IMPROVEMENT OF LOW QUALITY MEAT UTILIZING FUNCTIONAL INGREDIENTS

A Dissertation

by

BETSY LYN BOOREN

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2008

Major Subject: Food Science and Technology

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ABSTRACT

Improvement of Low Quality Meat Utilizing Functional Ingredients. (December 2008)

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Alternative methods to reduce the variation caused by pale, soft, and exudative (PSE) and dark, firm, and dry (DFD) conditions in meat tissues need to be examined. The objective of this dissertation was to determine if functional ingredients, like hydrocolloids and bicarbonates, improved the quality of PSE and DFD meat. This was accomplished by examining the rheological characteristics of meat model systems and products after enhancement with hydrocolloids and bicarbonates ingredient solutions. These results will be used to formulate and manufacture either enhanced beef steaks, beef roasts, or frankfurters to test the efficacy of use to improve the quality of DFD or PSE meat.

The flow behavior, steady-shear viscosity, and dynamic testing of hydrocolloid solutions were determined. Torsion Analysis (TA) and Texture Profile Analysis (TPA) were performed on PSE muscle tissue gel samples and frankfurters. Raw and cooked CIE color space values, pH, and sensory evaluation determination were made on meat gel samples, beef steaks, roast beef, and frankfurters.

Hydroxypropyl methylcellulose (1.0%HPMC), methylcellulose (1.0%SGMC), and konjac flour (0.125%KF) were found to be Newtonian in behavior. The dynamic moduli of these ingredients were resistant to changes in ionic strength and were tested for viability in a meat model system. Potassium bicarbonate (KHCO) was a viable substitute for sodium bicarbonate. The synergistic effect of combining KHCO with hydrocolloids, salt and sodium phosphate (SP) improved the color, pH, and textural properties of PSE ground pork and frankfurters, but did not effect sensory characteristics.

Acetic acid (AA), KF, and xanthan gum (XG) were added to beef steaks and bottom rounds to reduce the meat quality variation caused by high pH and animal age. The addition of AA and hydrocolloid treatments improved the color and pH of high pH muscles and did not appreciable affect shelf-life flavor of cooked roast beef. Solutions of AA, KF and XG were viable enhancement treatments for use in high pH beef bottom rounds to produce a fully cooked roast beef product.

DEDICATION

I dedicate this dissertation to my parents, Ann and Al Booren; sisters, Gail and Leslie Booren, whom without their love, support, friendship, and laughter I would not be nearly as successful as I have been. Thank you.

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NOMENCLATURE

η	Apparent Viscosity
K	Consistency Coefficient
n	Flow Behavior Index
$\dot{\gamma}$	Shear Rate
σ	Shear Stress

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CHAPTER I

INTRODUCTION: LITERATURE REVIEW

Pork Meat Quality – Pale, Soft, and Exudative

The pale, soft and exudative (PSE) condition is a common quality defect found in 10-40% of fresh pork muscles (Cannon and others 1995; Marriott and Schilling 1998). Between 1992 and 2002, the reported incidence of PSE had increased from 10.2% to 15.5% despite exhaustive research and interventions by the meat industry and producers (Miller 2004). PSE meat is characterized as having a soft and mushy texture, poor water holding capacity (WHC), and unnatural pale or grayish color. Postmortem pH decline of PSE meat is 3 times faster than normal muscle (Penny 1969), thus lowering muscle pH to below 6.0 within hours after harvest. The low pH of PSE muscle approaches muscle tissue's isoelectric point of 5.1 (Enfalt and others 1993), thus resulting in a greater protein denaturation compared to the favored protein-water attraction. Rapid pH decline in combination with elevated carcass temperatures causes the occurrence of protein denaturation, resulting in the loss of free water from the muscle (Briskey 1964; Bendall and Swatland 1988). The degree of protein denaturation in PSE products, specifically myosin, determines cooked product texture and cook loss (Offer and others 1989; Offer 1991).

Ideally the ability of the muscle proteins to gel is optimized in the pH range of 5.5 to 6.0 (Whiting 1984). The ability of PSE muscle to gel adequately decreases due to

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its low ultimate pH, 5.4 or lower, resulting in a weaker gel and loss of water (Camou and Sebranek 1991). Warner and others (1997) found that PSE chops had significantly higher raw drip loss (%), surface exudates, and CIE L* color values than normal pork loin chops. Processed meat products Decreased WHC, whether in fresh or processed pork, is detrimental to the meat industry since almost 75% of pork meat is sold with the addition of an enhancement solution or restructuring of the muscle tissues (Breidenstein and Williams 1987). The chemical and physical properties of thermally processed PSE muscle results in a product that is undesirable to the consumers in color, texture, and juiciness (Martinez and Zering 2004).

The decrease in pH of PSE muscle, also results in the loss of ability of the muscle to maintain buffering capacity, as seen by decreased protein functionality. Sodium bicarbonate (NaHCO), a common buffering agent in the food industry, assists in stabilizing muscle pH fluctuations and increases overall pH. The use of NaHCO has been shown to improve color, water holding capacity, and texture in both pre-rigor and post-rigor muscle (van Laack and others 1996, 1998; Kauffman and others 1998; Wynveen and others 2001; Alvarado and Sams 2003; Sen and others 2005). The addition of NaHCO can reduce the effect of a pH drop in PSE muscle (Kauffman and others 1998), although it is unable to emulate or retain protein functionality. Kauffman and others (1998) combined 0.3 M NaHCO with salt in an enhancement solution, but their inclusion increased saltiness of pork as determined by sensory panelists. However, NaHCO addition did significantly improve CIE L* color values and drip loss in pork muscle injected 24 h post-mortem (Kauffman and others 1998).

The causes of PSE in pork muscle, both ante- and post-mortem, have been studied extensively. Genotype and pre-harvest management have been shown to influence the potential development of PSE in the United States pig population and to affect muscle color, carcass composition and WHC (Cannon and others 1995).

Genotype

Carcass differences between swine breeds are common, but in the 1960's geneticists were able to identify a specific gene within the pig genome that was linked to the development of the PSE condition. This gene, the halothane gene, was linked to animals that were extremely sensitive to stress and had porcine stress syndrome (PSS). In the mid-1980's, another gene was linked with the increased occurrence of PSE characteristics in porcine muscle. Within in some Hampshire breed lines had a gene mutation, the Rendement Napole (RN) gene, which caused the PSE condition in these genetically susceptible animals. Both the halothane gene and the RN gene have been associated with the development of PSE in porcine muscle resulting in decreased muscle pH, loss of WHC, and paleness in color.

Halothane Gene

PSS is a genetic condition in which swine are unable to manage stress, ultimately resulting in premature death. The Halothane gene has been coined the PSS gene since exposure to halothane anesthesia gas or stress induced clinical malignant hyperthermia (Mitchell and Heffron 1982) that was diagnosed by the following symptoms: muscle rigidity, increased body temperature and increased levels of muscle lactic acid. The sensitivity to halothane is a recessive trait (n/n) and both animals with the n/n gene and carriers (N/n) have meat with PSE characteristics of increased drip loss, lower pH and pale color (Cheah and others 1984; Cheah and others 1998; Christian 1995; Fabrega and others 2002; Sather and others 1991). The Halothane gene is responsible for a mutation (RYR1) in the sarcoplasmic reticulum's ryanodine receptor in skeletal muscle (O'Brien 1986; Fujii and others 1991). The mutation causes increased levels of calcium (Ca^{2+}) to be released. Cheah and others (1984) reported that hogs that were halothane sensitive released Ca^{2+} at a greater rate during anaerobic metabolism than halothane insensitive hogs. During harvesting, as muscle converts from aerobic to anaerobic muscle metabolism, increased levels of Ca^{2+} causes extensive contraction within the muscle and increased post-mortem metabolism. The muscle is unable to control an elevation in temperature and the build-up of lactic acid. The rapid pH drop, as quickly as 1-hour post-mortem (Cheah and others 1985), in combination with elevated temperatures, causes the PSE condition to develop as proteins begin to denature, losing WHC and resulting in pale colored meat. Also, halothane sensitive animals have been reported to have greater levels of endogenous Ca^{2+} than insensitive animals with the rate of Ca^{2+} release being higher within the first 24 hours post-mortem (Cheah and others 1985).

Guardia and others (2004) demonstrated that animals with the n/n genotype were 81.1% more likely to develop PSE meat characteristics, almost double, the likelihood that N/N or N/n genotypes would develop PSE. The n/n genotype had a 21.87% greater likelihood of being PSE compared to roughly 5% for the N/N or N/n genotypes (Guardia and others 2004). Carcass differences have been documented between N/n carriers and N/N genotypes. Hamilton and others (2000) and Sather and others (1991) reported that

N/n carriers had shorter carcasses than normal animals, but according to Sather and others (1991) carcass yields did not differ. Heterozygous carriers have been found to express intermediate PSE conditions and halothane-sensitive traits compared to n/n and N/N animals (Sellier and others 1988). Halothane positive pigs have a higher lean muscle mass percentage, larger loin eyes, lower backfat thickness, and a higher lean/bone ratio than halothane negative pigs (Sybesma and Eikelnboom 1978; Oliver and others 1993). In contrast, Fabrega and others (2004) observed no differenced (P>0.05) in lean content and backfat thickness in halothane-positive and negative pigs. Sellier and others (1988) reported that breeds more sensitive to halothane, like the Pietrain breed and Belgian Landrace, had lower meat quality than those with a lower incidence of the halothane gene, like the Large White or Yorkshire breeds. Henckel and others (1992) did suggest that glycogen levels were a better predictor of PSE development than just selection against the halothane gene alone.

The monetary effect of PSS on producers and processors can be detrimental. Christian (1995) reported that producers and process could lose a minimum $10 per animal. Animals within breeds can be genetically tested for the Halothane gene, and many producers have already removed the gene from their genetic breed lines to reduce the negative impact of the Halothane gene.

Rendement Napole (RN)

In the mid-1980's, Le Roy and others (1990) identified a gene in Hampshire breed lines that caused the PSE condition in certain genetically susceptible animals. The Rendement Napole (RN) gene or Hampshire gene (McKeith and others 1998) was considered a dominant gene with the genotype being identified through DNA testing. Within the Hampshire population approximately 85% of the animals were carriers of the RN gene (Enfalt and others 1997b). Animals that have the dominant allele RN^- (either RN^-/RN^- or RN^-/rn^+) have lower post-mortem muscle quality since muscles exhibit the PSE characteristics of loss of protein functionality, loss of texture, WHC and paleness in color. Typically, no significant carcass differences were observed between RN^- and rn^+ carriers (Enfalt and others 1997a; Hamilton and others 2000; Miller and others 2000), though RN^- carriers have been documented to have leaner carcasses and decreased backfat thickness (Enfalt and others 1997a). The glycogen stores in skeletal muscle were greater for animals containing the dominant allele RN^- than those homozygous rn^+/rn^+ (Estrade and others 1993; Enfalt and others 1997a; Miller and others 2000).

Animals with the RN^- gene were able to produce greater quantities of muscle glycogen due to an altered AMP (adenosine monophosphate) kinase (Aberle and others 2001). During the harvesting process and the conversion of muscle to meat, the animal's biochemical pathways were still functional as long as energy stores were present. The break down of glycogen stores to glucose, in the presence of ATP, maintained the glycolytic pathway within the muscle. As the muscle proceeded to anaerobic metabolism, the levels of lactic acid increased thus lowering post-mortem muscle pH. Animals with the RN^- gene had a lower muscle pH than non-carriers due to the greater levels of glycogen in the muscle that was utilized in the production of lactic acid. Interestingly, the rate of pH decline during the conversion of muscle to meat for RN^- carriers was different ($P<0.05$) than non-carriers (Josell and others 2003b), which contrasted to the work of Monin and Sellier (1985). The ultimate lower post-mortem pH within the muscle causes protein denaturation and other similar effects seen in PSE meat (van Laack and Kauffman 1999). The unique mechanism of RN^- carriers having lower post-mortem pH, has allowed glycolytic potential to be used as a means to identify potential carriers (McKeith and others 1998). Levels of lactate, glycogen, glucose and glucose-6-phosphate were measured to determine glycolytic potential (Monin and Sellier 1985). Carriers of the RN^- gene had a glycolytic potential of 200 μmol lactate/g meat or greater (Monin and Sellier 1985; Fernandez and others 1992; Bertram and others 2000).

Meat with RN^-/rn^+ compared to rn^+/rn^+ allele has sensory tenderness differences, but sensory differences can be less for rn^+/rn^+ allele in taste intensity, smell intensity, and acidity (Lundstrom and others 1996; Josell and others 2003a). Warner-Bratzler shear force (WBS) values were similar between RN^-/rn^+ and rn^+/rn^+ meat (Miller and others 2000), which contrasted to the work of Josell and others (2003b) whom reported lower WBS for carriers. As expected, the muscle from RN^-/rn^+ carriers had greater cook loss (%), drip loss (%), pH, and paleness in color (Lundstrom and others 1996; Enfalt and others 1997a; Hamilton and others 2000; Josell and others 2003b). Though, Miller and others (2000) did not find CIE L*, a*, and b* color differences between RN^-/rn^+ and rn^+/rn^+ animals. Homozygote rn^+ carriers had narrow sarcoplasmic spaces that were similar to normal muscle, whereas RN^- had large, irregular intermyofibrillar spaces (Estrade and others 1993) that was hypothesized to affect drip loss of the muscle during storage.

Pre-harvest Management

Cannon and others (1995) reported a decrease in the incidence of PSE by use of improved animal handling and management practices prior to harvesting. Grandin (1994) believed that 10-15% of identified PSE was due to handling practices at the processing facility. Proper handling of the live animals, regardless of breed or genotype, has been shown to reduce the incidence of PSE. In 2002, the Pork Checkoff® launched the Trucker Quality™ Assurance Program, now designated the Transport Quality™ (TQA™) Assurance Program to help "swine transporters, producers and handlers understand how to handle, move and transport pigs and to enhance pig well-being and/or pork quality." (National Pork Board 2008).

Producers have reduced the potential development of PSE by consciously creating a growing environment that taught or familiarized the animals with noises, driving skills, and a familiarity with other hogs and humans needed to create a lower stress environment during transportation and harvesting. In the TQA™ manual (National Pork Board 2008), handlers were recommended to prevent sudden movements, loud noises, rough physical contact, and moving too many animals at one time. Handlers were encouraged to play radios to help the hogs adjust to potential noises that may be encountered during transportation and harvesting (Grandin 1994). Grandin (1994) also recommended that handlers walk through containment pens to allow the animals to adjust to a human presence to lessen their fear during handling. Hogs could be enticed to follow the driving directions of their handlers with equipment like sorting boards, shaker paddles, nylon flags, or caps, but not electric prods (Grandin 1994;

National Pork Board 2008). Other factors such as finishing pens constructed with familiar materials like concrete and metal, and ramps constructed at correct angles were needed to make transportation and the driving of the animals less stressful (Grandin 1994).

The conditions during transportation from the producer to the processor have been shown to affect the incidence of PSE in pigs. Length of transit, feeding, overcrowding, and temperature has affected quality in porcine muscle. Honkavaara (1989), as stated by Cannon and others (1995), determined that a transit time of less than 10-25 minutes had the lowest morality rate compared 45-80 minutes, which had the highest mortality rate. Assuming truck speeds of 60 mph or less, the recommended time of transit was roughly 30 miles or less from producer to processor. In the Pork Chain Quality Audit, Cannon and others (1996) reported that only 19.5% of hogs harvested traveled 50 miles or less, with the average distance being 93.7 miles.

In the TQA™ manual (National Pork Board 2008), transporters were given specific guidelines for the most effective method of loading, unloading, controlling temperature, prevention of overcrowding, maintaining the health of the animal and ensuring biosecurity during transportation. For instance, transportation ramps were recommended to have a 20-25 degree angle of incline for loading/unloading and the needed trailer square-footage based on live animal weight (National Pork Board 2008). Depending on weather season and current ambient temperature, trailer drivers needed to carefully plan with producers and processors delivery times, scheduled stops, and traveling conditions (Grandin 1994). Exposure temperatures to hogs on the transport trailers were controlled through the amount of bedding, damping of the bedding if hot, manipulation of trailer side-slants for air flow, and decreasing the amount of hogs per trailer (National Pork Board 2008).

Once at the harvesting facility, a variety of techniques have been employed to prevent or reduce stress inflicted on the animals prior to harvesting. Hogs that had access to water and had gone through fasting prior to harvesting typically had a reduced incidence of PSE in the final meat product (Warris and others 1994). Animals needed to be allowed to rest a minimum of 2-4 hours prior to harvesting with the recommendation that harvesting facilities schedule trucks to allow for rest (Grandin 1994). The reduction of body temperature and prevention of overheating to the hog have been achieved by showering the animal with water. Overheating of the hog must be prevented, as increased stress to the animal can lead to the development of PSE, particularly if the animal was stressed within 5 minutes of harvesting (Grandin 1994). To reduce body temperature, hogs can be showered with water and placed in pens that are not overcrowded.

Summary

Pale, soft and exudative meat has lower pH, poor texture, loss of free water, and paleness in color, which results in a final cooked product that is tough, dry, and unpalatable. PSE has been linked to the Rendement Napole gene and the Halothane gene that cause the genetic condition of Porcine Stress Syndrome. Genetic selection to eliminate these traits from breeds, and preventative handling has been demonstrated to reduce the incidence of PSE. Yet, genetics alone has not eliminated the PSE condition from the U.S. pork population. Producer, handler and processor pre-harvest management practices have reduced or decreased the incidence of PSE. Proper handling during confinement, transportation, and harvesting have an immediate impact on the formation of PSE traits in pork muscle.

Despite exhaustive genetic research and training of handlers, the incidence of PSE remains in the U.S. pork supply. The incidence of PSE affects producers, processors, and ultimately the consumer monetarily. Methods to improve the post-mortem PSE condition are needed to improve the quality of PSE pork, reduce variation in further processed pork products and increase the value of this low quality meat.

Beef Quality Improvement

The beef industry relies heavily on producing a beef product that is superior in palatability (Wulf and others 1997). The initial selection of a muscle affects tenderness, as do the chemical factors such as pH or ante- and post-mortem treatment of the muscle. Age, sex, and breed, also play an integral role in meat tenderness (Bailey 1989). The individual sub-primal chosen for a meat product greatly affects the attributes and quality of the final meat product (Bramblett and others 1959; McKeith and others 1985).

Tenderness is an important meat quality attribute that is affected by many different factors. The National Beef Tenderness Survey of 1998 (Brooks and others 2000) and the Beef Customer Satisfaction Study (Neely and others 1999, Lorenzen and others 1999, and Savell and others 1999) have demonstrated that tenderness was a contributing factor to consumer perception of taste. Boleman and others (1997) reported that consumers were willing to pay more for tender meat products and were able to detect variations in tenderness. Normally, less tender muscles were further processed to increase value. Morgan and others (1991) demonstrated that muscles from the chuck or round of a beef carcass need improvement in tenderness. Cooked beef bottom rounds can be tender after a long, moist cooking procedure (Noble and others 1990).

Dinardo and others (1984) and Powell and others (2000) have shown that increased length of cooking during thermal processing produced a more consistent, tender beef product. Meat thermally processed in a waterbath or a high moisture cook-in-bag environment compared to meat cooked in a conventional oven also produced a more tender beef product (Buck and others 1979; Dinardo and others 1984). Hamm (1966) and Draudt (1972) believed that the change in meat tenderness due to thermal processing was related to the interaction between myofibrillar proteins and collagen. Collagen solublized in the range of 60 ºC and 65 ºC (Seideman and Durland 1984; Brady and Hunecke 1985; Bailey 1989; Bertola, and others 1994). Machlik and Draudt (1963) observed that shear force values decreased in the temperature range of collagen solubility. The increase in tenderness was believed to be the result of collagen shrinking when exposed to a thermal treatment above 60 ºC (Bouton and others 1981; Leander and others 1980). The shrinkage causes the contraction of the collagen structure, thus resulting in loss of moisture (Davey and Gilbert 1974; Bengtsson and others 1976). The strength of the collagen structure may be reduced during shrinkage, thus contributing to the increased tenderness of the cooked meat (Beilken and others 1986; Powell and others 2000).

Overall maturity and ultimate muscle pH in beef have been shown to affect palatability, tenderness and overall appearance of end products. Beef with a normal pH, 5.4 to 5.7, from fed beef has a bright, cherry red lean color, and good flavor (Aberle, and others 2001). Carcasses harvested at advanced maturity, such as cows, were not comparable in these traits to young beef carcasses even at a normal pH (Smith and others 1982). Though, Miller and others (1983) reported no differences ($P>0.05$) for sensory attributes between steaks from young and mature animals. Cow muscles have been shown to have greater concentrations of myoglobin (Mb) and insoluble collagen (Cross and others 1973; Bailey 1989).

Methods to improve post-mortem whole muscle quality like dark, firm, and dry (DFD) muscle are needed. Dark-cutting beef or DFD is a meat quality defect characterized by increased muscle pH, water-holding capacity, and dark red color. Typically, DFD meat is the result of stress to animals prior to harvest and the inability of the animal to replenish glycogen energy stores. Longterm stress, applied to the animal, causes muscles to convert from an aerobic metabolism to an anaerobic metabolism as the muscle is unable to supply oxygen to its biochemical pathways. As glucose stores within the muscle are depleted, glycogen is broken down to provide the substrate, glucose, for anaerobic metabolism. If rest, feed, and water, prior to harvesting, do not replenish glycogen stores the muscle during the conversion to meat will not have an expected drop in pH to 5.8 or lower. After harvesting, normal muscle uses the glycogen stores to maintain energy in the muscle, which leads to a build up of lactic acid as pyruvate is unable to be utilized in the aerobic TCA cycle, thus lowering post-mortem muscle pH. The lack of glycogen results in a high ultimate muscle pH of 6.0 pH or higher, as lactic acid build-up is prevented.

The impact of DFD muscle, as reported by the 1995 National Beef Quality Audit (Smith and others 1995), cost the meat industry $100 million. Improvement of meat quality has occurred through genetics, nutrition, ante-mortem, and post-mortem interventions, yet muscle quality differences still exist. These factors are very difficult to control in a commercial meat processing facility, particularly in one where raw product is delivered in boxes or combo bins and little knowledge of the background of the meat product is known (Illing and Swan 1992; Little 2001). Post-mortem interventions have included the applications of organic acids like lactic and acetic acid, which have been applied primarily, to inhibit microbial growth, lower pH, and improve meat tenderness (Wenham and Locker 1976; Dixon and others 1987; Rao and Gault 1990; Lewis and Purslow 1991; Seuss and Martin 1993; Mikel and others 1996; Berge and others 2001; Young and others 2005). Also, Wulf and others (2002) reported more intense flavor and less tender ($P<0.05$) meat from DFD muscle compared to normal muscle. Alternative methods of improving DFD meat needs to be examined for texture and flavor improvement.

Meat Enhancement

The functionality of enhancement solutions when applied to muscle tissues will affect the quality of the meat product. A commercial enhancement solution typically contains the following: water, an alkaline sodium phosphate, and salt. Water acts as a carrier for the other components of the enhancement solution, but is also needed for additional moisture in the final cooked product (Murphy 2000).

The role of sodium phosphates in meat products varies based on the level added and the form used. The most common sodium phosphates used are alkaline sodium phosphates (SP). The primary role of SP is to increase water-holding capacity (WHC) by altering the ionic strength of the meat proteins to allow additional water molecules to bind to the protein (Pringle and others 1996). The increased WHC improves juiciness and also contributes to the texture of the meat product (Knipe and others 1990; Boles and Swan 1997; Detienne and Wicker 1999). Keeton and others (1984) observed that adding SP to frankfurters increased Texture Profile Analysis (TPA) attributes, particularly hardness, sensory panel attribute firmness, and amount of moisture in the raw and cooked products. Other phosphates like sodium acid pyrophosphate (SAPP) have been utilized as acidulants for color stability, anti-microbial effects and texture improvement (Hargett and others 1980; Madril and Sofos 1986; Calhoun and others 1996). Calhoun and others (1996) used SAPP with connective tissue in frankfurters to increase collagen solubility, which likely increased water binding capacity and texture within frankfurters.

Combined with phosphate, salt improves product texture (Stites and others 1989; Boles and Swan 1997; Wynveen and others 2001). The functions of salt in a meat product are primarily for flavor, extending shelf-life, and for extraction and binding of myofibrillar proteins (MacFarlane and others 1977; Whiting 1987; Mendonca and others 1989; Waters 2001). The alteration of ionic strength due to the addition of salt and sodium phosphate increases binding of myofibrillar proteins (Wu and Smith 1987) and increases WHC to give meat products a more firm and uniform texture. The synergistic effect of salt and SP has been shown to improve WHC, increased tenderness, increased pH, and increased cooking yield when compared to either ingredient individually (Ensor and others 1991; Shand and others 1993; Detienne and Wicker 1999; Robbins and others 2002; Alvarado and Sams 2003; Sen and others 2005). DeFreitas and others (1997) reported a lower protein transition temperature when 2% salt was added to pork muscle. The addition of salt and SP can alter not only protein denaturation, but also meat color by altering the ionic strength and pH of the muscle. The increase in WHC from salt and SP causes a darkening of the muscle as the light reflection is reduced and more water is bound to the protein (Fernandez-Lopez and others 2004).

Other ingredients may be included in enhancement solutions to improve meat quality. Such ingredients as antimicrobial agents, antioxidants to prevent lipid oxidation, flavorings or tenderizing agents may also be added in the form of marinades. Utilizing enhancement solutions as a method to decrease meat quality variation could include non-traditional ingredients like bicarbonate buffers and hydrocolloids.

Hydrocolloid Ingredients

Gums and hydrocolloids are ingredients that have the ability to thicken or gelatinize in aqueous systems. Typically, hydrocolloids are long-chain carbohydrate polymers that are soluble in an aqueous environment (Sharma 1981), which makes the use of these ingredients in a meat system ideal. The ability to entrap water and form a gel matrix despite changes in ionic conditions may improve WHC and texture of PSE meat tissue. The use of hydrocolloids and their functionality within meat systems has been well documented with a majority of the research conducted on restructured fish products (Perez-Mateos and others 2002; Montero and others 2001; da Ponte and others 1985) or other processed meat products (Funami and others 1998; DeFreitas and others 1997; Bater and others 1993, 1992; Egbert and others 1991; Wallingford and Labuza 1983). Processed meat products commonly have extracts, flours, and chemically modified hydrocolloids incorporated into a product to improve physical properties and add value (Glicksman 1982). Many low fat processed meat products contained hydrocolloids to improve texture and mouthfeel of the product (Keeton and others 1984).

Hydrocolloids in a whole muscle system may improve the textural properties of the muscle while binding the free water caused by protein denaturation of the PSE muscle or lowering pH in DFD muscle. All hydrocolloids selected for study in this dissertation are commonly used in dairy, beverage and processed meat products, but have not been used in whole muscle meat products. Additionally, hydrocolloids were chosen on manufacturer recommendations based on fluid and gel behavior over the temperature range of 4 - 85 °C and the pH range of 4.3 to 9.0. The temperature range was determined as the range that meat would be exposed to from the point of fabrication through cooking. The pH range of meat tissues included that of typical PSE and DFD meat, as well as the pH of fresh meat after the inclusion of SP and SAPP.

Methylcellulose Derivatives

Dow Chemical products, Methocel A4C FG®™, Methocel E15 FG®™, Methocel SG A150®™, (Dow Chemical Company, Midland, MI, U.S.A.) are being considered for use in meat products. The Methocel™ cellulose ingredients are available in two forms: methylcellulose (MC) and hydroxypropyl methylcellulose (HPMC). Each of these forms originates from cellulose, a linear polymer of β-(1,4) –D- glucose (Dow Chemical Company 2002). The difference between the two forms and other isoforms is the degree of substitution (DS) and molar substitution (MS) of methoxyl or hydroxyl groups to a glucose unit with a cellulose molecule. The DS describes the average amount of substitution per glucose unit on the 3 available reactive hydroxyl groups with the maximum of DS being 3. The MS was the amount of substituted hydroxypropyl moles per mole of glucose.

Methocel™ MC, per manufacture specifications, has a DS of 1.8 (Dow Chemical Company 2002). As the cellulose molecule is exposed to methyl chloride, it forms a MC molecule with methoxyl groups on the 2 and 6 carbon positions of the glucose unit. Methocel™ HPMC, per manufacture specifications, contains a DS of 1.9 and a MS of 0.23 (Dow Chemical Company 2002). The 0.23 mole of hydroxypropyl was substituted on the 2 carbon. Similar to the MC, the HPMC also has methoxyl groups on the 2 and 6 carbons (Dow Chemical Company 2002).

Typically, cellulose is insoluble in water due to its strong crystalline structure due to extensive inter- and intra- molecular hydrogen bonds, but disruption of the crystalline structure allows for bonding to additional molecules. The methylation and addition of hydroxypropyl groups prevents the cellulose molecule to form its desired crystalline structure due to disruption of the intermolecular bonding (Fennema 1996). Instead, methylation and hydroxypropylation of a cellulose molecule creates a 3-D organization that is a combination of crystalline and amorphous arrangements (Fennema 1996). The disruption of the intermolecular structure from the methyl and hydroxypropyl side groups allows for other molecules to bond the reactive side groups. As MC and HPMC are added to an aqueous solution, the water molecules can bond to the MC and HPMC and hydrate. As more water molecules bond to the MC and HPMC, swelling of the molecule occurs resulting in additional disruption of the intermolecular bonds. Eventually MC and HPMC will hydrate and then solublized in the aqueous solution resulting in an increase in solution viscosity. Optimal hydration temperature for MC is less than 13 ºC and for HPMC 25 ºC (Dow Chemical Company, 2002). Gelation occurs as the solutions are heated to the gelation temperature for MC between 50-55 ºC and HPMC 58-64 ºC (Dow Chemical Company, 2002).

MC and HPMC may have limited interaction with other polymers. This interaction is dependant on the ability of polymers to form intermolecular bonds with side groups of the cellulose chain. For instance, proteins may hydrogen bond to the MC and HPMC side groups (Bernal and others 1987).

Xanthan Gum

Xanthan gum (XG) is a polysaccharide fermentation by-product of the bacterium *Xanthomanoas campestris* (Fennema 1996). XG's structure consists of a backbone of glucose units similar to cellulose (β-(1,4) –D- glucose), but it contains side chains containing 2 mannose and 1 glucuronic acid with ½ of the side chains containing a pyruvic acid at the terminal mannose unit (Jannsson and others 1975). The side chains of the XG molecule have extensive intramolecular hydrogen bonding which forms a helical structure that is very stable to pH and temperature changes. XG molecules are able to form intermolecular bonds among each other creating double-helical associations (Jannsson and others 1975). In an aqueous solution, XG is very viscous even at low concentration levels and water molecules are able bond to its unique side chains resulting in an increased water-binding capacity (WBC) (Wallingford and Labuza 1983). As the xanthan molecule swells from the breaking of intermolecular bonds and disruption to the double-helical structure, viscosity is increased. Applying a steady shear, XG solutions exhibit shear-thinning or a decrease in viscosity. The shear causes a disruption within the conformation of the XG molecules and results in a re-alignment into a linear orientation. This allows for greater intermolecular association to occur, which would results in a lower solution viscosity. After removing the shear, the shear-thinning fluid behavior of a XG solution is not be permanent and the viscosity increases.

XG interacts with various other hydrocolloid polymers. In many situations, the double-helical XG network will interact with galactomannon polymers like guar gum, locust bean gum, and konjac flour. Galactomannon polymers consist of mannose chains with galactose side chains (Fennema, 1996). The ratio of mannose to galactose dictates the interaction with XG with higher ratios forming stronger gel networks. The lower the number of galactose units creates regions within galactomannon polymers that are linear. The greater the linear regions, the more interaction that occurs with the XG, thus forming a stronger gel. The intermolecular bonding between XG and other galactomannon polymers may be affected by concentration, pH and salt level.

Foegeding and Ramsey (1987) reported a decrease ($P<0.05$) of texture properties for meat gels with xanthan gum added.

Gellan Gum

Gellan Gum (GG) and its isomers form in a similar manner as xanthan gum. It is a fermentation by-product of a bacterium *Sphingomonas elodea* (Pollock 1993). The GG polymer consists of a linear anionic tetrasaccharide repeating unit consisting of 1,3-β-D-glucose, 1,4-β-D-glucuronic acid, 1,4-β-D-glucose and 1,4-α-L-rhamnose (Imeson 1997). The tetrasaccharide may have an average of 1.5 acyl substitutions per tetrasaccharide unit (1,3-β-D-glucose: 2 carbon substitution is glycerate and 6 carbon is acetate) (Imeson 1997). This branched structure also forms a helical structure similar to that described previously for XG. The extent of intermolecular bonding also dictates solution viscosity and bonding with other polymers. The substitution of acyl groups typically produces less brittle and more elastic gels than the unsubstituted structure as the helical structure was not as organized to form crystalline regions.

The hydration of GG in an aqueous solution is dependant on the ionic state of the water being used (Imeson 1997). Deionized and soft water will allow for partial hydration, but hydration in hard water, with high levels of divalent ions, is limited unless heat is applied to the solution. Divalent ions, like calcium, can bond to the GG molecule preventing the hydrogen bonding of water molecules. As the divalent ions disassociate with increase in temperature, hydration of the GG molecules occurred and viscosity increases. Like XG, GG exhibits, though less severe, shear-thinning flow behavior (Imeson 1997). GG viscosity is also sensitive to temperature changes. An increase in temperature lowers the viscosity caused by a disruption within the conformation of double helical structure due to loss of the stabilizing hydrogen bonds. During gel formation, GG, without the presence of cations, forms a gel network that is stable until temperature is applied (Imeson 1997). In the presence of cations, Gunning and Morris (1990) believe the double helical structure is stabilized by interactions with cations. The cations evidently caused association interaction between the GG structures, resulting in crystalline regions within gel network (Tang and others 1994).

The intermolecular bonding between GG and other polymers may be affected by concentration, pH and ionic strength. Due to its anionic nature, gellan gum may actually entrap other polymers or proteins within a gel matrix.

Konjac Flour

Konjac flour (KF) is processed from the tuber of the *Amorphophallus konjac* plant (Imeson 1997). KF, a polysaccharide, consists of linear galactomannon repeating units (β-1,4 with a mannose: glucose ratio of 1.6:1) and has acetyl side groups typically one every six residues (Imeson 1997). Similar to other hydrocolloids, KF has extensive intra- and inter- molecular hydrogen bonding, but is able to hydrate into an aqueous solution. As konjac flour is hydrated, the viscosity increases due to the disruption of intermolecular hydrogen bonding.

Due to its linear structure, konjac flour is able to interact with other polymers like GG or XG. The linear sections between acetyl side groups are able to interact with the double helical structure of XG or GG thus forming a gel network. Heating of the KF-XG/GG structure causes a conformation change in the XG molecule. The combination of interchain associations, when cooled, forms a stronger gel than each separately (Imeson 1997). The addition of a weak base and an increase in temperature removes the acetyl group, resulting in a thermally stable gel. The removal of the acetyl group allows the linear glucomannan units to form a gel network that is even stable during reheating (Imeson 1997).

Summary

Incorporation of hydrocolloids to in a meat system is dependant on understanding the hydrocolloid's functional properties (Albertsson 1971; Walkenstrom and Hermansson 1994) such as the degree of gelation or thickening and is dependent upon the hydrocolloid concentration, temperature, pH and ionic strength within the food system (Sarkar 1979; Stone and Stanley 1994; Sudhakar and others 1995; Drohan and others 1997; Walkenstrom and Hermansson 1997; Zasyphkin and others 1997; Dickinson 1998; Marcotte and others 1998). The utilization of hydrocolloids within a meat system is dependant on a complete understanding of the hydrocolloid's functional properties, and the protein-hydrocolloid equilibrium states of miscibility, thermodynamic incompatibility and complex coacervation (Walkenstrom and Hermansson 1994; Dickinson 2003).

Utilizing enhancement solutions that include hydrocolloids as a method of improving PSE and DFD muscle should be considered since muscle protein functionality cannot be recovered by pH adjustment alone (Lan and others 1995a). Both, XG and KF, have the ability to hydrate in an aqueous environment, potentially mask off-flavors present in DFD meat (Pangborn and others 1973; Pangborn and Szczesniak 1974), and lower muscle pH as their structures have unique functional properties (Shand and others 1993). The partially denatured state of PSE muscle proteins may result in a more ordered gel matrix than normal muscle, which most likely will cause an increase in gel strength (Lan and others 1995b). The combined addition of buffers, hydrocolloids, salt and phosphate may improve protein functionality of PSE meat, as the partially denatured PSE protein allows for greater flexibility for interaction with larger hydrocolloid molecules (Ensor and others 1991). The steric arrangement of muscle structure during the conversion of muscle to meat alters the arrangement of fiber bundles creating and increasing inter-spatial spaces between muscle fibers altering WHC and texture of the muscle (Schafer and others 2002). These spaces, particularly in PSE muscle, could be filled with hydrocolloid gels to improve or emulate protein functionality. Also, water trapped within hydrocolloid gels typically exhibit physical properties of free or bound water that remains bound or has a high water-binding capacity (WBC) when stress is applied to the gel structure (Wallingford and Labuza 1983). These unique properties of hydrocolloid gels make their application in a whole muscle system, particularly PSE muscle advantageous. Consideration must also be given to the protein configurations that have changed during heating and how they may have affected the rheological properties of meat proteins (Wu and others 1985). The addition of salt and SP may more effectively lower protein transition temperatures in a meat system than polysaccharides (DeFreitas and others 1997).

The protein: hydrocolloid interaction influenced the chemical and physical properties of a meat product by altering protein configuration during denaturation or binding water typically lost during cooking (Bernal and others 1987; DeFreitas and others 1997). Doerscher and others (2003) suggested that adding 20% or more pork collagen to isolated myofibrils interfered with heat-set gelation matrix, while 10% added pork collagen did not interfere with meat gelling. A similar theory may be true if hydrocolloids were added to a meat system. Shand and others (1993) concluded that adding hydrocolloid to a restructured beef product increased cook yield, but the lack of bind and texture properties offset the positive effect. Imeson and others (1977) found that anionic polysaccharides prevented protein: protein gelling of bovine serum albumin, and that any protein: hydrocolloid interaction was electrostatic. Foegeding and Ramsey (1987) also reported interference with the meat gelation process when hydrocolloids were added. The use of selected hydrocolloids in a whole muscle system may not have the protein: hydrocolloid difficulties found in processed meat products, but functionality has not been evaluated for processing in a whole muscle system.

Meat Texture Analysis

Rheological prediction of meat protein behavior has been examined by a variety of methods such as dynamic analysis, torsion testing, and TPA. Each method has strengths and weaknesses as it has been applied to muscle proteins and meat products. The encompassing benefit of characterizing meat gel behavior is the potential prediction of texture and sensory texture properties of the final product. This section examines each method and highlights rheological research performed on meat products and muscle proteins.

Dynamic Analysis

Dynamic testing of a sample is a non-destructive empirical method of characterizing viscoelastic foods through oscillation. At a constant strain and frequency, the dynamic moduli of a viscoelastic food can be quantified. The storage modulus (G′) is the measure of elasticity within the food product. The loss modulus (G′′) is the measure of the viscous component of the food product. Examination of the relationships between G′ and G′′ can predict gel behavior, gel strength and the point of gelation.

Most rheological studies involving meat gels have been performed on isolated myofibrils suspensions (Liu and Foegeding 1996; Boyer and others 1996; Xiong and Blanchard 1994; Egelandsdal and others 1986a, 1986b). Egelandsdal and others (1986a) stated that the dynamic moduli, G′ and G′′, were dependant on many factors like ionic strength, temperature, and protein configuration. Boyer and others (1996) suggested that native myofilaments could form a functional gel matrix in a low temperature, low ionic environment if the muscle filaments were pre-solublized in a 0.6 M or greater ionic solution first. The isolation of myosin filaments via ammonium sulphate (Egelandsdal and others 1986b) also has been examined. At low ionic strengths (0.24 M), myosin fibrils when heated to temperatures lower than 54 °C and stored up to 2 weeks, had lower G` indicating a weaker gel strength (Egelandsdal and others 1986b). Since myosin filaments were isolated, the orientation of the filaments may occur thus impacting gel strength (Engelandsdal and others 1986b), which may cause difficulty in predicting gel strength in whole muscle. Similarities in rheological properties would be expected using only one meat source like *Longissimus dorsi* muscle, but potential differences may likely be explained by muscle fiber type, state of rigor, fat content, collagen content, pH, and other endogenous properties of the muscle that were not controlled from their homeostatic state.

Examination of dynamic moduli has been performed to determine the effect of heat on muscle proteins, particularly at protein transition temperatures. Egelandsdal and others (1986a; 1986b) and Montejano and others (1984) found a weakening of meat gels during the denaturation of myosin filaments between 50 and 60 °C, but strengthening occurred as the filaments re-organized at higher temperatures (Boyer and others 1996). Further work of Egelandsdal and others (1986a) examined the effect of heavy meromyosin (HMM) and light meromyosin (LMM). They suggested that the increase of G' below 50 °C was due to the crosslinking of the HMM and the denaturation of LMM proteins caused a weakening of gel strength above 50 °C (Egelandsdal and other 1986a; Sano and others 1990; Boyer and others 1996). Xiong and Blanchard (1994) reported similar values and showed that HMM and actin proteins had increased protein: protein interactions and became insoluble when heated to 50 °C. This was also true for the actomyosin complex (Jiménez-Colmenero and others 1994). Fiber type also affected gel strength as Type IIB was 3 times more rigid than Type I fibers during thermal processing (Boyer and others 1996). This was further demonstrated as turkey gels were stronger than pork and beef (Montejano and others 1984). Also, Barbut and Mittal (1993) showed that pH differences and muscle fiber types impacted the rheological properties of muscle gels by having differences in dynamic moduli and their relationships to each other.

Texture Profile Analysis

In the 1963, General Foods introduced the Texturometer (Friedman and others 1963; Szczesnik and others 1963), which imitated the mastication of food products through 2 compressions and the measurement of force and time relationships. After several modifications and an adaptation to an Instron Universal Testing Machine (Bourne 1978; Bourne and others 1978), the following texture parameters were defined: fracturability, hardness, cohesiveness, adhesiveness, springiness, gumminess and chewiness. Fracturability was the force in which the sample crumbles, cracks or shatters (Szczesniak and others 1963), but Bourne and others (1978) defined the parameter as being a sudden reduction in force. In frankfurters, fracturability has been found difficult to isolate and define on the force-distance curves (Bourne and others 1978), as the parameter can only be identified 50% of the time. Hardness, or Hardness 1st-bite, was the maximum amount of force measured during the first compression (Bourne 1978). The second peak, or Hardness 2nd-bite, was the measurement of peak force during the second compression. Cohesiveness was calculated as a ratio of the positive force area under peak 2 over the area under peak 1 (Bourne 1978), giving a magnitude of how the food product recovers between compressions. Adhesiveness was the negative force area, measuring how much work was needed to remove the compression probe from the food product (Bourne 1978). Springiness was the height the food product recovers between compressions (Bourne 1978). Gumminess and chewiness were calculated parameters based from previously defined parameters. Gumminess, commonly associated with the denseness of the food product through chewing, was the product of Hardness 1st-bite and cohesiveness (Szczesniak and others 1963; Bourne 1978). Chewiness was the product of gumminess and springiness (Bourne 1978) as it encompassed the hardness, cohesiveness and elasticity of the food product (Szczesniak and others 1963).

Texture profile analysis (TPA) has been correlated to sensory panel evaluation (Szczesniak and others 1963) and has been an effective tool to predict the sensory texture properties of food products, including meat gels (Shand and others 1993; Calhoun and others 1996). Barbut and Mittal (1993) demonstrated that TPA analysis could detect differences in muscle type and pH of turkey meat, and that the gumminess attribute behaved as expected with higher values when pH was increased. Keeton and others (1984) evaluated non-meat proteins such as soy, milk and wheat gluten as ingredients in frankfurters and their effect on sensory and texture characteristics. The use of TPA by Calhoun and others (1996) was used to evaluate the texture for low-cost ingredient substitution in low fat frankfurters. Hargett and others (1980) using TPA found that frankfurters containing sodium acid pyrophosphates did affect the texture and sensory properties, particularly skin formation.

Torsion Testing

Torsion testing has examined the failure parameters of gel samples for prediction of texture in food products. Torsion testing measured 2 parameters at gel failure: shear stress and strain. The shear stress quantified the structural strength of a gel before failure, while the strain measured the deformity of the gel was able to withstand before failure (Montejano and others 1984b; Montejano and others 1985). Gel samples were milled to a standard dumbbell shape with torque and time rotation of 2.5 rpm (Kim and others 1986). Standardization of sample size allowed for consistent comparison within samples and among different food products. Shear stress had been highly correlated to the TPA attribute hardness. Strain was correlated to the TPA attribute of cohesiveness and found to be the most effective predictor of sensory texture (Montejano and others 1985).

Torsion testing has been performed on many types of food gels such as egg whites (Montejano and others 1984a) and meat gels (Montejano and others 1984b; Montejano and others 1985; Kim and others 1986; Saliba and others 1987; Lavelle and Foegeding 1993; Liu and Foegeding 1996). Lavelle and Foegeding (1993) isolated turkey breast and thigh myofibrils to determine if salt, pH and heating rate affected the fracture properties of their meat gels. The meat type and level of salt (between 0.5 to 1.0 M) did not effect the fracturing of the turkey gels, while pH and endpoint temperature did ($P<0.05$) influence shear stress and strain (Lavelle and Foegeding 1993). Saliba and others (1987) also examined the impact of heating rate and the addition of sugar on frankfurter production and gel strength. Similar to Lavelle and Foegeding (1993), heating rate had a greater influence on meat gel strength than added ingredients (Saliba and others 1987).

Objective of Dissertation

Alternative methods to reduce the variation induced by quality defects of PSE and DFD need to be examined. Hydrocolloids as ingredients have been incorporated into processed products in the meat industry, but not in whole muscle systems, as their behavior has been hard to predict. The ability to characterize the rheological behavior of hydrocolloid samples would allow selection of potential hydrocolloid ingredients for use in a meat system. The objective of this dissertation is to determine if functional ingredients, like hydrocolloids and bicarbonates, will improve the quality of PSE and DFD meat. This will be accomplished through evaluation of ingredient complexes for use in meat enhancement solutions, meat model systems, and meat products.

CHAPTER II

MATERIALS AND METHODS

Phase 1: Rheological Behavior of Enhancement Solution Ingredients

Study 1: Rheological Behavior of Hydrocolloids

Treatment Solutions

Select hydrocolloid at various concentrations (Table 1) were hydrated and solublized per manufacturer specifications. For more efficient hydration, MC, HPMC, and SGMC were hydrated and solublized in an ice water slurry, whereas the remaining hydrocolloids were hydrated and solublized in double-distilled, de-ionized water. Samples were mixed within a 250 mL glass beaker by a magnetic stir-bar on a stir-plate until hydrated and solublized. Treatment solutions were raised to a final volume of 200 mL, and held at 4 °C until analysis. Treatment solutions were tested at 0, 24, and 48 h to determine if refrigeration storage affected treatment fluid behavior. Prior to analysis, samples were allowed to equilibrate to 25 °C.

Flow and Dynamic Behavior

Approximately, 0.5-1.0 mL of treatment solution was used within the Haake RS 100 Controlled Stress Rheometer (Thermo Electron Corporation, Madison, WI, U.S.A.) with cone and plate fixture (60 mm and 1^o angle) to characterize sample flow and gel behavior. Up-down shear-rate sweeps from 0.01 to 100 s^{-1} were conducted for each sample at room temperature (25 °C). Flow behavior and steady shear viscosity was determined using standard methods (Steffe 1996). The region of linear viscoeleasticity

Table 1. Hydrocolloid ingredient solution concentrations.

Treatment	Concentration (w/v)		
Methylcellulose (MC)[a]	1.0%	2.0%	3.0%
Hydroxypropyl Methylcellulose (HPMC)[b]	1.0%	2.0%	3.0%
Super Gelling Methylcellulose (SGMC)[c]	1.0%	2.0%	3.0%
Xanthan Gum (XG)[d]	0.25%	0.50%	0.75%
Konjac Flour (KF)[e]	0.125%	0.25%	0.50%
Gellan Gum (GG)[f]	0.25%	0.50%	0.75%
Gellan Gum for low temp (GGLT)[g]	0.0625%	0.125%	0.25%

[a]Methocel A4C FG®™, Dow Chemical Company, Midland, MI, U.S.A.
[b]Methocel E15 FG®™, Dow Chemical Company, Midland, MI, U.S.A.
[c]Methocel SG A150®™, Dow Chemical Company, Midland, MI, U.S.A.
[d]Keltol® 521, CPKelco, Chicago, IL, U.S.A.
[e]Nutricol® XP 3464, FMC Corp., Philadelphia, PA, U.S.A.
[f]Kelgogel®, CPKelco, Chicago, IL, U.S.A.
[g]Kelgogel® LT100, CPKelco, Chicago, IL, U.S.A.

was determined by conducting a stress sweep at 1 Hz. Dynamic testing was performed to establish the onset of gelation and stability of gels under temperature sweeps (4 - 85 ^{o}C, 1.0 Pa, heating rate 30 ^{o}C/min) with temperature regulated by the Haake TC81 Peltier Temperature Controller (Thermo Electron Corporation, Madison, WI, U.S.A.). It was assumed that no slip was present between the sample and cone and plate attachments. Also during the temperature sweep, it was assumed no evaporation occurred at the higher temperatures. Samples were tested in triplicate.

Study 2: Rheological Behavior of Hydrocolloids with Sodium Chloride and Sodium Phosphate

Treatment Solution

Hydrocolloid treatments and concentrations (Table 2) were hydrated and solublized as previously described. To understand the effect of varying the ionic strength on rheological properties 0.0, 0.5, 1.0 1.5, 2.0, 2.5, and 3.0% sodium chloride (NaCl) and 0.0, 0.1, 0.2, 0.3 and 0.4% sodium phosphate (SP) were added to each hydrocolloid solution at each respective concentration. Samples were solublized and held at 4 °C until analysis. Prior to analysis, samples were allowed to equilibrate to 25 °C.

Flow and Dynamic Behavior

The dynamic moduli of treatment solutions were determined as previously described.

Table 2. Hydrocolloid ingredient solution concentrations evaluated at varying sodium chloride and sodium phosphate concentrations.

Treatment	Concentration (w/v)	
Methylcellulose (MC)[a]	1.0%	2.0%
Hydroxypropyl Methylcellulose (HPMC)[b]	1.0%	
Super Gelling Methylcellulose (SGMC)[c]	1.0%	2.0%
Xanthan Gum (XG)[d]	0.25%	0.50%
Konjac Flour (KF)[e]	0.125%	0.25%
Gellan Gum (GG)[f]	0.25%	0.50%
Gellan Gum for low temp (GGLT)[g]	0.0625%	0.125%

[a]Methocel A4C FG®™, Dow Chemical Company, Midland, MI, U.S.A.
[b]Methocel E15 FG®™, Dow Chemical Company, Midland, MI, U.S.A.
[c]Methocel SG A150®™, Dow Chemical Company, Midland, MI, U.S.A.
[d]Keltol® 521, CPKelco, Chicago, IL, U.S.A.
[e]Nutricol® XP 3464, FMC Corp., Philadelphia, PA, U.S.A.
[f]Kelgogel®, CPKelco, Chicago, IL, U.S.A.
[g]Kelgogel® LT100, CPKelco, Chicago, IL, U.S.A.

Phase 2: Pork Meat Model Systems

Study 1: Texture Behavior of Ground Pork Gels Containing Hydrocolloids and Buffer Ingredients

Treatment Solution

Hydrocolloid ingredients were hydrated and solublized as previously described. Buffer ingredients, at 0.3 M concentration, were added individually to treatment solutions, at a specific concentration level, and allowed to solublize (Experiment 1: Table 3; Experiment 2: Table 4). All solutions were then raised to a final volume of 200 mL. Prior to analysis, samples were allowed to equilibrate to 25 °C.

Meat Gel Preparation

Fresh, vacuumed-packaged normal (pH 5.6-5.9) and PSE (pH < 5.4) pork loins were shipped to Kleberg Center at Texas A&M University, College Station, TX. Each *longissimus dorsi* muscle was trimmed of all visible subcutaneous fat and connective tissue. Utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ, U.S.A.) which was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196) to ensure consistency among days, CIE L*, a* and b* color space values were determined, in triplicate. The pH, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA, U.S.A.) was also determined. Color and pH measurements were taken on the transverse surface of the *longissimus dorsi* muscle to verify pH selection. Loins were ground first through a 1.27 cm plate then through a 0.476 cm plate (Hobart Corporation, Model 4612, Troy, Ohio, U.S.A.), divided into

Table 3. Treatment Solutions.

Treatment
Control
ddH2O
Hydrocolloids
HPMC[a]
SGMC[b]
KF[c]
Sodium Bicarbonate/Hydrocolloid
NaHCO[d]
NaHCO[d]/HPMC[a]
NaHCO[d]/SGMC[b]
NaHCO[d]/KF[c]
Potassium Bicarbonate/Hydrocolloid
KHCO[d]
KHCO[d]/HPMC[a]
KHCO[d]/SGMC[b]
KHCO[d]/KF[c]
Ammonium Bicarbonate/Hydrocolloid
NHHCO[d]
NHHCO[d]/HPMC[a]
NHHCO[d]/SGMC[b]
NHHCO[d]/KF[c]

[a]Hydroxypropyl Methylcellulose (HPMC) – 1% (w/v): Methocel E15 FG®™, Dow Chemical Company, Midland, MI, U.S.A.
[b]Methylcellulose (SGMC) – 1% (w/v): Methocel SG A150®™, Dow Chemical Company, Midland, MI, U.S.A.
[c] Konjac Flour (KF) – 0.125% (w/v): Nutricol® XP 3464, FMC Corp., Philadelphia, PA, U.S.A.
[d]0.3 M buffer concentration

Table 4. Treatment solutions for pork gels and frankfurters.

Treatment
Meat Gels
Control
ddH2O
NaCl[a]/SP[b]
Bicarbonate Buffers
KHCO[c]
NHHCO[c]
Hydrocolloids
KF[d]
HPMC[e]
Bicarbonate/Hydrocolloid/Salt/Sodium Phosphate
KHCO[e]/KF[d]
KHCO[e]/KF[d]/NaCl[c]/SP[d]
NHHCO[c]/HPMC[e]
NHHCO[c]/HPMC[e]/NaCl[c]/SP[d]
Frankfurter
Control
KHCO[c]
KHCO[c]/HPMC[e]
KHCO[c]/KF[d]

[a]0.75% (w/v) salt
[b]SP (Sodium Phosphate) – 0.2% (w/v): Brifisol® 85 Instant, pH 8.5, BK Giulini Corp., Simi Valley, CA, U.S.A.
[c]0.3 M buffer concentration
[d]Konjac Flour (KF) – 0.125% (w/v): Nutricol® XP 3464, FMC Corp., Philadelphia, PA, U.S.A.
[e]Hydroxypropyl Methylcellulose (HPMC) – 1% (w/v): Methocel E15 FG®™, Dow Chemical Company, Midland, MI, U.S.A.

200 g portions and held at 4 °C. Each 200 g portion of normal or PSE sample was randomly assigned to a treatment solution prepared within 48 h of use. Individual treatment solutions were added to meat samples at 12% (w/w) of ground weight to simulate injection into a whole muscle system, and were homogenized for 60 s in a food processor (KitchenAid, Hobart Corporation, Troy, Ohio). Homogenized meat samples were bagged in oxygen impermeable plastic bags (OTR 1 $cm^3/m^2/$ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH), vacuum packaged, and stored at 4 °C.

Approximately, 15 g aliquots of homogenized meat sample were hand stuffed into 5 disposable polystyrene culture tubes (17 mm outer dia x 100 mm length, constant wall thickness) for rheological analysis. A second set of samples was prepared for cooked color and pH analysis, a 45 g aliquot of homogenized meat sample was hand stuffed into a disposable 50 mL polystyrene centrifuge tube. Tubes were capped and centrifuged (Garver Electrifuge, Model 54, Garver Manufacturing Co., Union City, IN, U.S.A.) at 600 x g for 30 min to remove air pockets and firmly pack the sample. Sample tubes were heated to a 75 °C endpoint in a water bath having a heating rate of approximately 0.75 °C /min. Sample temperature was monitored by inserting a copper constantan wire thermocouple (Omega Engineering, Inc., type T thermocouple, Stamford, CT, U.S.A.) into the geometric center of 1 sample tube per rack. Temperature was monitored with electronic thermometer (Omega Engineering, Inc., Model HH501BT, Stamford, CT, U.S.A.). After reaching 75 °C, samples were removed from water bath, capped and stored a minimum of 8 h at 4 °C.

Color and pH Analysis

Cooked meat gels were removed from 50 mL polystyrene tubes and cut in half laterally. Cooked CIE L*, a* and b* color space values were measured, in triplicate, using a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ, U.S.A.) which was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196). The pH was measured, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA, U.S.A.) at the interior cut surface on the pork gel.

Texture Analysis

Torsion Analysis

Torsion analysis was performed utilizing a digital viscometer modified with a torsion fixture (Brookfield viscometer, model 5XHBTD, London, England). Gel samples were prepared and analyzed according to the methods of Kim and others (1986). Gels samples were removed from 15 mL tubes and cut into 5, 28.7 mm samples. Plastic torsion disks designed for the torsion fixture were affixed to each end of gel sample with cyanoacrylate glue. The specimen was then milled into a dumbbell shape with a midsection diameter of 10 mm, and the sample placed on torsion apparatus. The mean shear stress (kPa) and strain at gel failure were determined on 5 replications of the same sample.

Texture Profile Analysis

Texture profile analysis (TPA) as described by Bourne (1978) was performed using a TA-XT2 Texture Analyzer (Texture Technologies Corp., Scarsdale, NY, U.S.A.)

with Texture Expert software (Stable Micro Systems LTD, version 1.16, 1997) and a 60 mm dia plunger attachment. Meat gels were removed from the 15 mL culture tubes and allowed to equilibrate to room temperature. Five meat gels per treatment were cut into a 1 dia : 1 length ratio and tested within 20 min to prevent loss of sample integrity due to evaporation. Pre-test and test speed was set for 1 mm/s. Samples were compressed twice. Each compression was at 75% of initial sample height with a 5 sec delay between compressions. Post-test speed was 2 mm/s. Hardness 1st bite (N), hardness 2nd bite (N), cohesiveness, and gumminess (N) were determined.

Energy Dispersive X-ray Spectroscopy

Energy Dispersive X-ray Spectroscopy (EDS) imaging was performed to visualize treatment solutions in the meat gel system. Normal pork and KF treated cooked meat gels were prepared as previously described. Samples were transferred to Texas A&M University Microscopy and Imaging Center for imaging preparation. Samples were excised to 2-3 mm cubes and prepared according to the methods of Ellis and Pendleton (2007) and Hawkins and others (2007). Imaging was performed on a Joel JSM-6400 equipped with a PGT EDS System.

Statistical Analysis

<u>Experiment 1</u>

Data were analyzed using the Proc GLM Model procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC, U.S.A.) as a 2 x 17 factorial arrangement with meat (normal, PSE) and treatment solution (Table 3), and meat by treatment solution as main effects. Processing day, processing day by meat, and processing day by treatment was included as a block. Significance was defined as $P<0.05$. Least squares means were determined and where Analysis of Variance indicated significance, least squares means were separated by the pdiff procedure of SAS using an alpha of <0.05.

Experiment 2

Data were analyzed using the GLM Model procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC, U.S.A.) as a 2 x 11 factorial arrangement with meat (normal, PSE) and treatment solution (Table 4) as main effects blocked by processing day. Significance was defined as $P<0.05$. Least squares means were determined and where Analysis of Variance indicated significance, least squares means were separated by the pdiff procedure of SAS using an alpha of <0.05.

Phase 3: Application of Hydrocolloids, Bicarbonates, and Acid Ingredients in Meat Products

Study 1: Frankfurters

Treatment Solution

Hydrocolloid and buffer solutions (Table 4) were prepared as previously described. Prior to analysis, samples were allowed to equilibrate to 25 °C.

Frankfurter Preparation

Fresh, vacuumed-packaged normal (n=3, pH 5.6-5.9) and PSE (n=3, pH < 5.4) pork loins were shipped to the Rosenthal Meat Science and Technology Center at Texas A&M University, College Station, TX, a state-inspected (Texas Department of Health) facility. Fresh ground beef trimmings (80/20) and frozen pork fat trimmings (60/40) were purchased from local vendors. Pork loins and thawed pork fat trimmings were ground through a 1.27 cm plate. The frankfurter formulation, on a percentage basis, for meat trimmings and non-meat ingredients is shown in Table 5. Meat trimmings and non-meat ingredients were chopped and emulsified in a bowl chopper (Type K64V-VA, Seydelman, Germany), and then stuffed into 28 mm dia collagen casing at approximately 90 g per link. Frankfurters were thermal processed in a smokehouse (model 1000, Alkar, Lodi, WI, U.S.A.) using an incremented cook cycle to a final internal temperature of 71 °C. After cooking, frankfurters were showered with water for 15 min to reduce product temperature and placed in a 4 °C cooler for a minimum of 12 h. Frankfurters were vacuum-packaged in oxygen impermeable vacuum bags and stored at 4 °C until analysis.

Color and pH Analysis

Frankfurters were cut in half latitudinally. Cooked CIE L*, a* and b* color space values were measured, in triplicate, using a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ, U.S.A.) was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196) to ensure consistency among days. The pH was measured, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA, U.S.A.). Color and pH measurements were determined at interior cut surface of the gel.

Texture Analysis

Torsion and TPA Analysis

Frankfurters were prepared and analyzed as previously described.

Table 5. Frankfurter formulation on a percentage (%) basis.

Ingredients	(%)
Meat Trimmings	**74.1**
Beef trimmings (80/20)	35.4
Pork trimmings	35.7
Pork fat (60/40)	3.0
Non-meat Ingredients	**25.9**
Spices[a]	2.1
Cure[b]	0.185
Corn syrup solids[c]	1.48
Hydrolyzed beef stock[d]	0.37
Hydrolyzed vegetable protein[e]	0.74
Sodium phosphate[f]	0.33
Water	8.7
Treatment Solution	12.0
Total (batter)	**100.0**

[a]Bolongna/Frank Seasoning (Blend 125), A.C. Legg, Inc., Calera, AL, U.S.A.
[b]D.Q. Curing Salt, Butcher & Packer Supply Company, Detroit, MI., U.S.A.
[c]Dextrose equivalent 42, Butcher & Packer Supply Company, Detroit, MI., U.S.A.
[d]B1301 Hydrolyzed Beef Stock, Proliant Meat Ingredients, Ankeny, IA, U.S.A.
[e] M.F.I. Hydrolyzed Vegetable Protein, Newly Weds Foods, Inc., Chicago, IL, U.S.A.
[f]Brifisol® 85 Instant, pH 8.5, BK Giulini Corp., Simi Valley, CA, U.S.A.

Sensory Evaluation

Consumer Frankfurter Panel

On the day of testing, consumers (n=92) within the Kleberg Animal and Food Sciences Center, Texas A&M University, College Station, TX, were recruited to evaluate frankfurter samples. Consumers were seated in individual booths that were separated from the sample preparation area. Frankfurter samples were steeped, individually by treatment, in boiling water for 5 min, removed from the water, and cut into 1.27 cm frankfurter slices. One frankfurter slice was served immediately to each consumer. Within each session, each consumer tested 8 samples and treatments were randomized to order within a session. Panelists were given a ballot packet containing a demographic sheet and 8 ballots. Consumers evaluated each sample on a 9-point hedonic scale (1=Dislike extremely, 9=Like extremely; 1= None, 9=Extremely intense) for the following attributes: overall like/dislike for the color, intensity of the color, overall like/dislike, overall like/dislike for the flavor, intensity of the flavor, overall like/dislike of texture, level of juiciness, and likelihood of purchasing this product in a retail store. Panelists cleansed their palette between samples using saltless crackers and double distilled deionized water.

Trained Texture Sensory Panel

On each testing day, a 5-member, trained descriptive attribute sensory panel evaluated each sample as defined by AMSA (1995), Meilgaard and others (2007), and Civille and Lyon (1996). Panelists evaluated each attribute using the Spectrum Intensity Scale for solid oral texture attributes (Meilgaard and others 2007). Ballot development sessions were conducted prior to testing sessions where representative testing samples were presented to the panelists. Texture attributes evaluated during sensory analysis were springiness, fracturability, hardness, cohesiveness, and juiciness. Training sessions used reference samples (Table 6) and samples from the study to anchor the panelists.

On day of testing, frankfurter samples were steeped, individually by treatment, in boiling water for 5 min. Frankfurter samples were removed from water and cut into1.27 cm frankfurter slices. Three frankfurter slices were immediately served to the trained sensory panel. In a randomized order, 8 samples were evaluated per day with a minimum of 5 minutes between each serving of test sample. Sample treatments were randomized within a sensory day. Panelists were presented with a warm-up sample to standardize and calibrate the panel each test day. Panelists were seated in individual booths that were separated from the sample preparation area. Samples were evaluated under red incandescent lights to reduce the effect of visual appearance on sensory attributes. Panelists cleansed their palette between samples using fat-free ricotta cheese, saltless crackers and double, distilled, deionized water.

Statistical Analysis

<u>Frankfurters</u>

Data were analyzed using the GLM Model procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC, U.S.A.) as a 2 x 4 factorial arrangement with meat (normal, PSE) and treatment solution (Table 4) as main effects blocked by processing day. Significance was defined as $P<0.05$. Least squares means were determined and.

Table 6. Descriptive attribute scale values and references for beef/pork frankfurter texture evaluation.

Scale Value	Reference	Brand/Type/Manufacturer
Springiness		
1.0	Cream Cheese	Kraft Foods/ Philadelphia, Kraft Foods Global, Inc., East Hanover, NJ 07936
5.0	Frankfurter	Hebrew National Beef Franks, ConAgra Foods Inc., P.O. Box 3768, Dept. HN, Omaha, NE 68103
9.5	Marshmallow	Hill Country Fare: mini-marshmallows, H-E-B, San Antonio, TX 78204
15.0	Jello	I box sugar-free jello, 2 packets Knox with 1.5 c hot water; Kraft Foods Global, Inc., East Hanover, NJ 07936
Fracturability		
1.0	Corn Muffin	Otis Spunkmeyer Corn Muffin, Otis Spunkmeyer Inc., San Leandro, CA 94577
4.0	Graham Crackers	Nabisco Grahams Original, Kraft Foods Global, Inc., East Hanover, NJ 07936
5.0	Rye Wafers	Wasa Light Rye Crispbread, Wasa North American LLC, Bannockburn, IL 60015
7.0	Ginger Snaps	Archway Ginger Snaps, Archway & Mother's Cookie Company, Inc., Battle Creek, MI 49017
9.0	Melba Toast	Old London Melba Snacks Original, Old London Foods, Inc., 1776 Eastchester Road, Bronx, NY 10461
13.0	Peanut Brittle	
15.0	Hard Candy	Life Saver's Hard Candy Wild Cherry, WM. Wrigley Jr. Company, Chicago, IL 60611
Hardness		
1.0	Cream Cheese	Kraft Foods/ Philadelphia, Kraft Foods Global, Inc., East Hanover, NJ 07936
3.0	Processed Cheese	H-E-B American Pasteurized Process Cheese, H-E-B, San Antonio, TX 78204
5.0	Frankfurter	Hebrew National Beef Franks, ConAgra Foods Inc., P.O. Box 3768, Dept. HN, Omaha, NE 68103

Table 6. Continued.

Scale Value	Reference	Brand/Type/Manufacturer
7.0	Olives	Goya Stuffed Queen Spanish Olives with Minced Pimientos, Goya Foods Inc., Secaucus, NJ 07096 - Pimientos removed
9.0	Peanut	Snax Peanuts Dry Roasted Regular, H-E-B, San Antonio, TX 78204
11.0	Carrot	
14.5	Hard Candy	Life Saver's Hard Candy Wild Cherry, WM. Wrigley Jr. Company, Chicago, IL 60611
Cohesiveness		
1.0	Corn Muffin	Otis Spunkmeyer Corn Muffin, Otis Spunkmeyer Inc., San Leandro, CA 94577
4.0	Processed Cheese	H-E-B American Pasteurized Process Cheese, H-E-B, San Antonio, TX 78204
8.0	Dried Fruit	Sun-Maid Natural California Raisins, Sun-Maid Growers of California, Department R, 13525 So. Bethel Ave, Kingsburg, CA 93631
10.0	Soft Pretzel	SuperPretzel, J&J Snack Foods Corp., Pennsauken, NJ 08109
12.0	Candy Chews	Starburst Original Fruit Chews, Mars Incorp., Hackettstown, NJ 07840
15.0	Chewing Gum	Wrigley's Doublemint, WM. Wrigley Jr. Company, Chicago, IL 60611
Juiciness		
1.0	Banana	
2.0	Carrot	
4.0	Fresh Mushroom	
8.0	Cucumber	
10.0	Apple	
12.0	Honeydew Melon	
15.0	Watermelon	

where Analysis of Variance indicated significance, least squares means were separated by the pdiff procedure of SAS using an alpha of <0.05

Consumer Frankfurter Panel

Consumer sensory data were analyzed as a factorial arrangement as previously described. Least squares means were calculated and where Analysis of Variance indicated significance (P<0.05), differences in least squares means were determined using the pdiff procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) at an alpha <0.05.

Trained Frankfurter Texture Sensory Panel

Trained panel texture data were analyzed as a factorial arrangement as previously described except that panelist was included in the model. The data were analyzed as a split-plot design where the whole plot was as defined in the aforementioned model. For the split, the effect of panelists and all two-way interactions with main effects were included in the model and the residual error term was defined as the error term. This analysis was used to determine the efficacy of the sensory panelists. Panelist by meat and treatment tended to not be significant and when significance was found (P<0.05), panel ratings, when averaged, did not change the interpretation of the results. Therefore, for the final sensory data analyses, data within an attribute were averaged across panelists and data were analyzed as previously described. Least squares means were calculated and where Analysis of Variance indicated significance (P<0.05), differences in least squares means were determined using the stderr pdiff procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) at an alpha <0.05.

Study 2: Beef Loin Steaks

Treatment Solution

Preliminary studies were conducted to determine if non-meat ingredients could be used to lower the pH and lighten color of high pH beef. After screening lactic acid, salt and acidic phosphates, it was determined that acetic acid (AA) was the most effective food grade ingredient to lower beef muscle pH. Xanthan gum (XG; Keltol® 521, CPKelco, Chicago, IL, U.S.A.) and konjac flour (Nutricol® XP 3464; FMC Corp., Philadelphia, PA, U.S.A.) were evaluated for use in combination with AA to determine if a lower pH could be achieved and decrease the dark color of beef strip loins. Varying levels of the aforementioned ingredients were evaluated during preliminary trials to determine the levels found to be effective.

Three treatment solutions (AA, AA/XG, and AA/ KF) were prepared within 48 h of the processing day. The 0.074 M AA (v/v) solution was prepared by the addition of AA and raised to the final volume with double, distilled, deionized water. The 0.250% (w/v) XG and 0.074 M AA (v/v) was prepared by hydrating and solublizing the XG in double, distilled, deionized water, then adding 0.074 M AA. The 0.125% KF and 0.074 M AA solution was prepared by hydrating and solublizing the KF in double, distilled, deionized water, then 0.074 M AA was added. Treatment solutions were held at 4 °C until day of processing.

Beef Steak Preparation

Beef carcasses were from two age groups, young (< 24 months) and old (> 48 months), having, high (> 6.0) and normal (5.3 - 5.7) pH carcasses were selected (n=6/subgroup). Two beef strip loins, IMPS#180, (n=24 carcasses or 6 carcasses per pH and age class, 8 loins/processed each day for 3 processing days) were removed from each carcass and trimmed of all visible fat. Each strip loin was cut into 2 equal sections perpendicular to the length of the *longissimus dorsi* muscle, resulting in four equal sections from each carcass. Each section within a carcass was randomly assigned a treatment: Control; 0.074 M AA; 0.074 M AA/ 0.250% XG; and 0.074 M AA/ 0.125% KF. Initial pH was taken, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA). CIE L*, a*, and b* color space values were determined, in triplicate, at the anterior *longissimus dorsi* muscle surface prior to injection using a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ). Colorimeter was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196) to ensure consistency among days.

Treatment solutions were injected (pickle injector, model B1-72, Inject Star of the Americas, Inc., Mountain View, AR, U.S.A.) into each strip loin section at a standard pump level of 12%. Strip loin sections were weighed prior to injection and after injection to verify pickup. Strip loin sections were double bagged in oxygen impermeable vacuum bags (OTR 1 cm^3/m^2/ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH), vacuum packaged, and tumbled for 15 min, then stored at 2 °C for 24 h to allow for brine equilibration. Strip loin sections within treatment were cut into three equal sections and sections randomly assigned to 0, 14 or 28 d of storage (ST). Within each ST, 3- 2.24 cm thick strip loin steaks were cut and assigned for sensory panel evaluation, chemical determination, or Warner-Bratzler shear force (WBS) analysis. Steaks were vacuum-packaged in oxygen impermeable vacuum bags (OTR 1 cm^3/m^2/ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH) and stored at 2 °C.

Color and pH Analysis

Steaks were removed from packaging and allowed to bloom for 20 min prior to color and pH analysis. Utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ), CIE L*, a* and b* color space values were determined in triplicate. Colorimeter was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196) to ensure consistency among days. The pH of each steak was determined, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA, U.S.A.). Color and pH measurements were determined at the steak surface on the *Longissimus dorsi* muscle.

Water-holding Capacity (WHC)

WHC was determined in duplicate as drip loss. An 8-10 g of muscle sample was weighed and suspended in a water resistant bag (VWR, West Chester, PA, U.S.A.). Samples were stored at 4 °C for 48 h, then removed and weighed. Drip loss was determined by the following equation: (100-(48 h sample weight/0 h sample weight)).

Warner-Bratzler Shear Force Analysis

Steak samples destined for WBS were removed and package purge determined prior to texture analysis. Package purge (%) was determined by difference using the following equation: (100-(Sample weight + dry package weight)/total package weight). WBS was performed on samples according to AMSA (1995) procedures for Intact Steaks/Roasts/Chops. Samples were thermocoupled in the geometric center of each sample using copper constantan wire. WBS steaks were cooked on an electric Hamilton Beach grill (model 31605A, Southern Pines, NC, U.S.A.) turned at 35 °C, then cooked to an internal temperature of 70 °C. After cooking, steaks were covered with a moisture impermeable barrier, and stored at 4 °C overnight. WBS samples were then removed from 4 °C storage and allowed to equilibrate to room temperature. Six-1.27 cm cores were taken parallel to the steak's muscle fiber orientation. WBS force was determined using a Universal Testing Instrument (Model SSTM-550, United Calibration Corp., Huntington Beach, CA, U.S.A.) fitted with a WBS device, and a 20 kg compression load cell. Shears were performed at a crosshead speed of 200 mm/min, and maximum force recorded in kg. Means were the average of six cores.

Sensory Evaluation

Two separate, 5-member, trained, descriptive attribute sensory panels evaluated each sample as defined by AMSA (1995) and Meilgaard and others (2007). Panelists evaluated each attribute using a 9-point descriptive intensity scale (AMSA 1995) where 0=none or the absence of an attribute and 8= extremely intense. Ballot development sessions were conducted prior to testing sessions where representative test samples were presented to the panelists. Sensory attributes evaluated were juiciness, muscle fiber tenderness, connective tissue, overall tenderness, overall flavor intensity, flavor

Table 7. Definition and references for descriptive flavor aromatics, basic tastes and mouthfeels for beef steak sensory attributes.

Attribute	Definition	Reference samples and scale
<u>Flavor Aromatics</u>		
Cooked beef lean	Aromatic associated with cooked beef muscle meat	Concentrated beef broth = 8
Cooked beef fat	Aromatic associated with cooked beef fat	Cooked beef fat = 8
Serum/bloody	Aromatic stimulated by raw or rare done beef	Beef patty (100 g) cooked 6 min each side = 8
Liver	Aromatic associated with liver	Cooked 1.27 cm sample of liver = 8
Cowy	Aromatic associated with beef from mature animals	Beef (100 g) made from cow meat; grilled to 70 °C = 8
Browned	Aromatic stimulated by browned or well done beef	Cooked beef to degree of doneness 85 °C = 8
Acid	Aromatic associated with acid-producing bacteria	Citric acid (2 g/ 1L water) = 8
Soured	Aromatic associated with soured milk or souring due to acid-producing bacteria	Citric acid (2 g/ 1L water) = 8
Cardboard	Aromatic associated with slightly stale beef (refrigerated for a few days only) and associated with wet cardboard and stale oils and fats	Wet cardboard placed in the mouth and air drawn over = 8
Painty	Aromatic associated with rancid oil and fat (distinctly like linseed oil)	Linseed oil = 8
Fishy	Aromatic associated with some rancid fats and oils (similar to old fish)	Catfish = 8

Table 7. Continued.

Attribute	Definition	Reference samples and scale
Basic Tastes		
Salt	Taste on the tongue associated with sodium ions	Potato chips (Pringles) = 7
Sour	Taste on the tongue associated with acids	Lemon juice (Real Lemon) =8.0
Bitter	Taste on the tongue associated with bitter agents such as caffeine, quinine, etc.	Caffeine (0.15% solution) = 8
Feeling Factors		
Metallic	Feeling factor on the tongue stimulated by metal or the aromatic associated with metals	Cooked 1.27 cm sample of liver = 8
Chemical burn	Feeling factor on tongue or lips	Room temperature water from clean tin can held for 24 hr covered, swished in mouth then expectorated = 8

aromatics (cooked beef lean, cooked beef fat, serum/bloody, liver, cowy, browned, acid, soured, cardboard, fishy, and painty), basic tastes (salt, sour, and bitter), and mouthfeels (metallic and chemical burn). Training sessions used reference samples and samples from the study to anchor the panelists (Table 7).

On day of testing, raw steak weights were recorded, a copper constantan thermocouple, a type T thermocouple (Omega Engineering, model TMQSS, Stamford, CT), was placed in geometric center of each sample, and the temperature was monitored with a digital thermometer (Omega Engineering, model HH501BT type T, Stamford, CT). Samples were cooked on an electric Hamilton Beach grill (model 31605A, Southern Pines, NC, U.S.A.) turned at 35 °C, then cooked to an internal temperature of 70 °C. Cooked weight and time were recorded and samples were cut into 1.74 cm cubes. Utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ), cooked meat CIE L*, a*, and b* color space values were determined on a cooked lean cut surface, in duplicate. Colorimeter was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196). Two meat cubes were immediately served to the trained sensory panel. Sixteen samples were evaluated, in a randomized order, each day during 2 sensory sessions (8 samples being evaluated per session). Sample treatments were randomized to order within a sensory day. During each session, panelists were served 8 samples with 5 min between each sample. After 8 samples, panelists were provided a 20 min break. Within each sensory day, panelists were given a warm-up control sample to standardize and calibrate panelists on each testing day. Panelists were seated in individual booths that were separated from the sample preparation area.

Samples were evaluated under red incandescent lights to reduce the effect of visual appearance on sensory attributes. Panelists cleansed their palette between samples using fat-free ricotta cheese, saltless crackers and double, distilled, deionized water.

Statistical Analysis

The data were analyzed using the Proc GLM procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) as 4 x 4 x 3 factorial arrangement and analyzed as a split-split plot design with carcass pH and age classification (animal type), injection treatment (treatment) and storage day as main effects. The whole-plot included the main effect of animal type, processing day as a block, and carcass within animal type was defined as the whole plot error term. For the first split, treatment and the interaction of animal type by treatment were defined as main effects and carcass within animal type by treatment was the error term. For the second split, ST, ST by animal type, and ST by treatment were included as main effects and the residual error was used as the error term. Significance was defined as $P<0.05$. For sensory evaluation, data were analyzed as a factorial arrangement as previously defined except panelist was included in the model. Data were analyzed as a split-split-split plot design where the whole plot and the first 2 splits where defined in the aforementioned model except that for the second split, carcass within animal type by treatment by ST was defined as the error term. In the third split, the effect of panelists and all two-way interactions with main effects were included in the model and the residual error term was defined as the error term. This analysis was used to determine the efficacy of the sensory panelists. As sensory panelists varied in expertise (23 years to 3 months), it was important to understand if a panelist by treatment interaction existed. Panelist by animal type, treatment and ST tended to not be significant (P>0.05) and when significance was found (P<0.05), it was verified that averaging across panelists did not change the interpretation of the results. Therefore, for the final sensory data analyses, data within an attribute were averaged across panelists and data were analyzed as described for other dependant variables. Least squares means were calculated and where Analysis of Variance indicated significance (P<0.05), differences in least squares means were determined using the stderr pdiff procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) at an alpha <0.05.

Study 3: Roast Beef

Treatment Solution

Hydrocolloid and acid solutions were prepared as previously described for use in beef loin steaks.

Roast Beef Preparation

Beef carcasses were from two age groups, young (< 24 months) and old (> 48 months), having, high (> 6.0) and normal (5.3 - 5.7) pH carcasses were selected (n=6/subgroup). Beef bottom rounds, IMPS#171B, (n=24 carcasses or 6 carcasses per pH and age class, 8/day, repeated over 3 processing days) were removed from each carcass and trimmed of all visible fat and connective tissue. Each bottom round was cut into 2 equal sections perpendicular to the length of the *biceps femoris* muscle, resulting in 4 equal sections from each carcass. Each section, within carcass, was randomly assigned to a treatment: Control; 0.074 M AA; 0.074 M AA/ 0.250% XG; 0.074 M AA/ 0.125% KF. Initial raw pH was measured, in duplicate, (pH meter calibrated daily with

4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA, U.S.A.). Raw CIE L*, a*, and b* color space values were determined, in triplicate, utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ). Colorimeter was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196) to ensure consistency among days. Color and pH measurements were taken at the anterior *biceps femoris* muscle surface.

Treatment solutions were injected (pickle injector, model B1-72, Inject Star of the Americas, Inc., Mountain View, AR, U.S.A.) into each bottom round section at a standard pump level of 12%. Bottom round sections were weighed prior and after injection to verify pickup. Sections were double bagged in oxygen impermeable vacuum bags (OTR 1 cm^3/m^2/ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH), vacuum packaged, and tumbled for 1 h, then stored at 2 ºC for 24 h to allow for brine equilibration. Roasts were vacuum-packaged in cook-in bags (CN-530 Cryovac Sealed Air, Duncan, SC, U.S.A.; OTR 20 cm^3/m^2/ 24h atm @ 22.8 ºC, 0% RH; WVTR 0.157 g/100 in^2/24 h @ 37.8 ºC, 100% RH) and the heaviest roast was thermocoupled to measure internal meat temperature. An incremental thermal processing cycle was used to program the smokehouse (model 1000, Alkar, Lodi, WI, U.S.A.) to cook to an internal meat temperature of 59 ºC followed by a minimum hold time of 20 min per USDA Appendix A regulations (USDA 1999a). Following USDA Appendix B regulations (USDA 1999b), sample temperature was lowered to below 4 ºC within 6 h and held at 4 ºC overnight. Sample roasts were removed from cook-in bags and cook yield ((cook weight/injected raw weight)*100) was determined. Roasts within treatment were cut into three equal sections and assigned to 0, 14, 28 d of storage (ST). For storage, roasts were vacuum-packaged in oxygen impermeable vacuum bags (OTR 1 cm^3/m^2/ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH) and stored at 2 ºC.

Color and pH Analysis

Roasts were removed from packaging and a 5 mm slice was removed for chemical analysis. After 30 min, utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ), CIE L*, a* and b* color space measurements were determined in triplicate at roast cut surface. Colorimeter was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196). The pH was determined at the roast cut surface, in duplicate (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA, U.S.A.).

Warner-Bratzler Shear Force Analysis

The WBS procedure was performed on samples according to AMSA (1995) methodology for Intact Steaks/Roasts/Chops. WBS samples were allowed to equilibrate to room temperature. Six, 1.27 cm cores were taken parallel to roast's muscle fiber orientation. WBS force was determined using a Universal Testing Instrument (Model SSTM-550, United Calibration Corp., Huntington Beach, CA, U.S.A.) fitted with a WBS device, and a 20 kg compression load cell. Shears were performed at a crosshead speed of 200 mm/min, and maximum force recorded in kg. Means were the average of six cores.

Sensory Evaluation

Two separate, 5-member descriptive attribute sensory panels evaluated each sample as defined by AMSA (1995) and Meildgaard and others (2007). Panelists evaluated each attribute using a 9-point descriptive intensity scale (AMSA 1995) where 0=none or the absence of an attribute and 8= extremely intense. Ballot development sessions were conducted prior to testing sessions where representative testing samples were presented to the panelists. Potential sensory attributes evaluated during sensory analysis were juiciness, muscle fiber tenderness, connective tissue, overall tenderness, overall flavor intensity, flavor aromatics (cooked beef lean, cooked beef fat, serum/bloody, liver, cowy, browned, acid, soured, cardboard, fishy, and painty), basic tastes (salt, sour, and bitter), and mouthfeels (metallic and chemical burn). Training sessions used reference samples and samples from the study to anchor the panelists (Table 8).

Samples were removed from a 4 ºC cooler and a 3 cm x 6 cm x 0.5 mm roast sample slice was immediately served to a trained meat descriptive attribute sensory panel. Sixteen samples, in a randomized order, were evaluated per day during 2 sensory sessions with up to 8 samples being evaluated per session. Sample treatments were randomized to order within a sensory day. During each session, panelists were served 8 samples with 5 min between each sample. After every 8th sample a 20 min break was provided. Sensory characteristics analyzed included flavor aromatics, texture and mouthfeel properties. Within each sensory day, panelists were served a warm-up sample

Table 8. Definition and references for descriptive flavor aromatics, basic tastes and mouthfeels for roast beef sensory attributes.

Attribute	Definition	Reference samples and scale
Flavor Aromatics		
Cooked beef lean	Aromatic associated with cooked beef muscle meat	Concentrated beef broth = 8
Cooked beef fat	Aromatic associated with cooked beef fat	Cooked beef fat = 8
Serum/bloody	Aromatic stimulated by raw or rare done beef	Beef patty (100 g) cooked 6 min each side = 8
Liver	Aromatic associated with liver	Cooked 1.27 cm sample of liver = 8
Cowy	Aromatic associated with beef from mature animals	Beef (100 g) made from cow meat; grilled to 70 °C = 8
Browned	Aromatic stimulated by browned or well done beef	Cooked beef to degree of doneness 85 °C = 8
Acid	Aromatic associated with acid-producing bacteria	Citric acid (2 g/ 1L water) = 8
Soured	Aromatic associated with soured milk or souring due to acid-producing bacteria	Citric acid (2 g/ 1L water) = 8
Cardboard	Aromatic associated with slightly stale beef (refrigerated for a few days only) and associated with wet cardboard and stale oils and fats	Wet cardboard placed in the mouth and air drawn over = 8
Painty	Aromatic associated with rancid oil and fat (distinctly like linseed oil)	Linseed oil = 8
Fishy	Aromatic associated with some rancid fats and oils (similar to old fish)	Catfish = 8

Table 8. Continued.

Attribute	Definition	Reference samples and scale
<u>Basic Tastes</u>		
Salt	Taste on the tongue associated with sodium ions	Potato chips (Pringles) = 7
Sour	Taste on the tongue associated with acids	Lemon juice (Real Lemon) =8.0
Bitter	Taste on the tongue associated with bitter agents such as caffeine, quinine, etc.	Caffeine (0.15% solution) = 8
<u>Feeling Factors</u>		
Metallic	Feeling factor on the tongue stimulated by metal or the aromatic associated with metals	Cooked 1.27 cm sample of liver = 8
Chemical burn	Feeling factor on tongue or lips	Room temperature water from clean tin can held for 24 hr covered, swished in mouth then expectorated = 8

to standardize and calibrate the panelists each testing day. The warm-up sample was a control sample. Panelists were seated in individual booths that were separated from the sample preparation area. Samples were evaluated under red incandescent lights to reduce the effect of visual appearance on sensory attributes. Panelists cleansed their palette between samples using fat-free ricotta cheese, saltless crackers and double distilled deionized water.

Statistical Analysis

The data were analyzed using the Proc GLM procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) as a split-split plot design (4 x 4 x 3 factorial arrangement) with carcass pH and age classification (animal type), injection treatment (treatment), ST, and two-way interactions as main effects. The whole-plot included the main effect of animal type, processing day as a block, and carcass within animal type was defined as the whole-plot error term. For the first split, treatment and the interaction of animal type by treatment were defined as effects with carcass within animal type by treatment as the error term. For the second split, storage day, storage day by animal type, and ST by treatment were included and the residual error was used as the error term. Significance was defined as $P<0.05$. For WBS analysis, 2 animals (1-young-high and 1-young-normal) were removed due to missing data. The WBS data were analyzed using the Proc Mixed procedure of SAS and the REML covariate test (SAS, version 9.1, SAS Institute, Inc., Cary, NC). Sensory data were analyzed as a factorial arrangement as previously defined except panelist was included in the model as a third split. In the third split the effect of panelists and all two-way interactions with main effects and panelists were included and the residual error term was defined as the error term. This analyses was used to determine the efficacy of the sensory panelists as each varied in expertise (23 years to 3 months). Panelist by animal type, treatment and ST tended to not be significant and when significance was found ($P<0.05$), panel ratings, when averaged, did not change the interpretation of the results. Therefore, for the final sensory data analyses, data within an attribute were averaged across panelists and data were analyzed as previously described. Least squares means were calculated and where Analysis of Variance indicated significance ($P<0.05$), differences in least squares means were determined using the pdiff procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) at an alpha <0.05.

CHAPTER III

RHEOLOGICAL BEHAVIOR OF HYDROCOLLOIDS

Overview

Our objective was to rheologically characterize hydrocolloid ingredient functionality in standard aqueous enhancement solutions prior to addition to whole-muscle meat. Hydrocolloids (methylcellulose (MC), hydroxypropyl methylcellulose (HPMC) and super gelling methylcellulose (SGMC): 1.000, 2.000, 3.000%; xanthan gum (XG): 0.250, 0.500, 0.750%; konjac flour (KF): 0.125, 0.250, 0.500%; gellan gum (GG): 0.250, 0.500, 0.750%; low temperature gellan gum (GGLT): 0.0625, 0.125, 0.250%) were hydrated in water. Samples were analyzed on a controlled-stress rheometer with a cone and plate fixture (60 mm, 1º). Flow behavior and steady-shear viscosity were determined by up-down shear-rate sweeps (0.01 - 100 1/s, 25 ºC, 60 s/ramp). Dynamic testing was performed to establish the onset of gelation and stability of gels (4 - 85 ºC, 1.0 Pa, heating rate 30 ºC/min). The MC, SPMC, HPMC, KF, and GG samples exhibited Newtonian behavior, while XG and GGLT exhibited shear-thinning characteristics. The dynamic moduli were similar for the KF and HPMC-1.000% samples, but the dynamic moduli was unstable after gelation for MC and SGMC samples. With Newtonian, inelastic behavior representing ideal solutions, dynamic testing evaluated hydrocolloids over common processing (shear rate) and cooking temperatures. These results were helpful to determine the feasibility of injecting hydrocolloids into raw whole muscle. Hydrocolloid treatments with Newtonian behavior and dynamic moduli resistant to change and the subsequent effect of ionic environment are needed to understand the viability of use of their ingredients in a meat system.

Introduction

Gums and hydrocolloids are ingredients that have the ability to thicken or gelatinize in aqueous systems. Typically, hydrocolloids are long-chain carbohydrate polymers that are soluble in an aqueous environment (Sharma 1981). The solubility of hydrocolloids in an aqueous environment makes the utilization of these ingredients in a meat system ideal. The use and functionality of hydrocolloids within meat systems has been well documented with a majority of the research in restructured fish products (Perez-Mateos and others 2002; Montero and others 2001; da Ponte and others 1985) or other processed meat products (Funami and others 1998; DeFreitas and others 1997; Bater and others 1993, 1992; Egbert and others 1991; Wallingford and Labuza 1983). Processed meat products commonly have extracts, flours, and chemically modified hydrocolloids incorporated within the product to increase functionality and value (Glicksman 1982). Many low fat processed meat products contained hydrocolloids to improve texture and mouthfeel of the product.

The utilization of hydrocolloids within a meat system is dependant on the complete understanding of the hydrocolloid's functional properties, particularly gelation (Walkenstrom and Hermansson 1994; Albertsson 1971). The degree of gelation or thickening depends on the hydrocolloid concentration present, temperature, pH and ionic strength within the food system (Dickinson 1998; Marcotte and others 1998; Drohan and others 1997; Walkenstrom and Hermansson 1997; Zasyphkin and others 1997; Sudhakar and others 1995; Stone and Stanley 1994; Sarkar 1979). The hydrocolloid ingredient complex would have to withstand temperature variation between refrigeration (4 ^{o}C) through cooking (85 ^{o}C) without negatively imparting color or sensory properties.

Improvement of meat quality has occurred through genetics, nutrition, ante-mortem, and post-mortem interventions, yet muscle quality differences still exist. Alternative methods are needed within the meat industry for the improvement of post-mortem whole muscle quality as seen in pale, soft and exudative (PSE) or dark, firm and dry (DFD) muscle. Hydrocolloids in a whole muscle system may improve the textural properties of the muscle while binding the free water caused by protein denaturation of the PSE muscle or lowering pH in DFD muscle. Utilizing enhancement solutions that include hydrocolloids as a method of improvement should be considered.

An in-depth understanding of the rheological properties of hydrocolloids in an aqueous system and within an environment of varying temperature to determine potential use in current meat processing facilities is needed. Therefore, the objective of this study was to characterize the rheological properties (fluid and gel behavior) of potential hydrocolloid ingredients in aqueous enhancement solutions. The effect of storage time on the fluid behavior and dynamic properties of the hydrocolloid solution was also determined.

Materials and Methods

The hydrocolloids were chosen based on manufacturer's recommendations and their functionality over the temperature range of 4 - 85 °C, and the pH range of 4.3 to

9.0. The temperature range was determined as the range that meat would be exposed to during fabrication, transportation, and cooking. The pH range included the pH of typical PSE and DFD meat, as well as the pH of alkali sodium phosphates (SP) typically added to fresh pork meat. All selected hydrocolloids are commonly used in dairy, beverage and processed meat products, but have not been used in whole-muscle meat products.

Sample Preparation

Hydrocolloid treatments and concentrations (Table 1) were hydrated and solublized per manufacturer specifications. Samples were mixed, raised to a final volume of 200 mL, and held at 4 °C until analysis. Treatment solutions were tested at 0, 24, and 48 hr to determine if refrigerated storage affected treatment fluid behavior. Prior to analysis, samples were allowed to equilibrate to 25 °C.

Flow and Dynamic Behavior

The Haake RS 100 Controlled Stress Rheometer (Thermo Electron Corporation, Madison, WI, U.S.A.) with cone and plate fixture (60 mm and 1^{o} angle) was utilized to characterize sample flow behavior. Up-down shear-rate sweeps from 0.01 to 100 s^{-1} were conducted for each sample at room temperature (25 °C). Flow behavior and steady shear viscosity were determined using standard methods (Steffe 1996). Dynamic testing was performed to establish the onset of gelation and stability of gels under temperature sweeps (4 - 85 ^{o}C, 1.0 Pa, heating rate 30 ^{o}C/min) with temperature regulated by the Haake TC81 Peltier Temperature Controller (Thermo Electron Corporation, Madison, WI, U.S.A.). Researchers assumed no slip was present between the sample and cone and plate attachments. Also during the temperature sweep, it was assumed no evaporation occurred at the higher temperatures. Samples were tested in triplicate.

Results and Discussion

Flow Behavior

The flow behavior of the hydrocolloids characterized was not affected by refrigerated storage up to 48 h. The knowledge that the flow behavior was stable under refrigerated storage will allow meat processors to pre-blend enhancement solutions in advance. It also will give flexibility for use of each solution if manufacturing delays occur within a facility.

Hydrocolloid treatments were characterized and model equations were determined as seen in Table 9. The MC, HPMC, SGMC, GG, 0.125% KF, and 0.250% KF were all Newtonian fluids, as denoted by Eq. 1 (Steffe 1996).

Eq. 1. $\sigma = \eta \dot{\gamma}$

with, σ, shear stress

η, apparent viscosity

$\dot{\gamma}$, shear rate

The η's of the Newtonian fluids were independent regardless of $\dot{\gamma}$ and σ, as denoted in Eq. 2 (Steffe 1996).

Eq. 2. $\eta = f(\dot{\gamma}) = \sigma/\dot{\gamma}$

Other Newtonian fluids, like water or honey, have been used in the meat industry as the base for enhancement solutions or as non-meat ingredients, and their constant viscosity had allowed them to be injected with relative ease. KF, XG, and GGLT at 0.500% were shear-thinning fluids (Eq. 3; Steffe 1996), which indicated the apparent viscosity of the fluid was effected by $\dot{\gamma}$ and σ, denoted by Eq. 4 (Steffe 1996).

Eq. 3. $\sigma = K(\dot{\gamma})^n$

with, K, consistency coefficient

n, flow behavior index

Eq. 4. $\eta = f(\dot{\gamma}) = K(\dot{\gamma})^{n-1}$

A greater shear rate applied to shear-thinning fluid resulted in a less viscous fluid. Both Newtonian and shear-thinning fluids may be viable for use in a whole muscle based on their inherent rheological properties. Realistically, consideration should be given to injection equipment specifications for use of high viscous fluids, final injection level within the product, and potential damage to the product. Shear-thinning fluids may be easier to inject into a whole muscle product as the shear stress and rate applied to the fluid during processing will cause the viscosity to decrease. Consideration should be given, as the shear-thinning fluid will become more viscous once injected into the muscle, when the shear rate and stress are removed. The fluid may cause muscle damage, similar to over-pumping, as the fluid expands.

The XG treatments were the only hydrocolloids evaluated that did not increase in viscosity with an increase in hydrocolloid concentration (Table 9), which was unexpected. The XG structure consisted of a backbone of glucose units similar to cellulose, but the side chains contained 2 mannoses and 1 glucuronic acid and ½ of the side chains contained a pyruvic acid (Jannson and others 1975). The side chains of the XG have extensive intramolecular hydrogen bonding that can form a helical structure

Table 9. Flow behavior characterization and model equations for hydrocolloid treatments at 25 °C.

Hydrocolloid	(w/v)	Fluid Type	Model Equation	R^2
MC	1.000%	Newtonian	$\sigma=0.0198\,\dot{\gamma}$	0.9978
MC	2.000%	Newtonian	$\sigma=0.1387\,\dot{\gamma}$	0.9994
MC	3.000%	Newtonian	$\sigma=0.5455\,\dot{\gamma}$	0.9970
HPMC	1.000%	Newtonian	$\sigma=0.0022\,\dot{\gamma}$	0.9175
HPMC	2.000%	Newtonian	$\sigma=0.0094\,\dot{\gamma}$	0.9899
HPMC	3.000%	Newtonian	$\sigma=0.0204\,\dot{\gamma}$	0.9985
SGMC	1.000%	Newtonian	$\sigma=0.0108\,\dot{\gamma}$	0.9913
SGMC	2.000%	Newtonian	$\sigma=0.0776\,\dot{\gamma}$	0.9995
SGMC	3.000%	Newtonian	$\sigma=0.2965\,\dot{\gamma}$	0.9979
XG	0.250%	Shear-Thinning	$\sigma=1.2160\,\dot{\gamma}^{0.2992}$	0.8591
XG	0.500%	Shear-Thinning	$\sigma=1.3958\,\dot{\gamma}^{0.2666}$	0.8150
XG	0.750%	Shear-Thinning	$\sigma=1.2950\,\dot{\gamma}^{0.2598}$	0.6744
KF	0.125%	Newtonian	$\sigma=0.0039\,\dot{\gamma}$	0.9713
KF	0.250%	Newtonian	$\sigma=0.0229\,\dot{\gamma}$	0.9973
KF	0.500%	Shear-Thinning	$\sigma=1.3348\,\dot{\gamma}^{0.2161}$	0.9945
GG	0.250%	Newtonian	$\sigma=0.0037\,\dot{\gamma}$	0.8340
GG	0.500%	Newtonian	$\sigma=0.0066\,\dot{\gamma}$	0.9476
GG	0.750%	Newtonian	$\sigma=0.0289\,\dot{\gamma}$	0.9841
GGLT	0.0625%	Shear-Thinning	$\sigma=1.3021\,\dot{\gamma}^{0.0728}$	0.8356
GGLT	0.125%	Shear-Thinning	$\sigma=1.1260\,\dot{\gamma}^{0.2997}$	0.9935
GGLT	0.250%	Shear-Thinning	$\sigma=73.9600\,\dot{\gamma}^{0.8212}$	0.7024

that is very stable to pH and temperature changes. In an aqueous solution, the water molecules were most likely able to bond to the unique side chains. The bonding of water most likely resulted in swelling of the XG. Swelling has been shown to break intermolecular bonding and disrupt the double-helical structure, which likely resulted in the XG increase in viscosity. The application of shear rate and shear stress most likely resulted in a disruption within the conformation of the XG molecules resulting in a linear orientation. This effect would explain the change in viscosity at increased rates of shear and stress. After shear rate and shear stress was removed, the apparent viscosity likely increased as the double-helical structure was reformed.

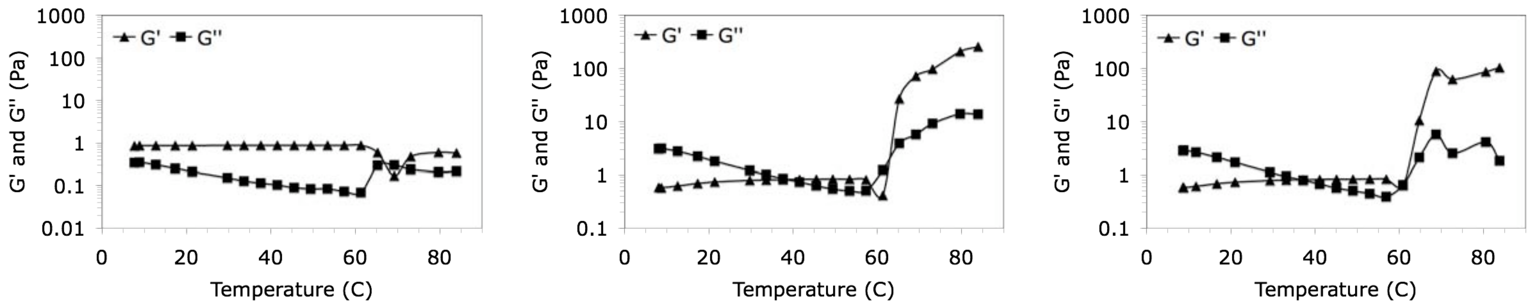
The 3.000% MC and SGMC solution apparent viscosity was about 27 times greater than the apparent viscosity of 1.000% of MC and SGMC (Table 9). For MC, SGMC and HPMC, the disruption of the intermolecular structure from the methyl and hydroxypropyl side groups of the cellulose polymer most likely allowed for water molecules to bond to the reactive side groups, causing the hydrocolloid to swell (Dow Chemical Company 2002). This swelling would likely result in additional disruption to the intermolecular bonding and increase viscosity.

KF, a polysaccharide, is composed of linear galactomannon repeating units (β-1,4 with a mannose: glucose ratio of 1.6:1) and acetyl side groups (Imeson 1997). KF has the ability to form extensive intra- and inter-molecular hydrogen bonds, but in this study, it was hydrated into an aqueous solution. As KF was hydrated, the viscosity most likely increased from the disruption of intermolecular hydrogen bonds. As seen in Table 9, the 0.125% KF and 0.250% KF were 3.9 and 22.9 times more viscous than water.

The linear anionic structure of GG and GGLT has been shown to be similar to XG, a branched structure with acyl side groups that form a helical structure due to intra- and inter- molecular bonding (Imeson 1997). The extent of intermolecular bonding has been shown to dictate solution viscosity. Increasing the concentration of GG from 0.0250% to 0.500% doubled the viscosity of the fluid, whereas increasing the concentration from 0.500% to 0.750% increased the viscosity of the fluid by a factor of 4.

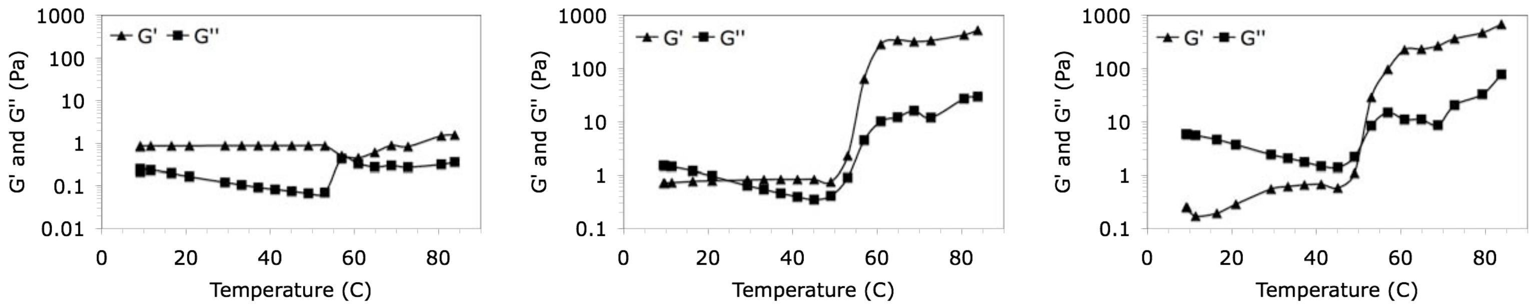
Dynamic Behavior

Hydrocolloids are viscoelastic in rheological behavior (Imeson 1997). The elastic modulus (G′, storage modulus) and viscous moduli (G′′, shear loss modulus) were characterized over 4 – 85 °C, a common temperature range for meat during commercial processing, transportation, and thermal processing. The dynamic moduli for MC, SGMC, 0.500% XG, 0.7500% XG, 0.500% KF, 0.500% GG, 0.750% GG, 0.125% GGLT, and 0.250% GLT were unstable as temperature increased (Figs. 1, 2, 3, 4, 5, and 6). The relationship between G′ and G′′ did not remain constant within the temperature range. The implication is that, depending on temperature, the hydrocolloid treatments viscoelastic properties may be more of a fluid or more like a gel. The HPMC, 0.125% KF, 0.250% KF, 0.250% GG, and 0.0625% GGLT treatments had stable dynamic moduli with the G′ being greater than the G′′ over the temperature range tested (Figs. 4, 5, 6, and 7). The treatments had greater elastic or solid modulli than viscous,



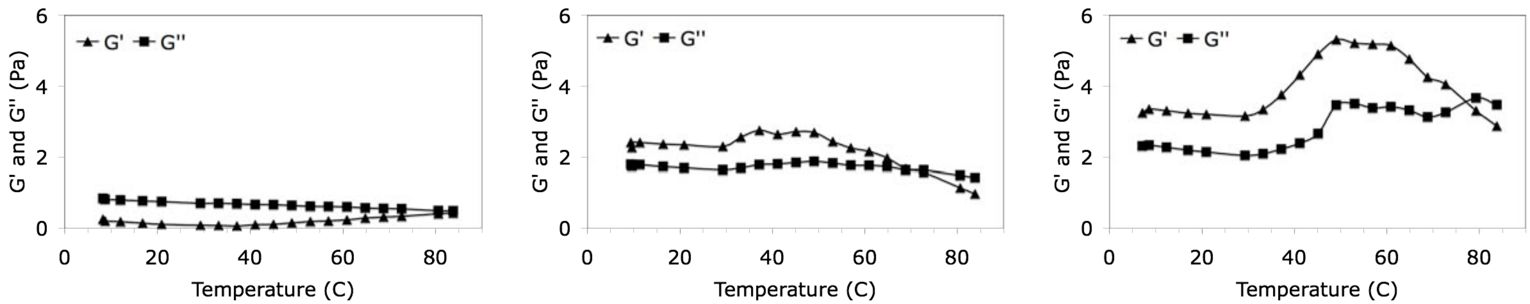
a. b. c.

Figure 1. Dynamic testing of a. 1.000% MC; b. 2.000% MC; and c. 3.000% MC for use in enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



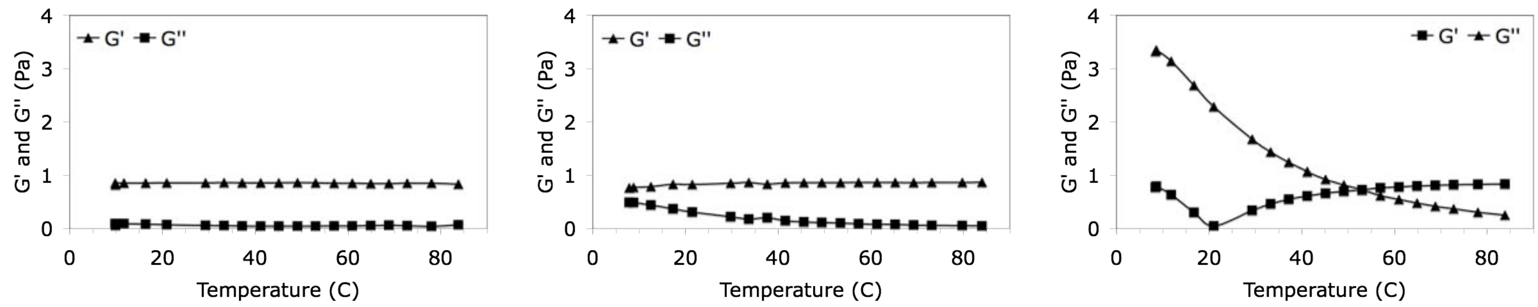
a. b. c.

Figure 2. Dynamic testing of a. 1.000% SGMC; b. 2.000% SGMC; and c. 3.000% SGMC for use in enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



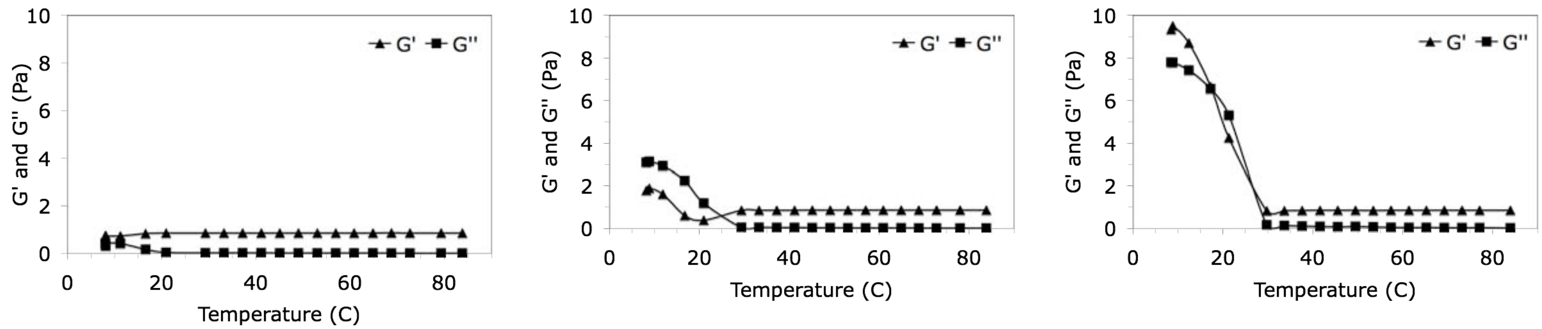
a. b. c.

Figure 3. Dynamic testing of a. 0.250% XG; b. 0.500% XG; and c. 0.750% XG for use in enhancement solutions at 1 Pa from 4 °C to 85 °C.



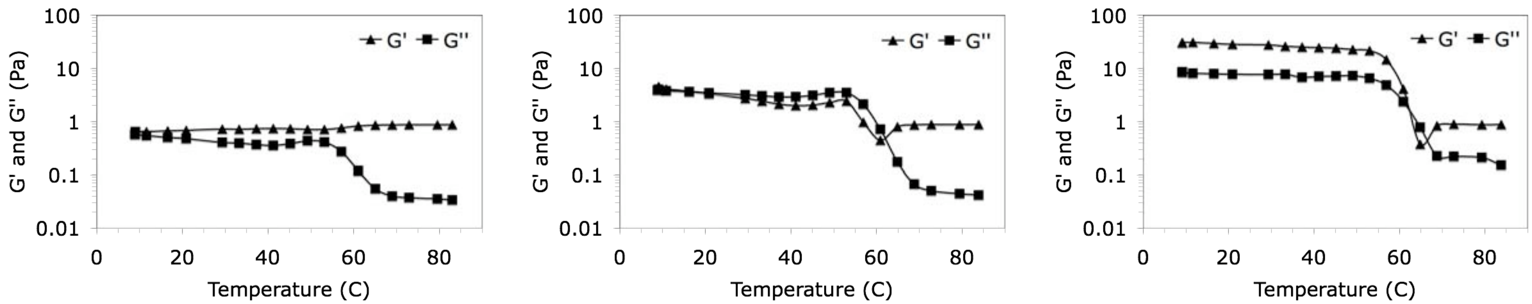
a. b. c.

Figure 4. Dynamic testing of a. 0.125% KF; b. 0.250% KF; and c. 0.500% KF for use in enhancement solutions at 1 Pa from 4 °C to 85 °C.



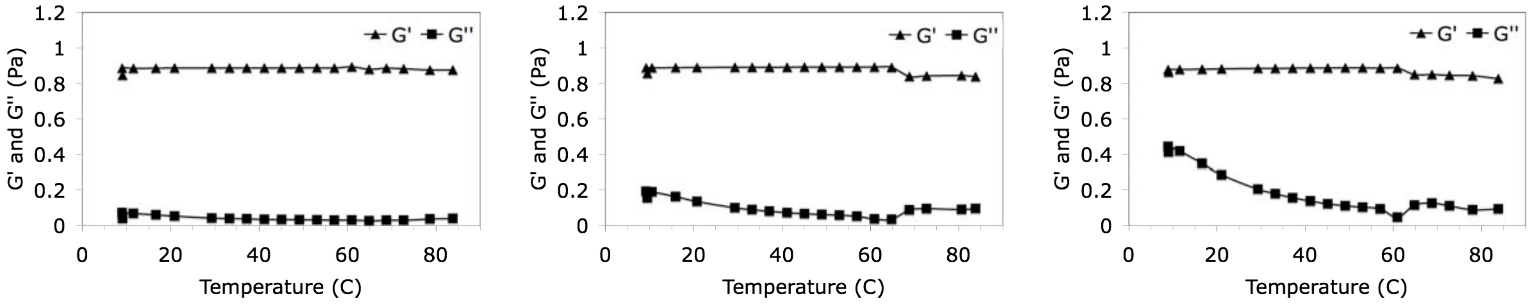
a. b. c.

Figure 5. Dynamic testing of a. 0.250% GG; b. 0.500% GG; and c. 0.750% GG for use in enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



a. b. c.

Figure 6. Dynamic testing of a. 0.0625% GGLT; b. 0.125% GGLT; and c. 0.250% GGLT for use in enhancement solutions at 1 Pa from 4 °C to 85 °C.



a. b. c.

Figure 7. Dynamic testing of a. 1.000% HPMC; b. 2.000% HPMC; and c. 3.000% HPMC for use in enhancement solutions at 1 Pa from 4 °C to 85 °C.

which implied that the hydrocolloid was more of a gel than a fluid. Interestingly, 0.250% XG also had a stable dynamic moduli, but unlike HPMC, the G´´ was greater than G´ over the temperature range (Fig. 5).

Viscoelastic characterization over a temperature range can help a meat scientist choose the best ingredient for the meat product application. For instance, hydrocolloid ingredient like 0.500% and 0.750% GG was more of liquid at colder temperatures, but as the temperature increased over 30 °C the hydrocolloid became more elastic than viscous (Fig. 5). This ingredient could be injected as a liquid, but during thermal processing would form a gel matrix, entrapping proteins and water, and potentially stabilizing the cooked texture and palatability properties.

Hydrocolloids resistant to temperature change, like HPMC, would allow a meat processor to apply the hydrocolloid treatment during raw processing and feel confident that the treatment would remain functional over the temperatures the product was exposed to during processing, storage, distribution, and consumption. These hydrocolloids may be used to improve meat quality texture characteristics in pale, soft and exudative (PSE) or dark, firm and dry (DFD) muscle.

Conclusion

The ability to characterize the flow behavior of hydrocolloid samples allowed selection of potential viable hydrocolloid ingredients for use in a meat system by having predictive behavior models. Flow behavior properties may indicate the possibility of using hydrocolloids within standard meat processing equipment. Refrigeration storage up to 48 h did not affect the rheological properties of MC, SGMC, HPMC, XG, KF, GG, and GGLT. The use of MC, SGMC, HPMC and KF in a whole muscle system may be a viable option as each has Newtonian flow behavior, thus similar to current aqueous enhancement solutions used in the meat industry. Shear-thinning fluids like XG and GGLT may also be potential ingredients in enhancement solutions, but careful selection of injection level must be considered. The flow behavior of shear-thinning fluids may cause muscle damage after injection as viscosity would increase once the shear effect from injection was removed. The viscoelastic properties of HPMC and KF demonstrated that each formed a stable gel structure, but further research to determine functionality in a meat system is needed.

The use of hydrocolloids as ingredients has increased in the meat industry, but not in whole muscle, since the hydrocolloid behavior has been hard to predict. The rheological evaluation of the hydrocolloid treatments has demonstrated that at lower concentrations and viscosities with stable dynamic moduli with G´ being greater than G´´ may be viable ingredients for use in whole muscle. Further research needs to examine if changes in ionic strength, like the addition of sodium chloride and sodium phosphate, will affect the flow behavior and dynamic properties of the hydrocolloid ingredients.

CHAPTER IV

RHEOLOGICAL BEHAVIOR OF HYDROCOLLOIDS WITH SODIUM CHLORIDE AND SODIUM PHOSPHATE

Overview

Our objective was to characterize the rheological properties of hydrocolloid ingredients and their functionality in aqueous meat enhancement solutions. Hydrocolloids (methylcellulose (MC) and super gelling methylcellulose (SGMC): 1.00, 2.00%; hydroxypropyl methylcellulose (HPMC): 1.00%; xanthan gum (XG): 0.25, 0.50%; konjac flour (KF): 0.125, 0.25%; gellan gum (GG): 0.25, 0.50%; low temperature gellan gum (GGLT): 0.0625, 0.125%) were hydrated in water with 0 - 3% NaCl or 0 - 0.4% sodium phosphate (SP). Samples were analyzed on a controlled-stress rheometer with a cone and plate fixture (60 mm, 1º). Flow behavior and steady-shear viscosity were determined by up-down shear-rate sweeps (0.01 - 100 1/s, 25 ºC, 60 s/ramp). Dynamic testing was performed to establish the onset of gelation and stability of gels (4 - 85 ºC, 1.0 Pa, heating rate 30 ºC/min). MC, SPMC, HPMC, and KF samples exhibited Newtonian behavior, while XG was shear-thinning. The addition of NaCl and SP to XG, MC-2.00% and SGMC-2.00% samples increased the apparent viscosity compared to 0.000% samples. The dynamic moduli were similar, regardless of NaCl or SP concentration, for the KF and HPMC-1.00% samples, but MC and SGMC were unstable after gelation. These results will help determine the feasibility of injecting hydrocolloid ingredients into raw, whole muscle. Hydrocolloid treatments that exhibited

Newtonian behavior and dynamic moduli resistant to changes in ionic strength should be evaluated further for their potential incorporation into a meat system.

Introduction

Gums and hydrocolloids are ingredients commonly used in foods to form gels in dairy products or to increase the viscosity of sauces or beverages. Hydrocolloids also have been used in processed or restructured meat products (Funami and others 1998; DeFreitas and others 1997; Bater and others 1993, 1992; Egbert and others 1991; Wallingford and Labuza 1983); however they are rarely used in whole muscle meat systems. To address this issue, the rheological properties of certain hydrocolloid ingredients under temperature ranges and storage conditions typical for a whole muscle meat system were characterized. The theoretical flow and gel behavior was shown to be compatible with standard processing systems and across the temperature range from fabrication to thermal processing, but did not address the influence of an increase in ionic environment on rheological properties. When salt and sodium phosphate (SP) are present, the ionic environment changes and in combination with the hydrocolloids, rheological properties may be affected.

A commercial meat enhancement solution typically consists of water, salt, and SP. Water acts as a solvent and carrier for the other components of the enhancement solution, but is also needed for additional moisture in the final cooked product (Murphy 2000). The primary role of SP is to increase water-holding capacity (WHC) through charge-charge repulsion of SP anions and myofibrils to allow additional water molecules to bind to the protein (Pringle and others 1996). Combined with SP, the addition of salt improves the product texture (Boles and Swan, 1997; Stites and others 1989). The function of salt in a meat product is critical as it is used to improve flavor, as an anti-microbial agent, and to extract and bind myofibrillar proteins (Waters 2001). The alteration in ionic strength due to the addition of salt and SP results in increased binding of myofibrillar proteins. The increase in WHC results in a firmer and more uniform textured meat product (Knipe and others 1990; Ensor and others 1991; Shand and others 1993; Boles and Swan 1997; Detienne and Wicker 1999; Robbins and others 2002; Alvarado and Sams 2003; Sen and others 2005).

Most rheological measurements of meat gels have been performed on isolated myofibrillar suspensions (Westphalen and others 2005; Boyer and others 1996; Xiong and Blanchard 1994; and Egelandsdal and others 1986a, 1986b). Egelandsdal and others (1986a) stated that the dynamic moduli, elastic modulus (G´, storage modulus) and viscous moduli (G´´, shear loss modulus) were dependant on many factors like ionic strength, temperature, and protein configuration. Knowing the dynamic moduli of hydrocolloids when exposed to changes in ionic strength and temperature would allow selection of a hydrocolloid that theoretically would work in a whole-muscle system.

The objective of this study was to characterize the rheological flow and gel behavior of hydrocolloid ingredients when used in whole muscle enhancement solutions. The effect of changes in ionic strength due to the addition of sodium chloride and sodium phosphate on the fluid behavior and dynamic properties of the hydrocolloid solution will be determined.

Materials and Methods

Sample Preparation

Previous identified hydrocolloid treatments and concentrations (Table 2), as potential ingredients for enhancement solutions, were hydrated and solublized. MC, HPMC, and SGMC were hydrated and solublized in an ice water slurry for more efficient hydration. The remaining hydrocolloids were hydrated and solublized in double-distilled, de-ionized water. To understand the effect of varying ionic strength on rheological properties, 0.00, 0.50, 1.00 1.50, 2.00, 2.50, and 3.00% sodium chloride (NaCl) and 0.00, 0.10, 0.20, 0.30 and 0.40% SP were added to each hydrocolloid solution at each respective concentration level. Samples were solublized and held at 4 °C until analysis. Prior to analysis, samples were allowed to equilibrate to 25 °C.

Flow and Dynamic Behavior

The Haake RS 100 Controlled Stress Rheometer (Thermo Electron Corporation, Madison, WI, U.S.A.) with cone and plate fixture (60 mm and 1^{o} angle) was utilized to characterize sample flow behavior. Up-down shear-rate sweeps from 0.01 to 100 s^{-1} were conducted for each sample at room temperature (25 °C). Flow behavior and steady shear viscosity was determined using standard methods (Steffe 1996). Dynamic testing was performed to establish the onset of gelation and stability of gels under temperature sweeps (4 - 85 ^{o}C, 1.0 Pa, heating rate 30 ^{o}C/min) with temperature regulated by the Haake TC81 Peltier Temperature Controller (Thermo Electron Corporation, Madison, WI, U.S.A.). Researchers assumed that no slip was present between the sample and cone and plate attachments. Also during the temperature sweep, it was assumed that no evaporation occurred at the higher temperatures. Samples were tested in triplicate.

Results and Discussion

The flow and dynamic behavior of GG and GGLT were unable to be determined. The addition of SP resulted in the precipitation of each hydrocolloid out of the aqueous base solution. GG and GGLT were known to be sensitive to divalent ions, preventing hydration by bonding to the hydrocolloid, and interrupting the hydrogen bonding of the water molecules (Imeson 1997; Szczesniak 1986). The anionic behavior of GG and GGLT most likely resulted in a bonding to the SP. Therefore, GG and GGLT were not considered as potential hydrocolloids for use in meat enhancement solutions.

Flow Behavior

Hydrocolloid treatments were characterized and model equations were determined as shown in Tables 10 and 11. The MC, HPMC, SGMC, and KF were Newtonian fluids. XG samples were shear-thinning fluids, which indicated that the apparent viscosity of the fluid was affected by shear rate ($\dot{\gamma}$) and shear stress (σ), which was in agreement with Szcesniak (1986). Both Newtonian and shear-thinning fluids may be viable for use in a whole-muscle product based on rheological flow properties. When using shear-thinning solutions, injection equipment designed for use with highly viscous fluids may be needed. Other considerations for these solutions would be the injection level and potential damage to the product that may occur during injection. Shear-thinning fluids may be easier to inject into a whole muscle product as the $\dot{\gamma}$ and σ applied to the fluid during processing will cause the apparent viscosity to decrease.

However, after injection and with time, the shear-thinning fluid becomes more viscous when the $\dot{\gamma}$ and σ are removed. The fluid may cause muscle damage similar to over-pumping as the enhancement solution expands post-injection.

The addition of NaCl and SP did not effect the apparent viscosity of 1.00% MC, 1.00% HPMC, 1.00% SGMC, and both KF treatments (Tables 10 and 11). The utilization of these hydrocolloids in a meat enhancement solution would be possible since the fluid behavior was not altered when combined with NaCl and SP. Interestingly, the addition of SP to the 2.00% MC did not effect the apparent viscosity of the treatment solution, whereas the addition of salt increased the apparent viscosity roughly 1.5 times (Table 11). Increasing the concentration of to MC 2.00% may have only allowed the smaller NaCl molecules to interact with the MC structure compared to the larger SP molecule. The increased interaction could have caused swelling of the MC molecule and have resulted in increased friction with resultant increase in the apparent viscosity. A similar trend was observed with the 2.000% SGMC (Table 11) and, as expected, increasing hydrocolloid concentration increased the apparent viscosity.

The apparent viscosity of XG was affected by the addition of NaCl and SP. At the same hydrocolloid concentration, the addition of SP increased viscosity and had greater shear-thinning behavior than the enhancement solution with salt (Table 11). The *n* value of a shear-thinning fluid indicates the shear-thinning effect on the treatment solution. A higher *n* value for a fluid exhibits less shear-thinning characteristics (Szczesniak 1986) than a fluid with a smaller *n*.

Table 10. Flow behavior and model equations for hydrocolloid treatments at 25 °C.

Hydrocolloid	(w/v)	Fluid Type	Model Equation	R^2
MC	1.000%	Newtonian	$\sigma=0.0198\,\dot{\gamma}$	0.9978
MC	2.000%	Newtonian	$\sigma=0.1387\,\dot{\gamma}$	0.9994
HPMC	1.000%	Newtonian	$\sigma=0.0022\,\dot{\gamma}$	0.9175
SGMC	1.000%	Newtonian	$\sigma=0.0108\,\dot{\gamma}$	0.9913
SGMC	2.000%	Newtonian	$\sigma=0.0776\,\dot{\gamma}$	0.9995
XG	0.250%	Shear-Thinning	$\sigma=1.2160\,\dot{\gamma}^{0.2992}$	0.8591
XG	0.500%	Shear-Thinning	$\sigma=1.3958\,\dot{\gamma}^{0.2666}$	0.8150
KF	0.125%	Newtonian	$\sigma=0.0039\,\dot{\gamma}$	0.9713
KF	0.250%	Newtonian	$\sigma=0.0229\,\dot{\gamma}$	0.9973

Table 11. Flow behavior characterization and model equations for hydrocolloid treatments with sodium chloride or sodium phosphate at 25 °C.

	Salt Addition				Sodium Phosphate[a] Addition			
Hydrocolloid (w/v)	NaCl (w/v)	Fluid Type	Model Equation	R^2	SP (w/v)	Fluid Type	Model Equation	R^2
MC	0.5%	Newtonian	$\sigma=0.0227\dot{\gamma}$	0.9985	0.1%	Newtonian	$\sigma=0.0202\dot{\gamma}$	0.9973
1.00%	1.0%	Newtonian	$\sigma=0.0243\dot{\gamma}$	0.9985	0.2%	Newtonian	$\sigma=0.0214\dot{\gamma}$	0.9981
	1.5%	Newtonian	$\sigma=0.0252\dot{\gamma}$	0.9985	0.3%	Newtonian	$\sigma=0.0216\dot{\gamma}$	0.9976
	2.0%	Newtonian	$\sigma=0.0251\dot{\gamma}$	0.9984	0.4%	Newtonian	$\sigma=0.0251\dot{\gamma}$	0.9979
	2.5%	Newtonian	$\sigma=0.0254\dot{\gamma}$	0.9970				
	3.0%	Newtonian	$\sigma=0.0258\dot{\gamma}$	0.9986				
MC	0.5%	Newtonian	$\sigma=0.2053\dot{\gamma}$	0.9997	0.1%	Newtonian	$\sigma=0.1552\dot{\gamma}$	0.9998
2.00%	1.0%	Newtonian	$\sigma=0.2016\dot{\gamma}$	0.9997	0.2%	Newtonian	$\sigma=0.1452\dot{\gamma}$	0.9999
	1.5%	Newtonian	$\sigma=0.2141\dot{\gamma}$	0.9997	0.3%	Newtonian	$\sigma=0.1621\dot{\gamma}$	0.9999
	2.0%	Newtonian	$\sigma=0.2310\dot{\gamma}$	0.9997	0.4%	Newtonian	$\sigma=0.1955\dot{\gamma}$	0.9998
	2.5%	Newtonian	$\sigma=0.2087\dot{\gamma}$	0.9997				
	3.0%	Newtonian	$\sigma=0.2027\dot{\gamma}$	0.9997				
HPMC	0.5%	Newtonian	$\sigma=0.0029\dot{\gamma}$	0.9628	0.1%	Newtonian	$\sigma=0.0023\dot{\gamma}$	0.8803
1.00%	1.0%	Newtonian	$\sigma=0.0028\dot{\gamma}$	0.9473	0.2%	Newtonian	$\sigma=0.0028\dot{\gamma}$	0.9445
	1.5%	Newtonian	$\sigma=0.0026\dot{\gamma}$	0.9578	0.3%	Newtonian	$\sigma=0.0025\dot{\gamma}$	0.9395
	2.0%	Newtonian	$\sigma=0.0024\dot{\gamma}$	0.9181	0.4%	Newtonian	$\sigma=0.0027\dot{\gamma}$	0.9498

Table 11. Continued.

Hydrocolloid (w/v)	Salt Addition: NaCl (w/v)	Fluid Type	Model Equation	R^2	Sodium Phosphate[a] Addition: SP (w/v)	Fluid Type	Model Equation	R^2
	2.5%	Newtonian	$\sigma=0.0024\dot{\gamma}$	0.8938				
	3.0%	Newtonian	$\sigma=0.0024\dot{\gamma}$	0.8923				
SGMC	0.5%	Newtonian	$\sigma=0.0128\dot{\gamma}$	0.9949	0.1%	Newtonian	$\sigma=0.0126\dot{\gamma}$	0.9921
1.00%	1.0%	Newtonian	$\sigma=0.0150\dot{\gamma}$	0.9966	0.2%	Newtonian	$\sigma=0.0127\dot{\gamma}$	0.9970
	1.5%	Newtonian	$\sigma=0.0140\dot{\gamma}$	0.9943	0.3%	Newtonian	$\sigma=0.0125\dot{\gamma}$	0.9976
	2.0%	Newtonian	$\sigma=0.0146\dot{\gamma}$	0.9967	0.4%	Newtonian	$\sigma=0.0135\dot{\gamma}$	0.9974
	2.5%	Newtonian	$\sigma=0.0130\dot{\gamma}$	0.9927				
	3.0%	Newtonian	$\sigma=0.0136\dot{\gamma}$	0.9970				
SGMC	0.5%	Newtonian	$\sigma=0.1110\dot{\gamma}$	0.9992	0.1%	Newtonian	$\sigma=0.1005\dot{\gamma}$	0.9993
2.00%	1.0%	Newtonian	$\sigma=0.1130\dot{\gamma}$	0.9987	0.2%	Newtonian	$\sigma=0.0929\dot{\gamma}$	0.9996
	1.5%	Newtonian	$\sigma=0.1099\dot{\gamma}$	0.9987	0.3%	Newtonian	$\sigma=0.0929\dot{\gamma}$	0.9993
	2.0%	Newtonian	$\sigma=0.0984\dot{\gamma}$	0.9984	0.4%	Newtonian	$\sigma=0.0964\dot{\gamma}$	0.9997
	2.5%	Newtonian	$\sigma=0.1024\dot{\gamma}$	0.9989				
	3.0%	Newtonian	$\sigma=0.1132\dot{\gamma}$	0.9979				
XG	0.5%	Shear-thinning	$\sigma=1.631\dot{\gamma}^{0.1170}$	0.9563	0.1%	Shear-thinning	$\sigma=2.341\dot{\gamma}^{0.0246}$	0.9867
0.25%	1.0%	Shear-thinning	$\sigma=1.516\dot{\gamma}^{0.1400}$	0.9175	0.2%	Shear-thinning	$\sigma=2.438\dot{\gamma}^{0.0314}$	0.9560
	1.5%	Shear-thinning	$\sigma=1.357\dot{\gamma}^{0.2348}$	0.9821	0.3%	Shear-thinning	$\sigma=2.202\dot{\gamma}^{0.0348}$	0.9693

Table 11. Continued.

Hydrocolloid (w/v)	Salt Addition NaCl (w/v)	Fluid Type	Model Equation	R^2	Sodium Phosphate[a] Addition SP (w/v)	Fluid Type	Model Equation	R^2
	2.0%	Shear-thinning	$\sigma=1.747\dot{\gamma}^{0.1264}$	0.9090	0.4%	Shear-thinning	$\sigma=2.628\dot{\gamma}^{0.0345}$	0.9872
	2.5%	Shear-thinning	$\sigma=1.439\dot{\gamma}^{0.0981}$	0.7895				
	3.0%	Shear-thinning	$\sigma=1.394\dot{\gamma}^{0.2555}$	0.9287				
XG 0.50%	0.5%	Shear-thinning	$\sigma=8.583\dot{\gamma}^{0.3122}$	0.8595	0.1%	Shear-thinning	$\sigma=42.339\dot{\gamma}^{0.0532}$	0.9744
	1.0%	Shear-thinning	$\sigma=9.355\dot{\gamma}^{0.3691}$	0.6380	0.2%	Shear-thinning	$\sigma=66.440\dot{\gamma}^{0.0552}$	0.9661
	1.5%	Shear-thinning	$\sigma=7.193\dot{\gamma}^{0.5180}$	0.8755	0.3%	Shear-thinning	$\sigma=68.272\dot{\gamma}^{0.0631}$	0.9943
	2.0%	Shear-thinning	$\sigma=12.076\dot{\gamma}^{0.3397}$	0.6945	0.4%	Shear-thinning	$\sigma=57.731\dot{\gamma}^{0.0654}$	0.9795
	2.5%	Shear-thinning	$\sigma=13.480\dot{\gamma}^{0.1455}$	0.9095				
	3.0%	Shear-thinning	$\sigma=16.868\dot{\gamma}^{0.1276}$	0.7348				
KF 0.125%	0.5%	Newtonian	$\sigma=0.0048\dot{\gamma}$	0.9810	0.1%	Newtonian	$\sigma=0.0042\dot{\gamma}$	0.9646
	1.0%	Newtonian	$\sigma=0.0045\dot{\gamma}$	0.9821	0.2%	Newtonian	$\sigma=0.0043\dot{\gamma}$	0.9674
	1.5%	Newtonian	$\sigma=0.0043\dot{\gamma}$	0.9835	0.3%	Newtonian	$\sigma=0.0049\dot{\gamma}$	0.9749
	2.0%	Newtonian	$\sigma=0.0048\dot{\gamma}$	0.9843	0.4%	Newtonian	$\sigma=0.0057\dot{\gamma}$	0.9827
	2.5%	Newtonian	$\sigma=0.0044\dot{\gamma}$	0.9780				
	3.0%	Newtonian	$\sigma=0.0052\dot{\gamma}$	0.9852				
KF 0.25%	0.5%	Newtonian	$\sigma=0.0245\dot{\gamma}$	0.9973	0.1%	Newtonian	$\sigma=0.0208\dot{\gamma}$	0.9966
	1.0%	Newtonian	$\sigma=0.0223\dot{\gamma}$	0.9976	0.2%	Newtonian	$\sigma=0.0235\dot{\gamma}$	0.9979

Table 11. Continued.

Hydrocolloid (w/v)	Salt Addition				Sodium Phosphate[a] Addition			
	NaCl (w/v)	Fluid Type	Model Equation	R^2	SP (w/v)	Fluid Type	Model Equation	R^2
	1.5%	Newtonian	$\sigma=0.0224\dot{\gamma}$	0.9971	0.3%	Newtonian	$\sigma=0.0239\dot{\gamma}$	0.9977
	2.0%	Newtonian	$\sigma=0.0240\dot{\gamma}$	0.9967	0.4%	Newtonian	$\sigma=0.0218\dot{\gamma}$	0.9975
	2.5%	Newtonian	$\sigma=0.0172\dot{\gamma}$	0.9951				
	3.0%	Newtonian	$\sigma=0.0200\dot{\gamma}$	0.9975				

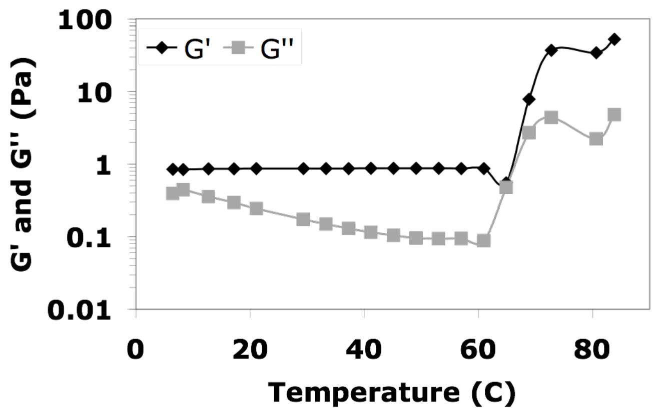
[a]Brifisol® 85 Instant, pH 8.5, BK Giulini Corp., Simi Valley, CA, U.S.A.

The realistic application of hydrocolloids in an enhancement solution for injection into whole-muscle must include an evaluation of the processing equipment and the limiting parameters of such equipment. Hydrocolloid solutions, like those of 2.00% MC, 2.00% SGMC, and 0.50% XG, were roughly 100 to 500 times more viscous than water. Despite the inherent flow behavior of these solutions, they theoretically could be used in common meat processing equipment. However, the extremely high apparent viscosity of these solutions would most likely make them difficult to inject using standard meat processing equipment. Based on flow behavior, only the following hydrocolloid concentrations should be considered for use in meat enhancement solutions: 1.00% MC, 1.00% HPMC, 1.00% SGMC, 0.25% XG, and 0.125% KF.

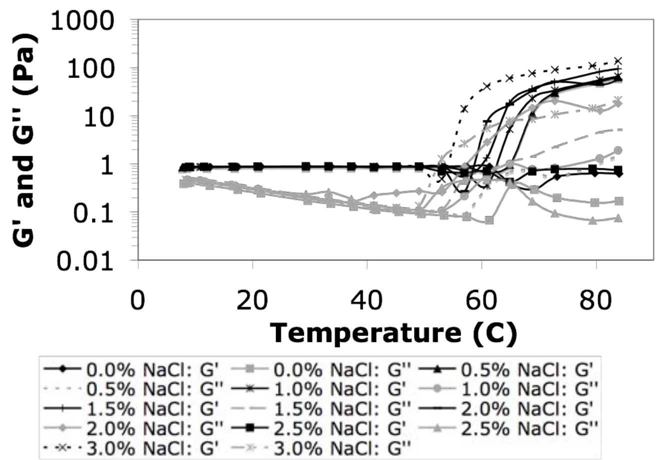
Dynamic Behavior

Hydrocolloids, evaluated within this study, were viscoelastic in rheological behavior and both the elastic modulus (G′, storage modulus) and viscous moduli (G′′, shear loss modulus) were characterized (Figs. 8, 9, 10, and 11). The addition of NaCl and SP did effect the dynamic moduli of the MC, SGMC, and XG hydrocolloid treatments. Whereas, the HPMC and KF treatments had stable moduli, despite changes in temperature and the addition of salt and SP (Figs. 9; 11).

The instability of the dynamic moduli for 1.000% MC with changes in ionic strength (Fig. 8) was similar to 1.00% SGMC (data not shown). The dynamic moduli with the addition of NaCl and SP followed similar trends with treatments not containing salt and SP. The G′ was greater than the G′′ as temperature increased, indicating there



a.



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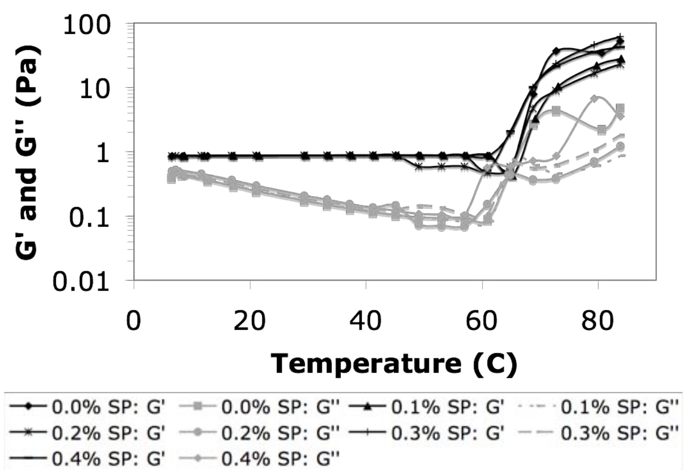
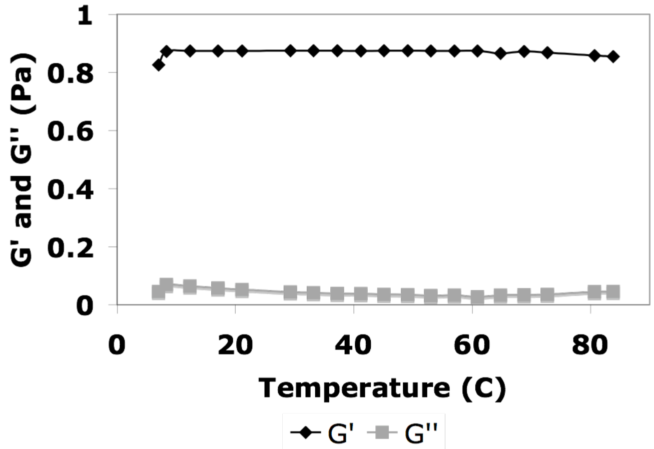
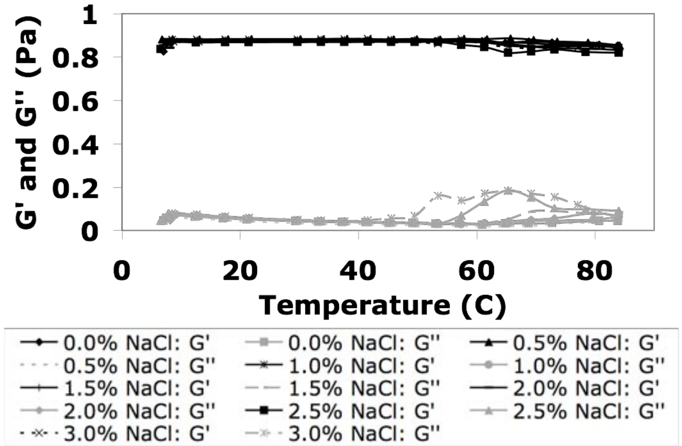


c.

Figure 8. Dynamic testing of hydrocolloid ingredients for use in enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C: a. 1.000% MC; b. 1.000% MC with NaCl; c. 1.000% MC with SP.



a.



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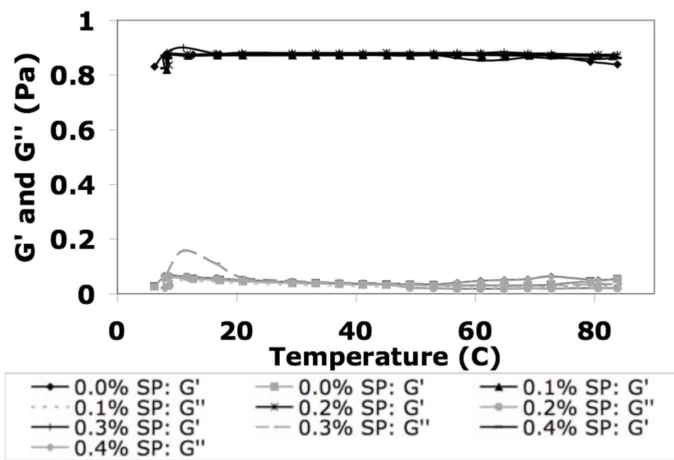
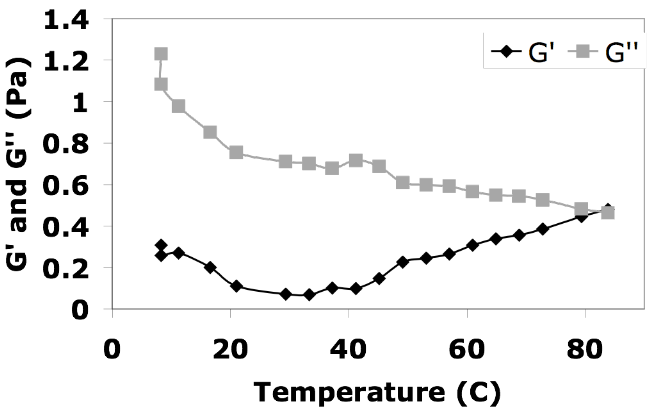
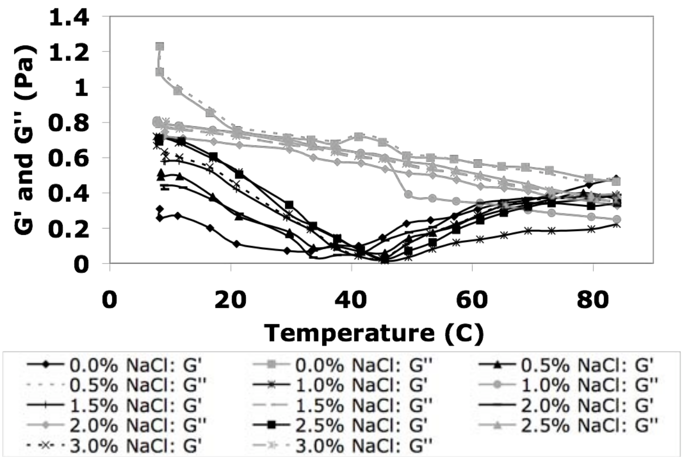


c.

Figure 9. Dynamic testing of hydrocolloid ingredients for use in enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C: a. 1.000% HPMC; b. 1.000% HPMC with NaCl; c. 1.000% HPMC with SP.



a.



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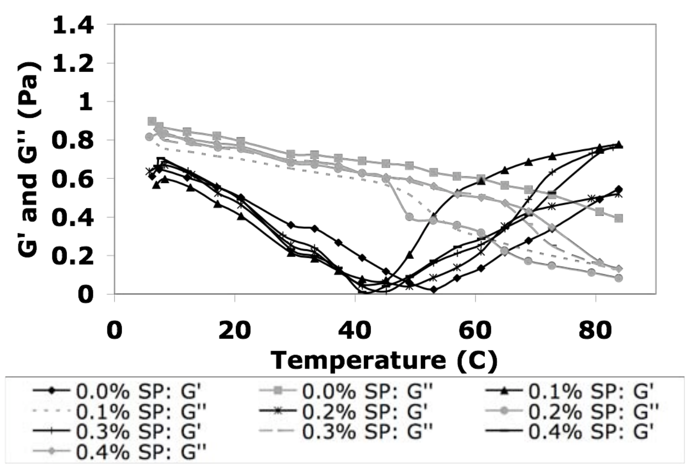
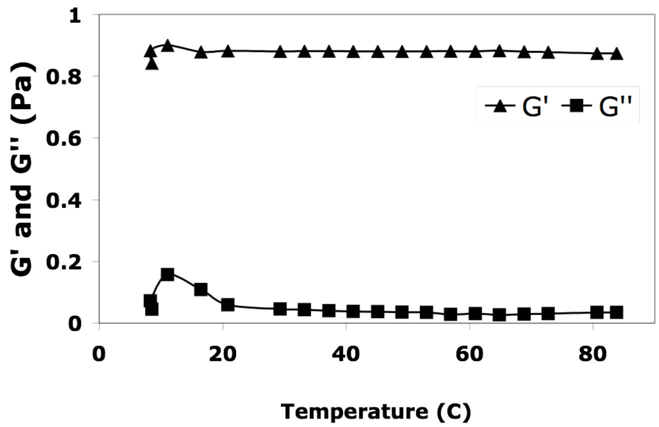
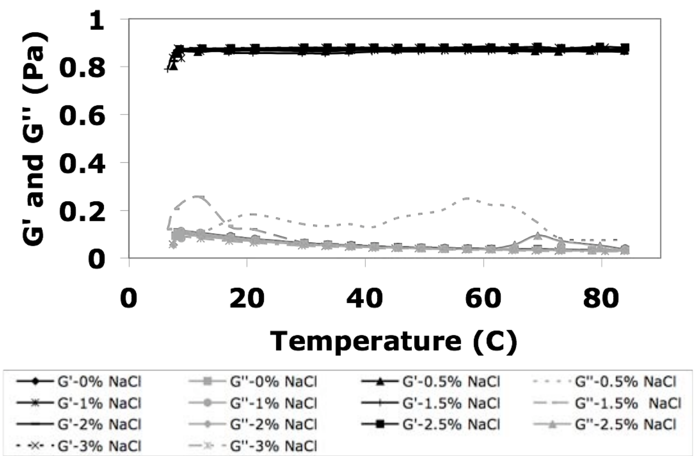


c.

Figure 10. Dynamic testing of hydrocolloid ingredients for use in enhancement solutions at 1 Pa from 4 °C to 85 °C: a. 0.250% XG; b. 0.250% XG with NaCl; c. 0.250% XG with SP.



a.



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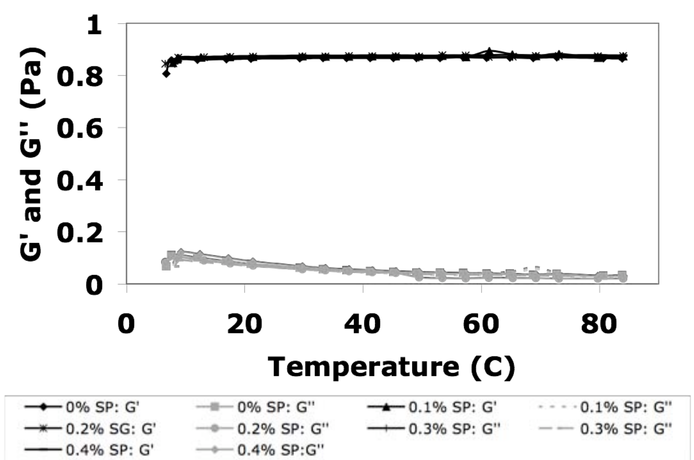


c.

Figure 11. Dynamic testing of hydrocolloid ingredients for use in enhancement solutions at 1 Pa from 4 °C to 85 °C: a. 0.125% KF; b. 0.125% KF with NaCl; c. 0.125% KF with SP.

was a greater elastic component to the viscoelastic hydrocolloid. As the temperature approached 60 °C, the dynamic moduli became less stable, particularly with the addition of salt (Fig. 8) which lowered the observed temperature for instability. The XG treatment (0.50% XG treatment not shown) had similar instability of the dynamic moduli, but was affected more by the addition of SP than NaCl (Fig. 10).

The instability of the dynamic moduli demonstrated changes occurred within the hydrocolloid solution at those temperatures, whether the hydrocolloid ingredient was more of a gel (greater G′ than G′′) or a fluid (G′′ greater than G′). When unstable, the hydrocolloid dynamic behavior cannot be accurately predicted. Interestingly, the temperature of instability for the hydrocolloid ingredients evaluated, occurred in the temperature range associated with muscle protein denaturation and coagulation. Though not tested in this study, the inclusion of a hydrocolloid ingredient may interfere with the denaturation, coagulation, and re-orientation of muscle proteins during cooking and most likely, either positively or negatively, may affect cooked meat texture. Based on the scope of this study, these treatments can be used in the meat products. Though, careful consideration should be given when including a hydrocolloid ingredient in an enhancement solution for a whole-muscle product, particularly, its dynamic behavior during protein transition temperatures.

Most rheological research of meat gels has been performed on isolated myofibrils suspensions as seen in Boyer and others (1996), Xiong and Blanchard (1994) and Egelandsdal and others (1986a; 1986b). Egelandsdal and others (1986a; 1986b) and Montejano and others (1984b) found a weakening of meat gels during the denaturation of myosin filaments between 50 and 60 °C, but strengthening occurred as the filaments re-organized at higher temperatures (Boyer and others 1996). Further work by Egelandsdal and others (1986a) examined the effect of heavy meromyosin (HMM) and light meromyosin (LMM). They suggested that the increase of G′ below 50 °C was due to the crosslinking of the HMM and the denaturation of LMM proteins caused a weakening of gel strength above 50 °C (Egelandsdal and other 1986a; Sano and others 1990; Boyer and others 1996). Xiong and Blanchard (1994) reported similar values and showed that HMM and actin proteins had increased protein: protein interactions and became insoluble when heated to 50 °C. This was also true for the actomyosin complex (Jiménez-Colmenero and others 1994). Based on desired properties needed within a meat product, a hydrocolloid ingredient could be selected to work in concert with the muscle proteins, like MC or SGMC, or if texture improvement was needed, a thermally stable hydrocolloid may be utilized like HPMC or KF. Being resistant to temperature change will allow a meat processor to apply the hydrocolloid treatment during raw processing and feel confident the treatment will remain functional over the temperatures the product is exposed to during processing, storage, distribution, and consumption.

Egelandsdal and others (1986a) stated that the dynamic moduli, G′ and G′′, were dependant on many factors like ionic strength, temperature, and protein configuration. Boyer and others (1996) suggested that native myofilaments would form a functional gel matrix in a low temperature and low ionic environment if the muscle filaments were pre-solublized in a 0.6 M or greater ionic solution first. At low ionic strengths (0.24 M) and storage up to 2 weeks, myosin fibrils when heated to temperatures lower than 54 °C had lower G′ indicating a weaker gel matrix (Egelandsdal and others 1986b). The dynamic properties of HPMC and 0.125% KF may interact with the muscle proteins as each was not effect by changes in ionic strength (Fig. 9; 11).

Conclusion

Understanding the effect of salt and SP addition to hydrocolloid ingredients for use in a whole-muscle meat system based on rheological behavior of aqueous solutions was examined. The use of MC, SGMC, HPMC and KF in a whole muscle system may be a viable option as each have Newtonian flow behavior, with and without salt and SP, as they have flow behavior similar to current aqueous enhancement solutions used in the meat industry. Shear-thinning fluids like XG may also be potential ingredients in enhancement solutions, as apparent viscosity decreases with the application of shear rate and stress. The ability of HPMC and KF to maintain a constant apparent viscosity with changing ionic strengths, as well as constant dynamic moduli in wide range of temperatures, further demonstrated the possibility of their use in a meat system. The viscoelastic properties of HPMC and KF showed that each formed a stable gel structure, but further research is needed to determine functionality in a meat system.

CHAPTER V

TEXTURAL BEHAVIOR OF GROUND PORK GELS CONTAINING HYDROCOLLOIDS AND NON-MEAT BUFFER INGREDIENTS FOR IMPROVEMENT OF PALE, SOFT, AND EXUDATIVE PORK

Overview

The objective of this research was to characterize the effects of hydroxypropyl methylcellulose (HPMC), methylcellulose (MC), konjac flour (KF), sodium bicarbonate (NaHCO), potassium bicarbonate (KHCO) and ammonium bicarbonate (NHHCO) combinations for reducing the variation of meat quality attributes of normal or PSE pork muscle. Fresh *Longissimus dorsi* categorized as normal (pH 5.6-5.9) or PSE (pH < 5.4) were ground to 0.476 cm and assigned a treatment solution: control, dd water, 1.00%HPMC, 1.00%MC, 0.125%KF, 0.30 M NaHCO, 0.30 M NaHCO+1.00%HPMC, 0.30 M NaHCO+1.00%MC, 0.30 M NaHCO+0.125%KF, 0.30 M KHCO, 0.30 M KHCO+1.00%HPMC, 0.30 M KHCO+1.00%MC, 0.30 M KHCO+0.125%KF, 0.30 M NHHCO, 0.30 M NHHCO+1.00%HPMC, 0.30 M NHHCO+1.00%MC, and 0.30 M NHHCO+0.125%KF. Treatment solutions were added at 12% of ground weight, homogenized, stuffed into 15 mL tubes, and cooked to an internal temperature of 75 °C. Torsion analysis and Texture Profile Analysis (TPA) was performed on cooked gel samples. Treatment by meat interaction occurred for TPA attributes. All PSE meat KHCO treatments and the PSE-NHHCO+HPMC combination had improved Hardness-1st bite values that resembled the normal-control samples. This trend was consistent for all TPA attributes. Cooked color and pH improved for buffer-hydrocolloid treatments. KHCO and NHHCO were viable substitutions for NaHCO as a buffer ingredient to work synergistically with HPMC and KF for improvement of pH, color attributes, and texture properties. Additional research needs to be performed to determine if sodium chloride and sodium phosphate, common enhancement solution ingredients, will affect the functionality of KHCO, NHHCO, HPMC, and KF in ground pork systems.

Introduction

Pale, soft, and exudative (PSE) pork muscle is a common quality defect found in 10-40% of fresh pork (Marriott and Schilling 1998). Between the 1992 and 2002, the reported incidence of PSE had increased from 10.2 to 15.5% despite exhaustive research, and industry/producer interventions (Miller 2004). PSE meat is characterized as having a soft and mushy texture, poor-water holding capacity, low pH, and an unnatural pale or grayish color. The low pH, in combination with an elevated carcass temperature immediately post-harvest in PSE carcasses, causes protein denaturation to occur and free water can leave the muscle (Briskey 1964; Bendall and Swatland 1988). PSE muscle gelation has less protein functionality than normal muscle gelation due to weaker gel strength and water loss (Camou and Sebranek 1991).

The decrease in pH of PSE muscle, also results in the loss of ability of the muscle to maintain buffering capacity, as seen by decreased protein functionality. Sodium bicarbonate (NaHCO), a common buffering agent in the meat industry, assists the muscle in stabilizing pH fluctuations and increases overall pH. The utilization of NaHCO had demonstrated improvements in color, water holding capacity, and texture in pre-rigor and post-rigor muscle (van Laack and others 1996, 1998; Kauffman and others 1998; Wynveen and others 2001; Alvarado and Sams 2003; Sen and others 2005). The pH of PSE muscle approaches the muscle's pI and has increased protein: protein interactions as compared to normal muscle. NaHCO increases the muscle pH by overcoming the buffering capacity of the meat, changing the ionic strength of the muscle, and altering meat color by allowing more free water to bind to the muscle proteins. The increase in WHC from NaHCO would cause a darkening of the muscle as the light reflection was reduced and more water was bound to the protein (Fernandez-Lopez and others 2004). Kauffman and others (1988) reported a significant ($P<0.05$) improvement to CIE L* color values and drip loss in pork muscle injected with Nacho 24 h post-mortem. Unfortunately, the use of Nacho could not recover or emulate protein functionality lost in PSE muscle, and sensory panelists reported increased saltiness levels in NaHCO treated pork (Kauffman and others 1998). Alternative buffer ingredients that produced similar chemical and physical properties in PSE meat without the increased saltiness of NaHCO are needed. Also, the inability of Nacho to recover protein functionality in PSE muscle demonstrates the need for additional non-meat ingredients to be used in PSE meat products. Hydrocolloids in a whole muscle system may improve the textural properties of the muscle while binding the free water caused by protein denaturation of the PSE muscle. Similar improvements have been observed in the production of low-fat frankfurters containing hydrocolloids (Barbut and Mittal 1996), and should be considered for use in PSE pork.

Utilizing enhancement solutions containing bicarbonate buffers and hydrocolloids may improve PSE pork muscle. Hydrocolloids have been shown that they can be used in conjunction with salt and sodium phosphate in a meat enhancement solution, though their work did not address the feasibility in a meat system. Therefore, the objective of this study was to determine if the addition of buffer and hydrocolloid ingredients will affect the rheological properties of normal and PSE cooked ground pork gels.

Materials and Methods

Treatment Solution Preparation

Hydrocolloid ingredients were hydrated per manufactures specification in 150 mL of double distilled deionized water, and solublized. Buffer ingredients, at 0.3 M concentration, were added to the treatment solution, to their respective concentration level, and allowed to solublize (Table 3). All treatment solutions were raised to a final volume of 200 mL. Prior to analysis, samples were allowed to equilibrate to 25 °C.

Meat Gel Preparation

Fresh, vacuumed-packaged normal (pH 5.6-5.9) and PSE (pH < 5.4) pork loins were shipped to the Kleberg Center at Texas A&M University, College Station, TX. Each *longissimus dorsi* muscle was trimmed of all visible *subcutaneous* fat and connective tissue. Color and pH measurements were determined at chop surface on the *longissimus dorsi* muscle to verify pH selection. Loins were ground to 1.27 cm then to 0.476 cm (Hobart Corporation, Model 4612, Troy, Ohio, U.S.A.), sectioned into 200 g portions and held at 4 °C. Within each normal or PSE ground sample, a 200 g portion was randomly assigned a treatment solution prepared within 48 h of the processing day. Treatment solutions were added to meat samples at 12% of ground weight to simulate injection of treatment solution into a whole muscle system, and were homogenized for 60 s in a food processor (KitchenAid, Hobart Corporation, Troy, Ohio). Homogenized meat samples were bagged in oxygen impermeable vacuum bags (OTR 1 cm^3/m^2/ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH), vacuum packaged, and stored at 4 °C.

Five, 15 g aliquots, approximately, of homogenized meat sample were hand stuffed into 5 disposable polystyrene culture tubes (17 mm outer dia x 100 mm length, constant wall thickness) for rheological analysis. A second set of samples was prepared for cooked color and pH analysis, a 45 g aliquot of homogenized meat sample was hand stuffed into a disposable 50 mL polystyrene centrifuge tube. Tubes were capped and centrifuged (Garver Electrifuge, Model 54, Garver Manufacturing Co., Union City, IN, U.S.A.) at 600 x g for 30 min to remove air pockets and firmly pack the sample. Sample tubes were heated to a 75 °C endpoint in a water bath having a heating rate of approximately 0.75 °C /min. Sample temperature was monitored by inserting a copper constantan wire thermocouple (Omega Engineering, Inc., type T thermocouple, Stamford, CT, U.S.A.) into the geometric center of 1 sample tube per rack. Temperature was monitored with electronic thermometer (Omega Engineering, Inc., Model HH501BT, Stamford, CT, U.S.A.). After reaching 75 °C, samples were removed from water bath, capped and stored a minimum of 8 h at 4 °C.

Color and pH Analysis

Cooked meat gels were removed from 50 mL polystyrene tubes and cut in half laterally. Cooked CIE L*, a* and b* color space values were measured, in triplicate, using a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ, U.S.A.) which was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196). The pH was measured, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA, U.S.A.) at the interior cut surface on the pork gel.

Texture Analysis

Torsion Analysis

Torsion analysis was performed utilizing a digital viscometer modified with torsion fixture (Brookfield viscometer, model 5XHBTD, London, England). Gel samples were prepared and analyzed according to the methods of Kim and others (1986). Gels samples were removed from 15 mL tubes and cut into 5-28.7 mm samples. Plastic torsion disks designed for torsion fixture were affixed to each end of gel sample via cyanoacrylate glue, milled into a dumbbell shape with a midsection diameter of 10 mm, and placed on torsion apparatus. The shear stress (kPa) and strain at gel failure was determined as a mean of the five samples.

Texture Profile Analysis

Texture profile analysis (TPA) was performed as described by Bourne (1978) using a TA-XT2 Texture Analyzer (Texture Technologies Corp., Scarsdale, NY, U.S.A.) with Texture Expert software (Stable Micro Systems LTD, version 1.16, 1997) with 60 mm dia plunger attachment. Meat gels were removed from 15 mL tubes and allowed to equilibrate to room temperature. Five meat gel samples were cut into 1 dia : 1 length ratio and ran within 20 min to prevent loss of sample integrity due to evaporation. Pre-test and test speed was set for 1 mm/s. Samples were compressed twice. Each compression was at 75% of initial sample length with a 5 sec delay between compressions. post-test speed was 2 mm/s. Hardness 1st bite (N), hardness 2nd bite (N), cohesiveness, and gumminess (N) were determined.

Statistical Analysis

Data was analyzed using the Proc GLM Model procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC, U.S.A.) as a 2 x 17 factorial arrangement with meat (normal, PSE) and treatment solution (Table 3), and meat by treatment solution as main effects. Processing day, processing day by meat, and processing day by treatment was included as a block. Significance was defined as $P<0.05$. Least squares means were determined and where Analysis of Variance indicated significance, least squares means were separated by the pdiff procedure of SAS using an alpha of <0.05.

Results and Discussion

Meat by processing day interactions were significant ($P<0.05$) as a result of inherent pork loin variation within normal and PSE muscle (Table 12) across processing days. Cooked color, pH, and torsion evaluation of meat gel samples were not significant ($P>0.05$) for meat by treatment interactions (Table 12).

Cooked pH and CIE b* color space values did not differ ($P>0.05$) among normal and PSE samples. As expected, PSE samples were lighter and less red in color than normal samples (Table 12). Meat type did not affect (P>0.05) the stress or strain of normal and pork gels (Table 12). This was unexpected as PSE gels were expected to be more brittle and require a greater force for gel failure, as PSE chops typically are less tender than normal chops.

It was hypothesized that the addition of buffers would increase pH and result in meat gels from low pH meat that was similar to the normal control gels. The addition of buffer ingredient increased the cooked gel pH (P<0.05) gels compared to controls or without buffer ingredients (Table 12). Hydrocolloid addition did not alter cooked pH that agrees with previous unpublished work of the researchers. The addition of NaHCO, KHCO, and NHHCO increased cooked pH (P<0.05) with or without the inclusion of hydrocolloid ingredients, similar to that reported of Sen and others (2005) These results suggest that buffer treated samples had improved cooked pH and their use would allow for improved modification of low pH meat. When hydrocolloids were used in combination with buffer ingredients the pH increased, but when hydrocolloids were used alone pH was not affected (Table 12). As the low pH of PSE muscle approaches the muscle's isoelectric point (Enfalt and others 1993), it would have a greater protein-protein interaction compared to the favored protein-water interaction, resulting in the loss of free water from the muscle (Briskey 1964; Bendall and Swatland 1988). Using NaHCO, KHCO, and NHHCO to increase the pH of the muscle prior to thermal processing may improve cooked color, pH, and texture of the gels as the denaturation of protein in PSE products, specifically myosin, determines the cooked product texture and

Table 12. Least squares means for torsion testing, cooked pH and CIE color space values for cooked meat gels affected by meat source and hydrocolloid/buffer treatments.

		Cooked CIE Color Space Values			Torsion Testing	
Effect	Cooked pH	L*	a*	b*	Stress (kPa)	Strain
Meat Source	0.056^{k}	0.0143^{k}	0.0298^{k}	0.4723^{k}	0.1204^{k}	0.0583^{k}
Normal	6.38	79.43^{b}	8.47^{a}	7.39	49.90	1.07
PSE	6.13	80.71^{a}	7.74^{b}	7.31	55.46	0.97
Treatment	<0.0001^{k}	<0.0001^{k}	<0.0001^{k}	0.1498^{k}	<0.0001^{k}	<0.0001^{k}
Control	6.00^{d}	79.90^{b}	8.58^{a}	7.08	63.36^{a}	0.88^{ij}
ddH2O	5.99^{d}	81.33^{a}	7.64^{f}	7.27	52.10^{defgh}	0.94^{ghi}
Hydrocolloid						
HPMC	5.98^{d}	81.13^{a}	7.91^{def}	7.17	55.17^{bcdef}	0.93^{hij}
SGMC	5.98^{d}	81.48^{a}	7.86^{ef}	7.14	47.55^{ghi}	0.85^{j}
KF	5.99^{d}	81.53^{a}	7.67^{f}	7.23	58.60^{b}	0.96^{fghi}
Sodium Bicarbonate/Hydrocolloid						
NaHCO	6.40^{a}	79.61^{b}	8.12^{bcde}	7.49	49.48^{ghi}	1.06^{cd}
NaHCO/HPMC	6.39^{ab}	79.52^{bc}	8.29^{abc}	7.47	50.69^{efghi}	1.17^{ab}
NaHCO/SGMC	6.36^{bc}	80.02^{b}	8.30^{abc}	7.24	52.79^{cdefg}	1.21^{a}
NaHCO/KF	6.37^{bc}	79.45^{bc}	8.23^{bcd}	7.49	47.05^{gi}	1.10^{bc}
Potassium Bicarbonate/Hydrocolloid						
KHCO	6.38^{ab}	79.78^{b}	8.11^{bcde}	7.46	45.53^{i}	1.03^{cdefg}
KHCO/HPMC	6.37^{bc}	79.64^{b}	8.10^{bcde}	7.54	55.22^{bcdef}	1.04^{cdef}
KHCO/SGMC	6.37^{bc}	78.79^{c}	8.37^{ab}	7.27	55.98^{bcde}	1.05^{cde}
KHCO/KF	6.37^{bc}	79.34^{bc}	8.22^{bcd}	7.53	45.54^{i}	0.98^{defgh}

Table 12. Continued.

Effect	Cooked pH	Cooked CIE Color Space Values L*	a*	b*	Torsion Testing Stress (kPa)	Strain
<u>Ammonium Bicarbonate/Hydrocolloid</u>						
NHHCO	6.36^{bc}	79.98^{b}	8.11^{bcde}	7.42	46.92^{hi}	0.97^{efgh}
NHHCO/HPMC	6.36^{bc}	79.87^{b}	7.95^{def}	7.57	56.90^{bcd}	1.03^{cdefg}
NHHCO/SGMC	6.34^{c}	79.95^{b}	8.32^{abc}	7.02	57.61^{bc}	1.06^{cd}
NHHCO/KF	6.34^{c}	79.86^{b}	8.00^{cde}	7.50	49.99^{fghi}	1.06^{cd}
RMSE[l]	0.029	0.666	0.279	0.361	10.522	0.167

[abcdefghij]Mean values within a column and effect followed by the same letter are not significantly different ($P > 0.05$).
[k]P-value from analysis of variance tables
[l]Root Mean Square Error

cook loss (Offer and others 1989; Offer 1991). Utilizing enhancement solutions that include hydrocolloids as a method of improvement for PSE and DFD muscle should be considered as protein functionality can not be recovered by pH adjustment alone (Lan and others 1995a). The partially denatured state of PSE muscle proteins may result in a more ordered gel matrix than normal muscle, which most likely will cause an increase in gel strength (Lan and others 1995b). The combined addition of buffers and hydrocolloids may improve protein functionality of PSE meat, as the partially denatured PSE protein allows for greater flexibility for interaction with larger hydrocolloid molecules (Ensor and others 1991). The steric arrangement of muscle during the conversion of muscle to meat alters the arrangement of fiber bundles creating and increasing inter-spatial spaces between muscle fibers impacting WHC and texture of the muscle (Schafer and others 2002). These spaces, particularly in PSE muscle, could be filled with hydrocolloid gels to improve or emulate protein functionality.

Color space values were measured on pork gels to determine if buffer of hydrocolloid addition would improve or not detrimentally affect pork gel color. We hypothesized hat buffer addition would decrease CIE L* and increase CIE a* color space values and that hydrocolloid addition would not affect color space values of pork gels. Our goal was to identify combinations of ingredients that would result in color similar o normal-control gels. CIE L* color space values were not affected by meat by treatment interaction ($P=0.4830$); however, treatment affected cooked CIE L* color space values ($P<0.0001$). Control samples were intermediate in lightness and samples with the addition of water or hydrocolloids only resulted in the lightest colored cooked meat gels

(Table 12). The combination of KHCO/SGMC resulted in the lowest cooked CIE L* color space values. The addition of other buffer/hydrocolloid treatment combinations resulted in lightness similar to the control treatment. NaHCO/HPMC, NaHCO/KF, and KHCO/SGMC, and KHCO/KF treated gels had the darkest gel color with. The NaHCO, KHCO, and NHHCO treated samples had a darkening of color, which was likely caused by the increase of meat pH (Alvardo and Sams 2003; Sen and others 2005). Though amount of water in the cooked gels was not measured, the change in ionic strength likely resulted in a greater water-holding capacity (WHC) of the meat gel, which would explain the darkening of the meat gels. Barbut and Mittal (1996) did observe a darker, redder frankfurter when cellulose hydrocolloids were present, which agreed with our results as cellulose hydrocolloids when combined with a buffer ingredient produced the reddest pork gels. A reddening of the gel color was the greatest (Table 12) for control, NaHCO/HPMC, NaHCO/SGMC, KHCO/SGMC, and NHHCO/SGMC treated gels.

The texture of the meat gel was not affected ($P>0.05$) by meat source or meat by treatment interaction during torsion testing (Table 12). The control meat gels required the greatest force ($P<0.05$), 63.36 kPa, to break the meat gel compared to the treated gel samples. The stress at gel failure was higher than reported by Montejano and others (1985) whom thermal processed their meat gels to 90 °C. Samples treated with NaHCO, KHCO, and NHHCO ingredients and the combination of each with KF produced the most brittle gels, as each required less stress or force to cause a break within the gel structure. The addition of buffer ingredients resulted in a greater strain or deformation of the meat gels before failure (Table 12), which agreed with pH differences in turkey gels (Lavelle and Foegeding 1993). Control gels had similar strain to gels treated with water and hydrocolloids. The KHCO and NHHCO treated gels had similar strain ($P<0.05$) and were less rubbery than NaHCO/HPMC and NaHCO/SGMC. Though, Lavelle and Foegeding (1993) evaluated changes in ionic strength from the addition of salt, they observed no differences in torsion gel properties between 0.5 M and 1.0 M salt concentration in turkey gels.

Meat by treatment interactions occurred for TPA attributes (Figs. 12, 13, 14, and 15). Within treatment application, Hardness-1st bite (Hard1), hardness-2nd bite (Hard2), and gumminess had similar trends as they were affected by meat type in agreement with Shand and others (1993). Hard1 was the amount of force of gel failure during the first compression and Hard2 the amount of force for gel failure for the second compression (Bourne 1982). Bourne (1982) defined the cohesiveness of a sample as the degree of deformation the gel can withstand before gel failure. Gumminess was defined of the magnitude of Hard1 times Cohesiveness (Bourne 1982). We hypothesized that the addition of buffer, hydrocolloids or the buffer/hydrocolloid combination would recover

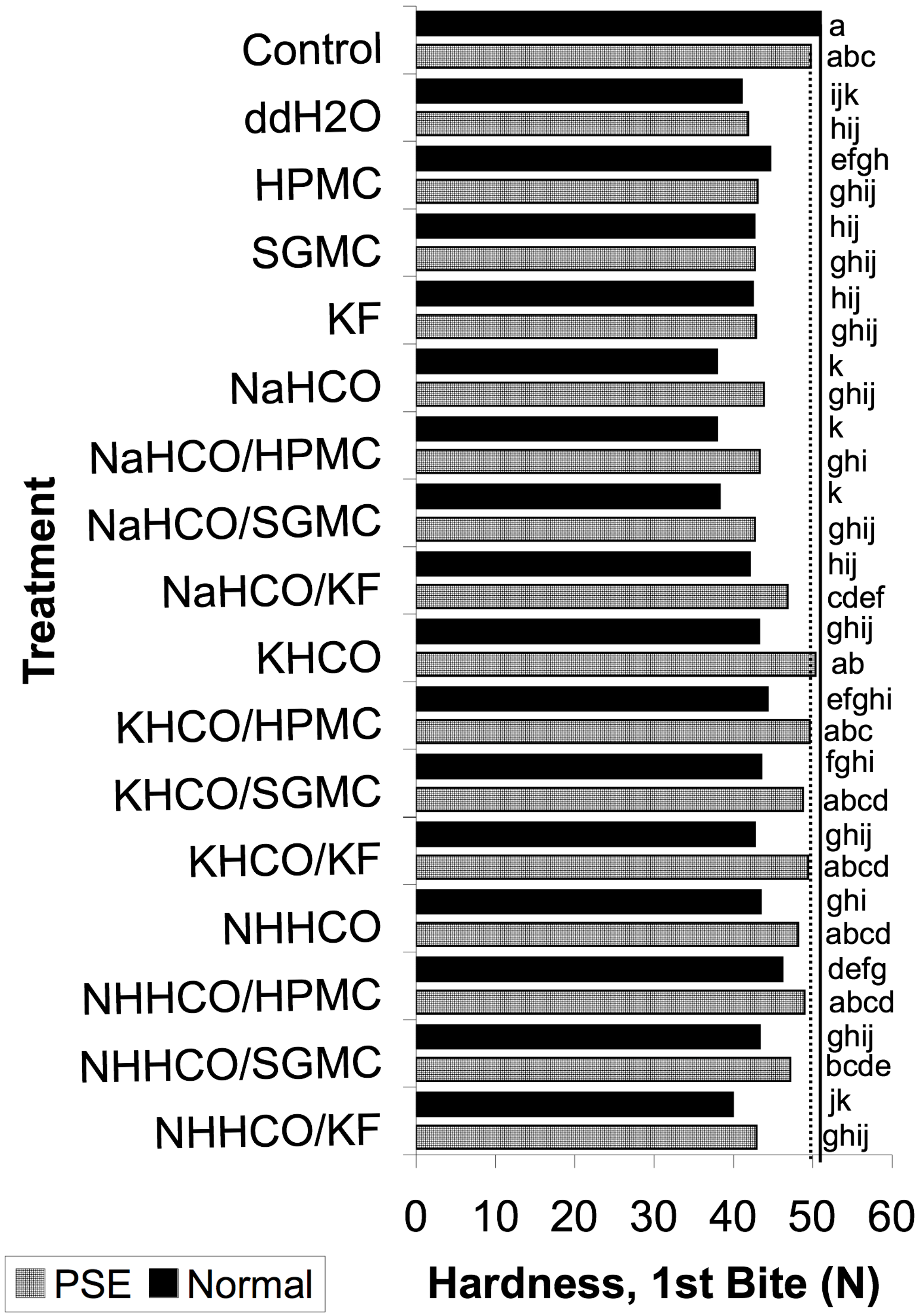


Figure 12. Meat by buffer treatment interaction for cooked meat gels on TPA attribute: Hardness-1st Bite (N) (P<0.0015).

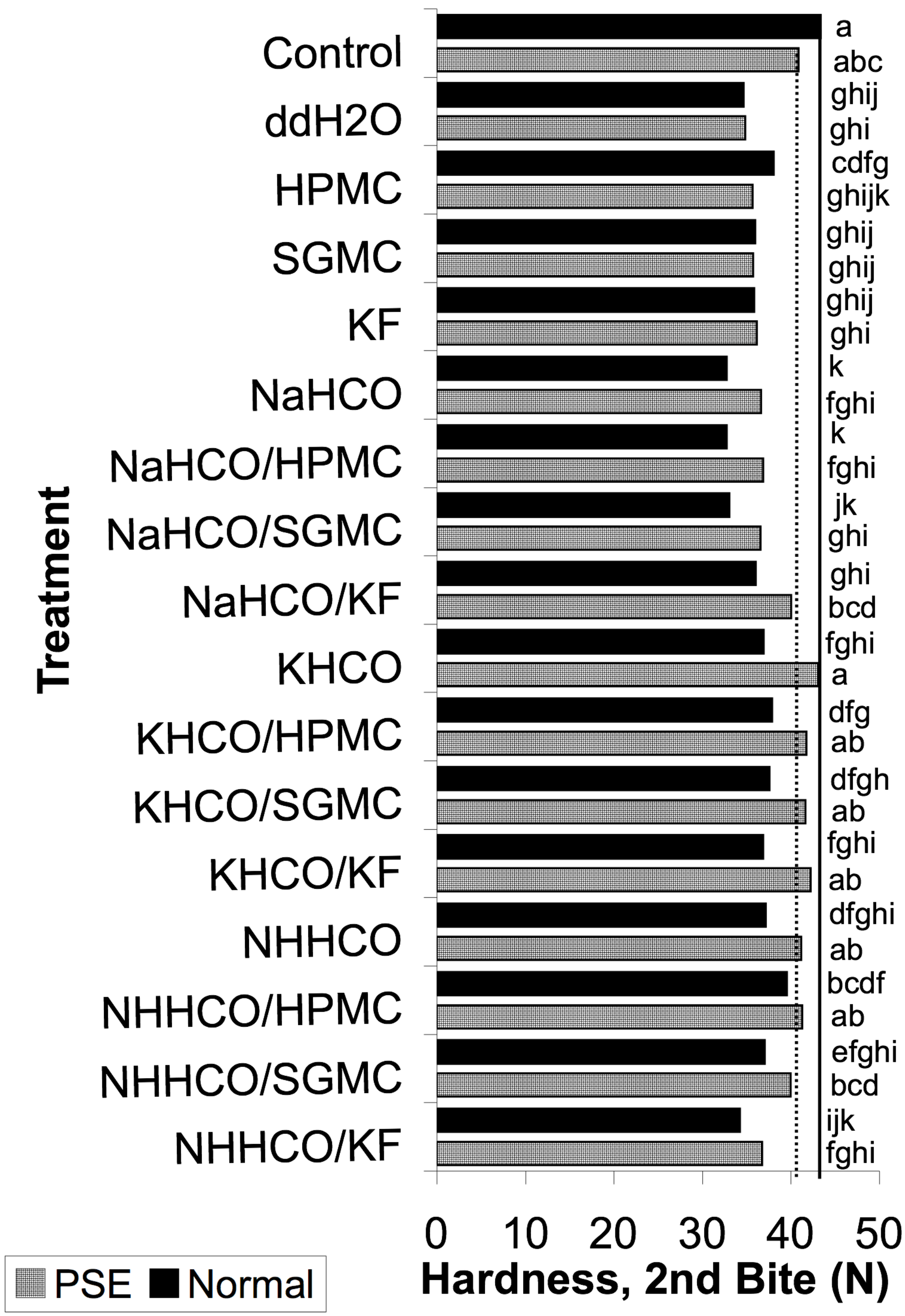


Figure 13. Meat by buffer treatment interaction for cooked meat gels on TPA attribute: Hardness-2nd Bite (N) (P<0.0001).

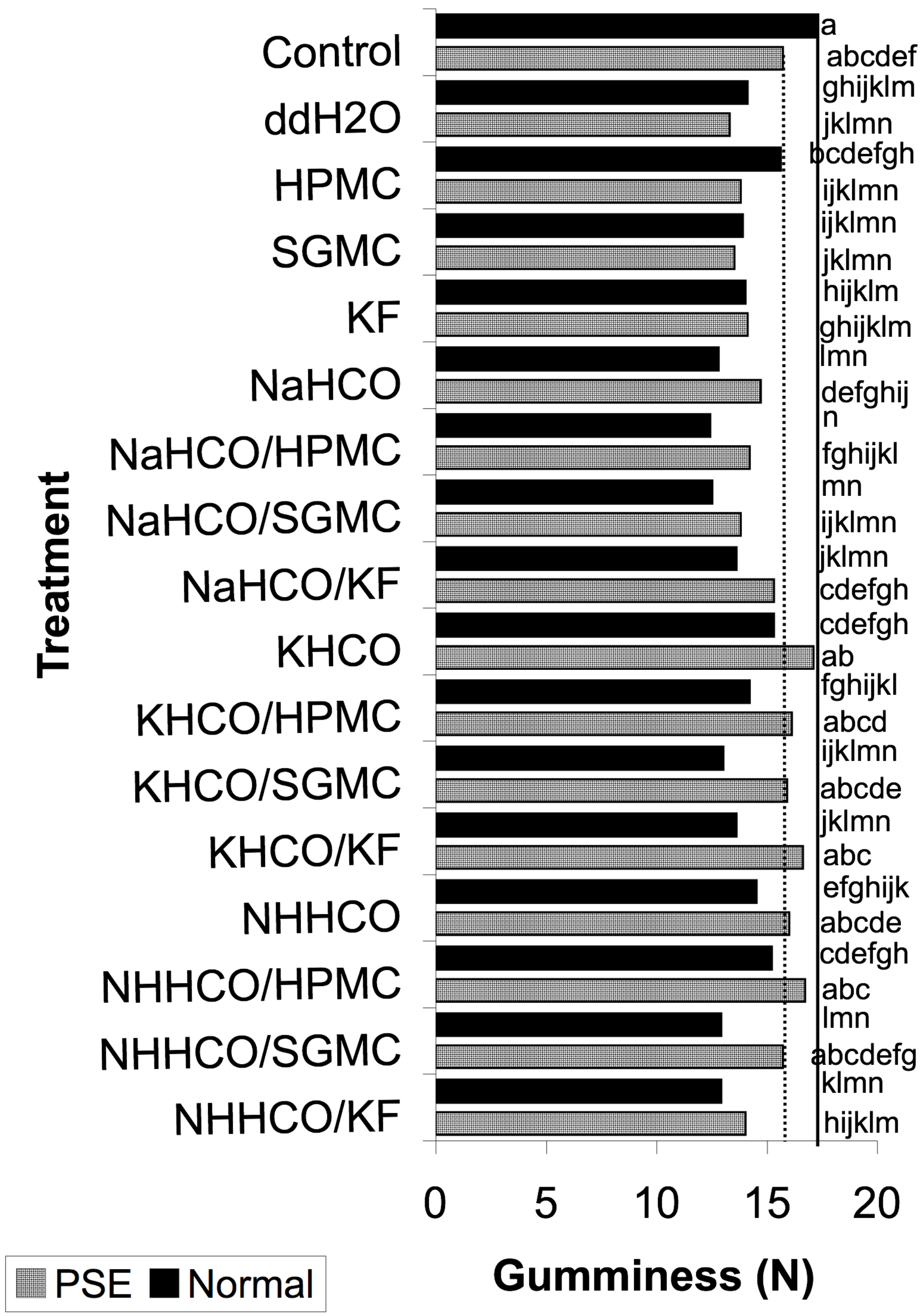


Figure 14. Meat by buffer treatment interaction for cooked meat gels on TPA attribute: Gumminess (N) (P<0.0001).

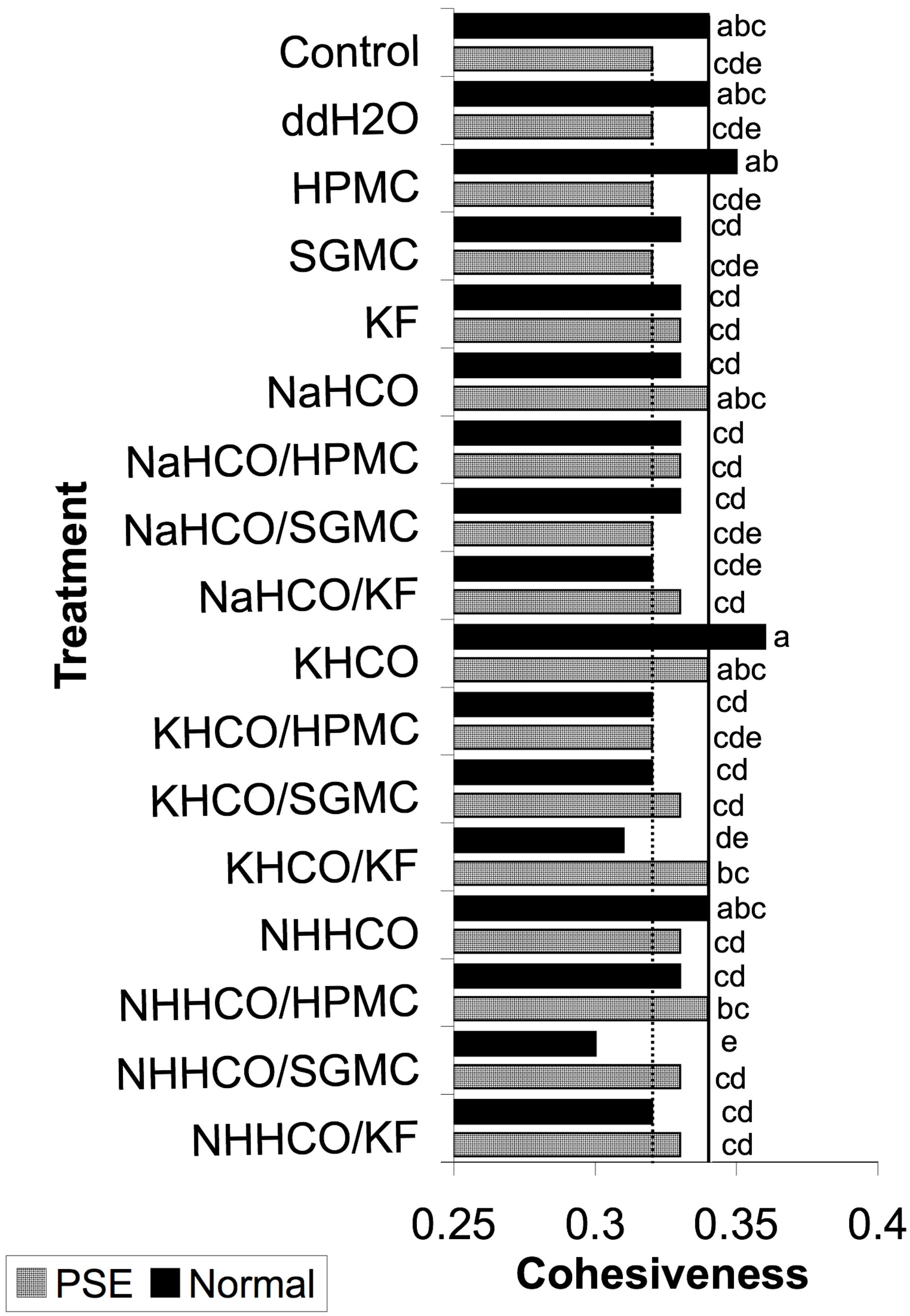


Figure 15. Meat by buffer treatment interaction for cooked meat gels on TPA attribute: Cohesiveness (P<0.0037).

protein functionality lost in PSE meat or emulate normal meat texture. Using the control gels as standards for improvement, ingredient treatments were compared to the normal-control gels (denoted by solid line) and PSE-control gels (denoted by dashed line). The addition of water to normal and PSE meat produced similar gels that were significantly softer than control gels for Hard1, Hard2, and gumminess (Figs. 12, 13, and 14). Hydrocolloids used in this study, when added alone, resulted in cooked pork gels with a softer texture than control gels that were similar to gels with water added, with the exception of normal-HPMC gels (Figs. 12, 13, and 14). The Hard1, Hard2 and gumminess attributes were similar ($P>0.05$) within normal and PSE gels for control, water, SGMC, KF, and NHHCO/KF treated gels. Though, Hard1 and gumminess were slightly higher than those previously reported (Montejano and others 1985). The addition of buffer ingredients impacted gel texture properties. With the exception of NaHCO/SGMC, NHHCO, and NHHCO/KF treated gels, the PSE gels containing a buffer ingredient had increased Hard1, Hard2, and gumminess compared to the normal gels within their respective treatment (Figs. 12, 13, and 14). The PSE gels that were treated with KHHCO, KHCO/HPMC, KHCO/SGMC, KHCO/KF, NHHCO, and NHHCO/HPMC were similar ($P<0.05$) to normal control samples for Hard1, Hard2, and gumminess. Though, using the control-line and PSE-dashed line as an evaluation guide, the PSE meat treated with KHCO, KHCO/HPMC, and KHCO/KF were similar to normal-control gels or had improved Hard1, Hard2, and gumminess when compared to PSE-control gels. The greater Hard1, Hard2 and gumminess values for PSE gels may be attributed to less water within the sample. PSE chops typically are tougher than normal chops due to protein denaturation and loss of WHC. Unfortunately, the amount of moisture of the gels was not measured in this study and if the assumption that PSE gels were similar to PSE chops, it was difficult to determine if the treatment effects were due to the buffer/hydrocolloid ingredients or loss of WHC. Proteins that have denatured prior to aggregation will re-order themselves during the aggregation phase, resulting in a more organized gel matrix than if aggregation occurs after or during denaturation (Acton and others 1981). The partially denatured state of PSE muscle proteins may result in a greater interaction with the hydrocolloid and a more ordered gel matrix during the cooking process than normal muscle that most likely will cause an increase in gel strength (Ensor and others 1991). A cohesiveness value nearing 1 would indicate a gel having little deformation between compressions, whereas a lower value would demonstrate a sample that had little recovery from the deformation applied. Though significantly different ($P<0.05$) between meat sources and treatments, the cohesiveness values were realistically similar as the gels samples were only able to recover roughly 30-35% of between the first and second compressions (Fig. 15), which agreed with Montejano and others (1985). Treated PSE gels similar to the normal control gels were considered as potential treatments to apply to PSE meat to reduce the variation between normal meat detected by TPA analysis.

Conclusion

Buffer ingredients had the greatest impact on gel color, texture and pH. Potassium bicarbonate and NHHCO are viable ingredients to replace NaHCO, as NaHCO treated samples were, generally, similar to KHCO, and NHHCO treated samples. Concerns raised by Kauffman and others (1998) and van Laack and others (1996; 1998) of increased saltiness by sensory panels when utilizing NaHCO would be avoided if KHCO and NHHCO were used. Further research is needed to determine if the utilization in a meat product of HPMC, SGMC, KF, KHCO and NHHCO in an enhancement solution containing salt and sodium phosphate is feasible and rheological desirable.

CHAPTER VI

TEXTURAL BEHAVIOR OF GROUND PORK GELS CONTAINING HYDROCOLLOIDS AND NON-MEAT BUFFER INGREDIENTS FOR IMPROVEMENT OF FRANKFURTERS CONTAINING PALE, SOFT, AND EXUDATIVE PORK

Overview

The objective of this research was to characterize the effect of potassium bicarbonate (KHCO), ammonium bicarbonate (NHHCO), hydroxypropyl methylcellulose (HPMC), and konjac flour (KF) to reduce the variation of meat quality attributes in normal or PSE pork muscle. Fresh normal (pH 5.6 - 5.9) and PSE (pH < 5.4) *Longissimus dorsi* muscles were ground and assigned a treatment solution: control, distilled deionized water, 0.750%NaCl+0.200% sodium phosphate (SP), 0.300 M KHCO, 0.300 M NHHCO, 0.125% KF, 1.000% HPMC, 0.300 M KHCO+0.125% KF, 0.3 M KHCO+0.125%KF+0.75% NaCl + 0.2% SP, 0.3 M NHHCO+1.000% HPMC, and 0.300 M NHHCO+1.000% HPMC+0.750% NaCl+0.20% SP. Treatment solutions were added, homogenized, stuffed into 15 mL tubes, and cooked to an internal temperature of 75 °C. Torsion analysis and Texture profile analysis (TPA) was performed on gel samples. PSE treated samples containing buffer/hydrocolloid treatments had similar hardness-1st bite, hardness-2nd bite, and gumminess values to the normal-control samples. Torsion stress of KHCO, NHHCO, KHCO/KF, and KHCO/KF/NaCl/SP for PSE treated samples was less than ($P<0.05$) controls gels. The

NHHCO treated samples had air pockets in the cooked gel. Consumers (n=92) evaluated normal and PSE beef/pork frankfurters produced with the following treatments: control, KHCO, KHCO/HPMC, and KHCO/KF. Treatment had no effect ($P>0.05$) on overall like/dislike of flavor, but PSE frankfurters were preferred ($P<0.05$) to normal (5.70 and 5.40, respectively). The use of KHCO with hydrocolloids, salt and SP improved the color, pH and texture properties of PSE ground pork; further research to examine the effectiveness in whole PSE pork muscle systems is needed.

Introduction

Pale, soft and exudative (PSE) pork muscle is a common quality defect found in 10-40% of fresh pork despite exhaustive producer and processor interventions (Marriott and Schilling 1998). PSE muscle is characterized as having a soft and mushy texture, poor-water holding capacity, low pH, and unnatural pale or grayish color (Briskey 1964; Bendall and Swatland 1988; Camou and Sebranek 1991). Functional ingredients like bicarbonates have been demonstrated to improve color, water holding capacity, and texture in PSE muscle (Kauffman and others 1998; van Laack and others 1998; van Laack and others 1996; Wynveen and others 2001; Alvarado and Sams 2003; Sen and others 2005). Sodium bicarbonate was used in combination with salt in an enhancement solution, which caused increased saltiness levels detected by sensory panelists (Kauffman and others 1998). To prevent increased levels of saltiness, other alternative bicarbonates were evaluated and were found to have equal, if not superior, improvement of color and texture properties of PSE meat.

Although the addition of sodium bicarbonate reduced the effect of a pH drop in PSE muscle (Kauffman and others 1998), it was unable to emulate or retain protein functionality. Hydrocolloids have been used in processed meat products as replacers for fat and binders and for low-cost formulation (Wallingford and Labuza 1983; Keeton and others 1984; Egbert and others 1991; Bater and others 1992, 1993; Calhoun and others 1996; DeFreitas and others 1997; Funami and others 1998). Hydrocolloids in a meat system may improve the textural properties of the muscle while binding the free water caused by protein denaturation of the PSE muscle. Barbut and Mittal (1996) examined the effect of cellulose gums as fat replacers in frankfurters and its impact on sensory characteristics. Cellulose gums were seen to lower CIE L* and increase the CIE a* color space values of beef/pork frankfurters and effect texture properties (Barbut and Mittal 1996). It was previously hypothesized, in earlier chapters, that the addition of hydrocolloids to a meat system would emulate protein functionality and would improve PSE muscle. While some improvement to the chemical and physical properties of PSE muscle gels was observed, the synergistic effect of bicarbonate ingredients with hydrocolloids was the most effective.

The chemical and physical properties of PSE muscle produce a meat product, when thermal processed, that is typically undesirable to the consumer in color, texture, and juiciness characteristics (Martinez and Zering 2004). The decreased water holding capacity is detrimental to the meat industry since almost 75% of pork meat is sold in a processed form that includes injection of an enhancement solution (Breidenstein and Williams 1987). Hydrocolloids for the use in meat enhancement solutions were characterized, as changes in ionic strength caused from salt and sodium phosphate would affect the hydrocolloid fluid and viscoelastic properties. The addition of bicarbonate buffers and hydrocolloids to improve PSE meat were examined, it was not determined if the addition of salt or sodium phosphate, common enhancement ingredients, would also impact the rheological properties of muscle. Therefore, the objective of this study was to determine if the addition of hydrocolloids, buffer ingredients, salt and sodium phosphate will improve PSE muscle by evaluation of the physical and rheological characterization of normal and PSE gels and frankfurters.

Materials and Methods

Treatment Solution Preparation

Hydrocolloid ingredients were hydrated, per manufacture specification, as previously defined, in double distilled deionized water, and solublized. Buffer ingredients, at 0.3 M concentrations, were added to the treatment solution, to respective concentration level, and allowed to solublize (Table 4). Prior to analysis, samples were allowed to equilibrate to 25 °C.

Meat Gel Preparation

Fresh, vacuumed-packaged normal (pH 5.6-5.9) and PSE (pH < 5.4) pork loins were shipped to Kleberg Center at Texas A&M University, College Station, TX. Each Longissimus muscle was trimmed of all visible *subcutaneous* fat and connective tissue. Utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ) calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196), CIE L*, a* and b* color space values were measured in triplicate, and pH, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA) were determined at chop surface on the *longissimus dorsi* muscle to verify pH selection. Loins were ground to 1.27 cm then to 0.476 cm (Hobart Corporation, Model 4612, Troy, Ohio, U.S.A.), portioned into 200 g portions and held at 4 °C. Within each normal or PSE ground sample, the 200 g portion was assigned a treatment solution prepared within 48 h of processing day. Treatment solutions were added to meat samples at 12% of ground weight to simulate injection of treatment solution into a whole muscle system, and were homogenized for 60 s in a food processor (KitchenAid, Hobart Corporation, Troy, Ohio). Homogenized meat samples were bagged in oxygen impermeable vacuum bags (OTR 1 cm^3/m^2/ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH), vacuum packaged, and stored at 4 °C. Five, approximate, 15 g aliquots of homogenized meat sample was stuffed into disposable polystyrene 15 mL culture tubes (17 mm outer dia x 100 mm length, constant wall thickness) for rheological analysis. Cooked color and pH analysis was determined from 1-45 g aliquot of homogenized meat sample stuffed into disposable polystyrene 50 mL centrifuge tubes. Tubes were capped and centrifuged (Garver Electrifuge, Model 54, Garver Manufacturing Co., Union City, IN, U.S.A.) at 600-x g for 30 minutes to remove further air pockets and firmly pack the sample. Sample tubes were heated to 75 °C in a water bath having a heating rate of approximately 0.75 °C /min. Sample temperature was monitored by inserting copper constantan wire thermocouple (Omega Engineering, Inc., type T thermocouple, Stamford, CT, U.S.A.) in geometric center of sample tube with 1 tube/rack being thermocoupled. Temperature was monitored with electronic thermometer (Omega Engineering, Inc., Model HH501BT, Stamford, CT, U.S.A.). After reaching 75 °C samples were removed from the water bath, capped and stored a minimum of 8 h at 4 °C.

Frankfurter Preparation

Fresh, vacuumed-packaged normal (pH 5.6 - 5.9) and PSE (pH < 5.4) pork loins were shipped to the Rosenthal Meat Science and Technology Center at Texas A&M University, College Station, TX, a state-inspected (Texas Department of Health) facility. Fresh ground beef trimmings (80/20) and frozen pork fat trimmings (60/40) were purchased from local vendors. Pork loins and thawed pork fat trimmings were ground through a 1.27 cm plate. The frankfurter formulation, on a percentage basis, for meat trimmings and non-meat ingredients is shown in Table 5. Meat trimmings and non-meat ingredients were chopped and emulsified in a bowl chopper (Type K64V-VA, Seydelman, Germany), and then stuffed into 28 mm dia collagen casing at approximately 90 g per link. Frankfurters were thermal processed in a smokehouse (model 1000, Alkar, Lodi, WI, U.S.A.) using an incremented cook cycle to a final internal temperature of 71 °C. After cooking, frankfurters were showered with water for 15 min to reduce product temperature and placed in a 4 °C cooler for a minimum of 12 h. Frankfurters were vacuum-packaged in oxygen impermeable vacuum bags (OTR 1 $cm^3/m^2/$ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH) and stored at 4 °C until analysis.

Color and pH Analysis

Cooked meat gels were removed from 50 mL polystyrene tubes. Cooked meat gels and frankfurters were cut in half laterally. After 20 min, cooked CIE L*, a* and b* color space values were measured, in triplicate, using a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ) calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196). The cooked gel pH (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA) was determined, in duplicate, at the interior cut surface.

Texture Analysis

Torsion Analysis

Torsion analysis was performed utilizing a digital viscometer modified with torsion fixture (Brookfield viscometer, model 5XHBTD, London, England). Gel samples were prepared and analyzed according to the methods of Kim and others (1986). Gels samples were removed from 15 mL tubes. Gel samples and frankfurters were cut into 5-28.7 mm samples. Plastic torsion disks designed for torsion fixture were affixed to each end of sample via cyanoacrylate glue, milled into a dumbbell shaped with a midsection diameter of 10 mm, and placed on the torsion apparatus. The shear stress (kPa) and strain at gel failure were determined as a mean of five samples.

Texture Profile Analysis

Texture profile analysis (TPA) was performed as described by Bourne (1978) using a TA-XT2 Texture Analyzer (Texture Technologies Corp., Scarsdale, NY, U.S.A.) with Texture Expert software (Stable Micro Systems LTD, version 1.16, 1997) with 60 mm dia plunger attachment. Meat gels were removed from 15 mL tubes. Meat gels and frankfurters were allowed to equilibrate to room temperature. Five samples were cut into 1 dia : 1 length ratio and ran within 20 min to prevent loss of sample integrity due to evaporation. Pre-test and test speed was set for 1 mm/s. Samples were compressed twice. Each compression was to 75% of initial sample length with 5 sec delay between compressions. Post-test speed was 2 mm/s. Hardness of 1st bite (N), Hardness 2nd bite (N), Cohesiveness, and Gumminess (N) were determined as a mean of five samples.

Sensory Evaluation

Consumer Frankfurter Panel

On day of testing, consumers (n=92) were recruited within Kleberg Animal and Food Sciences Center, Texas A&M University, College Station, TX to evaluate frankfurter samples. Consumers were seated in individual booths that were separated from the sample preparation area. Frankfurter samples were seeped in boiling water for 5 min, removed from water, and cut into 1.27 cm frankfurter slices. One frankfurter slice was immediately served to each consumer. Within each session, a maximum of 8 consumers per session and a minimum of 4 sessions ran, each consumer tested 8 samples under natural lighting. Sample treatments were assigned a 3-digit code and randomized to order within a session. Panelists were given a ballot packet containing a demographic sheet and 8 ballots. Consumers evaluated each sample on 9-point scales. Overall Like/Dislike of the sample, color, flavor and texture were evaluated using 1=Dislike extremely and 9=Like extremely. The intensity of color, flavor, and texture were evaluated using 1=None and 9=Extremely intense. The likelihood of purchase of the sample was evaluated using 1=Extremely unlikely and 9=Extremely likely. Between samples, panelists cleansed their palette using salt-less saltine crackers and double, distilled, deionized water.

Trained Texture Sensory Panel

On each testing day, a 5-member, trained, descriptive attribute sensory panel evaluated each sample as defined by AMSA (1995) and Meilgaard and others (2007). Panelists evaluated each attribute using the Spectrum Intensity Scale for solid oral texture attributes (Meilgaard and others 2007). Ballot development sessions were conducted prior to testing sessions where representative testing samples were presented to the panelists. Texture attributes evaluated during sensory analysis were springiness, fracturability, hardness, cohesiveness, and juiciness on 15-point scales as defined in Table 6. Training sessions used reference samples (Table 6) and samples from the study to anchor the panelists.

On day of testing, frankfurter samples were seeped in boiling water for 5 min. Frankfurter samples were removed from water and cut into 1.27 cm frankfurter slices. Three frankfurter slices were immediately served to the trained sensory panel. In a randomized order, 8 samples with 5 minutes between each sample were evaluated per day. Sample treatments were randomized to order within a sensory day and assigned a unique 3-digit code. Within each testing day, panelists conducted a warm-up sample to standardize and calibrate the panelists each testing day. Panelists were seated in individual booths that were separated from the sample preparation area. Samples were evaluated under red incandescent lights to reduce the effect of visual appearance on sensory attributes. Between samples, panelists cleansed their palette using fat-free ricotta cheese, salt-less saltine crackers and double distilled deionized water.

Energy Dispersive X-ray Spectroscopy

Energy Dispersive X-ray Spectroscopy (EDS) imaging was performed to visualize treatment solutions in the meat gel system. Normal-control and normal-KF treated cooked meat gels were prepared as previously described. Samples were transferred to Texas A&M University Microscopy and Imaging Center for imaging preparation. Samples were excised to 2-3 mm cubes and prepared according to the methods of Ellis and Pendleton (2007) and Hawkins and others (2007). Imaging was performed on a Joel JSM-6400 equipped with a PGT EDS System.

Statistical Analysis

Data for meat gels were analyzed using the GLM Model procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC, U.S.A.) as a 2 x 11 factorial arrangement with meat (normal, PSE) and treatment solution (Table 4) as main effects blocked by processing day. The meat by treatment interaction was included in the model. Significance was defined as $P<0.05$. Least squares means were determined and where Analysis of Variance indicated significance, least squares means were separated by the pdiff procedure of SAS using an alpha of <0.05.

Data for frankfurter texture analyses was analyzed using the GLM Model procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC, U.S.A.) as a 2 x 4 factorial arrangement with meat (normal, PSE), treatment solution (Table 4) and their interaction as main effects. Processing day was included as a block. Significance was defined as P<0.05. Least squares means were determined and where Analysis of Variance indicated significance, least squares means were separated by the stderr procedure of SAS using an alpha of <0.05.

For the consumer frankfurter sensory data, data were analyzed as a factorial arrangement as previously defined, but with consumer session as a random effect. Least squares means were calculated and where Analysis of Variance indicated significance (P<0.05), differences in least squares means were determined using the stderr pdiff procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) at an alpha <0.05.

For the trained texture sensory frankfurter data, data were analyzed as a factorial arrangement as previously defined for frankfurter texture analysis except panelist was included in the model. The data were analyzed as a split-plot design where the whole plot included factors as previously described for the frankfurter texture analysis. The whole plot error was defined as meat by processing day. For the split, the effect of panelists and all two-way interactions with main effects were included in the model and the residual error term was defined as the error term. This analyzes was used to determine the efficacy of the sensory panelists. Panelist by meat and treatment tended to not be significant and when significance was found (P<0.05), panel ratings, when averaged, across panelists did not change the interpretation of the results. Therefore, for the final sensory data analyses, data within an attribute were averaged across panelists and data were analyzed as previously described. Least squares means were calculated and where Analysis of Variance indicated significance (P<0.05), differences in least squares means were determined using the stderr pdiff procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) at an alpha <0.05.

Results and Discussion

Meat Gels

Meat by processing day interactions were significant ($P<0.05$) for cooked pH, CIE L* color space, moisture, torsion and TPA measurements (data not shown) as inherent variation within normal and PSE pork loins between processing days would be expected. Cooked pH, cooked CIE color space values, and stress were not affected ($P<0.05$) by meat by treatment interactions (Table 13). As expected, the cooked pH of normal meat was higher ($P<0.05$) than the PSE meat. Interesting, both normal and PSE gels did not differ ($P>0.05$) in L* and b* CIE color space values. The similarity of the L* CIE color space values contradicted the work in Chapter V. Similar to the gels in Chapter V, normal gels were redder in color compared to PSE gels (Table 13). PSE gels were more brittle with a strain of 0.91 ($P<0.05$) compared to the normal meat gels with a strain of 1.05.

The addition of water and NaCl/SP to gels resulted in similar cooked pH, CIE L* and a* color space, and strain values to hydrocolloid treated gels (Table 13) which was in agreement of results shown in Chapter V. The gels containing buffer ingredients were paler in color and had a higher cooked meat pH than control, water, NaCl/SP, KF and HPMC treated gels, which agreed with the research shown in Chapter V. The reddest gels were those treated with KHCO, control, NHHCO, and NHHCO/HPMC/NaCl/SP

Table 13. Least squares means for cooked pH, CIE color space values, and torsion strain content for cooked meat gels affected by meat source and hydrocolloid treatments.

Effect	Cooked pH	Cooked CIE Color Space Values L*	a*	b*	Torsion Testing Strain
Meat Source	0.0097^{e}	0.2677^{e}	0.0076^{e}	0.6490^{e}	0.0269^{e}
Normal	6.38^{a}	78.54	8.21^{a}	8.09	1.05^{a}
PSE	5.97^{b}	79.44	6.69^{b}	8.18	0.91^{b}
Treatment	<0.0001^{e}	<0.0001^{e}	<0.0001^{e}	0.4291^{e}	<0.0001^{e}
Control	5.98^{a}	78.83^{abc}	7.69^{bc}	8.09	0.80^{f}
ddH2O	5.97^{a}	79.83^{cd}	6.92^{a}	7.91	0.85^{ef}
NaCl/SP	5.97^{a}	80.18^{d}	6.86^{a}	8.27	0.86^{ef}
Bicarbonate Buffers					
KHCO	6.40^{d}	78.24^{a}	8.21^{c}	7.89	1.05^{bc}
NHHCO	6.35^{bcd}	77.92^{a}	7.77^{bc}	8.08	1.00^{cd}
Hydrocolloids					
KF	5.96^{a}	79.67^{bcd}	6.67^{a}	8.45	0.88^{e}
HPMC	5.97^{a}	80.38^{d}	6.49^{a}	8.50	0.91^{de}

Table 13. Continued.

Effect	Cooked	Cooked CIE Color Space Values			Torsion Testing
	pH	L*	a*	b*	Strain
Bicarbonate/Hydrocolloid					
KHCO/KF	6.36^{cd}	78.62^{ab}	7.92^{bc}	8.05	1.06^{bc}
KHCO/KF/NaCl/SP	6.35^{bcd}	78.31^{a}	7.98^{bc}	7.98	1.12^{ab}
NHHCO/HPMC	6.29^{b}	78.65^{ab}	7.59^{b}	8.16	1.09^{ab}
NHHCO/HPMC/NaCl/SP	6.30^{bc}	78.25^{a}	7.87^{bc}	8.09	1.15^{a}
RMSE[f]	0.056	0.951	0.515	0.483	0.149

[abcd]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[e]P-value from analysis of variance tables
[f]Root Mean Square Error

(Table 13). Treatment did not effect (P>0.05) the CIE b* color space values of the gel. The addition of KHCO and NHHCO/HPMC were had similar (P<0.05) strain values. The NHHCO had small air pockets in the meat gel that most likely affected the rheological measurements of the gel. The addition of salt and SP with NHHCO/HPMC resulted in the highest strain on treated gels (Table 13), indicating the gel had the ability to withstand a greater level of deformity before gel failure. Salt concentration (0.5 to 1.0 M) in turkey breast and turkey thigh gels was similar for shear stress and strain (Lavelle and Foegeding 1993). The pH and endpoint temperature were found to be greater influence on gel properties of the turkey gels, than salt concentration. Strain levels were similar and stress values were higher than those reported by Montejano and others (1985), most likely due to thermal processing of the gels to 75 °C in our study, not the 90 °C as reported by Montejano and others (1985). The ability to withstand a greater deformation before failure was most likely due to the extraction of salt-soluble proteins to form a stronger protein gel matrix when the buffer ingredients, salt and SP were added. Hydrocolloid addition had little effect on cooked pH, CIE L* and a* color space values, and strain. Hydrocolloid addition showed similar results in Chapter V, where as Barbut and Mittal (1996) reported darker, redder frankfurters when cellulose hydrocolloids were added.

There were meat by treatment interactions for stress, TPA attributes and moisture content (Figs. 16, 17, 18, 19, 20, and 21). Within treatment application, stress, Hardness-1st bite (Hard1), hardness-2nd bite (Hard2), and gumminess were similarly affected by meat type in agreement with Shand and others (1993) and data shown in

Chapter V. Hard1 and gumminess levels were higher than those reported by Montejano and others (1985). We hypothesized that the addition of buffer, hydrocolloids, NaCl/SP or the buffer/hydrocolloid/NaCl/SP combinations would recover protein functionality lost in PSE meat or emulate normal meat texture. Using the control gels as standards for improvement, ingredient treatments were compared to the normal-control gels (denoted by solid line) and PSE-control gels (denoted by dashed line). Regardless of meat source, control samples were similar ($P>0.05$) for stress, Hard1, Hard2, and gumminess. Interestingly, the gels treated with water and NaCl/SP were similar, within meat type for stress, Hard1, Hard2 and gumminess values. Adding water and NaCl/SP solution produced softer ($P<0.05$) gels than control gels. This indicated that the addition of water to the ground meat system impacted the rheological properties of the gels.

The addition of bicarbonate buffers across stress and TPA attributes trended similar within normal and PSE gels. Gels containing HPMC or KF from the PSE and normal meat had similar Hard2 and gumminess values. The stress of the KF gels made of PSE meat was higher than gels made from normal muscle (Fig. 16). This indicated PSE-KF gels were able to withstand more force before gel failure than normal-KF gels or had a stronger gel matrix. Differences were detected ($P<0.05$) between gels made from normal and PSE muscle within buffer/hydrocolloid and buffer/hydrocolloid/NaCl/SP treatments. The addition of NaCl/SP to buffer/hydrocolloid treatments did not, positively or negatively, change gel texture. Most likely the differences between meat type was due to the ability of normal muscle to

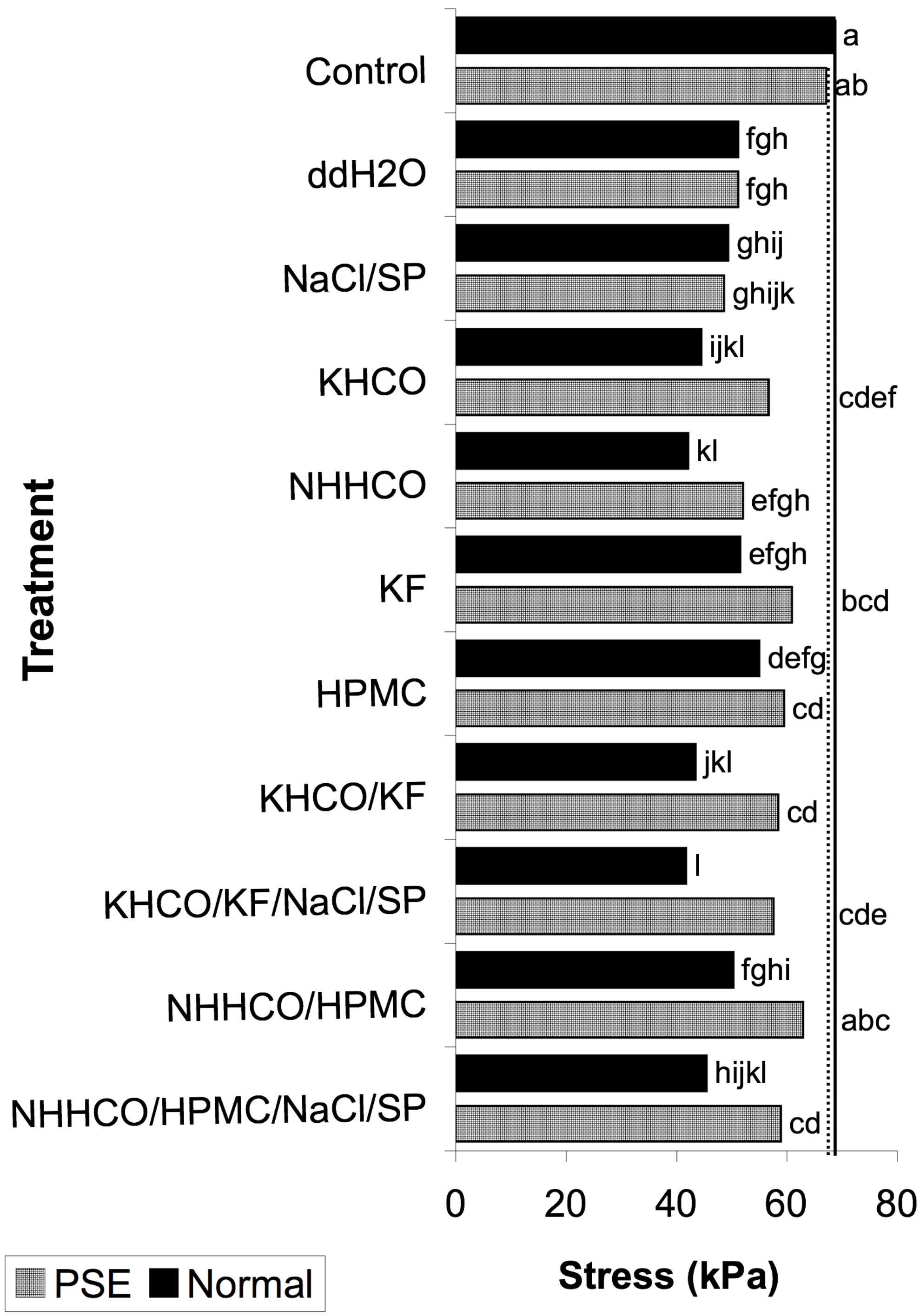


Figure 16. Meat by treatment interaction for cooked meat gels on torsion testing attribute: Stress (kPa) (P<0.0001).

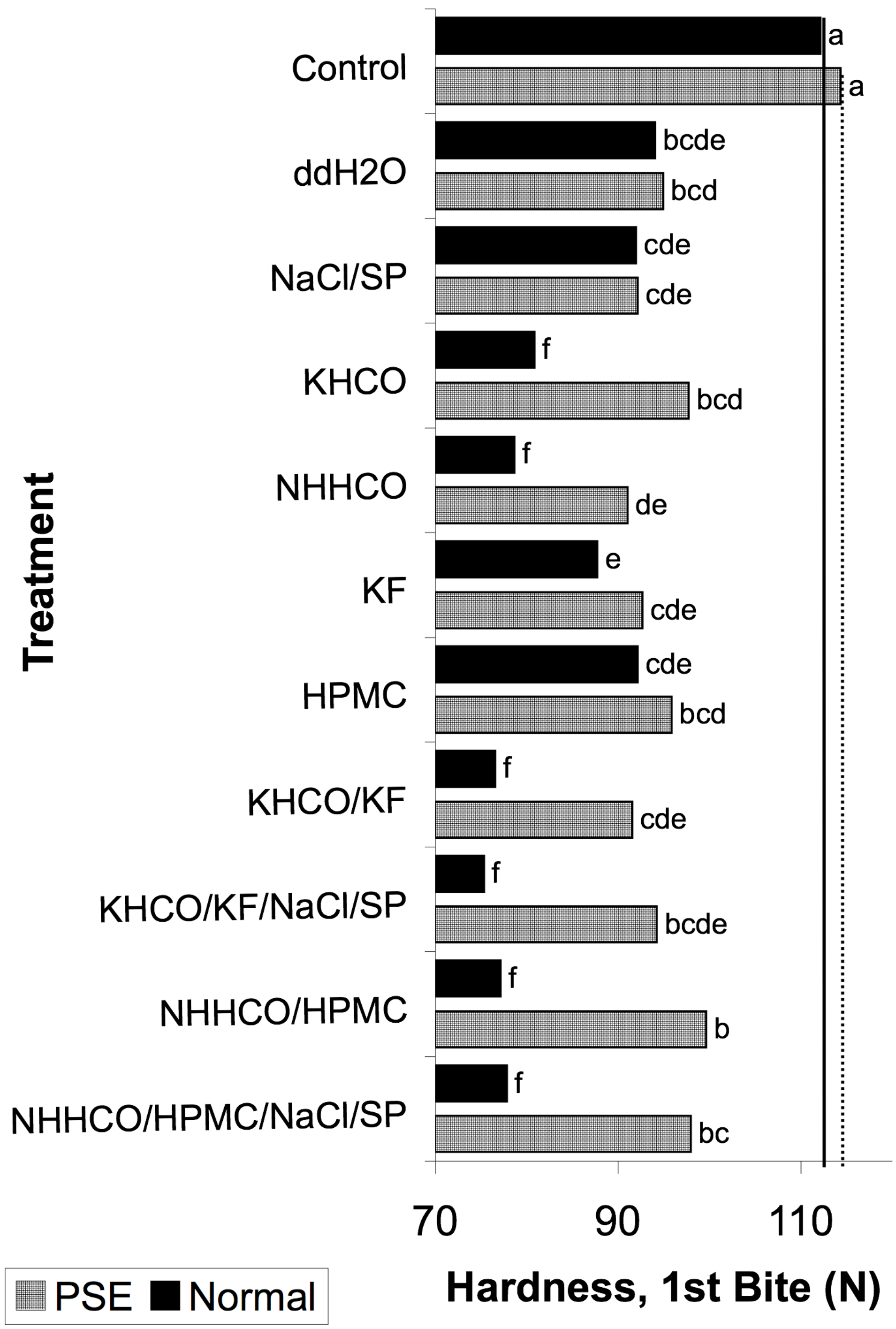


Figure 17. Meat by treatment interaction for cooked meat gels on TPA attribute: Hardness-1st Bite (N) (P<0.0001).

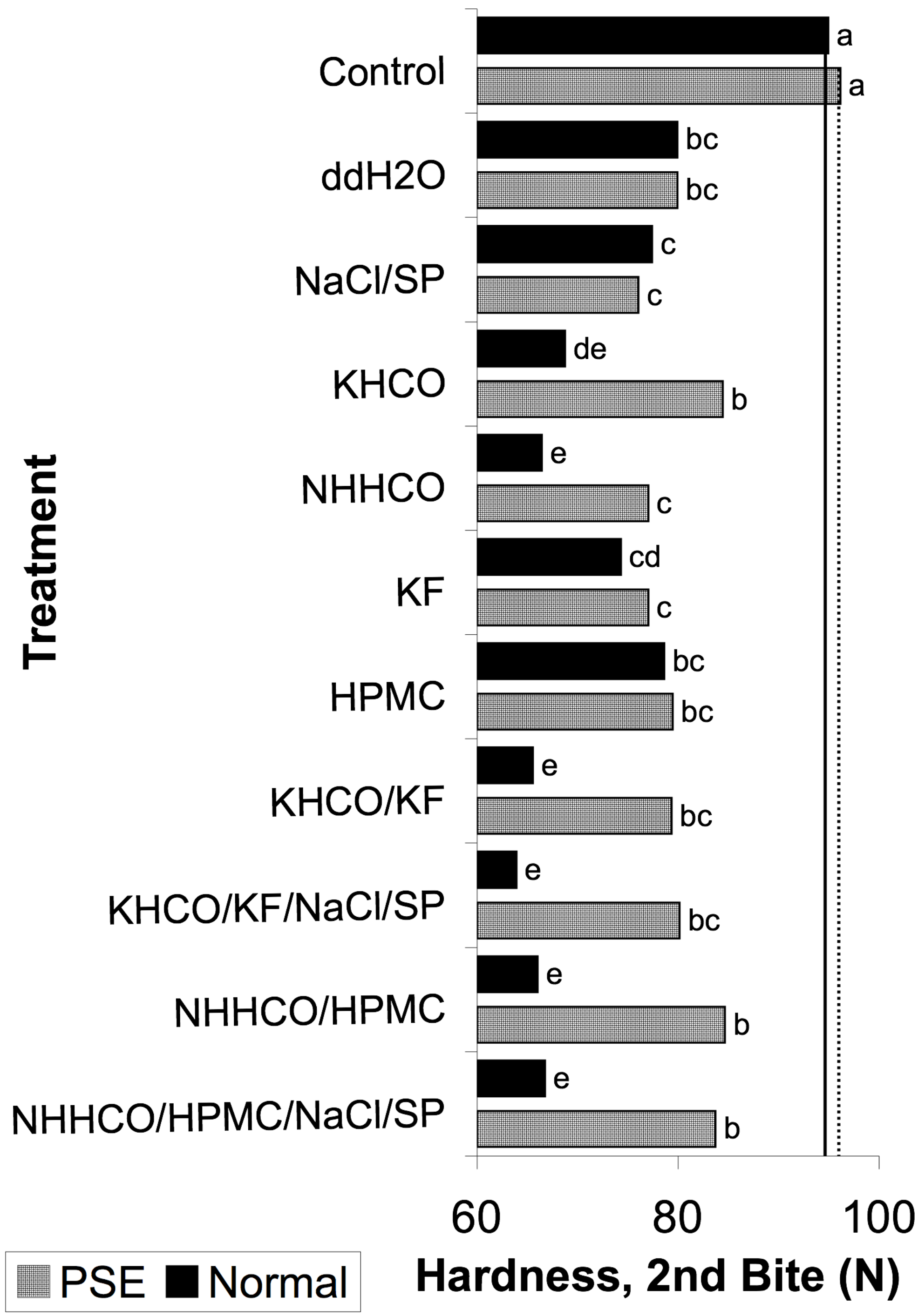


Figure 18. Meat by treatment interaction for cooked meat gels on TPA attribute: Hardness-2nd Bite (N) (P<0.0001).

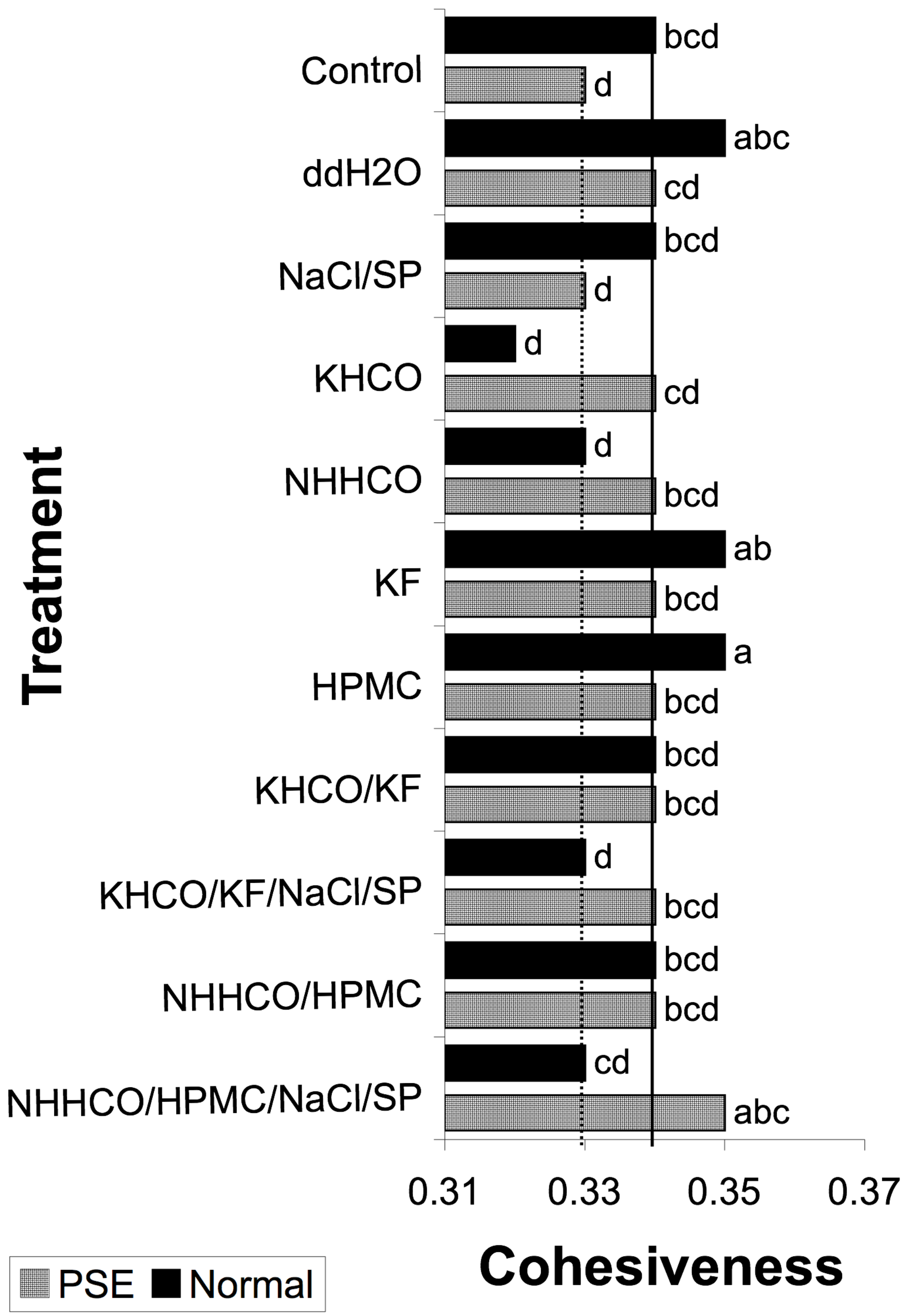


Figure 19. Meat by treatment interaction for cooked meat gels on TPA attribute: Cohesiveness (P<0.0002).

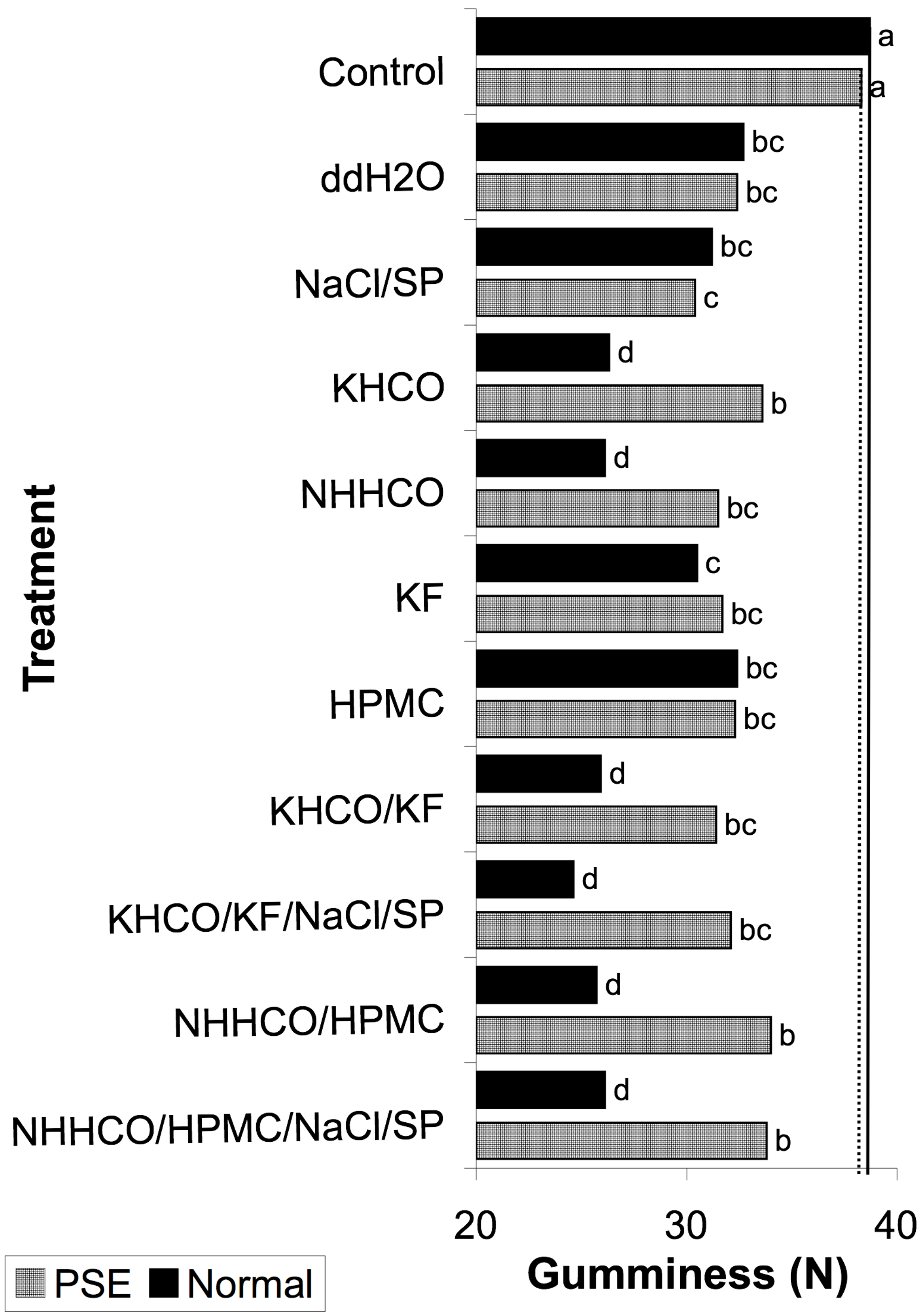


Figure 20. Meat by treatment interaction for cooked meat gels on TPA attribute: Gumminess (N) (P<0.0001).

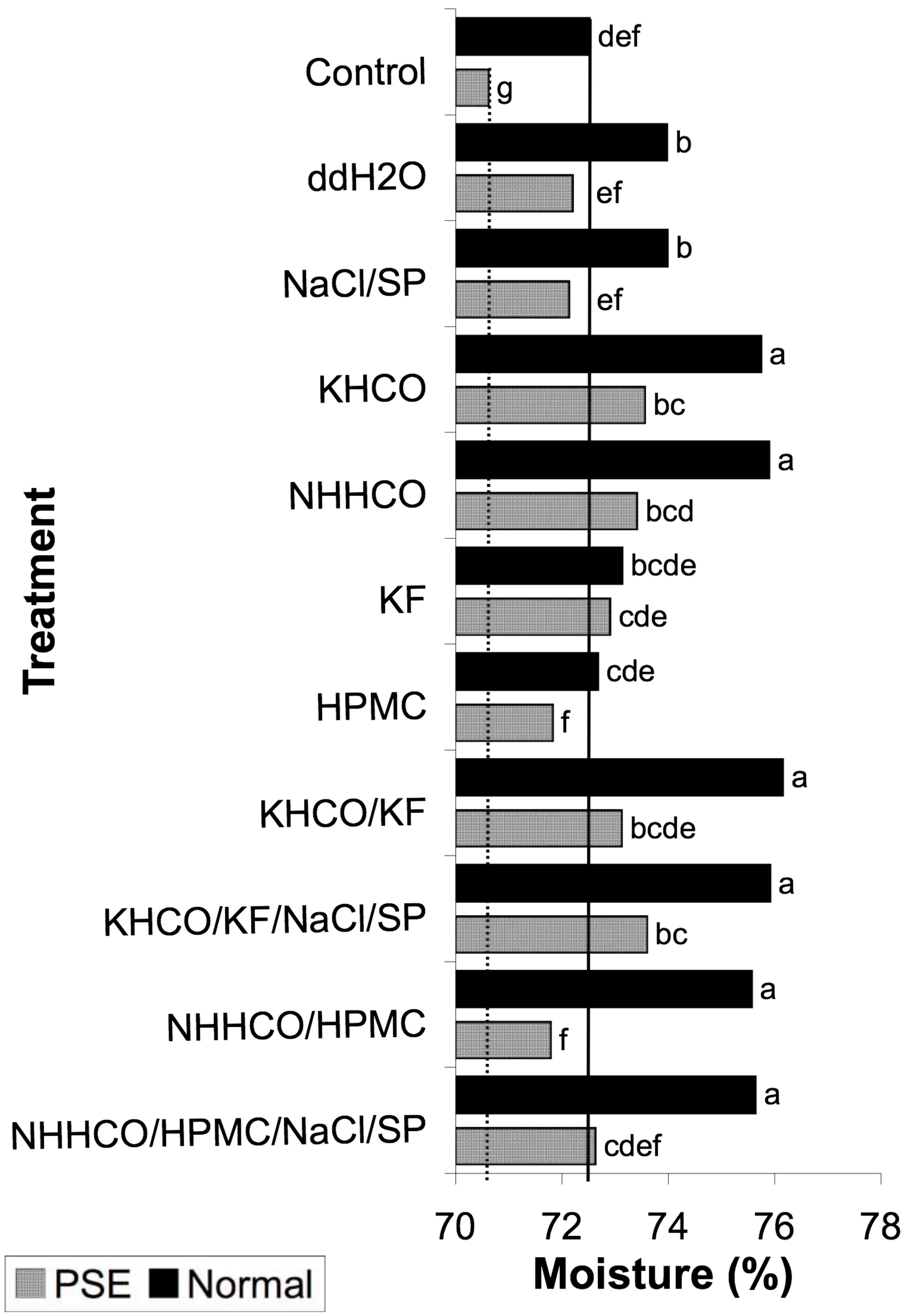


Figure 21. Meat by treatment interaction for cooked meat gels on moisture (%) (P<0.0008).

buffer changes in ionic strength; whereas, the denatured proteins of PSE meat may have lost the ability to buffer ionic changes and was more reactive to the added non-meat ingredients. The cohesiveness of the meat gels (Fig. 19) was similar to previous work of Chapter V and Monetjano and others (1985) and expected from a ground meat gel.

Amount of water differed between meat type and ingredient treatment addition (Fig. 21) As expected, PSE-control gels had the lowest amount of moisture. The addition of water and NaCl/SP to had similar moisture levels within meat type (Fig. 21). Only KF treated gels had similar ($P>0.05$) amount of water present between meat types (Fig. 21). All other treated gels, had a higher moisture content for normal gels than PSE gels. All normal treated gels had higher moisture levels than normal-control gels and all PSE treated gels had more water than PSE-control gels. The KHCO, NHHCO, KF, KHCO/KF, KHCO/KF/NaCl/KF, and NHHCO/HPMC/NaCl/SP treated PSE gels had moisture levels higher than normal-control gels (Fig. 21). Some would argue that the moisture levels explained the rheological differences between normal and PSE gels, as the increased water would lower Hard1, Hard2, and gumminess. Though control, water, and NaCl/SP treated gels had more water present in normal gels than PSE gels, yet the rheological behavior was similar for stress, Hard1, Hard2, and gumminess within treatments for meat type. Moisture content may not be the only factor in observed rheological differences in treated gels, but the buffer and hydrocolloid ingredients may influence the muscle protein binding. During thermal processing, muscle proteins typically denature, aggregate and then coagulate Acton and others (1981) explained that this action dictated gel strength. Proteins that have denatured prior to aggregation will re-order themselves during the aggregation phase, resulting in a more organized gel matrix than if aggregation occurs after or during denaturation (Acton and others 1981). The partially denatured state of PSE muscle proteins may result in a more ordered gel matrix than normal muscle that most likely will cause an increase in gel strength. The combined addition of buffers, hydrocolloids, salt and phosphate produced PSE gels that were similar to control-normal gels, as the partially denatured PSE protein allows for greater flexibility for interaction with larger hydrocolloid molecules (Ensor and others 1991). It is unclear if the rheological improvement would be acceptable in a PSE meat product, as no human sensory evaluation has been performed with these ingredients.

Energy Dispersive X-ray Spectroscopy

The utilization of hydrocolloids within a meat system is dependant on understanding the hydrocolloid's functional properties, particularly gelation, and determination of protein-hydrocolloids equilibrium states of miscibility, thermodynamic incompatibility and complex coacervation (Walkenstrom and Hermansson 1994; Dickinson 2003). EDS imaging was used to visualize the hydrocolloid-protein relationship within a cooked meat gel. The EDS imaging was able to detected differences between the control and treated samples (Fig. 22). The KF sample appeared to have a "coating" on the cut meat surface. This coating was believed to be the hydrocolloid treatment solution and based on the images (Fig. 22) completely distributed throughout the meat system. This was seen in greater detail at 2000x and 5000x magnification (Fig. 22). The EDS imaging demonstrated that treatment solutions when applied directly to a ground meat system appeared to improve the texture functionality

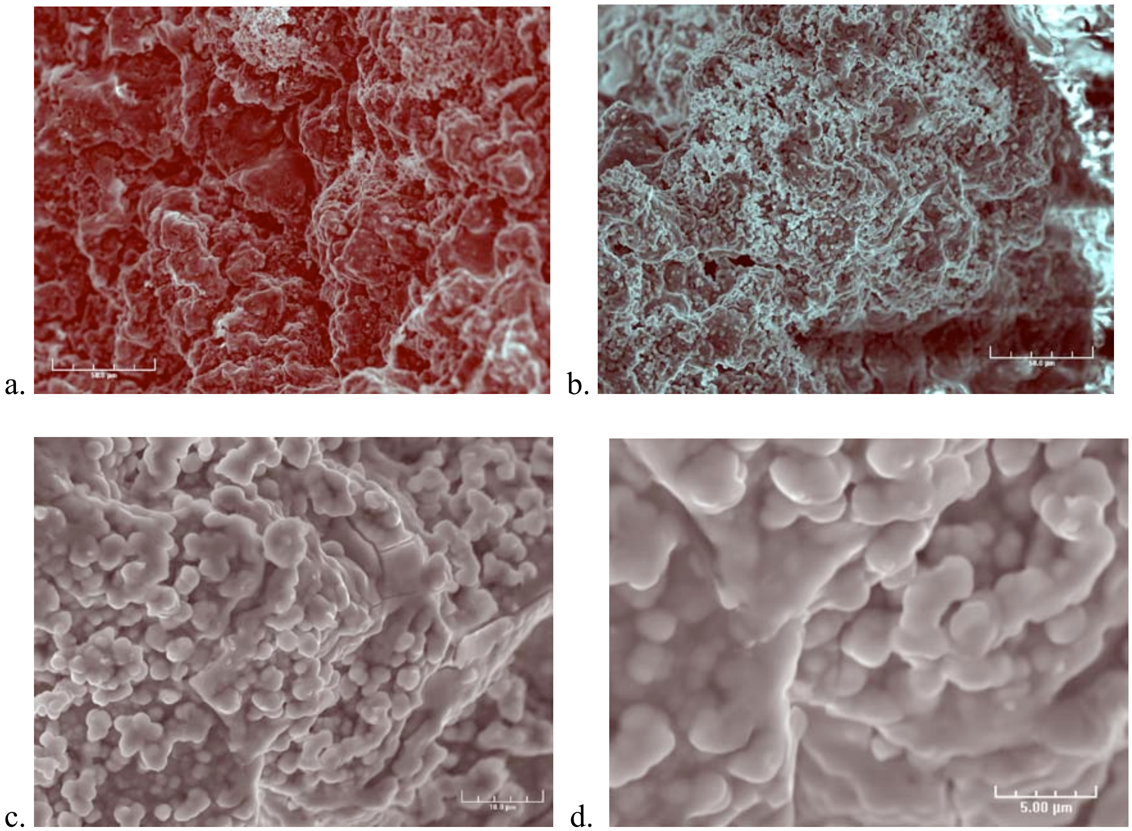


Figure 22. EDS imaging of a. normal control, 500x; b. KF, 500x; c. KF, 2000x; d. KF, 5000x.

by filling in spaces within the meat gel. Boyer and others (1996) and Montejano and others (1984) showed that the more porous the protein-gel matrix the weaker the muscle rigidity. As seen by the EDS images, the hydrocolloid treatments appeared to coat the meat fibers. This coating most likely filled in the spaces of gels between proteins, lowering the porosity of the meat gel, thus improving gel strength. Though, Barbut and Mittal (1996) raised the concern of loss of water-holding capacity (WHC) of hydrocolloids added to frankfurters as the coating of hydrocolloids may block the binding sites of the muscle protein to water, but this was not observed in our study.

Frankfurter

Only flavor consumer sensory attributes varied between normal and PSE frankfurters (Table 14). Consumers liked the flavor and indicated it was more intense for PSE-frankfurters compared to normal-frankfurters ($P<0.05$). Meat by treatment interaction was reported for the texture of the frankfurter (Fig. 23) with control-frankfurters having the lowest preference ratings. Consumers liked the texture of normal-KHCO and normal and PSE treated KHCO/HPMC and KHCO/KF gels (Fig. 23). Interestingly, treatment did not affect ($P>0.05$) the overall like/dislike of flavor or overall like/dislike of the frankfurter. Though the intended use was different than this study, the addition of sodium acid pyrophosphate to frankfurters was not detectable to a trained flavor and texture sensory panel (Hargett and others 1980; Calhoun and others 1996). Frankfurters were chosen to evaluate buffer and hydrocolloid ingredients for improvement in frankfurters as the product was similar to the ground pork model gel system and the familiarity of the frankfurters to the consumers. Perhaps the frankfurter

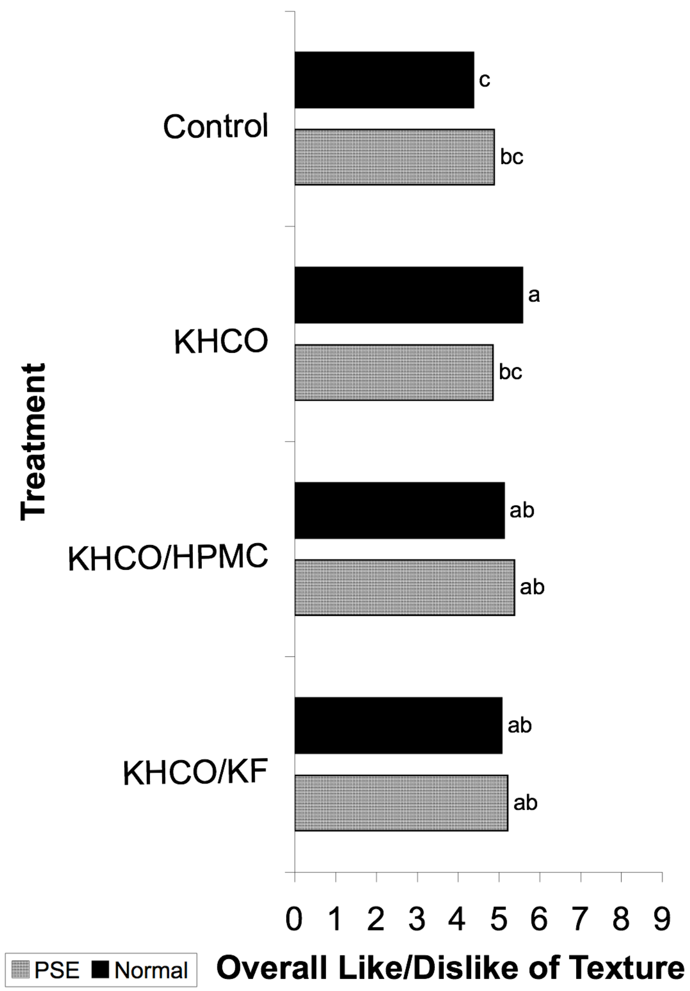
Table 14. Least squares means for beef/pork frankfurters for consumer sensory panel color, flavor, texture, juiciness and purchase attributes.

Effect	Overall Like/Dislike Color	Intensity of Color	Overall Like/Dislike Sample	Overall Like/Dislike Flavor	Intensity of Flavor	Overall Like/Dislike Texture	Level of Juiciness	Likelihood of Purchase
Meat Source	0.2414[e]	0.1843[e]	0.7207[e]	0.0311[e]	0.0002[e]	0.7499[e]	0.3120[e]	0.4192[e]
Normal	5.82	4.93	5.47	5.40[b]	4.97[b]	5.03	5.27	4.77
PSE	5.67	4.79	5.52	5.70[a]	5.40[a]	5.07	5.39	4.88
Treatment	0.0252[e]	<0.0001[e]	0.1092[e]	0.1519[e]	0.0339[e]	0.0059[e]	0.0045[e]	0.0035[e]
Control	5.50[b]	4.26[c]	5.32	5.29	4.94[b]	4.62[b]	5.00[b]	4.40[b]
KHCO	6.02[a]	5.22[a]	5.75	5.70	5.43[a]	5.21[a]	5.52[a]	5.11[ab]
KHCO/HPMC	5.81[ab]	5.13[ab]	5.47	5.55	5.20[ab]	5.24[a]	5.52[a]	5.01[b]
KHCO/KF	5.64[b]	4.83[b]	5.43	5.65	5.18[ab]	5.13[ab]	5.27[ab]	4.79[b]
RMSE[f]	1.728	1.454	1.760	1.869	1.608	1.943	1.622	2.025

[abcd]Mean values within a column and effect followed by the same letter are not significantly different ($P > 0.05$).
[e]P-value from analysis of variance tables
[f]Root Mean Square Error

model and the beef/pork combination for the meat source was not the right product to evaluate bicarbonate/hydrocolloid treatments as the inherent frankfurter production reduced the variation of the pork muscle utilized. To address this issue, additional research in meat products should include 100% pork frankfurters or whole muscle pork chops. Control frankfurters were the least preferred across consumer attributes (Table 14; Fig. 23). Internal CIE color differences did occur (Table 16), but were expected among meat type and treatment as they were similar to previous work. The percent moisture in the frankfurters did not differ between meat type and treatment (Table 15), but consumers perceived a juiciness difference between treatments (Table 14). The water trapped within hydrocolloid gels typically exhibit physical properties of free or bound water that remained bound or had a high water-binding capacity (WBC) when stress was applied to the gel structure (Wallingford and Labuza 1983). Severe stress, like during mastication of the frankfurter, most likely released the water trapped in the hydrocolloid gel matrix. The trained descriptive texture panel found difference in fracturability due to treatment (Table 16). The KHCO and KHCO/HPMC were more brittle than the control and KHCO/KF frankfurters (Table 17). Treatment solutions did not negatively impact sensory characteristics of frankfurters, thus allowing meat processors to use the buffer/hydrocolloid treatment solutions to reduce the texture variation between PSE and normal pork meat without changing the flavor profile of the product.

Meat by processing day interactions were significant ($P<0.05$) for the rheological behavior of the frankfurters (data not shown) Inherent variation in pork loin within



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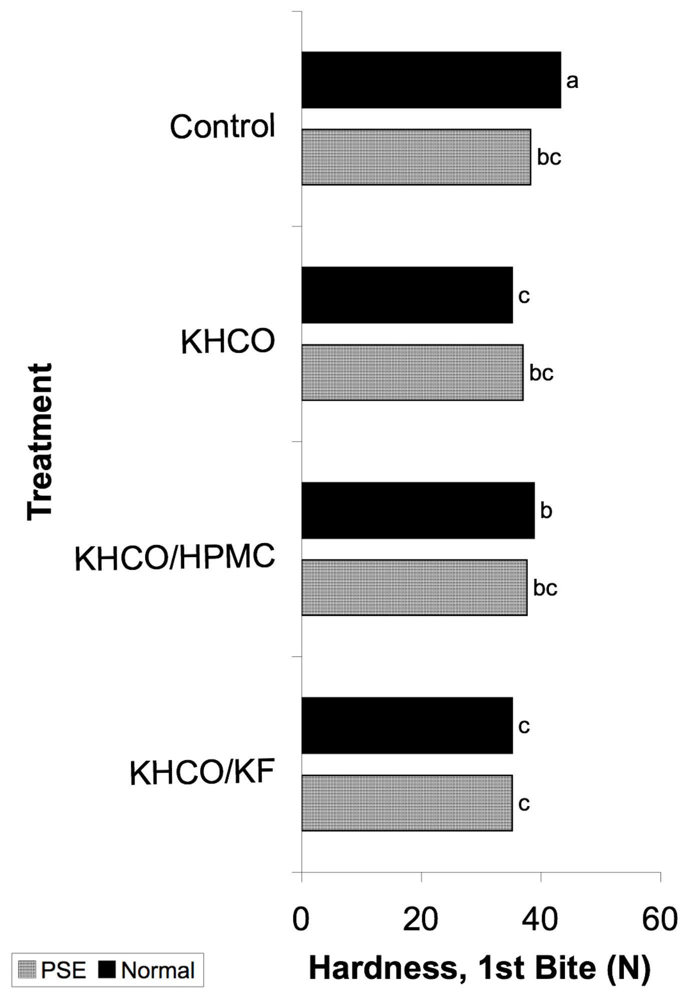


b.

Figure 23. Meat by treatment interaction for beef/pork frankfurters on a. consumer panel attribute overall like/dislike of texture; b. TPA attribute: Hardness-1st Bite (N).

Table 15. Least squares means for cook pH, and internal and external color, and moisture level for beef/pork frankfurters affected by meat source and hydrocolloid/buffer treatments.

Effect	Cooked pH	Cooked Internal CIE Color Space Values L*	a*	b*	Cooked External CIE Color Space Values L*	a*	b*	Moisture (%)
Meat Source	0.3519[e]	0.0133[e]	0.0612[e]	0.0584[e]	0.2773[e]	0.2561[e]	0.2217[e]	0.7114[e]
Normal	6.18	56.60[b]	16.21	8.84	51.47	16.54	20.20	66.08
PSE	6.13	57.56[a]	16.63	8.77	51.72	17.72	21.10	66.03
Treatment	0.7249[e]	0.0233[e]	0.0273[e]	0.2012[e]	0.2686[e]	0.0533[e]	0.0097[e]	0.2772[e]
Control	6.08	58.24[a]	16.91[a]	8.60	52.44	17.94	18.84	66.26
KHCO	6.25	56.92[b]	16.00[b]	8.70	51.07	17.39	20.91	65.97
KHCO/HPMC	6.13	56.09[b]	16.29[b]	8.96	51.56	15.41	20.91	66.26
KHCO/KF	6.15	57.09[ab]	16.47[ab]	8.95	51.32	17.90	21.94	65.72
RMSE[f]	0.254	1.011	0.448	0.324	1.195	1.558	1.301	0.5292

[abcd]Mean values within a column and effect followed by the same letter are not significantly different ($P > 0.05$).
[e]P-value from analysis of variance tables
[f]Root Mean Square Error

Table 16. Least squares means for trained panel texture attributes for beef/pork frankfurters affected by meat source and hydrocolloid/buffer treatments.

Effect	Springiness	Fracturability	Hardness	Cohesiveness	Juiciness
Meat Source	0.3745[e]	0.4778[e]	0.3701[e]	0.3206[e]	0.2254[e]
Normal	11.90	6.15	6.93	6.97	4.52
PSE	12.05	6.25	7.02	7.07	4.57
Treatment	0.9651[e]	0.0053[e]	0.2585[e]	0.9916[e]	0.9516[e]
Control	12.00	6.50[a]	7.17	7.07	4.57
KHCO	12.00	6.03[b]	6.90	6.93	4.50
KHCO/HPMC	12.03	6.03[b]	6.87	7.07	4.67
KHCO/KF	11.87	6.23[ab]	6.97	7.00	4.43
RMSE[f]	1.345	0.573	0.631	1.901	1.613

[abcd]Mean values within a column and effect followed by the same letter are not significantly different ($P > 0.05$).
[e]P-value from analysis of variance tables
[f]Root Mean Square Error

Table 17. Least squares means for torsion testing and texture profile analysis for beef/pork frankfurters affected by meat source and hydrocolloid/buffer treatments.

Effect	Torsion Testing: Stress (kPa)	Torsion Testing: Strain	Texture Profile Analysis: Hardness, 1st Bite, (N)	Hardness, 2nd Bite, (N)	Cohesiveness	Gumminess (N)
Meat Source	0.8430[e]	0.8433[e]	0.0325[e]	0.1529[e]	0.0661[e]	0.0441[e]
Normal	38.16	1.81	38.1[a]	30.4	0.23	8.8[a]
PSE	37.74	1.79	36.9[b]	28.5	0.21	7.7[b]
Treatment	0.0005[e]	0.5055[e]	<0.0001[e]	0.8666[e]	0.7568[e]	0.0675[e]
Control	44.27[a]	1.75	40.7[a]	29.7	0.22	9.0
KHCO	35.62[b]	1.78	36.0[bc]	29.4	0.21	7.7
KHCO/HPMC	35.51[b]	1.83	38.2[b]	29.5	0.22	8.6
KHCO/KF	36.40[b]	1.83	35.1[c]	28.6	0.22	7.8
RMSE[f]	9.154	0.236	4.650	5.487	0.042	2.279

[abcd]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[e]P-value from analysis of variance tables
[f]Root Mean Square Error

normal and PSE muscle between processing days was not surprising. The control frankfurters had increased stress at gel failure than KHCO, KHCO/HPMC, and KHCO/KF. A meat by treatment interaction was reported for Hard1 of frankfurters (Fig. 23) and control-normal frankfurters had the highest Hard1 values ($P<0.05$) when compared to frankfurters from other meat by treatment combinations. Hard1 values for frankfurters were similar to those reported by Saliba and others (1987), but higher than Barbut and Mittal (1996). TPA parameters for frankfurters trended similar to Keeton and others (1984), though Hard1, Hard2 and gumminess were higher and cohesiveness lower than TPA parameters reported in this study. The difference was most likely the result of Keeton and others (1984) using nonmeat proteins like soy, milk and wheat gluten as ingredients within the frankfurters, and the buffer/hydrocolloid treatment did not produce equivalent gel strengths. The addition of a buffer and hydrocolloid ingredients reduced the variation between normal and PSE meat, by either recovering PSE-protein functionality or emulating normal-protein functionality.

Conclusion

KHCO is a viable substitution for sodium bicarbonate as a buffer ingredient for improvement of pH, color attributes, and texture properties. KHCO would address the issue of increased saltiness sensory levels as reported by Kauffman and others (1998) and van Laack and others (1998; 1996) and does not produce the unacceptable air pockets in the gel product like NHHCO. The synergistic effect of KHCO with HPMC or KF and standard enhancement solution ingredients of salt and phosphate improved the texture properties of PSE ground pork to decrease the variation of quality to resemble normal pork meat. The EDS imaging showed that treatment solutions, when in applied directly to a ground meat system, appeared to improve the texture functionality by filling in spaces within the meat gel. Treatment solution did not negatively affect the sensory flavor and texture attributes as rated by consumer and trained descriptive sensory panels. Meat processors could use KHCO with HPMC or KF as ingredients to improve color, texture, and pH of PSE meat. The reduction of variation between PSE and normal pork muscle would improve pork quality and add value to PSE meat products.

CHAPTER VII

STRATEGIES FOR IMPROVEMENT OF FUNCTIONAL PROPERTIES OF STEAKS FROM YOUNG AND MATURE BEEF UTILIZING HYDROCOLLOIDS AND ACETIC ACID

Overview

Our objective was to reduce the quality variation of beef steaks from high pH muscle of mature animals utilizing xanthan gum (XG), konjac flour (KF), and acetic acid (AA). Carcasses from two ages, young (USDA A maturity) and mature (USDA C/D/E maturity), and within an age group, high (>6.0) and normal (5.3-5.7) pH carcasses were selected (n=6/subgroup). Two loins (IMPS#180) from each carcass were cut into 2 equal sections perpendicular to the length of the *Longissimus dorsi* muscle. Each section was assigned an aqueous based treatment: Control; 0.074 M AA; 0.074 M AA/0.250% XG; and 0.074 M AA/ 0.125% KF. Treatment solutions were injected at 12% pump level, loins were tumbled, cut into 3 sections and sections assigned to 0, 14 or 28 storage day (ST). Three, 2.24 cm steaks were cut from each section for sensory panel evaluation, chemical determination, or WBS analysis. AA decreased pH and increased initial yellow (a*) and red color (b*) of steaks; however, with storage the addition of non-meat ingredients resulted in lighter, slightly more yellow, and redder steaks. Treatment did not effect mechanical or sensory tenderness measures. Non-meat ingredients increased overall flavor intensity, but did not effect other flavors aromatics, basic tastes, or off-flavors. There was no significant interaction between ST and

treatment indicating that adding non-meat ingredients would not result in or alter normal storage effects. Therefore, AA, KF and XG are viable options for use in high pH beef loin steaks.

Introduction

The U.S. beef industry strives to produce a beef product that is superior in palatability. Ultimate pH and overall maturity in beef are known to affect palatability, tenderness and overall appearance of end products. Normal pH, 5.4 to 5.7, young-beef has a bright, cherry red lean color, and good flavor (Aberle, and others 2001). Carcasses harvested at advanced maturity, such as cows, are not comparable in these traits to young beef carcasses even at a normal pH. Cow muscles have been shown to have greater concentrations of myoglobin (Mb) and insoluble collagen (Cross and others 1973; Bailey 1989).

Alternative methods to improve post-mortem whole muscle quality like dark, firm, and dry (DFD) muscle are needed. DFD is a meat quality defect characterized by increased muscle pH, water-holding capacity, and dark red color (Abril and others 2001). Typically, DFD meat is the result of stress to animals prior to harvesting and the inability of the animal to replenish glycogen energy stores. Meat with lower glycogen stores have limited pH drop during the conversion to meat and result in a high ultimate muscle pH, 6.0 pH or higher, as lactic acid build-up is prevented. Wulf and others (2002) reported more intense flavor and less tender ($P<0.05$) meat from DFD muscle compared to normal muscle. Alternative methods of improving DFD meat need to be examined to improve meat texture and flavor.

The possibility of using hydrocolloids in a meat enhancement solution has been examined. Xanthan gum (XG) and konjac flour (KF) have been shown to be stable in environments of varying ionic strengths and shown to be compatible for standard meat processing systems. Both, XG and KF, have the ability to hydrate in an aqueous environment, potentially mask off-flavors present in DFD meat (Pangborn and others 1973; Pangborn and Szczesniak 1974), and lower muscle pH as their structures have unique functional properties.

Acetic acid has been used as a marinade base to improve muscle tenderness and to lower the meat surface pH for microbial decontamination (Wenham and Locker 1976; Dixon and others 1987; Rao and Gault 1990; Lewis and Purslow 1991; Seuss and Martin 1993; Mikel and others 1996). Acetic acid may provide sufficient pH decrease in DFD meat to lower pH when used in an enhancement solution. Our objective was to determine the effect of hydrocolloids and acetic acid addition on pH, color, tenderness and palatability of DFD beef muscle and their subsequent effect on meat from animals varying in age during vacuum package storage.

Materials and Methods

Treatment Solution Preparation

Preliminary studies were conducted to determine if non-meat ingredients could be used to lower the pH and lighten color of high pH beef. After screening lactic acid, salt and acidic phosphates, it was determined that acetic acid (AA) was the most effective food grade ingredient to lower beef muscle pH. Xanthan gum (XG; Keltol® 521, CPKelco, Chicago, IL, U.S.A.) and konjac flour (Nutricol® XP 3464; FMC Corp., Philadelphia, PA, U.S.A.) were evaluated for use in combination with AA to lower pH and have efficacy for decreasing dark color in beef strip loins. Varying levels of the aforementioned ingredients were evaluated during preliminary research and the levels used in this experiment represented the highest level found to be effective.

Three treatment solutions (AA; AA/XG; and AA/ KF) were prepared within 48 h of processing day. The 0.074 M AA solution was prepared by the addition of AA and raised to the final volume with double, distilled, deionized water. The 0.250% (w/v) XG and 0.074 M AA was prepared by hydrating and solublizing the XG in double, distilled, deionized water, then adding 0.074 M AA. The 0.125% KF and 0.074 M AA solution was prepared by hydrating and solublizing the KF in double, distilled, deionized water, then 0.074 M AA was added. Treatment solutions were held at 4 °C until day of processing.

Meat Preparation

Beef carcasses were from two ages, young (USDA A maturity) and mature (USDA C/D/E maturity) and within an age group, high (> 6.0) and normal (5.3 - 5.7) pH carcasses were selected (n=6/subgroup). Two beef strip loins (n=24 carcasses or 6 carcasses per pH and age class, IMPS#180, 8/processed each day for 3 processing days) were removed from each carcass and trimmed of all visible fat. Each strip loin was cut into 2 equal sections perpendicular to the length of the *longissimus dorsi* muscle, resulting in four equal sections from each carcass. Each section within a carcass was randomly assigned a treatment: Control; 0.074 M AA; 0.074 M AA/ 0.250% XG; and 0.074 M AA/ 0.125% KF. Initial pH, in duplicate, (pH meter calibrated daily with 4.0

and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA) and CIE L*, a*, and b* color space values in triplicate were determined in triplicate using a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ) calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196) to ensure consistency among days, at the anterior *longissimus dorsi* muscle surface prior to injection.

Treatment solutions were injected (pickle injector, model B1-72, Inject Star of the Americas, Inc., Mountain View, AR, U.S.A.) into each strip loin section at a standard 12% pump level. Strip loin sections were weighed prior to injection and after injection to verify pickup. Strip loin sections were double bagged in oxygen impermeable vacuum bags (OTR 1 $cm^3/m^2/$ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH), vacuum packaged, and tumbled for 15 min, then stored at 2 °C for 24 h to allow for brine equilibration. Strip loin sections within treatment were cut into three equal sections and the three sections were randomly assigned to 0, 14 or 28 d of storage (ST). Within each ST, 3- 2.24 cm thick strip loin steaks were cut and assigned for sensory panel evaluation, chemical determination, or Warner-Bratzler shear force (WBS) analysis. Steaks were vacuum-packaged in oxygen impermeable vacuum bags (OTR 1 $cm^3/m^2/$ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH) and stored at 2 °C.

WBS Analysis

The WBS steak samples were removed and package purge, and texture analysis was performed. Package purge (%) was determined by difference through the following equation: (100-(Sample weight + dry package weight)/total package weight). WBS was performed on samples according to AMSA (1995) for Intact Steaks/Roasts/Chops. Samples were thermocoupled in the geometric center of each sample using copper constantan wire and were monitored with a digital thermometer (Omega Engineering, model HH501BT type T, Stamford, CT) with a type T thermocouple (Omega Engineering, model TMQSS, Stamford, CT). WBS steaks were cooked on an electric Hamilton Beach grill (model 31605A, Southern Pines, NC, U.S.A.) turned at to 35 °C, then to an internal temperature of 70 °C, covered with a moisture impermeable barrier and stored at 4 °C overnight. WBS samples were removed from 4 °C storage and allowed to equilibrate to room temperature. Six, 1.27 cm, cores were taken parallel to the steak's muscle fiber orientation. WBS force was determined using a Universal Testing Instrument (Model SSTM-550, United Calibration Corp., Huntington Beach, CA, U.S.A.) with a WBS device, 20 kg compression load cell with a crosshead speed of 200 mm/min, and maximum force recorded in kg as a mean of the six cores.

Color, pH and Water-holding Capacity Analysis

Steaks were removed from packaging and allowed to bloom for 20 min prior to color and pH analysis. Utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ) CIE L*, a* and b* color space values was calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196) to ensure consistency among days, in triplicate, and pH, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA) were determined at steak surface on the *Longissimus dorsi* muscle. The

WHC was determined, in duplicate, through drip loss. Approximately, 8-10 g of sample were weighed, hung and suspended in a water resistant bag (VWR, West Chester, PA, U.S.A.). Samples were stored at 4 °C for 48 h, then samples were removed and weighed. Drip loss was determined by the following equation: (100-(48 h sample weight/0 h sample weight)).

Sensory Evaluation

Two separate, 5-member, trained, descriptive attribute sensory panels evaluated each sample as defined by AMSA (1995) and Meilgaard and others (2007). Panelists evaluated each attribute using a 9-point descriptive intensity scale (AMSA 1995) where 0=none or the absence of an attribute and 8= extremely intense. Ballot development sessions were conducted prior to testing sessions where representative testing samples were presented to the panelists. Sensory attributes evaluated during sensory analysis were juiciness, muscle fiber tenderness, connective tissue, overall tenderness, overall flavor intensity, flavor aromatics (cooked beef lean, cooked beef fat, serum/bloody, liver, cowy, browned, acid, soured, cardboard, fishy, and painty), basic tastes (salt, sour, and bitter), and mouthfeels (metallic and chemical burn). Training sessions used reference samples and samples from the study to anchor the panelists (Table 7).

On day of testing, the steak raw weight was recorded, a copper constantan thermocouple was placed in geometric center of each sample, and was monitored with a digital thermometer (Omega Engineering, model HH501BT type T, Stamford, CT) with a type T thermocouple (Omega Engineering, model TMQSS, Stamford, CT). Samples were cooked on an electric Hamilton Beach grill (model 31605A, Southern Pines, NC, U.S.A.) turned at 35 °C, then cooked to an internal temperature of 70 °C. Cooked weight and time were recorded and samples were cut into 1.74 cm cubes. Utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ), calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196) to ensure consistency among testing days, cooked meat CIE L*, a*, and b* color space values were determined on a cooked lean cut surface, in duplicate. Two cubes of sample were immediately served to the trained sensory panel. In a randomized order, 16 samples were evaluated per day during 2 sensory sessions with up to 8 samples being evaluated per session. Sample treatments were randomized to order within a sensory day. During each session, panelists were served 8 samples with 5 min between each sample. After 8 samples, panelists were provided a 20 min break. Within each sensory day, panelists conducted a warm-up sample to standardize and calibrate the panelists each testing day. The warm-up sample was a control sample. Panelists were seated in individual booths that were separated from the sample preparation area. Samples were evaluated under red incandescent lights to reduce the effect of visual appearance on sensory attributes. Panelists cleansed their palette using fat-free ricotta cheese, saltless saltine crackers and double distilled deionized water.

Statistical Analysis

The data were analyzed using the Proc GLM procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) as 4 x 4 x 3 factorial arrangement and analyzed as a split-split plot design with carcass pH and age classification (animal type), injection treatment (treatment) and ST as main effects. The whole plot included the main effect of animal type, processing day as a block, and carcass within animal type was defined as the whole plot error term. For the first split, treatment and the interaction of animal type by treatment were defined as effects with carcass within animal type by Treatment as the error term. For the second split, ST, ST by animal type, and ST by treatment were included and the residual error was used as the error term. Significance was defined as $P<0.05$. For sensory data, data were analyzed as a factorial arrangement as previously defined except panelist was included in the model. Data were analyzed as a split-split-split plot design where the whole plot and the first 2 splits where as defined in the aforementioned model except that for the second split, carcass within animal type by treatment by ST was defined as the error term. In the third split the effect of panelists and all two-way interactions with main effects were included in the model and the residual error term was defined as the error term. This analyzes was used to determine the efficacy of the sensory panelists. As sensory panelists varied in expertise (23 years to 3 months), it was important to understand if panelists by treatment interactions existed. Panelist by animal type, treatment and ST tended to not be significant ($P>0.05$) and when significance was found ($P<0.05$), it was verified that averaging across panelists did not change the interpretation of the results. Therefore, for the final sensory data analyses, data within an attribute were averaged across panelists and data were analyzed as described for other dependant variables. Least squares means were calculated and where Analysis of Variance indicated significance ($P<0.05$), differences in least squares means were determined using the stderr pdiff procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) at an alpha <0.05.

Results and Discussion

Effect of pH and Animal Age

As expected, beef top loin sections within animal type were affected by initial pH, storage pH and color values defined by treatment (Table 18; Fig. 24). Mature-high pH and young-high pH loins were darker in color and had higher pH than loins from mature-normal pH and young-normal pH loins as would be expected by design. Mature-high pH loins had higher red (a*) and yellow (b*) CIE color space values than young-high pH loins most likely due to the higher myoglobin content expected in meat from mature animals. However, mature-normal pH loins were darker (lower L* values) initially, but upon storage CIE L* color space values did not differ for mature-normal pH and young-normal pH loins (Fig. 25). Additionally, young-normal pH loins were more yellow and red than mature-normal pH loins initially and after storage. These data agreed with Young and others (2005), even though they reported color using a ground beef system. Young-normal pH loins were redder, but did not differ in yellow color when compared to mature-normal pH loins (Fig. 25).

Animal type did not affect purge loss (%) or drip loss (%) (Table 19), however, high pH loins had higher cook yields than normal pH loins. After cooking, young-normal pH steaks were lighter in internal color than steaks from the other animal types indicating that steaks from young-high pH loins were similar in darkness as steaks from mature animals. Mature steaks, regardless of pH level, were tougher and had more sensory connective tissue than steaks from young beef carcasses; however, WBS values and sensory tenderness rating for steaks from mature carcasses were not appreciably

Table 18. Least squares means for beef steaks for main effects for initial and storage day pH, and initial and storage day CIE color space values.

Main Effects	Initial pH	Storage Day pH	Initial CIE Color Space Values L*	a*	b*	Storage Day CIE Color Space Values L*	a*	b*
Animal Type	<0.0001^{e}	<0.0001^{e}	<0.0001^{e}	<0.0001^{z}	<0.0001^{e}	0.0003^{e}	<0.0001^{e}	<0.0001^{e}
Mature-High pH	6.75^{a}	6.49^{a}	33.96^{bc}	18.86^{b}	6.06^{b}	36.90^{b}	20.57^{b}	6.23^{c}
Mature-Normal pH	5.77^{b}	5.63^{b}	34.49^{b}	19.92^{b}	7.47^{c}	39.43^{a}	22.64^{a}	9.25^{b}
Young-High pH	6.61^{a}	6.32^{a}	31.09^{c}	13.81^{c}	3.81^{c}	35.51^{c}	17.08^{c}	4.60^{d}
Young-Normal pH	5.63^{b}	5.54^{b}	40.35^{a}	23.28^{a}	10.39^{a}	44.42^{a}	22.73^{a}	10.68^{a}
Treatment	0.9131^{e}	0.0002^{e}	0.0618^{e}	0.0003^{e}	0.0253^{e}	<0.0001^{e}	0.0050^{e}	0.0044^{e}
Control	6.20	6.07^{a}	34.64	18.52^{bc}	6.66^{a}	36.55^{b}	20.00^{b}	7.12^{b}
AA	6.19	5.91^{c}	35.71	19.76^{a}	7.54^{b}	40.22^{a}	20.69^{a}	7.96^{a}
AA/XG	6.18	6.00^{b}	34.65	18.49^{c}	6.65^{a}	39.82^{a}	21.11^{a}	7.90^{a}
AA/KF	6.19	6.00^{b}	34.89	19.10^{b}	6.88^{a}	39.67^{a}	21.23^{a}	7.78^{a}
Storage Day		0.0433^{e}				0.0219^{e}	0.0167^{e}	<0.0001^{e}
0 Day		6.03^{a}				38.84^{ab}	21.04^{a}	7.64^{b}
14 Day		5.99^{ab}				38.75^{b}	20.26^{b}	6.76^{c}
28 Day		5.97^{b}				39.61^{a}	20.97^{a}	8.67^{a}
RMSE^{f}	0.115	0.154	1.518	1.063	1.111	2.334	2.041	1.503

^{abcd}Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
^{e}P-value from analysis of variance tables
^{f}Root Mean Square Error

Table 19. Least squares means for beef steaks for main effects for purge loss, drip loss, cook yield, cooked CIE color space values, and Warner-Bratzler shear force.

Main Effects	Purge Loss (%)	Drip Loss (%)	Cook Yield (%)	Cooked CIE Color Space Values L*	a*	b*	Warner-Bratzler Shear Force (kg)
Animal Type	0.6849[d]	0.2916[d]	0.0129[d]	0.0125[d]	0.1910[d]	0.0067[d]	0.0082[d]
Mature-High pH	4.20	1.58	84.13[a]	50.70[b]	20.45	9.24[b]	2.66[ab]
Mature-Normal pH	5.23	1.28	80.05[b]	51.51[b]	21.16	10.91[a]	3.07[a]
Young-High pH	3.78	1.13	84.68[a]	52.32[b]	20.93	9.57[b]	2.02[b]
Young-Normal pH	5.79	1.17	79.91[b]	56.52[a]	19.24	10.19[ab]	2.25[b]
Treatment	0.4375[d]	0.0328[d]	<0.0001[d]	0.0035[d]	0.1996[d]	0.0122[d]	0.6467[d]
Control	4.11	1.12[b]	84.61[a]	51.17[b]	21.22	9.55[b]	2.52
AA	4.83	1.28[ab]	80.77[b]	53.39[a]	20.18	10.22[ab]	2.51
AA/XG	4.78	1.34[a]	81.26[b]	53.14[a]	20.28	9.64[b]	2.44
AA/KF	5.27	1.41[a]	82.13[b]	53.34[a]	20.11	10.52[a]	2.53
Storage Day	<0.0001[d]	0.0001[d]	0.1030[d]	0.0077[d]	<0.0001[d]	0.3173[d]	<0.0001[d]
0 Day	1.32[c]	1.40[a]	81.25	52.70[ab]	22.71[a]	10.01	2.75[a]
14 Day	3.71[b]	1.45[a]	82.81	51.87[b]	20.49[b]	9.75	2.47[b]
28 Day	9.20[a]	1.02[b]	82.51	53.72[a]	18.13[c]	10.18	2.29[c]
RMSE[e]	6.116	0.746	5.099	3.878	3.390	1.881	0.603

[abc]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[d]P-value from analysis of variance tables
[e]Root Mean Square Error

Table 20. Least squares means for beef steaks for main effects for trained sensory descriptive flavor aromatics attributes[e].

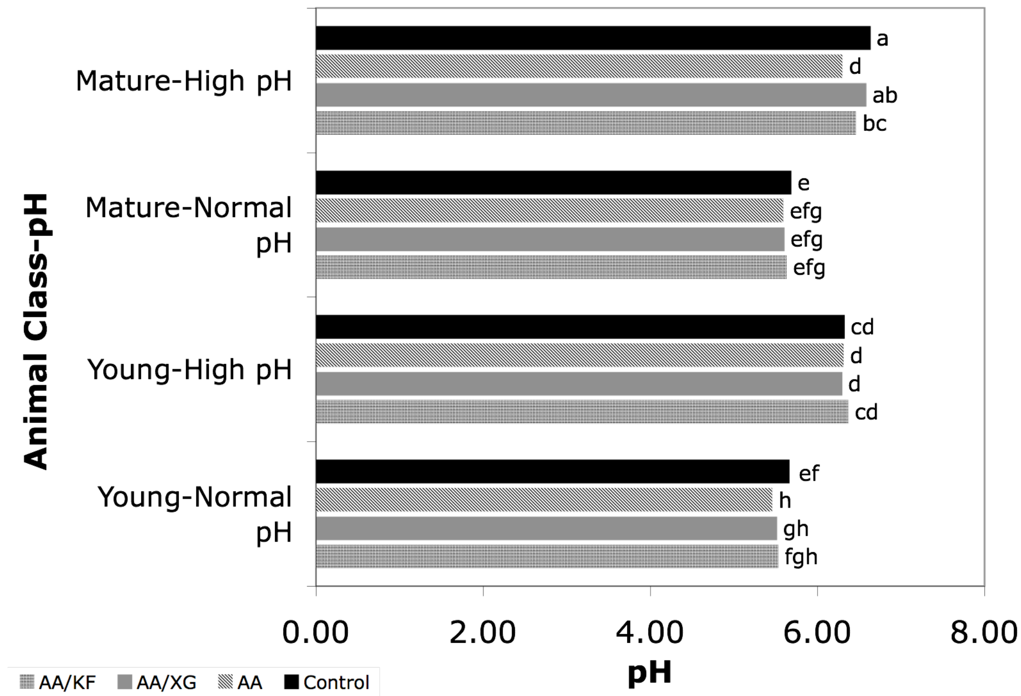
Main Effects	Juiciness	Muscle Fiber Tenderness	Connective Tissue	Overall Tenderness	Overall Flavor Intensity	Aromatics: Cooked Beef Lean	Cooked Beef Fat	Serum/ Bloody	Liver	Cowy
Animal Type	0.0173[f]	0.0003[f]	<0.0001[f]	<0.0001[f]	0.0196[f]	0.0004[f]	0.0035[f]	0.5611[f]	0.0062[f]	<0.0001[f]
Mature-High pH	5.62[b]	5.63[bc]	5.39[b]	5.32[b]	5.48[b]	4.28[c]	1.07[a]	0.59	0.22[ab]	0.94[a]
Mature-Normal pH	5.72[b]	5.37[c]	5.63[b]	5.22[b]	5.77[a]	4.82[ab]	0.73[b]	0.75	0.12[bc]	0.67[b]
Young-High pH	6.12[a]	6.89[a]	7.05[a]	6.85[a]	5.81[a]	4.69[b]	1.15[a]	0.68	0.26[a]	0.42[c]
Young-Normal pH	5.45[b]	6.27[ab]	6.87[a]	6.26[a]	5.78[a]	5.09[a]	0.66[b]	0.60	0.06[c]	0.12[d]
Treatment	0.0437[f]	0.0649[f]	0.8167[f]	0.2037[f]	0.0042[f]	0.9788[f]	0.1991[f]	0.1978[f]	0.7110[f]	0.1978[f]
Control	5.86[a]	6.11[a]	6.29	5.96	5.84[a]	4.72	0.93	0.73	0.17	0.63
AA	5.63[bc]	5.96[b]	6.20	5.85	5.68[b]	4.72	0.96	0.59	0.14	0.50
AA/XG	5.82[a]	6.12[a]	6.23	5.99	5.68[b]	4.73	0.92	0.68	0.17	0.51
AA/KF	5.60[c]	5.96[b]	6.23	5.85	5.64[b]	4.70	0.80	0.62	0.18	0.50
Storage Day	<0.0001[f]	0.0294[f]	<0.0001[f]	0.0038[f]	0.0016[f]	<0.0001[f]	<0.0001[f]	0.8456[f]	0.0293[f]	<0.0001[f]
0 Day	5.86[a]	5.96[b]	5.96[b]	5.78[b]	5.61[b]	4.80[a]	0.81[b]	0.63	0.12[b]	0.50[c]
14 Day	5.90[a]	6.13[a]	6.37[a]	6.01[a]	5.79[a]	4.82[a]	0.81[b]	0.66	0.21[a]	0.36[b]
28 Day	5.42[b]	6.03[ab]	6.37[a]	5.95[a]	5.74[a]	4.53[b]	1.08[a]	0.67	0.16[ab]	0.75[a]
RMSE[g]	0.548	0.457	0.581	0.500	0.356	0.485	0.391	0.426	0.547	0.461

[abcd]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[e]Juiciness: 1= extremely dry, 8= extremely juicy; Muscle fiber and overall tenderness: 1= extremely tough, 8=extremely tender; Connective Tissue Amount: 1= abundant, 8= none; Aromatics; 1= extremely bland, 8= extremely intense
[f]P-value from analysis of variance tables
[g]Root Mean Square Error

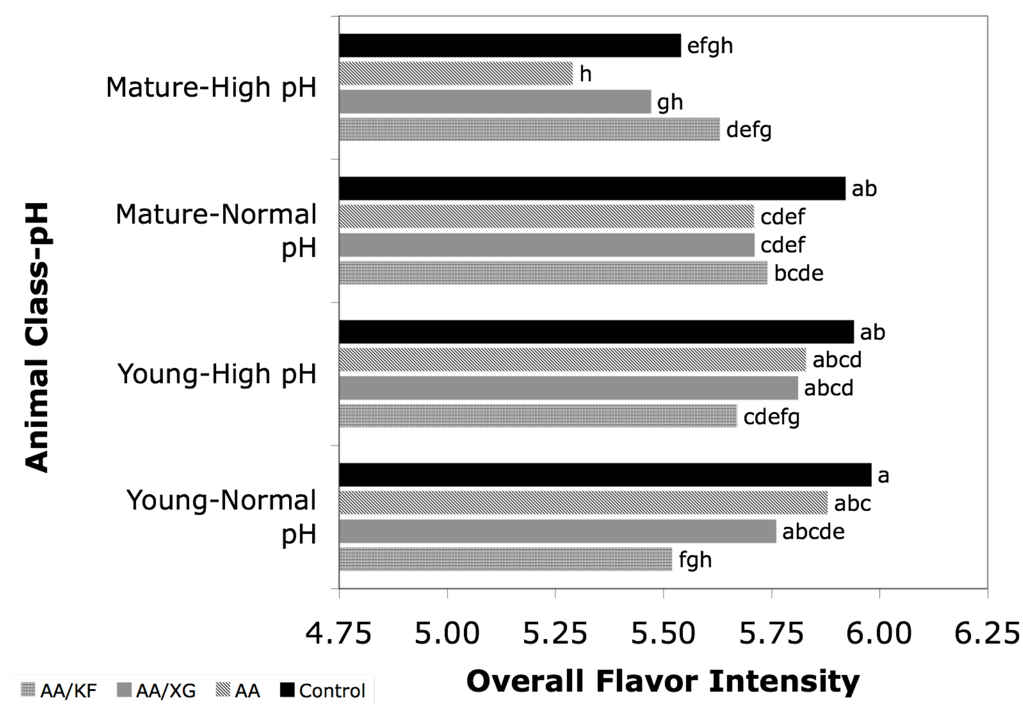
Table 21. Least squares means for beef steaks for main effects for trained basic tastes and off flavors sensory descriptive flavor aromatics attributes[d].

	Basic Tastes			Off Flavors	
Main Effects	Salt	Sour	Bitter	Metallic	Acid
Animal Type	0.0002[e]	0.0135[e]	0.0558[e]	0.7047[e]	0.9764[e]
Mature-High pH	0.63[c]	1.01b	1.60	1.49	0.44
Mature-Normal pH	0.84[b]	1.29[a]	1.44	1.45	0.47
Young-High pH	0.77[bc]	1.00[b]	1.47	1.34	0.41
Young-Normal pH	1.04[a]	1.36[a]	1.27	1.39	0.45
Treatment	0.1978[e]	0.6736[e]	0.6895[e]	0.4115[e]	0.9172[e]
Control	0.89	1.21	1.51	1.47	0.47
AA	0.79	1.09	1.42	1.32	0.42
AA/XG	0.81	1.17	1.43	1.43	0.46
AA/KF	0.78	1.20	1.42	1.45	0.42
Storage Day	0.0693[e]	0.0006[e]	0.0002[e]	0.0014[e]	<0.0001[e]
0 Day	0.79	1.09[b]	1.35[b]	1.32[b]	0.27[b]
14 Day	0.79	1.04[b]	1.34[b]	1.36[b]	0.30[b]
28 Day	0.88	1.37[a]	1.65[a]	1.57[a]	0.76[a]
RMSE[f]	0.294	0.612	0.546	0.492	0.491

[abc]Mean values within a column and followed by the same letter are not significantly different (P > 0.05).
[d]Basic Tastes: 1= extremely bland, 8= extremely intense; Mouthfeels: 1= extremely bland, 8= extremely intense; Off Flavors: 1= extremely bland, 8= extremely intense.
[e]P-value from analysis of variance tables
[f]Root Mean Square Error

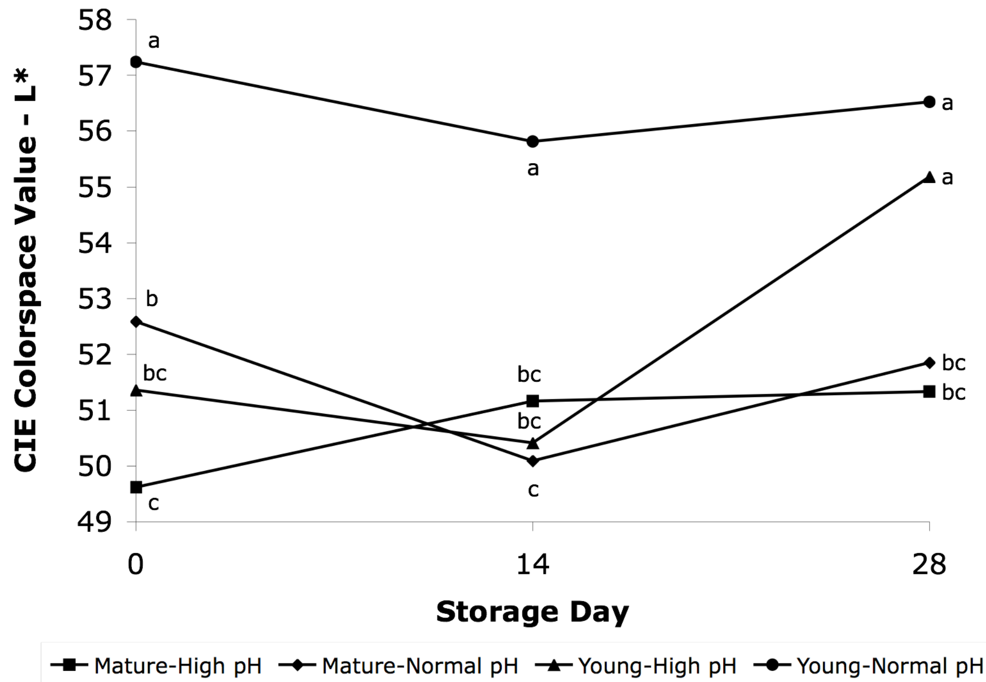


a.

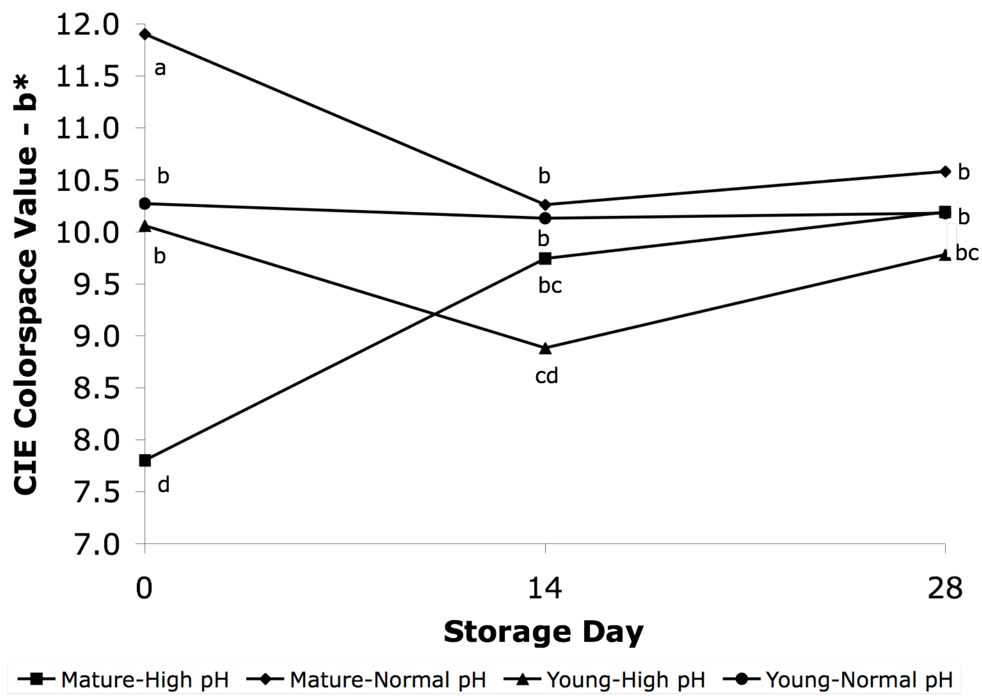


b.

Figure 24. Least squares means of beef steaks of the interaction of animal type x treatment: a. storage day pH (P<0.0483) and b. trained sensory descriptive attribute overall flavor intensity (P<0.0239).

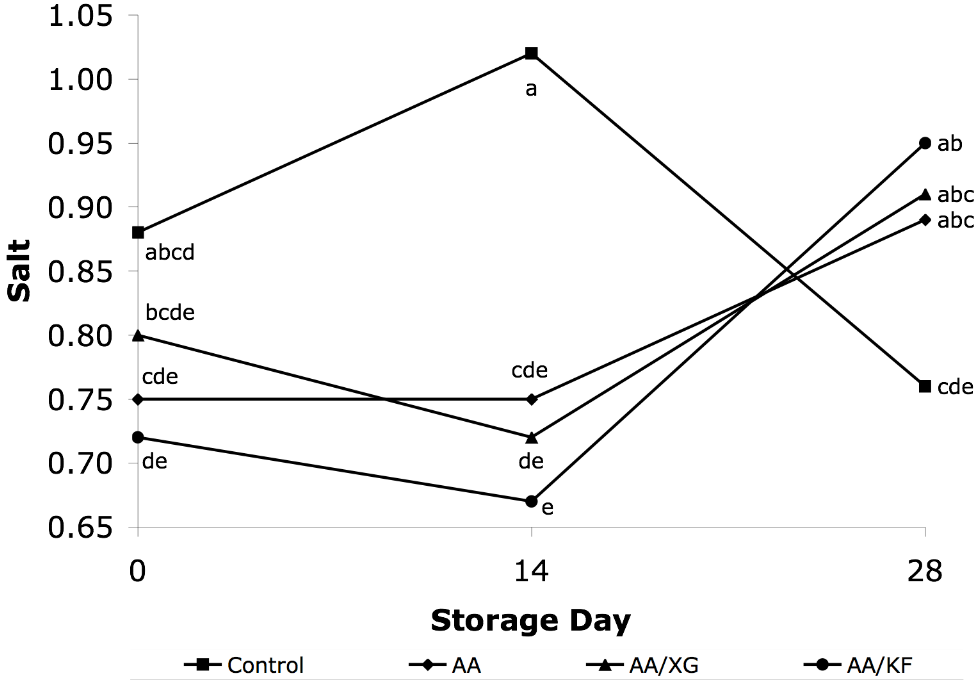


a.

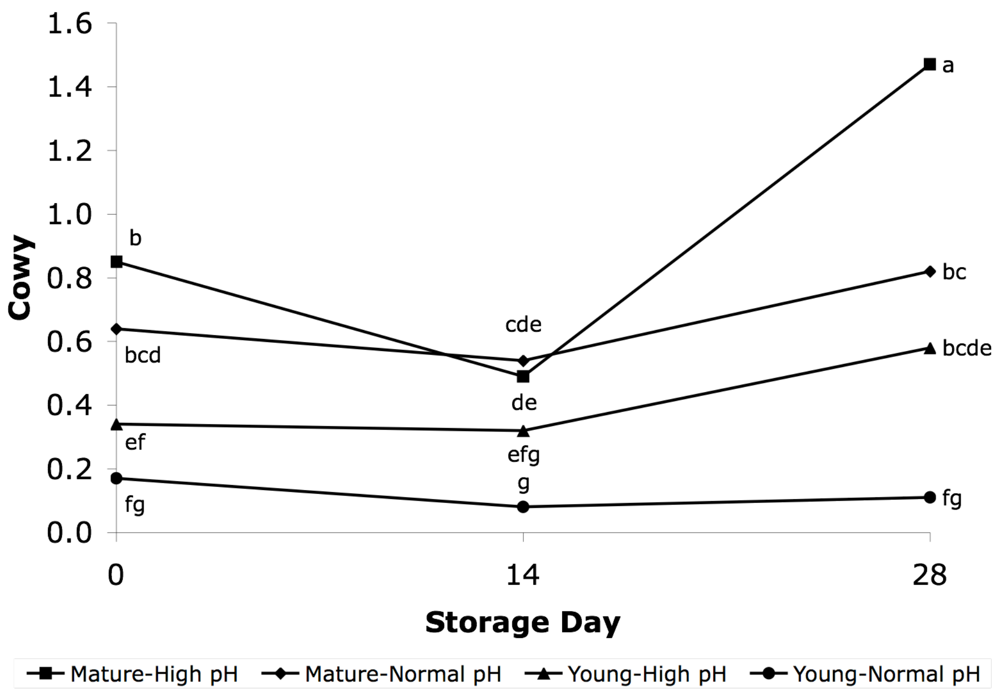


b.

Figure 25. Least squares means for beef steaks of the interaction effect of animal type x storage day for cooked: a. CIE L* color space value (P<0.0125) and b. CIE b* color space value (P<0.0001).



a.



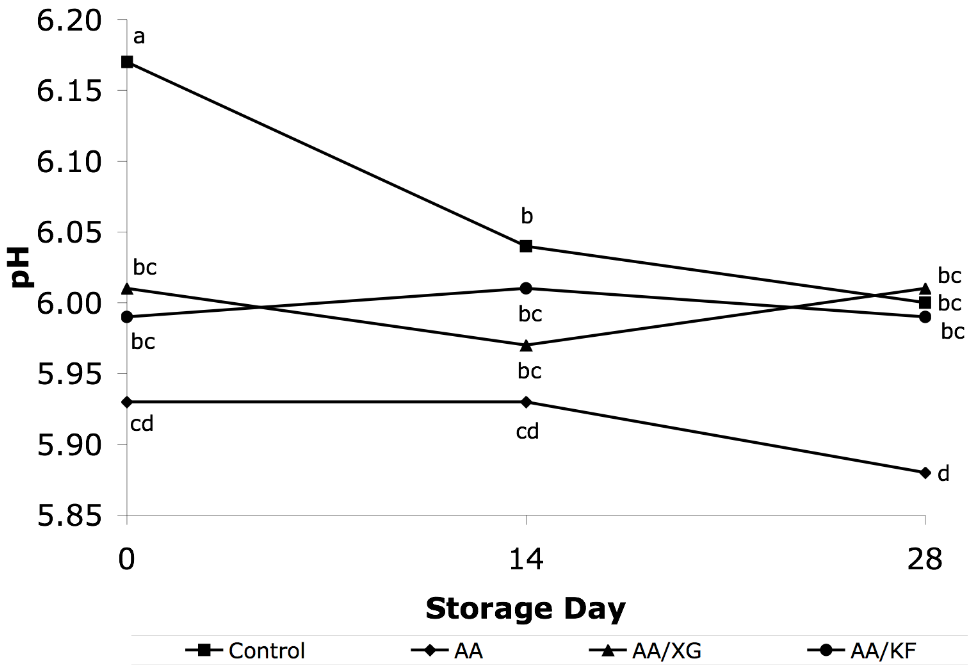
b.

Figure 26. Least squares means of beef steaks: a. interaction treatment x storage day trained sensory descriptive attribute salt (P<0.0015) and b. interaction animal type x storage day trained sensory descriptive attribute cowy (P<0.05).

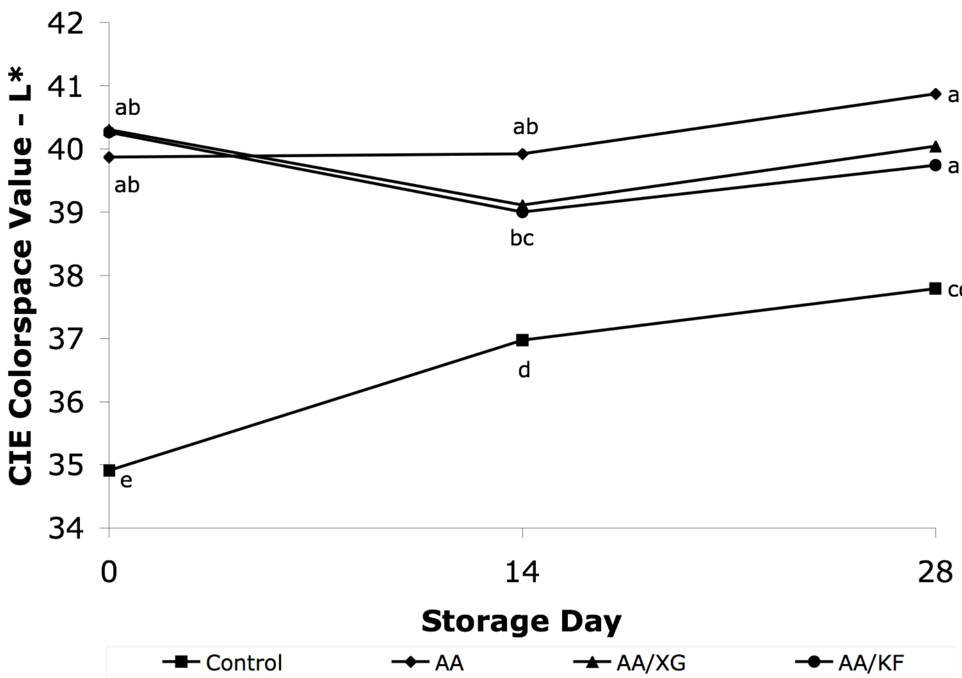
tough (Tables 19 and 20) as similarly reported by Berge and others (2001). WBS values were similar to McKeith and others (1985) whom evaluated young-normal pH animals. Steaks from young-high pH were the juiciest. Overall flavor intensity, cooked beef lean, cooked beef fat, livery, and cowy flavor aromatics; and salt and sour basic tastes differed in steaks from the four animal type (Tables 20 and 21; Fig 24). Juiciness, connective tissues, overall tenderness and WBS values for mature steaks were higher than those reported by Smith and others (1982). Normal pH steaks tended to be higher in cooked beef lean flavor and sour basic tastes; and lower in cooked beef fat, livery and cowy flavor aromatics. Steaks from young-normal pH had higher salty basic taste (Fig. 26). These results were as expected; however, greater flavor differences may have been expected between mature and young beef. These results show that pH and age of animal, at harvest, influence the color, tenderness and sensory attributes of beef and these results are as expected. The objective of our study was to see if the addition of non-meat ingredients would result in high pH beef or beef from matureer animals to be similar in quality, color, and sensory attributes to normal pH beef from young beef.

Effect of Treatment

The addition of AA decreased pH and increased initial red (a*) and yellow (b*) color of steaks; however, with storage the addition of non-meat ingredients resulted in lighter and slightly more yellow and red steaks (Fig. 27). The drop in pH was expected with the addition of AA, but the addition of XG and KF also were expected to decrease pH. The XG structure consisted of a backbone of glucose units with the side chains



a.



b.

Figure 27. Least squares means of beef steaks of the interaction treatment x storage day: a. storage day pH (P<0.0383) and b. storage day CIE L* color space values (P<0.0054).

containing mannoses, glucuronic acid, and pyruvic acid (Jannsson and others 1975). The side chains of the XG have extensive intramolecular hydrogen bonding that can form a helical structure that is very stable with pH and temperature changes. The KF, a polysaccharide, consisted of linear galactomannon repeating units and had acetyl side groups (Imeson 1997). The expected decrease in pH was in agreement with Rao and others (1989) and Rao and Gault (1990), but in our study a decrease in pH of a similar magnitude as literature value were not found. This likely was the result of the addition of AA. In our study, a 0.074 M AA solution in combination with XG or KF was injected at 12%, whereas Rao and others (1989) allowed treatment solutions to equilibrate with meat samples for 48 h and it was used without additional ingredients. The low pH of the AA may have interfered in the XG and KF functionality.

Steaks containing AA had lighter cooked color (Table 22), which was expected as the reduced pH was closer to the muscle pI that would result in less water bound to the muscle protein. The decrease in WHC would cause a lightening of the muscle as less water was bound to the protein and more free water would result in increased surface lightness (Fernandez-Lopez and others 2004).

Treatment did not affect the mechanical or the sensory overall tenderness measures (Tables 19 and 20) as were similarly reported by Wenham and Locker (1976). However, Rao and Gault (1990) reported an increase in muscle tenderness by a weakening of myofibrillar strength. Control steaks and steaks containing AA/XG were slightly juicier and had greater muscle fiber tenderness than steaks from the other treatments (Table 20). The synergistic effect of the AA and the ability of XG to bind water may have resulted in the increased juiciness and muscle fiber tenderness. AA, AA/XG, and AA/KF treated steaks had higher drip loss and cook loss than control steaks (Table 19). This was expected as the addition of non-meat ingredients required the addition of about 11% water. While this water, would in general be, bound with the meat matrix, a slight increase in purge loss, drip loss and cook loss would be expected. Interestingly, steak purge loss was not affected ($P>0.05$) by treatment (Table 19). The steric arrangement of muscle during the conversion of muscle to meat alters the arrangement of fiber bundles creating and increasing inter-spatial spaces between muscle fibers, thus impacting WHC and texture of the muscle (Schafer and others 2002). Most likely the hydrocolloid ingredients formed a gel matrix that encased water molecules present in the inter-spatial areas of the muscle, which would result in similar purge loss. The drip loss and cooking yield of the product should follow similar trends to purge loss, but in our study did not as AA/hydrocolloid treated steaks had increased drip loss and lower cook yield when compared to control treated steaks. The mechanism for hydrocolloids to bind water or water binding capacity (WBC) may explain these differences. Water trapped within hydrocolloid gels typically exhibit physical properties of free or bound water that remained bound or has a WBC when stress was applied to the gel structure (Wallingford and Labuza 1983). Most likely excising of the sample for drip loss analysis caused stress on the hydrocolloid gel resulting in a release of water within the gel matrix. The ability to retain water within a meat system may differ between AA and the hydrocolloids ingredients and would need to be further researched to better understand the mechanism and effects on improving a whole muscle product.

In a ground meat system that hydrocolloids most likely coat the muscle fibers, but the mechanism may be different in a whole muscle system and should be investigated.

The addition of non-meat ingredients effected overall flavor intensity (Fig. 24), but did not effect other flavors aromatics, basic tastes, or off-flavors (Tables 20 and 21). This was most likely due to a masking effect of other aromatic or basic taste attributes by the hydrocolloid ingredients (Pangborn and others 1973; Pangborn and Szczesniak 1974). Young animals and mature-normal pH had decreased overall flavor intensity when treated with AA, AA/XG, and AA/KF compared to the control steaks. Interestingly, the mature-high pH when treated with AA/KF had increased overall flavor intensity (Fig. 24) that was greater than mature-high pH control steaks and yet resembled young-high pH. One goal when adding non-meat ingredients is the ingredients do not impart ingredient specific flavors or enhance negative flavor attributes. In this study, as flavor was not affected, the addition of these ingredients as defined by treatment did not negatively affect flavor.

Effect of Storage Day

The ST pH trended to be lower than initial pH (Table 18). The application of the treatments lowered pH and lightened the meat on 0 day of storage. With increased ST, the pH and CIE L* color space values tended to not change (Fig. 27) for AA treated samples. Control steaks had a lower pH and were lighter in color after 14 and 28 ST (Fig. 27) as similarly reported by Seuss and Martin (1993). Steaks containing XG and KF did not differ in pH and CIE L* color space values with storage. These results indicate that the addition of non-meat ingredients stabilized the pH and lightness of steaks during storage.

As ST increased, steaks were more tender, most likely due to endogenous proteolysis or postmortem aging effects. The effect of improved tenderness with increased postmortem storage as been well documented (Koohmaraie and others 1987; Berge and others 2001). As expected, steaks from mature animals had more cowy flavor aromatics that became more intense with increased storage time (Fig. 26). Steaks were juicier after 0 and 14 d of storage than steaks stored for 28 d. Cooked beef lean decreased at 14 d of storage. Steaks stored for 28 d had higher cooked beef fat, sour, bitter, metallic, and acid flavor attributes than steaks stored for 0 d (Tables 20 and 21). These results were as expected and were similar to previously reported effects in beef steaks during vacuum-package, refrigerated storage. As there were not significant interactions between storage day and treatment, these results indicated that the addition of non-meat ingredients would not result or alter normal storage of these steaks. Therefore, these ingredients would be viable options for use in high pH beef top loin steaks.

Conclusion

The addition of AA, XG, and KF may assist in converting high pH beef strip loin steaks to be similar in color and sensory characteristics of normal pH beef, and does not result or alter normal storage effects in these steaks. The work within this study suggests different mechanisms for improvement between AA and hydrocolloids occur when applied to meat that varies in age and pH. Additional studies need to be conducted to more fully understand these mechanisms and what level of ingredients may be added to optimize this effect.

CHAPTER VIII

STRATEGIES FOR IMPROVEMENT OF FUNCTIONAL PROPERTIES OF ROAST BEEF FROM YOUNG AND MATURE BEEF UTILIZING HYDROCOLLOIDS AND ACETIC ACID

Overview

Our objective was to reduce the quality variation of roast beef from high pH muscle of mature animals utilizing xanthan gum (XG), konjac flour (KF), and acetic acid (AA). Beef carcasses were from two age groups, young (USDA A maturity) and mature (USDA C/D/E maturity) and within an age group, high (>6.0) and normal (5.3-5.7) pH carcasses were selected (n=6/subgroup). Two outside rounds (IMPS#171B) from each carcass were cut into 2 sections perpendicular to the length of the *biceps femoris* muscle and assigned a treatment: Control; 0.074 M AA; 0.074 M AA/0.250% XG; and 0.074 M AA/ 0.125% KF. The treatment solutions were injected, cooked to an internal meat temperature of 59 ºC, and chilled. Roasts within treatment were cut into 3 sections and assigned to 0, 14, 28 d storage day (ST). On each ST, a 5 mm slice was removed for color (CIE L*, a*, b*) and pH analysis. The remainder of the section was sliced into 5-0.5 cm slices and evaluated by a 5-member expert, descriptive attribute sensory panel. AA and AA/KF treated roasts resulted in lighter color that was stable during storage. Roasts containing AA/XG, initially, had darker color, but with increased storage, CIE L* color space values increased. Treatment had no effect on roast beef sensory attributes, except that AA roasts were drier. The use of AA, XG, and KF had positive affect on pH

and color of cooked beef bottom round roasts, but did not appreciably effect sensory properties during roast beef storage.

Introduction

The beef sub-primal used as a source for a value-added beef product greatly affects the attributes and quality of the final meat product (Bramblett and others 1959; McKeith and others 1985). Morgan and others (1991) found that beef muscles from the chuck or round were tough. Due to the inherent toughness of beef *bicep femoris* muscles, these muscles are commonly used for fully-cooked, value-added beef products. Hamm (1966) believed that the change in meat tenderness due to thermal processing was related to the interaction between myofibrillar proteins and collagen. The use of long, moist cooking procedures allows for solubilization of connective tissue and improved tenderness of myofibrillar proteins. When these methods are used for tougher cuts, improvements in tenderness have been reported (Buck and others 1979; Dinardo and others 1984; Noble and others 1990; Powell and others 2000).

The ultimate pH and overall carcass maturity are known to affect beef palatability, tenderness and overall appearance. Normal pH, 5.4 to 5.7, young beef has a bright, cherry red lean color, and good flavor (Aberle and others 2001). Carcasses harvested at advanced maturity, such as cows, have meat that is dark red and typically less palatable (Smith and others 1982). Cow muscles are more distinct than muscles from young beef carcasses primarily due to greater concentrations of myoglobin (Mb) and increased insoluble collagen (Cross and others 1973; Bailey 1989). Dark, firm, and dry (DFD) meat, a quality defect, characterized by increased muscle pH (>6.0), high water-holding capacity, and dark red color. After the conversion of muscle to meat, meat with the DFD quality defect has limited utility. Use of processing technologies to convert DFD meat to be similar to normal pH meat would provide the meat industry with a method to improve value and marketability of DFD meat. Post-mortem interventions to reduce variation of DFD meat have included the use of organic acids, like lactic and acetic. These acids have been used to inhibit microbial growth, lower pH and improve meat tenderness (Rao and Gault 1990; Berge and others 2001; Young and others 2005; Sawyer and others 2008). Other non-meat ingredients, such as hydrocolloids, could be used to improve tenderness, palatability and color of DFD meat. The use of hydrocolloids in meat enhancement solutions has been examined. Xanthan gum (XG) and konjac flour (KF) have been shown to be stable in environments of varying ionic strengths to have flow behavior compatible for use in standard meat processing systems, and to be stable over temperature ranges used to manufacture cooked beef. Both XG and KF have the ability to hydrate in an aqueous environment, potentially mask off-flavors present in DFD meat (Pangborn and others 1973; Pangborn and Szczesniak 1974), and lower muscle pH as their structures have unique functional properties.

Utilizing enhancement solutions that include hydrocolloids and acetic acid (AA) as a method to improve palatability and color of DFD meat should be considered. The objective of this study was to determine if the addition of hydrocolloids and acetic acid effected the color, mechanical tenderness and palatability of fully cooked roast beef from

DFD *biceps femoris* muscle. The effect of animal age, muscle pH, and vacuum-packaged refrigerated storage will be determined.

Materials and Methods

Treatment Solution Preparation

Based on the previous work and previously described, three treatment solutions (0.074 M AA; 0.074 M AA/0.250% (w/v) XG; and 0.074 M AA/ 0.125% KF) were prepared within 48 hours of processing day. Treatment solutions were held at 4 ºC until day of processing.

Roast Beef Preparation

Beef carcasses (n=6/subgroup) were from two ages, young (USDA A maturity) and mature (USDA C/D/E maturity) and within an age group, high (> 6.0) and normal (5.3 - 5.7) pH carcasses were selected. Beef bottom rounds (n=24 carcasses or 6 carcasses per pH and age class, IMPS#171B, 8/day, repeated over 3 processing days) were removed from each carcass and trimmed of all visible fat and connective tissue. Each bottom round was cut into 2 equal sections perpendicular to the length of the *biceps femoris* muscle, resulting in 4 equal sections from each carcass. Each section, within carcass, was randomly assigned a treatment: Control; 0.074 M AA; 0.074 M AA/ 0.250% XG; 0.074 M AA/ 0.125% KF. Initial raw pH, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA, U.S.A.) and raw CIE L*, a*, and b* color space values, in triplicate, utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ), that was calibrated daily using a white tile

(Y=93.24, x=0.3137, y=0.3196) to ensure consistency among days, were taken at the anterior *biceps femoris* muscle surface.

Treatment solutions were injected (pickle injector, model B1-72, Inject Star of the Americas, Inc., Mountain View, AR, U.S.A.) into each bottom round section at a standard 12% pump level. Bottom round sections were weighed prior and after injection to verify pickup. Sections were double bagged in oxygen impermeable vacuum bags (OTR 1 cm^3/m^2/ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH), vacuum packaged, and tumbled for 1 h, then stored at 2 ºC for 24 h to allow for brine equilibration. Roasts were vacuum-packaged in cook-in bags (CN-530 Cryovac Sealed Air, Duncan, SC, U.S.A.; OTR 20 cm^3/m^2/ 24h atm @ 22.8 ºC, 0% RH; WVTR 0.157 g/100 in^2/24 h @ 37.8 ºC, 100% RH) and the heaviest roast was thermocoupled to measure internal meat temperature. An incremental thermal processing cycle was used to program the smokehouse (model 1000, Alkar, Lodi, WI, U.S.A.) to cook to an internal meat temperature of 59 ºC and held for a minimum of 20 min per USDA Appendix A regulations (USDA 1999a). Following USDA Appendix B regulations (USDA 1999b), sample temperature was lowered to below 4 ºC within 6 h and held at 4 ºC overnight. Sample roasts were removed from cook-in bags and cook yield ((cook weight/injected raw weight)*100) was determined. Roasts within treatment were cut into three equal sections and assigned to 0, 14, 28 d of storage (ST). For storage, roasts were vacuum-packaged in oxygen impermeable vacuum bags (OTR 1 cm^3/m^2/ 24h atm @ 4.4 ºC, 0% RH; WVTR g/100 in^2/24 h @ 37.8 ºC, 100% RH) and stored at 2 ºC.

Color and pH Analysis

Roasts were removed from packaging and a 5 mm slice was removed for chemical analysis. After 30 min, utilizing a Minolta CR-300 Colorimeter (light source C and 0° view angle; Minolta, Ramsey, NJ), calibrated daily using a white tile (Y=93.24, x=0.3137, y=0.3196), CIE L*, a* and b* color space measurements were determined in triplicate at roast cut surface. The pH, in duplicate, (pH meter calibrated daily with 4.0 and 7.0 pH buffer solutions; IQ Scientific Instrument, Model IQ150, IQ Scientific Instrument, Inc., Carlsbad, CA, U.S.A.) was determined at the roast cut surface.

Sensory Evaluation

Two separate, 5-member expert, descriptive attribute sensory panels evaluated each sample as defined by AMSA (1995) and Meildgaard and others (2007). Panelists evaluated each attribute using a 9-point descriptive intensity scale (AMSA 1995) where 0 =none or the absence of an attribute and 8 = extremely intense. Ballot development sessions were conducted prior to testing sessions where representative testing samples were presented to the panelists. Potential sensory attributes evaluated during sensory analysis were juiciness, muscle fiber tenderness, connective tissue, overall tenderness, overall flavor intensity, flavor aromatics (cooked beef lean, cooked beef fat, serum/bloody, liver, cowy, browned, acid, soured, cardboard, fishy, and painty), basic tastes (salt, sour, and bitter), and mouthfeels (metallic and chemical burn). Training sessions used reference samples and samples from the study to anchor the panelists (Table 8). Samples were removed from a 4 ºC cooler and a 3 cm x 6 cm x 0.5 mm roast sample slice was immediately served to a trained meat descriptive attribute sensory panel. In a randomized order, 16 samples were evaluated per day during 2 sensory sessions with up to 8 samples being evaluated per session. Sample treatments were randomized to order within a sensory day. During each session, panelists were served 8 samples with 5 min between each sample. After 8 samples, a 20 min break was provided. Within each sensory day, panelists conducted a warm-up sample to standardize and calibrate the panelists each testing day. The warm-up sample was a control sample. Panelists were seated in individual booths that were separated from the sample preparation area. Samples were evaluated under red incandescent lights to reduce the effect of visual appearance on sensory attributes. Panelists cleansed their palette using fat-free ricotta cheese, salt-less saltine crackers and double distilled deionized water between samples.

Warner-Bratzler Shear Force Analysis

Remaining roast samples were utilized for Warner-Bratzler Shear (WBS) analysis. The WBS procedure was performed on samples according to AMSA (1995) for Intact Steaks/Roasts/Chops. WBS samples were allowed to equilibrate to room temperature. Six-1.27 cm cores were taken parallel to the muscle fiber orientations. WBS force was determined using a Universal Testing Instrument (Model SSTM-550, United Calibration Corp., Huntington Beach, CA, U.S.A.) with a WBS device, 20 kg compression load cell with a crosshead speed of 200 mm/min, and maximum force recorded in kg as a mean of the six cores.

Statistical Analysis

The data were analyzed using the Proc GLM procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) as a split-split plot design (4 x 4 x 3 factorial arrangement) with carcass pH and age classification (animal type), injection treatment (treatment), ST, and two-way interactions as main effects. The whole plot included the main effect of animal type, processing day as a block, and carcass within animal type was defined as the whole plot error term. For the first split, treatment and the interaction of animal type by treatment were defined as effects with carcass within animal type by treatment as the error term. For the second split, storage day, storage day by animal type, and ST by treatment were included and the residual error was used as the error term. Significance was defined as $P<0.05$. For WBS analysis, 2 animals (1-young-high pH and 1-young-normal pH) were removed due to missing data. The WBS data were analyzed using the Proc Mixed procedure of SAS and the REML covariate test (SAS, version 9.1, SAS Institute, Inc., Cary, NC). Sensory data were analyzed as a factorial arrangement as previously defined except panelist was included in the model as a third split. In the third split the effect of panelists and all two-way interactions with main effects and panelists were included and the residual error term was defined as the error term. This analyses was used to determine the efficacy of the sensory panelists as each varied in expertise (23 years to 3 months). Panelist by animal type, treatment and ST tended to not be significant and when significance was found ($P<0.05$), panel ratings, when averaged, did not change the interpretation of the results. Therefore, for the final sensory data analyses, data within an attribute were averaged across panelists and data were analyzed as previously described. Least squares means were calculated and where Analysis of Variance indicated significance ($P<0.05$), differences in least squares means were determined using the pdiff procedure of SAS (SAS, version 9.1, SAS Institute, Inc., Cary, NC) at an alpha <0.05.

Results and Discussion

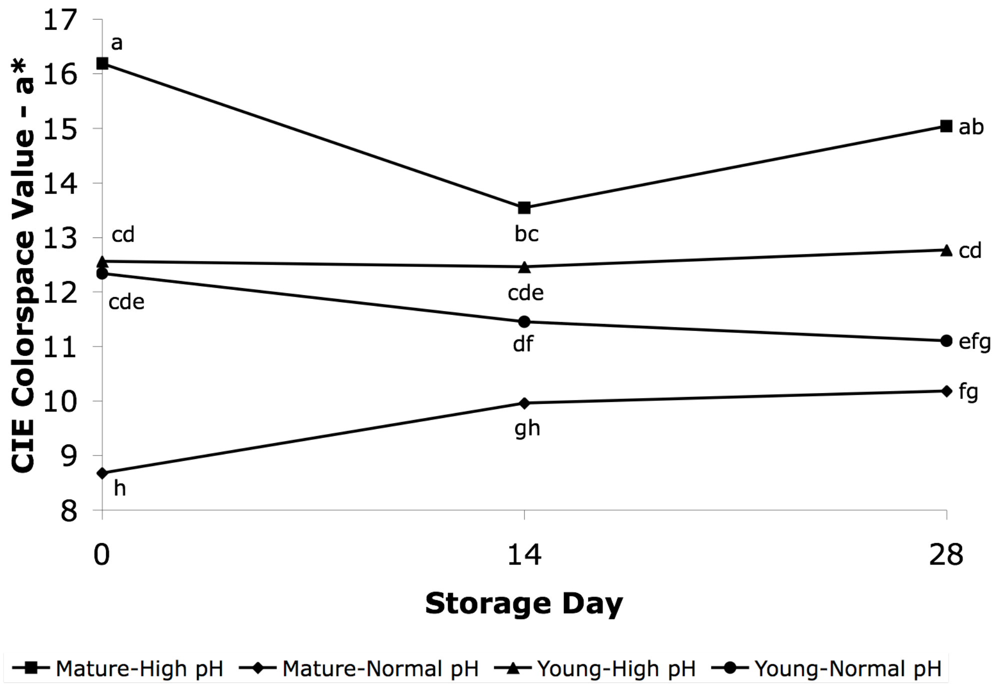
Effect of pH and Animal Age

High pH-high pH bottom rounds had the highest raw and cooked pH ($P < 0.05$) (Table 22). Initial muscle pH for DFD muscles was higher than those reported by Wulf and other (2002). This was most likely the result of our pH selection based on the *biceps femoris* muscle compared to Wulf and others (2002) using the *Longissimus dorsi* muscle pH as selection criteria. Raw and cooked bottom rounds from mature animals were darker (lower L* values) and tougher than rounds from young animals (Table 22). Interestingly, the raw high pH-high pH rounds were less red (a*) and yellow (b*) in color (Table 22), but cooked roasts from mature-high pH animals tended to have higher CIE a* and b* color space values ($P<0.05$) during storage than from the other animal types (Fig. 28). Younger animals were yellowier (b*) and the yellow color from mature animals was less stable during storage (Fig. 28). Cooked roasts from mature animals most likely would have less insoluble connective tissue (Bailey 1989) and were tougher than cooked roasts from mature animals, though we did not measure collagen content. Wenham and Locker (1976), Rao and Gault (1990) and Lewis and Purslow (1991) found that application of organic acids, at similar levels to this study, improved meat tenderness through the weakening of myofibrillar and collagen protein structure.

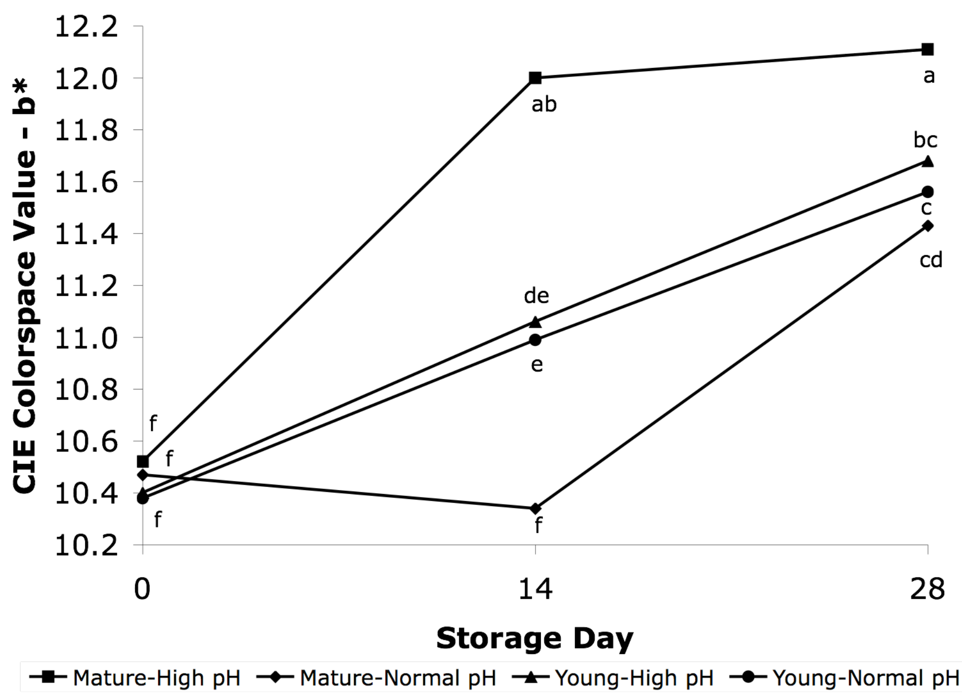
Table 22. Least squares means for roast beef main effects for pH, and initial and storage day CIE color space values.

Effect	Raw pH	Cooked pH	Raw CIE Color Space Values L*	Raw CIE Color Space Values a*	Raw CIE Color Space Values b*	Cooked CIE Color Space Values L*	Cooked CIE Color Space Values a*	Cooked CIE Color Space Values b*	Warner-Bratzler Shear Force (kg)
Animal Type	<0.0001^{e}	0.0009^{e}	<0.0001^{e}	0.0002^{e}	<0.0001^{e}	<0.0001^{e}	0.0067^{e}	0.0568^{e}	<0.0001^{e}
Mature-High pH	6.45^{a}	6.39^{a}	36.10^{c}	20.74^{b}	7.23^{c}	52.10^{b}	14.93^{a}	11.54	4.11^{a}
Mature-Normal pH	5.61^{b}	5.88^{b}	38.74^{c}	26.25^{a}	11.33^{b}	51.94^{b}	9.60^{c}	10.75	4.06^{a}
Young-High pH	5.84^{b}	5.99^{b}	42.37^{b}	25.68^{a}	11.43^{ab}	56.79^{a}	12.60^{ab}	11.05	2.58^{b}
Young-Normal pH	5.65^{b}	5.81^{b}	45.94^{a}	27.81^{a}	13.33^{a}	57.29^{a}	11.63^{bc}	10.98	2.57^{b}
Treatment	0.4798^{e}	<0.0001^{e}	0.9691^{e}	0.1007^{e}	0.1020^{e}	0.0070^{e}	<0.0001^{e}	0.0163^{e}	0.0457^{e}
Control	5.89	6.21^{a}	40.78	25.74	11.28	53.29^{b}	13.80^{a}	11.20^{a}	3.13^{b}
AA	5.91	5.87^{c}	40.94	24.88	10.62	55.06^{a}	11.20^{c}	10.89^{b}	3.16^{b}
AA/XG	5.89	6.03^{b}	40.73	24.66	10.47	54.72^{a}	12.27^{b}	11.20^{a}	3.67^{a}
AA/KF	5.87	5.97^{b}	40.70	25.21	10.95	55.06^{a}	11.49^{bc}	11.02^{ab}	3.36^{ab}
Storage Day		<0.0001^{e}				0.0021^{e}	0.2518^{e}	<0.0001^{e}	0.1428^{e}
0 Day		6.05^{c}				53.86^{b}	12.44	10.44^{c}	3.51
14 Day		5.89^{b}				54.65^{a}	11.85	11.09^{b}	3.19
28 Day		6.12^{a}				55.09^{a}	12.27	11.69^{a}	3.29
RMSE[d]	0.088	0.245	1.808	1.538	1.205	2.427	2.505	0.716	0.351

[abc]Mean values within a column and effect followed by the same letter are not significantly different ($P > 0.05$).
[d]Root Mean Square Error
[e]P-value from analysis of variance tables.



a.



b.

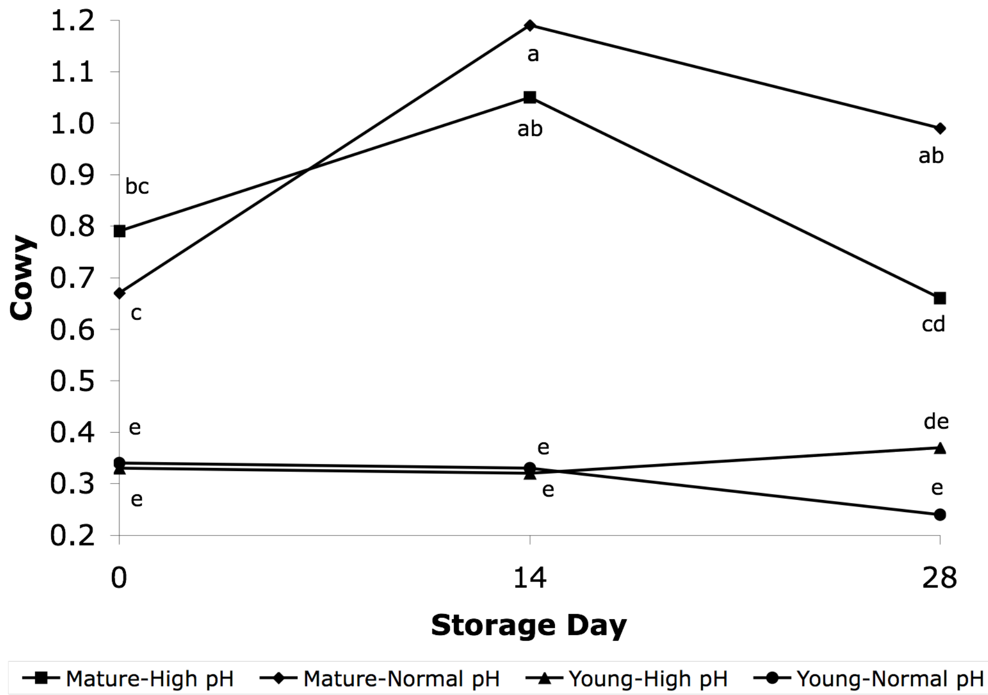
Figure 28. Least squares means for cooked roast beef of the interaction of animal type x storage day: a. ST CIE a* color space values (P<0.0061) and b. ST CIE b* color space values (P<0.0001).

Differences due to animal type in raw and cooked bottom rounds were as expected, except the initial pH differences previously discussed and sensory attributes differed by animal type. Bottom rounds from mature animals had higher cowy aromatics during storage than young animals (Fig. 29). The basic taste of bitterness was increased during ST ($P<0.05$), for all animal type except mature-high pH (Fig. 29). This was most likely due to a masking effect of other aromatics or basic taste attributes (Pangborn and others 1973; Pangborn and Szczesniak 1974). Meat from mature animals has been shown to differ from meat from younger animals (Smith and others 1982; Wulf and others 2002).

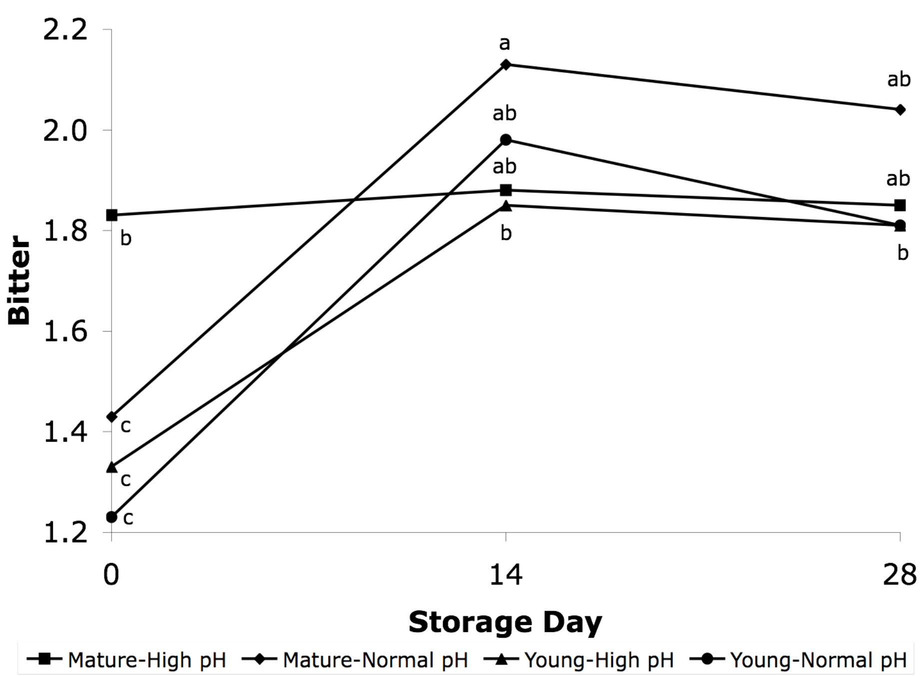
In summary, animal type and pH categories as selected due to design, differed in visual and sensory attributes as expected. As high pH meat was selected to represent a quality defect, treatments were imposed to reduce effects due to animal type and pH.

Effect of Treatment

Addition of non-meat ingredients decreased cooked meat pH during storage with the greatest effect reported in AA treated roasts (Table 22). Hydrocolloid treatments have not been the main vector to change pH in a muscle system as the meat buffered any pH changes the addition of hydrocolloids had within the cooked meat product. Hydrocolloid gels appeared to fill in steric spaces during cooking and processing that improved texture attributes in cooked ground pork gels, a similar mechanism was expected in a whole muscle meat system. Strong bases like bicarbonate ingredients when added to a pork model system increased meat pH, and strong acids like lactic and AA may be able to overcome the buffering capacity of the muscle to reduce the muscle



a.

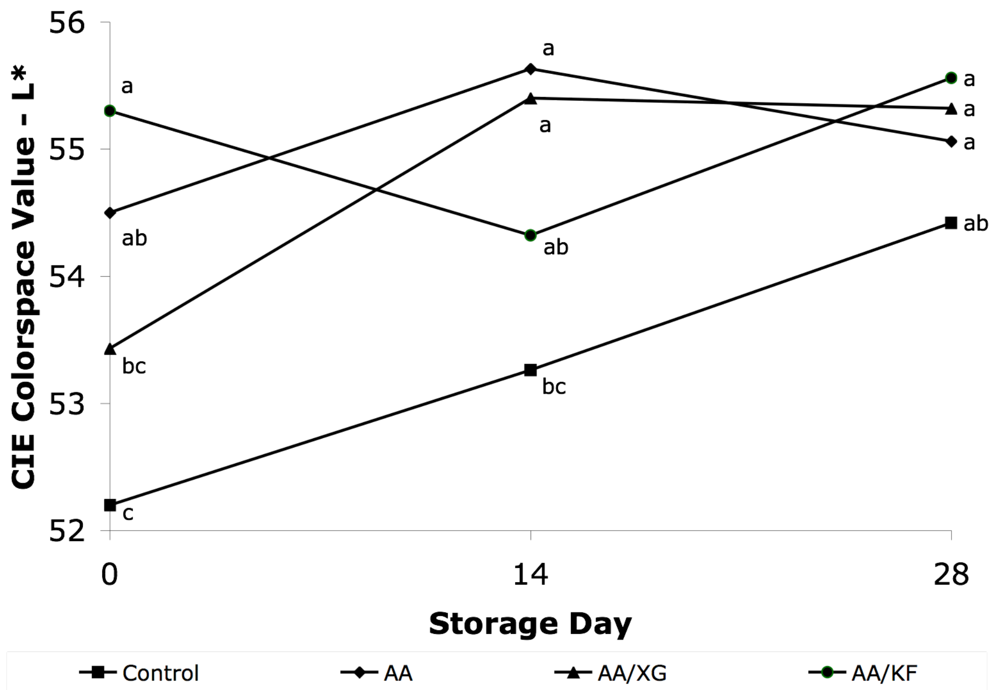


b.

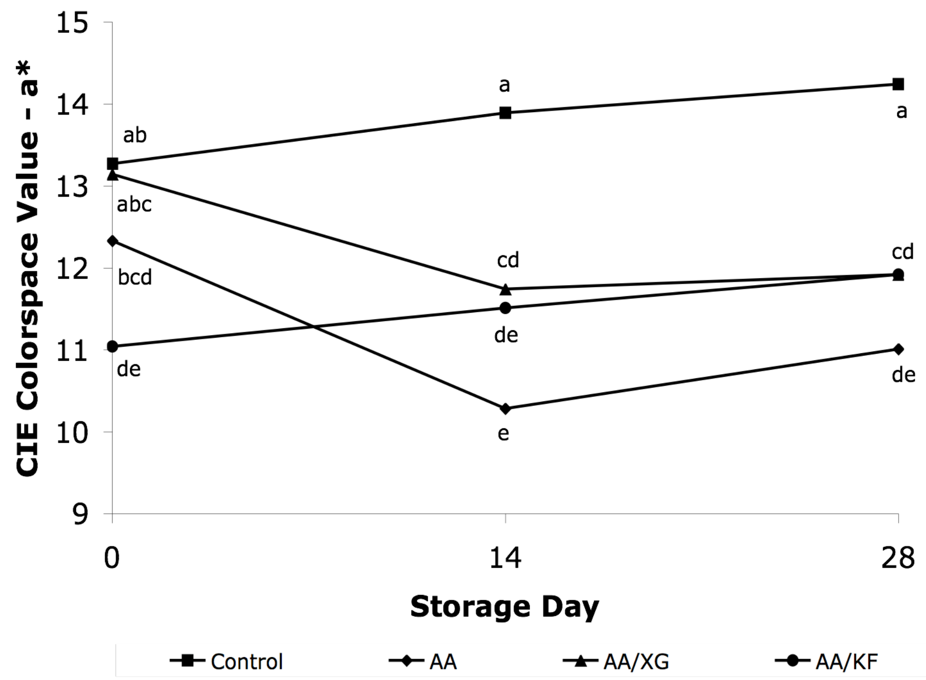
Figure 29. Least squares means for the interaction of animal type x ST for cooked roast beef trained sensory descriptive attributes: a. cowy (P<0.0320) and b. bitter (P<0.0051).

pH (Rao and Gault 1990; Seuss and Martin 1993; Berge and others 2001; Young and others 2005; Sawyer and others 2008). Our goal was to use AA to lower meat pH, especially for high pH meat from mature and young animals. AA addition lowered pH to levels below the control. There was not an interaction for treatment by animal type indicating that treatment did not lower pH differentially by animal type. Interestingly, the AA/XG did not result in the lowest cooked pH, which was unexpected as researchers assumed the synergistic effect of AA with the acidic side chains of XG would result in the lowest cooked pH. Most likely, the XG interfered with the muscle protein reaction with AA so that AA less available to interact with the muscle protein.

The protein: hydrocolloid interaction has been shown to influence the chemical and physical properties of a meat product (Bernal and others 1987; DeFreitas and others 1997). The addition of AA and AA/XG resulted in lighter cooked color that was stable during storage (Fig. 30). Roasts treated with AA/XG, initially, had darker color, but with increased storage, CIE L* color space values increased. This would be expected as the reduced pH would be closer to the pI of the muscle that would result in less water bound to the muscle protein. As pH decreased there would be an expectant decrease in WHC. As WHC decreased more free water would most likely increase and would result in higher levels of free water on the lean surface. Increased surface free water has been shown to increase CIE L* color space values (Fernandez-Lopez and others 2004). Obviously a secondary mechanism also may be responsible for the increased CIE L* values during storage. Cellulose gums were seen to lower CIE L* and increase the CIE



a.



b.

Figure 30. Least squares means for the interaction treatment x ST on cooked roast beef: a. CIE L* color space values (P<0.0397) and b. CIE a* color space values (P<0.0454).

a* color space values in beef/pork frankfurters (Barbut and Mittal 1996), though hydrocolloid used in this study were not cellulose based. The addition of hydrocolloids to the frankfurters decreased the percentage of myoglobin resulting in a paler color (Barbut and Mittal 1996) and a similar mechanism may be occurring in the cooked roast beef. The cooked AA roasts were not as red (a*) after 14 days of storage when compared to other treatments during storage (Fig. 30). The AA, AA/XG, and AA/KF roasts were less red than control bottom round roasts (Fig. 30). Trout (1989) reported the pink color of fully cooked high-pH meat was due to either partial denaturation of myoglobin or formation of a pink hemochrome. Foegeding and Ramsey (1987) also reported an interference of the meat gelation process when hydrocolloids were added. The addition of AA/hydrocolloids treatments may have interfered with the myoglobin: hydrocolloid interaction by increasing the rate of myoglobin denaturation during cooking, which would result in less red meat color.

Treatment had no effect on roast sensory attributes, except that roasts containing AA were drier (Tables 23 and 24). The lowering of muscle pH when AA was added to the cooked beef roasts most likely reduced the WHC of the product, thus making them appear less juicy. The application of AA and hydrocolloids did not negatively impact the sensory characteristic of the cooked beef roast beef. This would be a great benefit to a meat processor, as the treatments could be applied to improve color and pH of high-pH meat without the negative ramifications of off-flavors to the treated cooked beef roasts.

Table 23. Least squares means for roast beef main effects for trained sensory descriptive juiciness, tenderness, overall flavor, and flavor aromatics attributes[e].

						Aromatics				
Effect	Juiciness	Muscle Fiber Tenderness	Connective Tissue	Overall Tenderness	Overall Flavor Intensity	Cooked Beef Lean	Cooked Beef Fat	Serum/ Bloody	Liver	Cowy
Animal Type	0.0791[d]	<0.0001[d]	<0.0001[d]	<0.0001[d]	0.0059[d]	<0.0001[d]	0.0407[d]	0.3955[d]	0.1718[d]	0.0003[d]
Mature-High pH	4.71	4.49[b]	4.00[c]	4.01[c]	4.98[c]	3.79[c]	0.59[a]	0.46	0.15	0.83[a]
Mature-Normal pH	4.37	5.03[b]	4.80[b]	4.70[b]	5.57[a]	4.35[b]	0.39[b]	0.30	0.24	0.95[a]
Young-High pH	4.84	6.17[a]	6.21[a]	6.06[a]	5.31[b]	4.43[ab]	0.57[a]	0.45	0.30	0.34[b]
Young-Normal pH	4.82	6.24[a]	6.34[a]	6.10[a]	5.46[ab]	4.57[a]	0.53[ab]	0.44	0.15	0.30[b]
Treatment	0.0450[d]	0.3766[d]	0.3286[d]	0.2964[d]	0.9855[d]	0.0370[d]	0.2014[d]	0.2313[d]	0.4415[d]	0.3065[d]
Control	4.82[a]	5.51	5.45	5.28	5.32	4.31[a]	0.58	0.41	0.22	0.63
AA	4.50[b]	5.38	5.21	5.09	5.34	4.17[b]	0.47	0.36	0.22	0.69
AA/XG	4.67[ab]	5.53	5.34	5.23	5.35	4.36[a]	0.53	0.42	0.23	0.57
AA/KF	4.75[ab]	5.52	5.34	5.27	5.31	4.29[a]	0.51	0.46	0.16	0.54

Table 23. Continued.

Effect	Juiciness	Muscle Fiber Tenderness	Connective Tissue	Overall Tenderness	Overall Flavor Intensity	Aromatics: Cooked Beef Lean	Aromatics: Cooked Beef Fat	Aromatics: Serum/ Bloody	Aromatics: Liver	Aromatics: Cowy
Storage Day	0.1207[d]	0.0282[d]	0.0732[d]	0.9785[d]	0.0346[d]	<0.0001[d]	0.0021[d]	0.0007[d]	0.0042[d]	0.0188[d]
0 Day	4.74	5.64[a]	5.23	5.23	5.41[b]	4.55[a]	0.44[b]	0.50[a]	0.29[a]	0.53[b]
14 Day	4.59	5.41[b]	5.31	5.21	5.34[ab]	4.16[b]	0.62[a]	0.42[a]	0.15[b]	0.72[a]
28 Day	4.73	5.41[b]	5.48	5.21	5.24[b]	4.13[b]	0.50[b]	0.32[b]	0.18[b]	0.56[b]
RMSE[c]	0.564	0.682	0.769	0.768	0.450	0.378	0.350	0.332	0.303	0.497

[ab]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[c]Root Mean Square Error
[d]P-value from analysis of variance tables.
[e]Juiciness: 1= extremely dry, 8= extremely juicy; Muscle fiber and overall tenderness: 1= extremely tough, 8=extremely tender; Connective Tissue Amount: 1= abundant, 8= none; Aromatics; 1= extremely bland, 8= extremely intense

Table 24. Least squares means for roast beef for main effects for trained sensory descriptive basic tastes, mouthfeels, and flavor aromatics attributes[f].

	Basic Tastes			Mouthfeel		Aromatics		
Effect	Salt	Sour	Bitter	Metallic	Chemical Burn	Acid	Cardboard	Fishy
Animal Type	0.0114[e]	0.0001[e]	0.0809[e]	0.0501[e]	0.1727[e]	0.0890[e]	0.0019[e]	0.1261[e]
Mature-High pH	0.65[b]	1.20[c]	1.85	1.59	0.22	0.52	0.18[a]	0.24
Mature-Normal pH	0.76[b]	1.73[ab]	1.87	1.82	0.19	0.68	0.10[bc]	0.38
Young-High pH	0.78[ab]	1.60[b]	1.66	1.73	0.16	0.67	0.10[b]	0.07
Young-Normal pH	0.90[a]	1.93[a]	1.67	1.87	0.12	0.80	0.05[c]	0.11
Treatment	0.8410[e]	0.1653[e]	0.6519[e]	0.4761[e]	0.1600[e]	0.8733[e]	0.1081[e]	0.2887[e]
Control	0.80	1.54	1.82	1.73	0.23	0.63	0.10	0.24
AA	0.77	1.71	1.78	1.79	0.14	0.70	0.08	0.22
AA/XG	0.76	1.56	1.73	1.81	0.16	0.68	0.16	0.18
AA/KF	0.77	1.65	1.73	1.69	0.15	0.67	0.09	0.16
Storage Day	<0.0001[e]	<0.0001[e]	<0.0001[e]	<0.0001[e]	0.3704[e]	<0.0001[e]	0.0133[e]	<0.0001[e]
0 Day	0.78[b]	1.34[c]	1.46[b]	1.42[c]	0.18	0.28[b]	0.14[a]	0.11[b]
14 Day	0.86[a]	1.85[a]	1.96[a]	2.04[a]	0.19	0.92[a]	0.06[b]	0.12[b]
28 Day	0.68[c]	1.65[b]	1.88[a]	1.80[b]	0.14	0.80[a]	0.11[ab]	0.37[a]
RMSE[d]	0.269	0.477	0.447	0.519	0.236	0.617	0.184	0.368

[abc]Mean values within a column and followed by the same letter are not significantly different (P > 0.05).
[d]Root Mean Square Error
[e]P-value from analysis of variance tables.
[f]Basic Tastes, Mouthfeel, Aromatic: 1= extremely bland, 8= extremely intense

An improvement of tenderness was expected with AA treated roasts (Rao and Gault 1990), but WBS values for control roasts were similar to AA and AA/KF (Table 22).

Effect of Storage Day

Roasts stored for 14 d had the lowest pH and pH was highest in roasts stored for 28 d (Table 22). The increase in pH at 28 d was unexpected, one cause for the increase of pH might have resulted in a breakdown of the hydrocolloid matrix during storage. The water trapped within hydrocolloid gels typically exhibit physical properties of free or bound water that remained bound or had a high water-binding capacity (WBC) when stress was applied to the gel structure (Wallingford and Labuza 1983). Though not evaluated prior to this study, long term storage may impact the WBC of the hydrocolloid and AA gels as syneresis may have occurred. Syneresis of the gel most likely would result in the loss of integrity or weakening from the hydrocolloid gel during storage. The increase of free water released for the hydrocolloid/AA gel within the cooked beef roast may explain the increase ($P<0.05$) in cooked pH at 28 ST (Tables 22).

With increased storage, cooked beef bottom round roasts changed in descriptive sensory flavor attributes. Panelists detected fishy flavor aromatics, common sensory attributes associated with increased lipid oxidation, with increased storage (Table 24). ST by treatment interactions were not significant ($P>0.05$). Treatment solutions did not negatively impact sensory characteristics during refrigerated vacuum-package storage, thus allowing meat processors to use the hydrocolloid/AA treatment solutions to reduce the variation between high pH and normal pH meat without changing the flavor profile of the product.

Conclusion

The use of AA, AA/XG, and AA/KG to improve the color and pH of high pH meat did not appreciable affect flavor shelf-life, negatively or positively, of cooked, vacuum-packaged, refrigerated beef bottom round roasts. Therefore, AA, KF and XG are viable enhancement solution ingredients for use in high pH beef bottom round to produce a fully cooked roast beef product that would be similar to a cooked roast beef product from normal pH beef bottom rounds.

CHAPTER IX

SUMMARY AND CONCLUSIONS

Summary

The use of hydrocolloids as ingredients has occurred in the meat industry, but not in whole muscle, as their behavior has been hard to predict. The ability to characterize the flow behavior of hydrocolloid samples allowed selection of potential viable hydrocolloid ingredients for use in a meat system by having predictive behavior models. Flow behavior properties may indicate the possibility of using hydrocolloids within standard meat processing equipment. Refrigeration storage up to 48 h did not affect the rheological properties of MC, SGMC, HPMC, XG, KF, GG, and GGLT. The use of MC, SGMC, HPMC and KF in a whole muscle system may be a viable option as each has Newtonian flow behavior, and thus are similar to current aqueous enhancement solutions used in the meat industry. Shear-thinning fluids like XG and GGLT may also be potential ingredients in enhancement solutions, but careful selection of injection level must be considered. The flow behavior of shear-thinning fluids may cause muscle damage after injection as viscosity would increase once the shear effect from injection was removed. The viscoelastic properties of HPMC and KF demonstrated that each formed a stable gel structure. The rheological evaluation of the hydrocolloid treatments demonstrated that at lower concentrations and viscosities with stable dynamic moduli where G' was greater than G'' these hydrocolloids might be viable ingredients for use in whole muscle.

Understanding the effect of salt and SP addition on hydrocolloid ingredients rheological behavior in aqueous solutions was examined. The use of MC, SGMC, HPMC and KF in a whole muscle system may be a viable option as each have Newtonian flow behavior, with and without salt and SP, and additionally, they have flow behavior similar to current aqueous enhancement solutions used in the meat industry. Shear-thinning fluids like XG may also be potential ingredients in enhancement solutions, as apparent viscosity decreases with the application of shear rate and stress. The ability of HPMC and KF to maintain a constant apparent viscosity with changing ionic strengths, as well as constant dynamic moduli in wide range of temperatures, further demonstrated the possibility of use in a meat system. The viscoelastic properties of HPMC and KF showed that each formed a stable gel structure.

To understand if buffer ingredients also improve functionality of PSE pork, the rheological behavior of pork gels using NaHCO, KHCO, and NHHCO were examined. Buffer ingredients had the greatest impact on gel color, texture and pH. Potassium bicarbonate and NHHCO are viable ingredients to replace NaHCO, as NaHCO treated samples were, generally, similar CIE color space values, pH, and gel behavior to KHCO, and NHHCO treated samples. Concerns of increased saltiness by sensory panels when utilizing NaHHCO would be avoided if KHCO and NHHCO were used, though NHHCO produced unacceptable air pockets in the meat gel. The synergistic effect of potassium bicarbonate with HPMC or KF and standard enhancement solution ingredients of salt and phosphate improved the texture properties of PSE ground pork to decrease the variation of quality to resemble normal pork meat. The EDS imaging has showed that treatment solutions, when applied directly to a ground meat system, appeared to improve the texture functionality by filling in spaces within the meat gel.

The used of KHCO and HPMC and KF did improve PSE meat by improving CIE color space values, increasing pH, and gel texture to be similar to normal pork meat. Frankfurters were chosen to evaluate buffer and hydrocolloid ingredients for improvement in frankfurters, as the product was similar to the ground pork model gel system and the familiarity of the frankfurters to the consumers. Treatment solutions did not negatively affect the sensory flavor and texture attributes as rated by consumer and trained descriptive sensory panels. Meat processors could use KHCO with HPMC or KF as ingredients to improve color, texture, and pH of PSE meat. The reduction of variation between PSE and normal pork muscle would improve pork quality and add value to PSE meat products.

AA, KF, and XG were added to beef steaks and bottom rounds to reduce the meat quality variation caused by high pH and animal age. The addition of AA, XG, and KF may assist in converting high pH beef strip loin steaks to be similar in color and sensory characteristics of normal pH beef. Also, the treatments improved the color and pH of high pH meat and did not appreciable affect flavor shelf-life of cooked roast beef. AA, KF and XG are viable enhancement solution ingredients for use in high pH beef bottom round to produce a fully cooked roast beef product.

Conclusions

Functional ingredients like hydrocolloids, bicarbonates, and AA improve the quality of PSE and DFD meat. The potassium bicarbonate with HPMC or KF combinations are viable ingredients to improve pork quality, but further research for use in whole muscle pork is needed. Also, additional research should examine possible ingredient replacement of sodium phosphate by KHCO in meat enhancement solutions. The rising costs of enhancement solution ingredients have meat processors seeking lower cost solutions. Identifying replacement ingredients that have the same functionality as traditional ingredients, like sodium phosphates, would be beneficial to the meat industry.

Hydrocolloids were utilized in whole beef muscle. AA, KF and XG are viable enhancement solution ingredients for use in high pH beef loins and high pH beef bottom round to produce a fully cooked roast beef product. However, additional studies need to be conducted to more fully understand what level of AA, XG, and KF ingredients may be added to optimize this effect.

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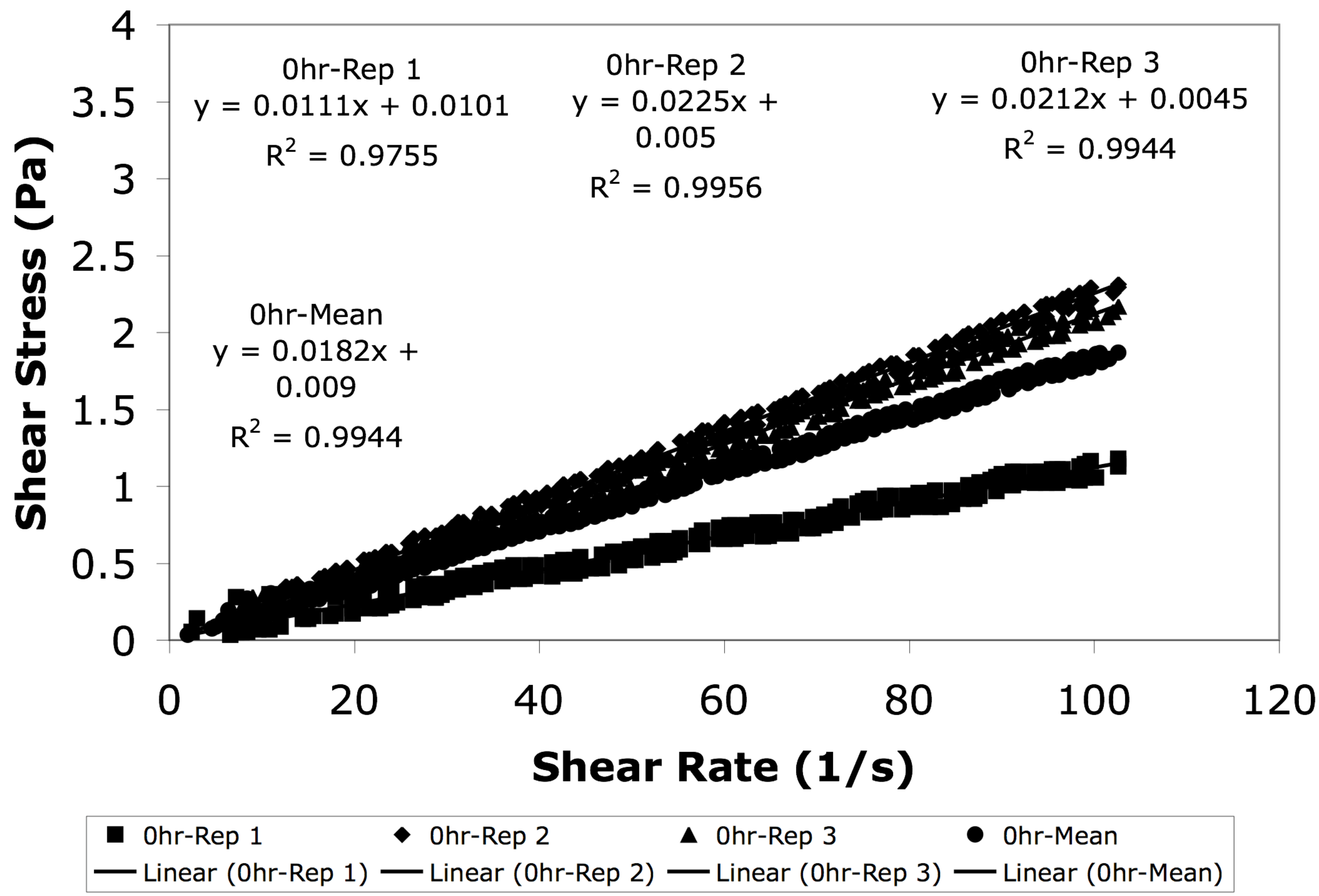
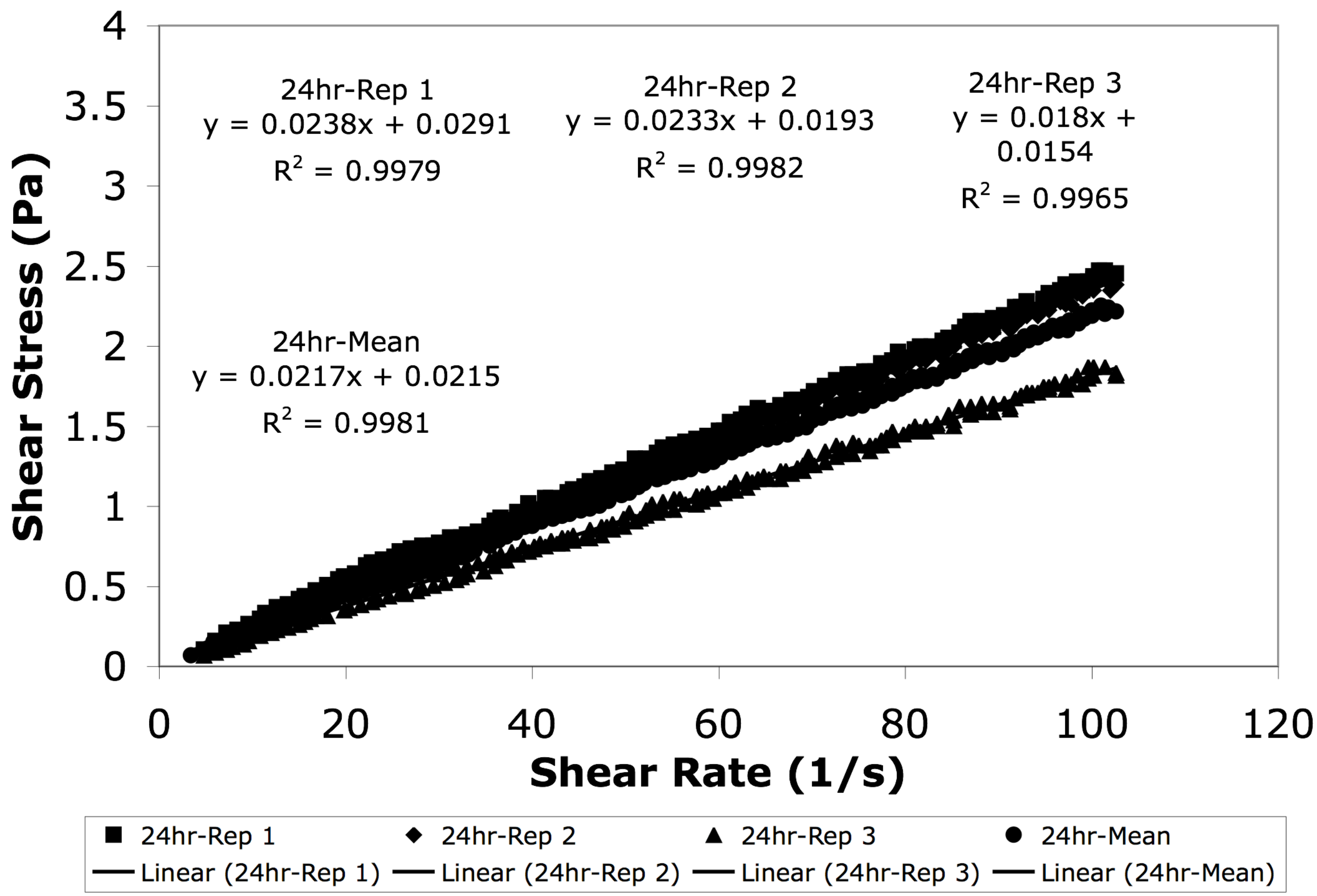
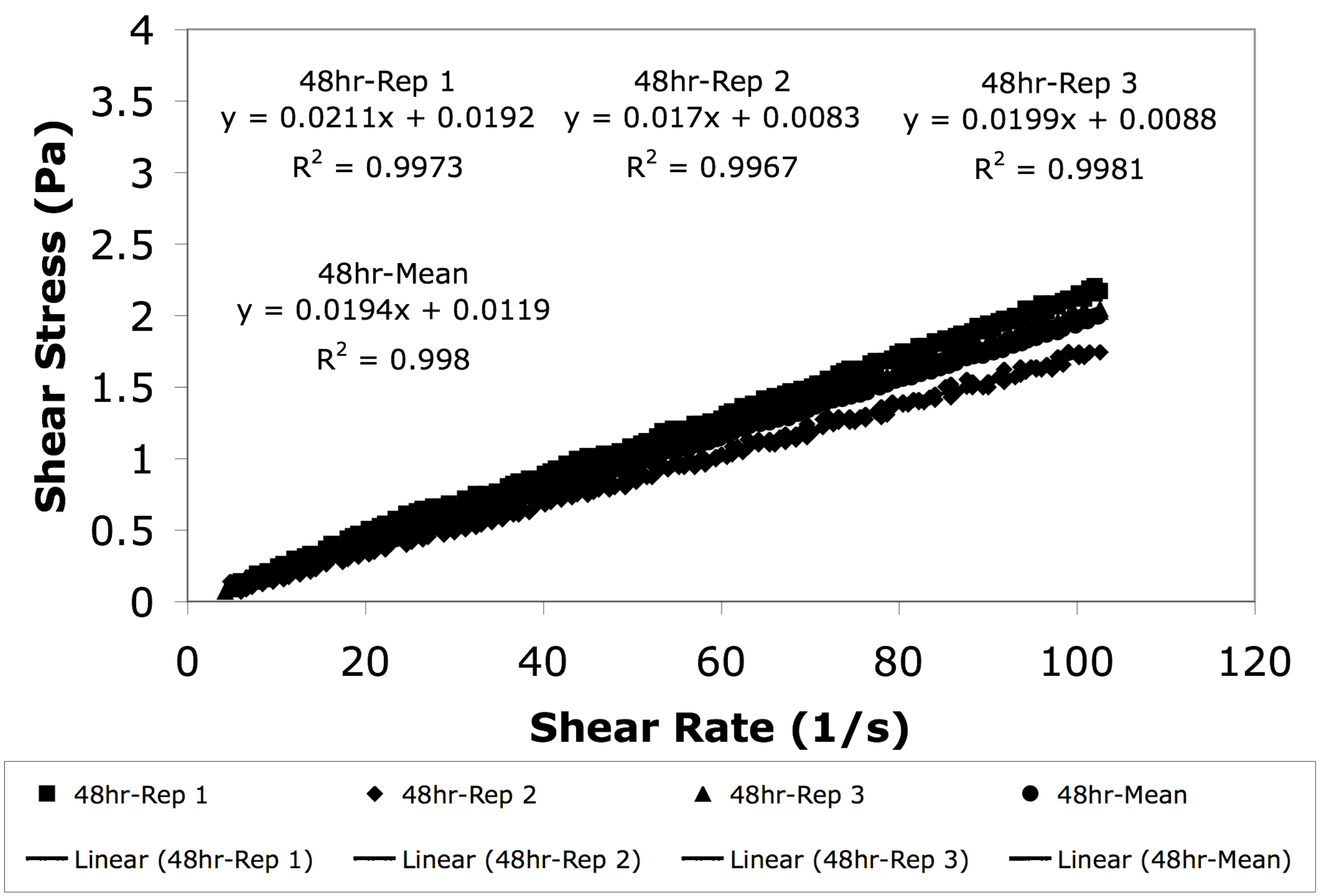
APPENDIX A



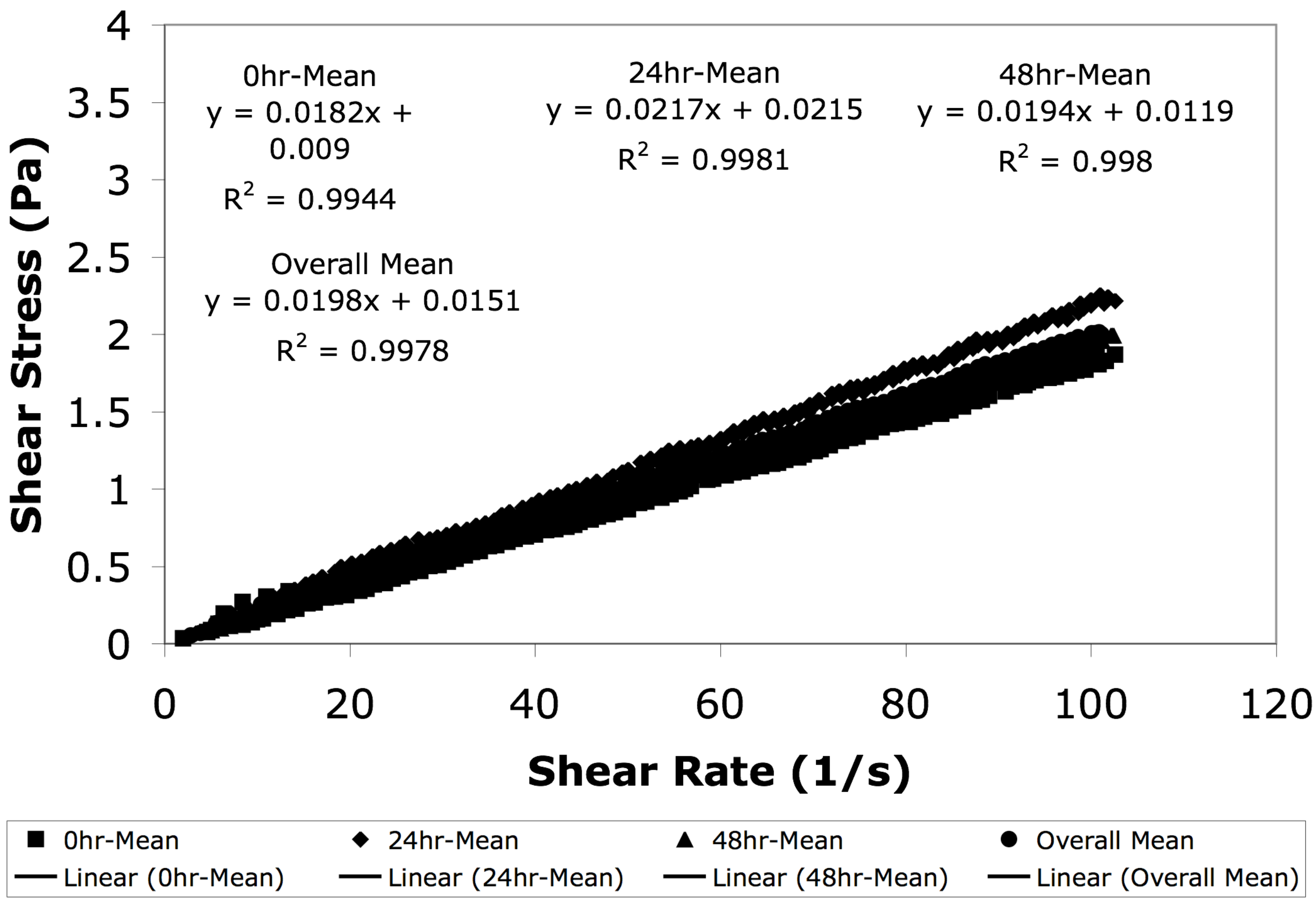
A-1. Fluid behavior for 1.000% MC at 0 h and 25 °C.



A-2. Fluid behavior for 1.000% MC at 24 h and 25 °C.



A-3. Fluid behavior for 1.000% MC at 48 h and 25 °C.



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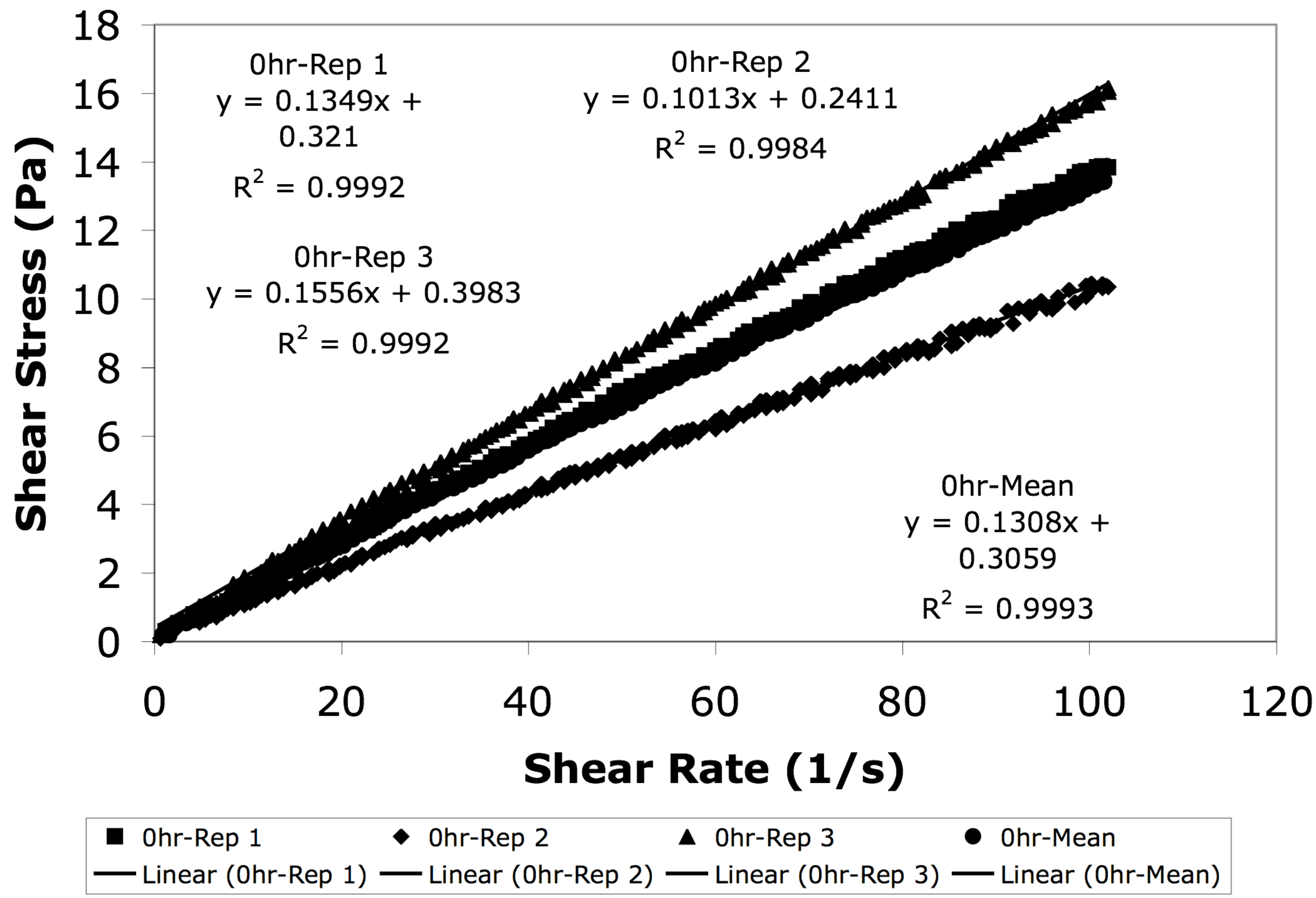

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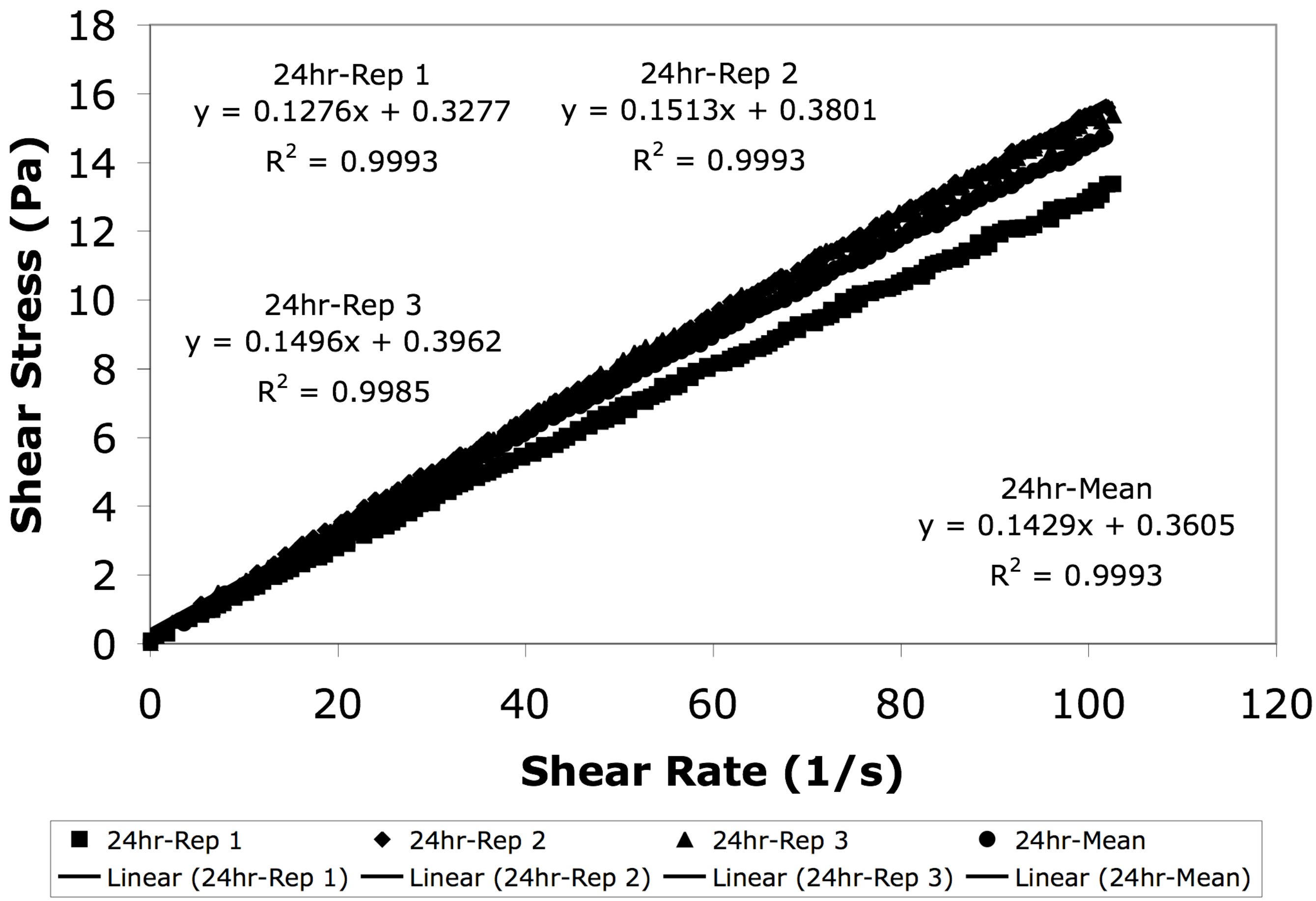
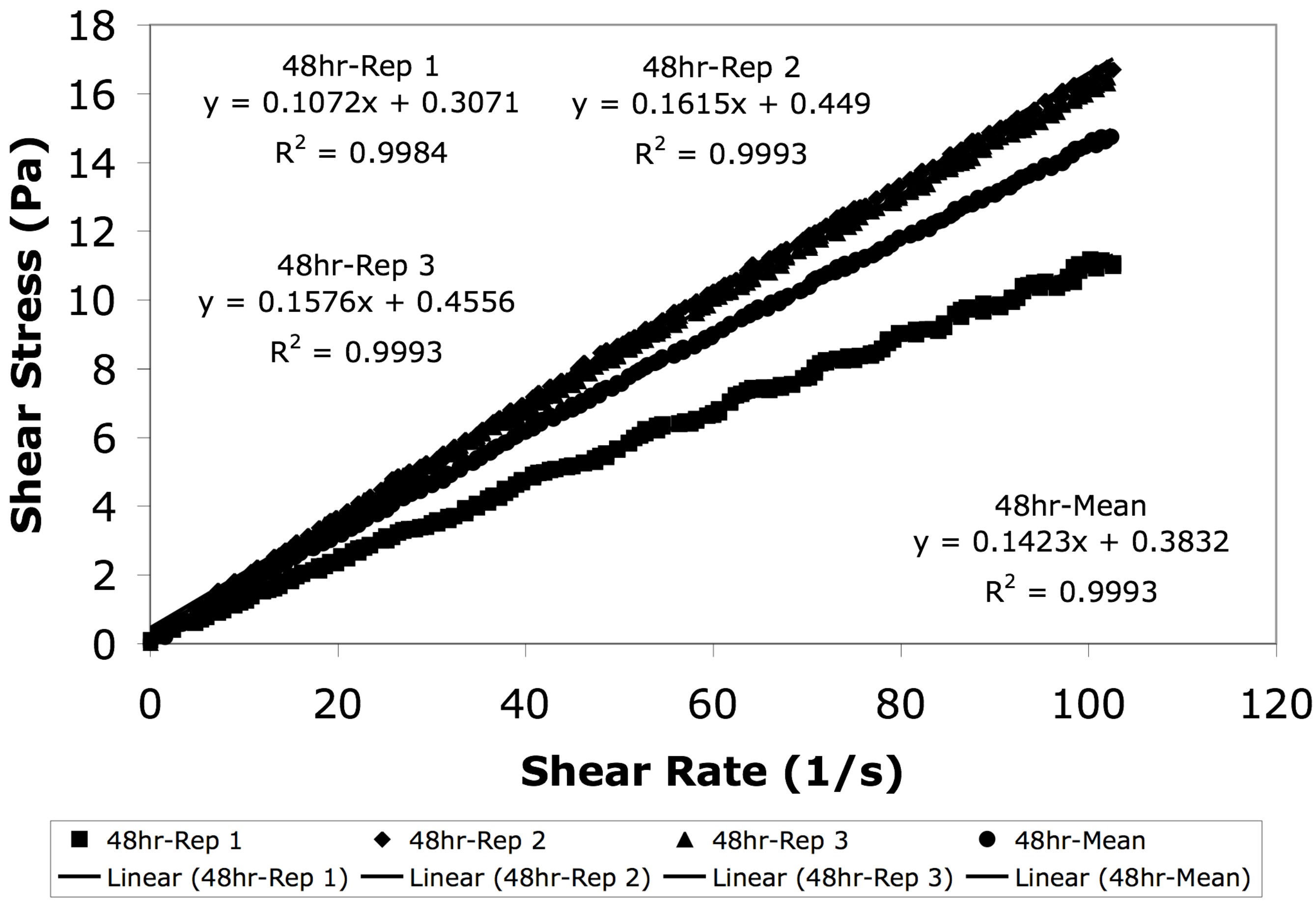
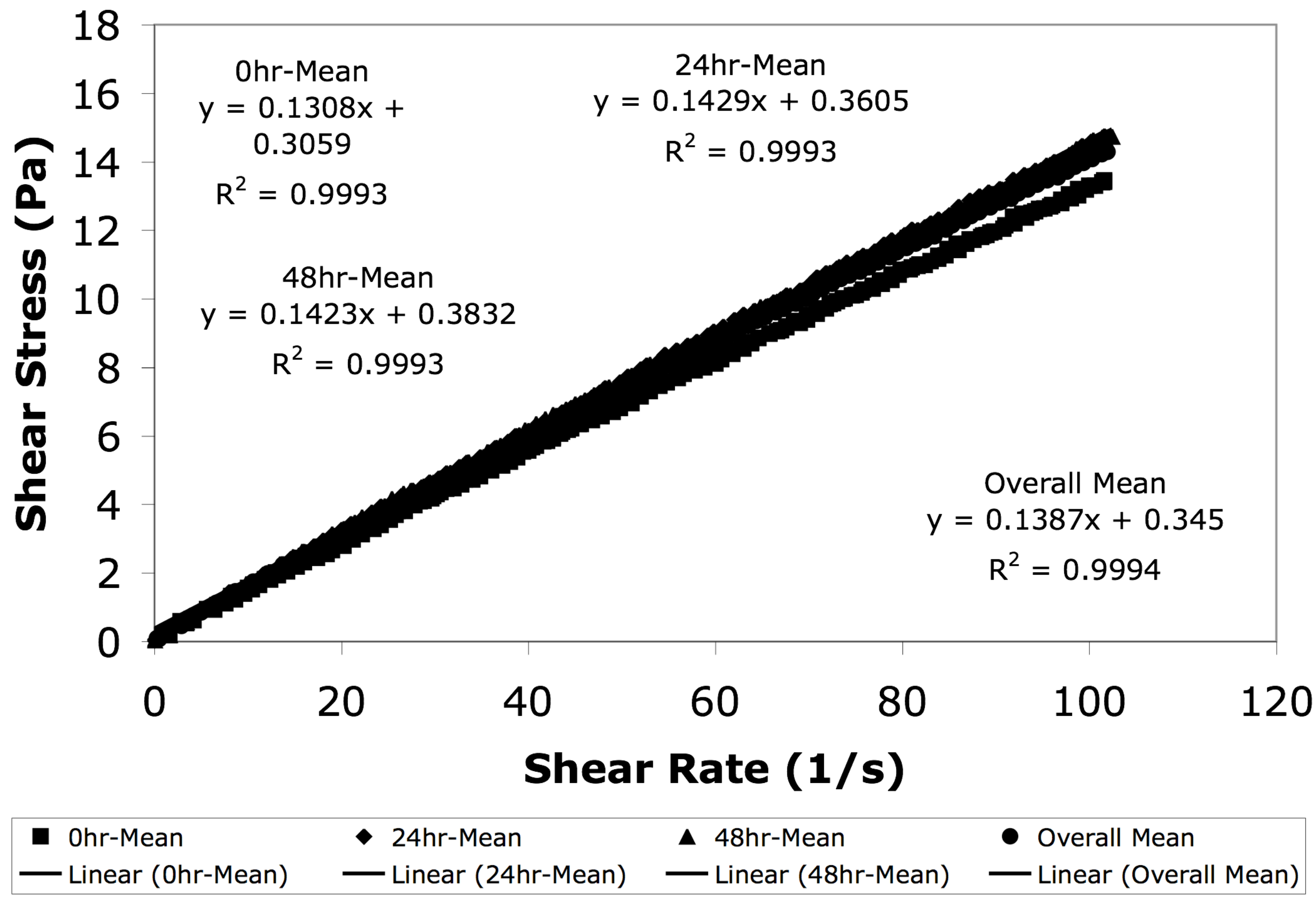


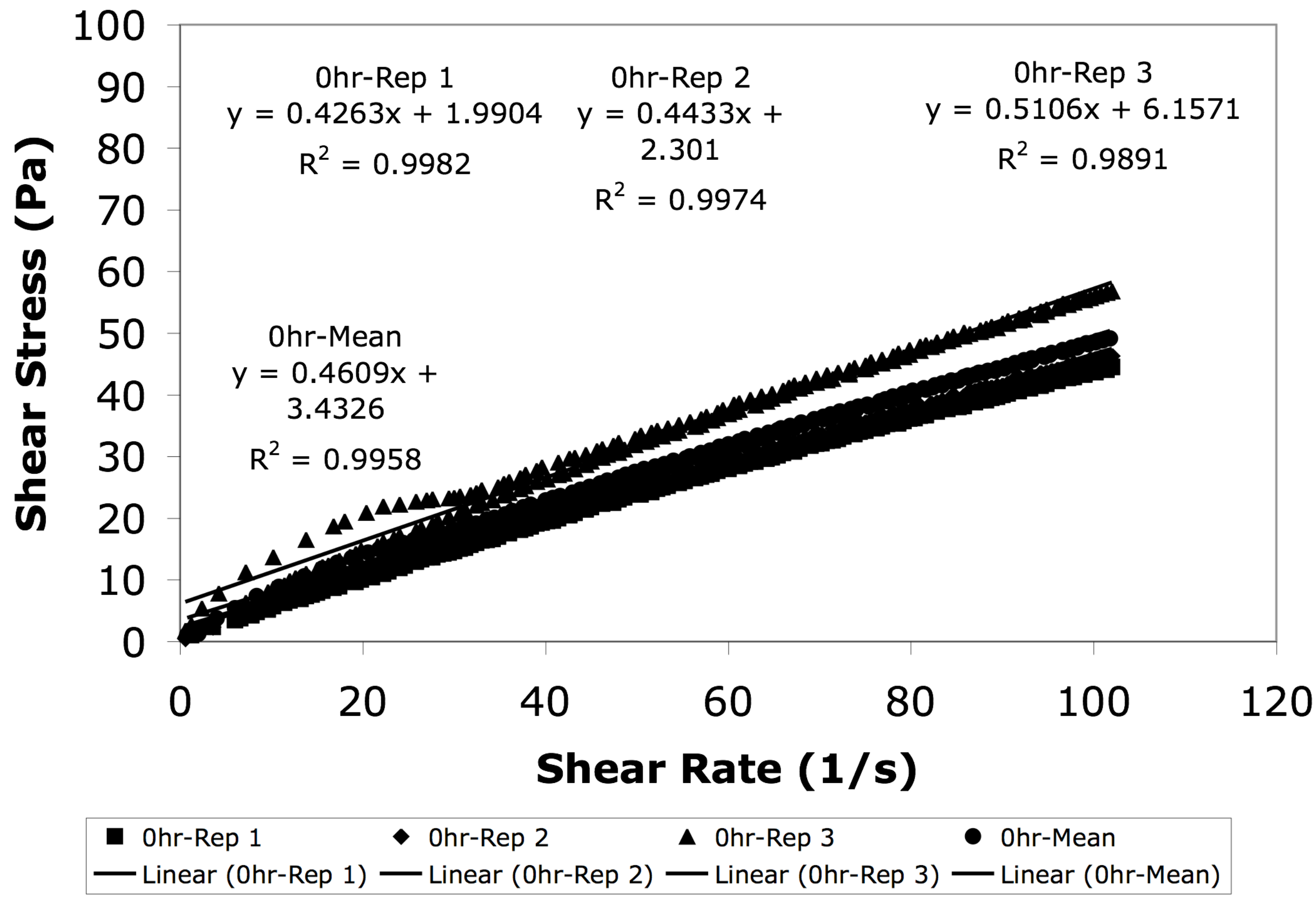
A-6. Fluid behavior for 2.000% MC at 24 h and 25 ^{o}C.



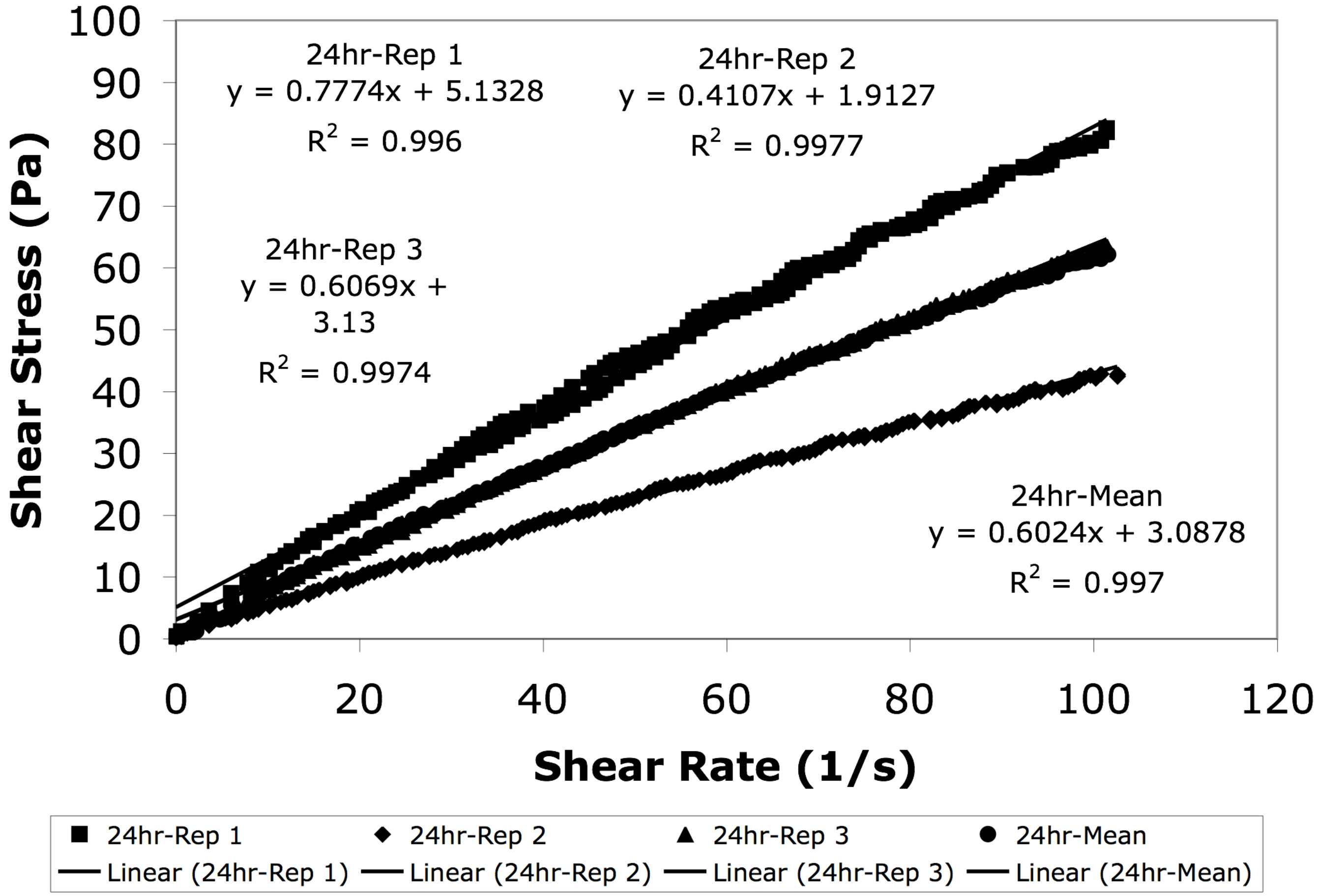
A-7. Fluid behavior for 2.000% MC at 48 h and 25 °C.



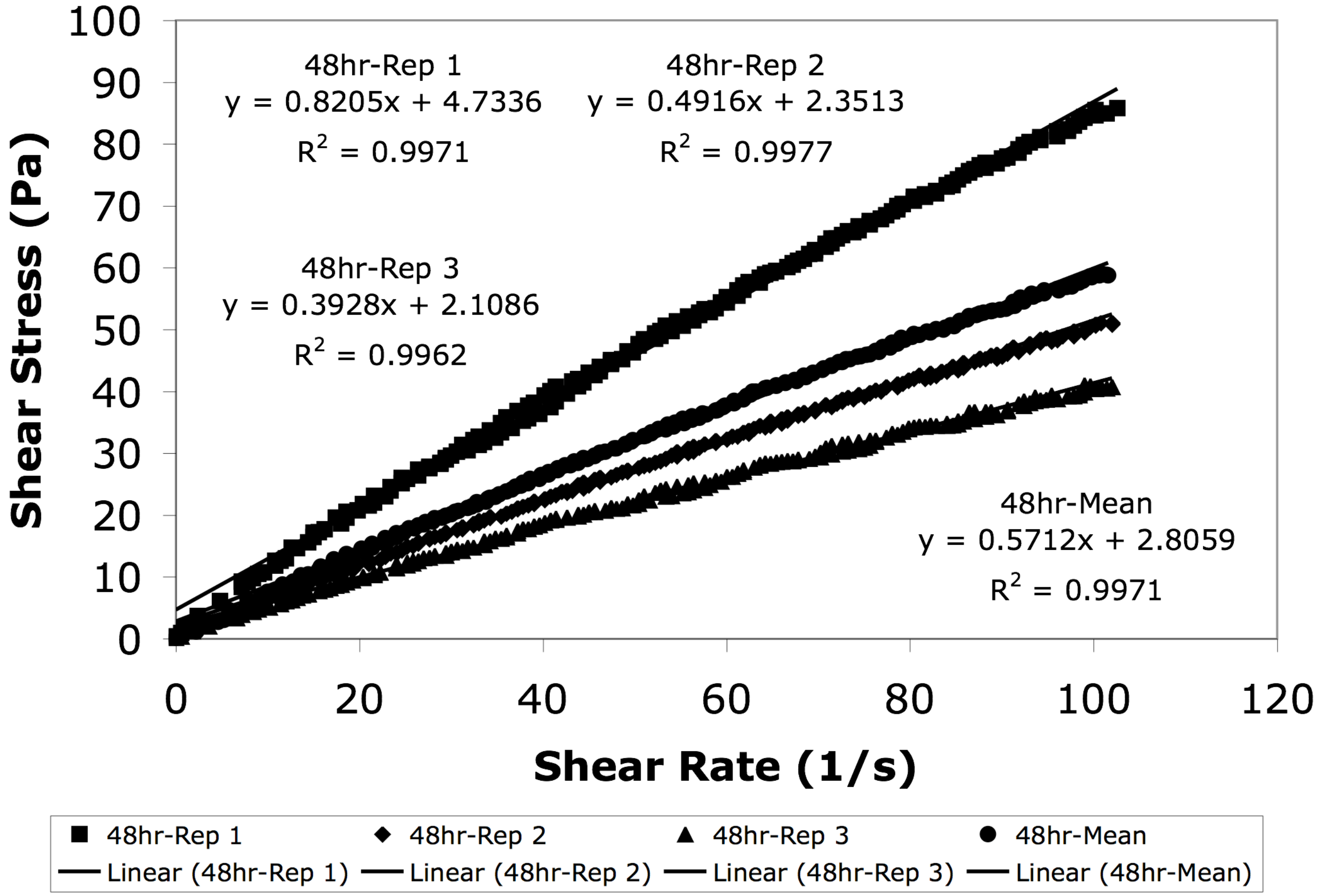
A-8. Fluid behavior for 2.000% MC at 25 °C.



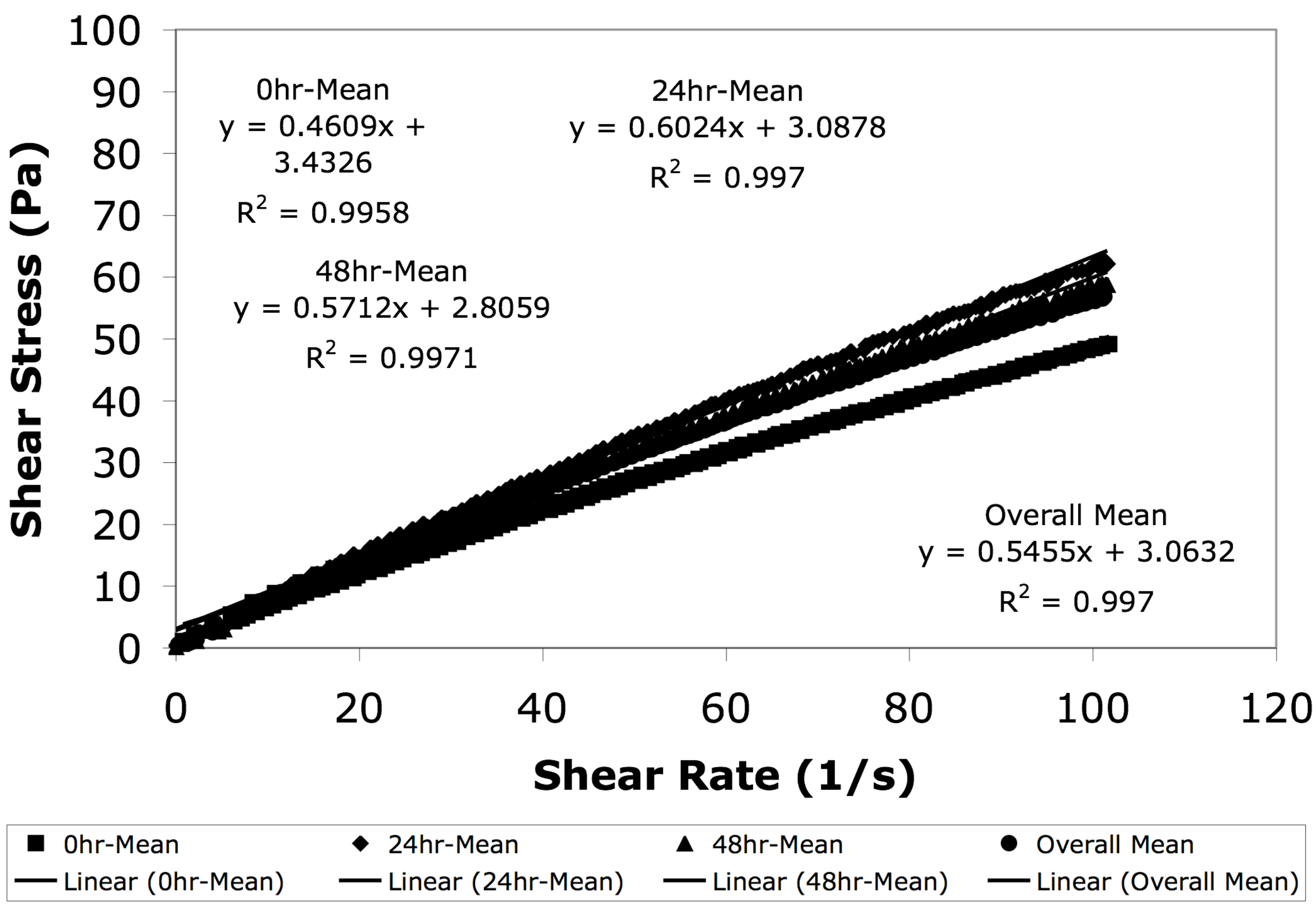
A-9. Fluid behavior for 3.000% MC at 0 h and 25 °C.



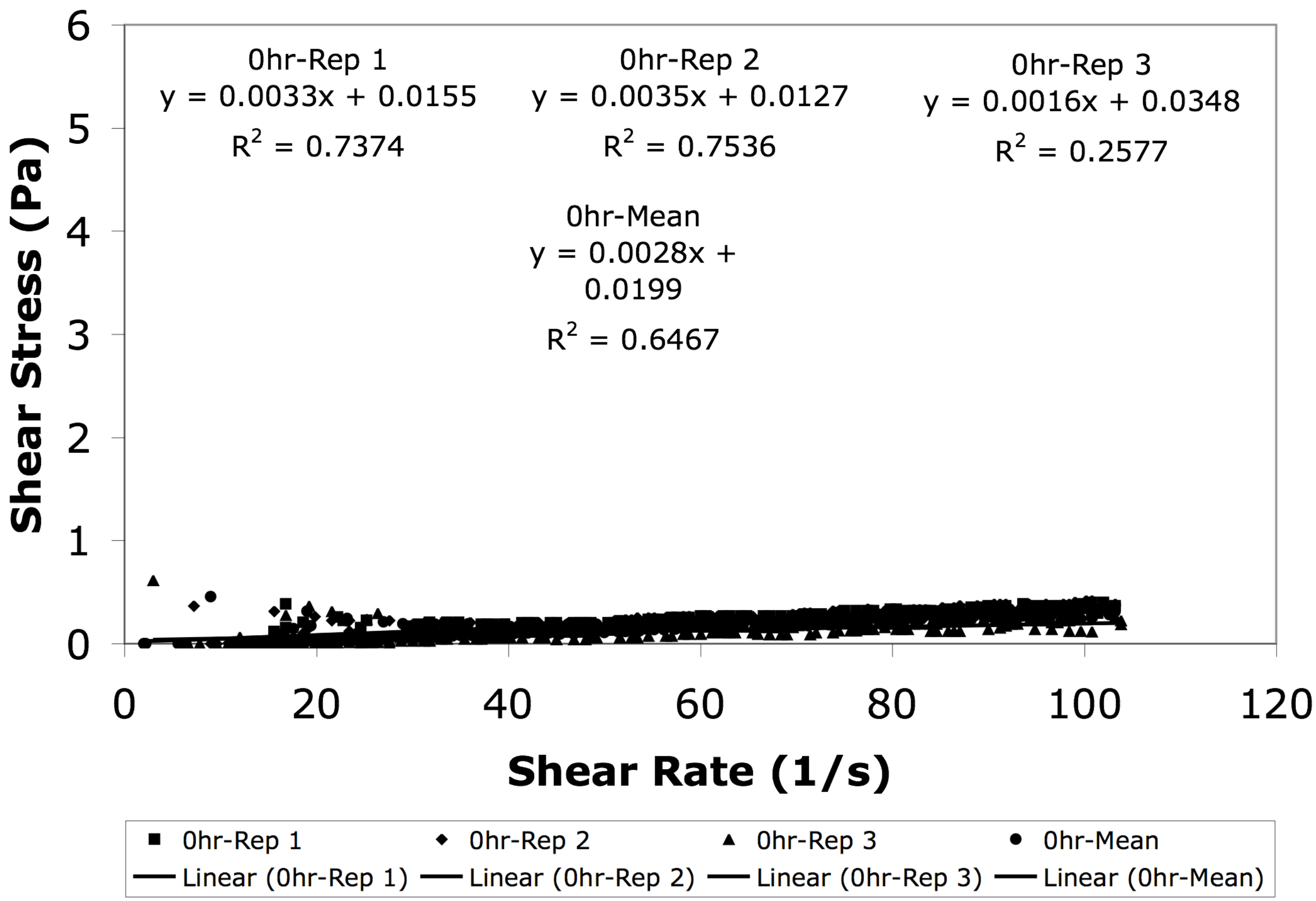
A-10. Fluid behavior for 3.000% MC at 24 h and 25 ^{o}C.



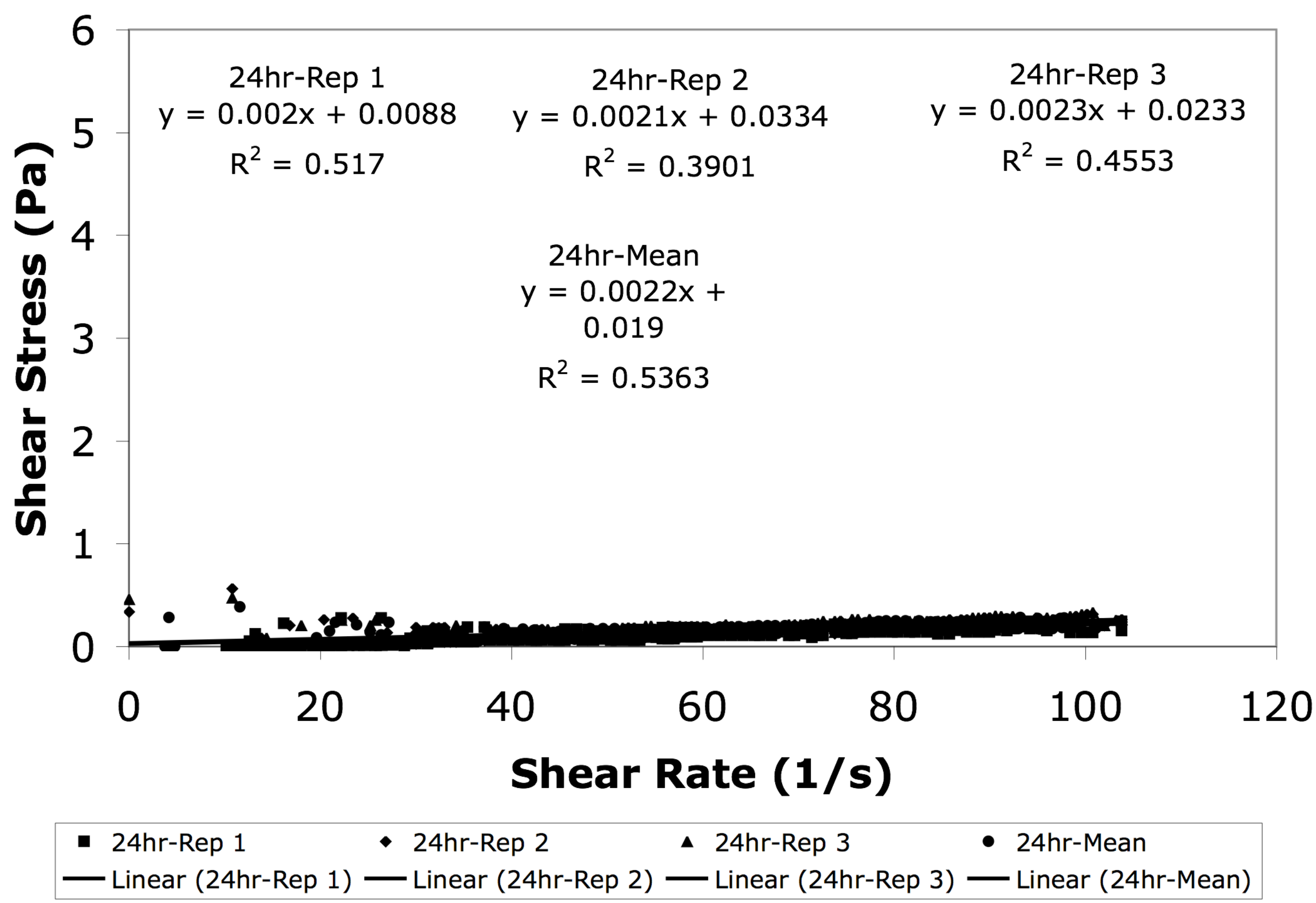
A-11. Fluid behavior for 3.000% MC at 48 h and 25 °C.



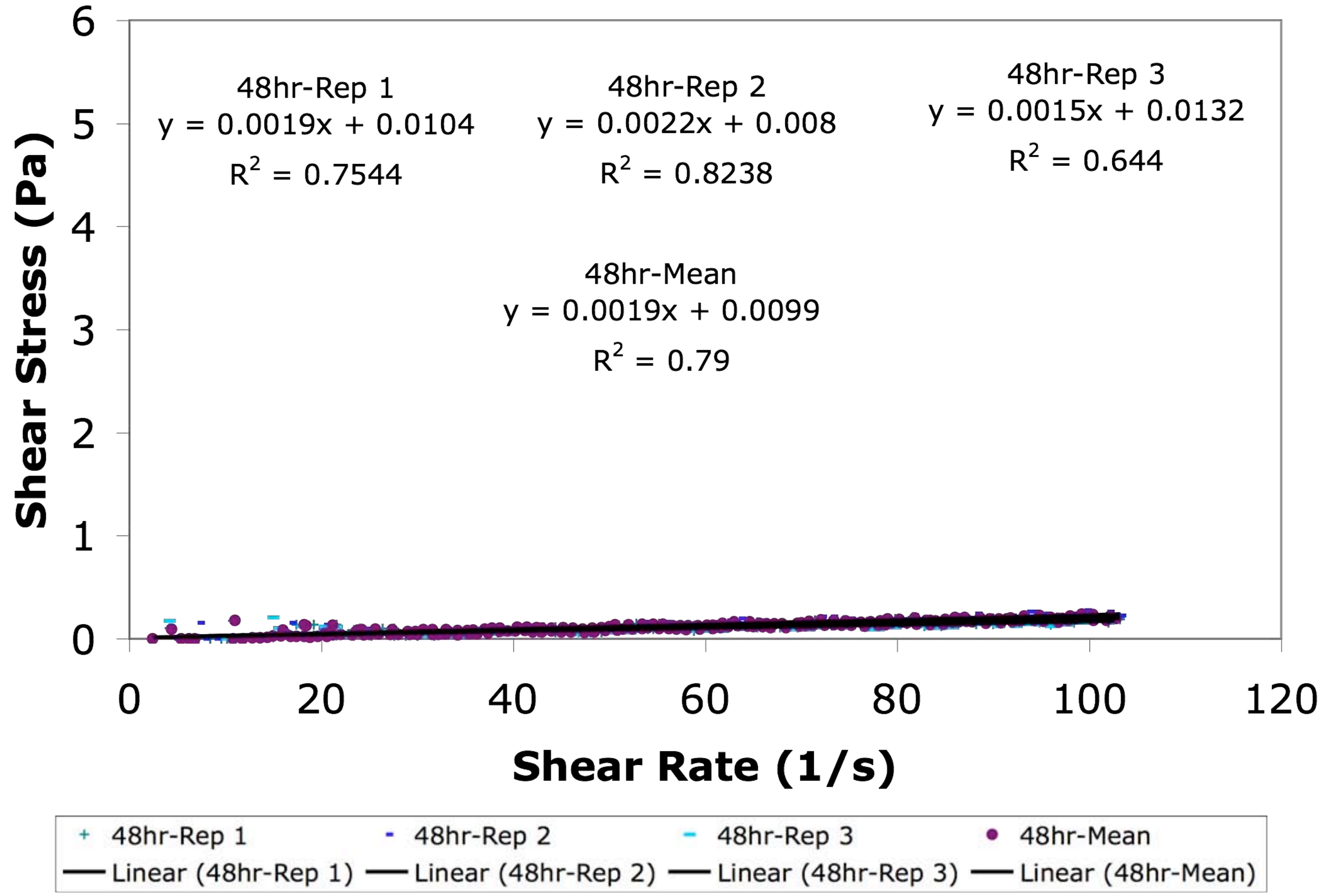
A-12. Fluid behavior for 3.000% MC at 25 °C.



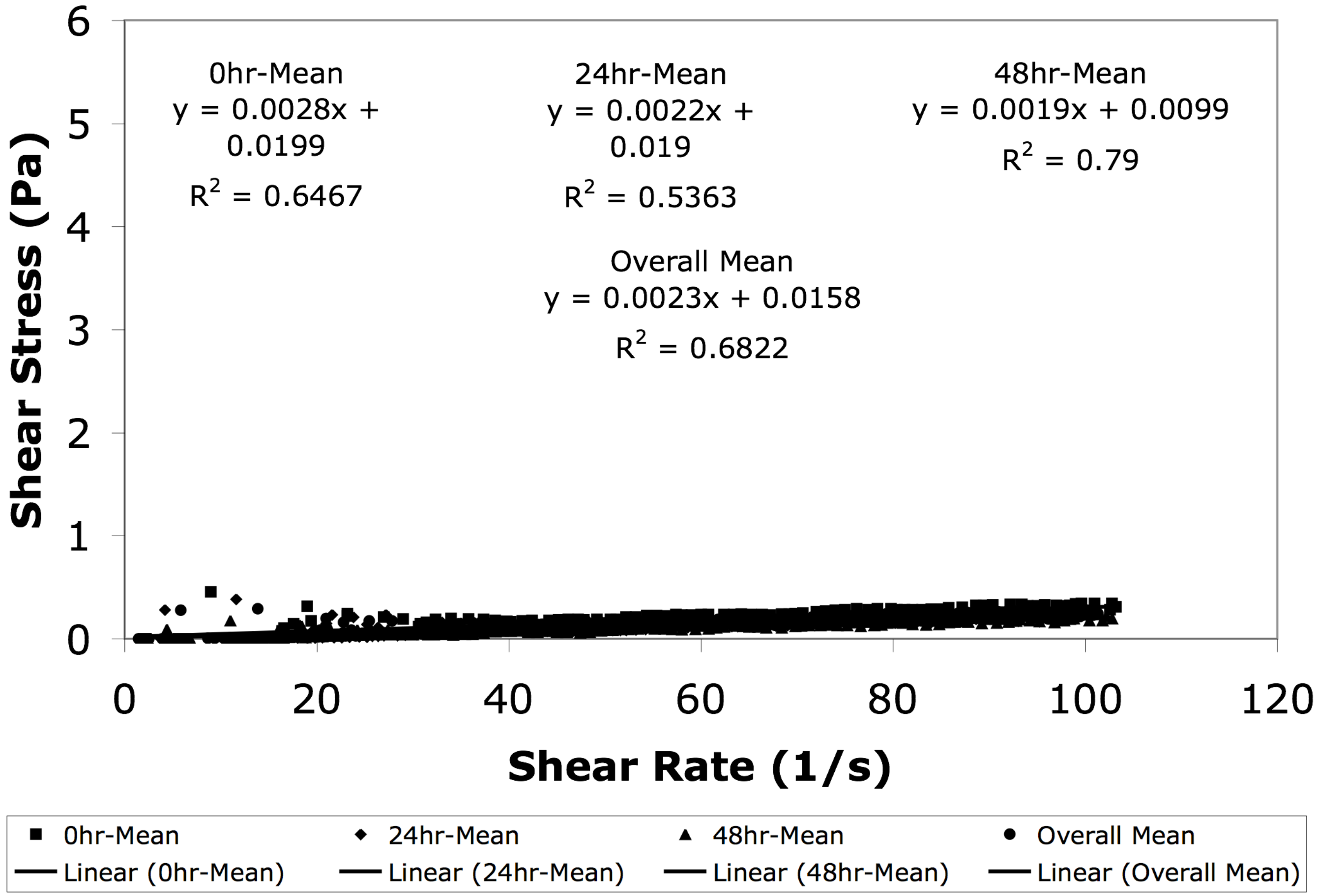
A-13. Fluid behavior for 1.000% HPMC at 0 h and 25 °C.



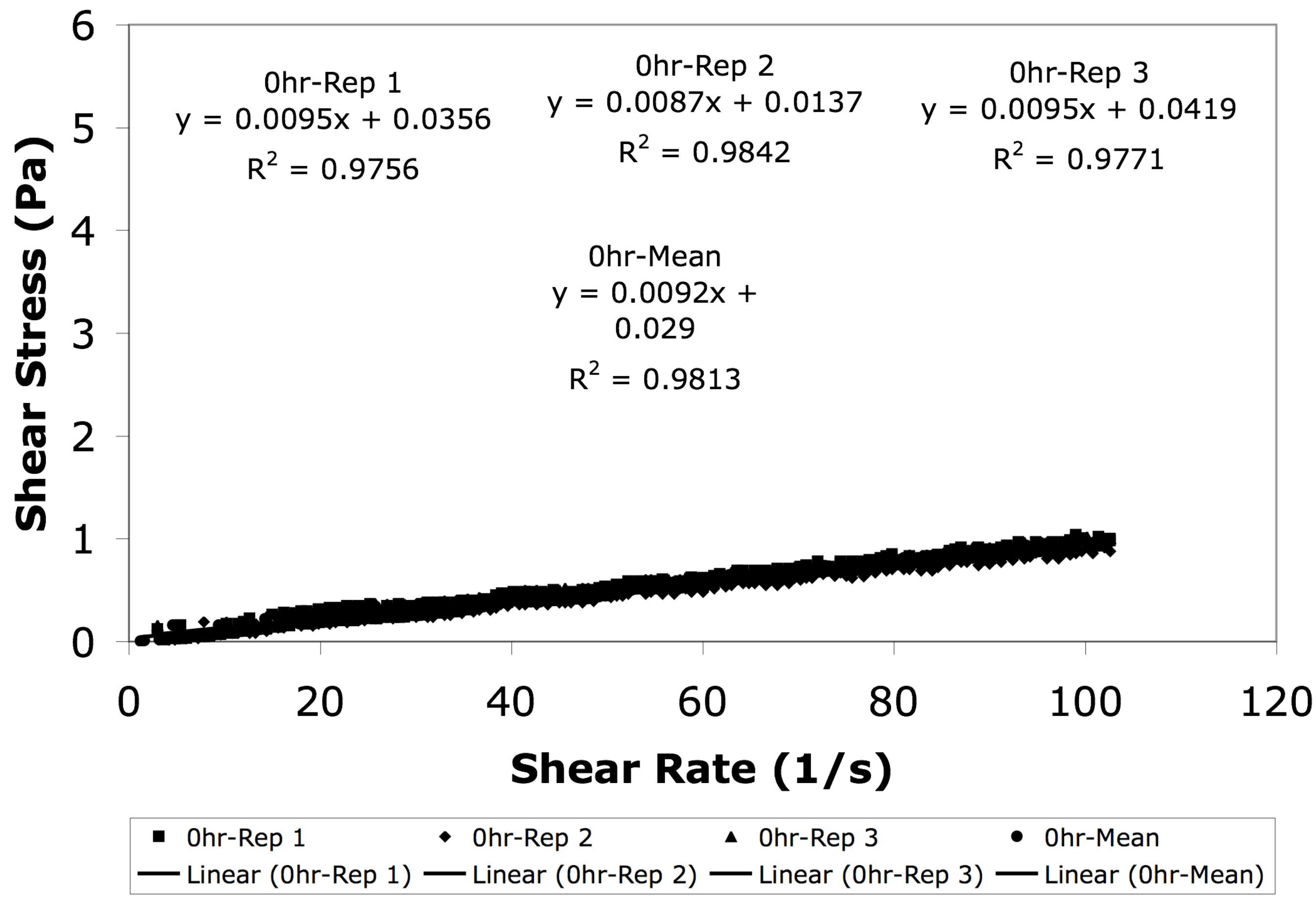
A-14. Fluid behavior for 1.000% HPMC at 24 h and 25 °C.



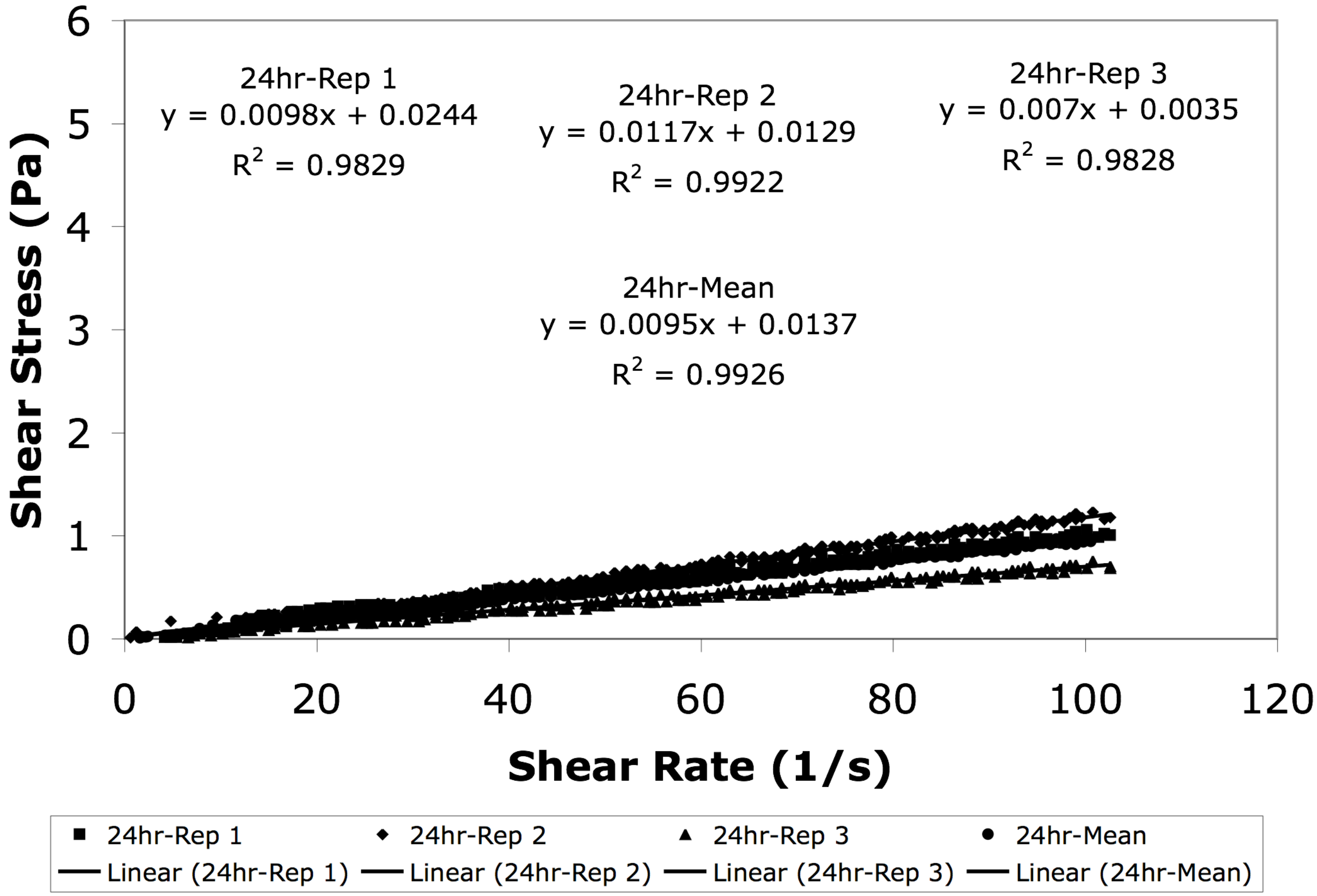
A-15. Fluid behavior for 1.000% HPMC at 48 h and 25 ^{o}C.



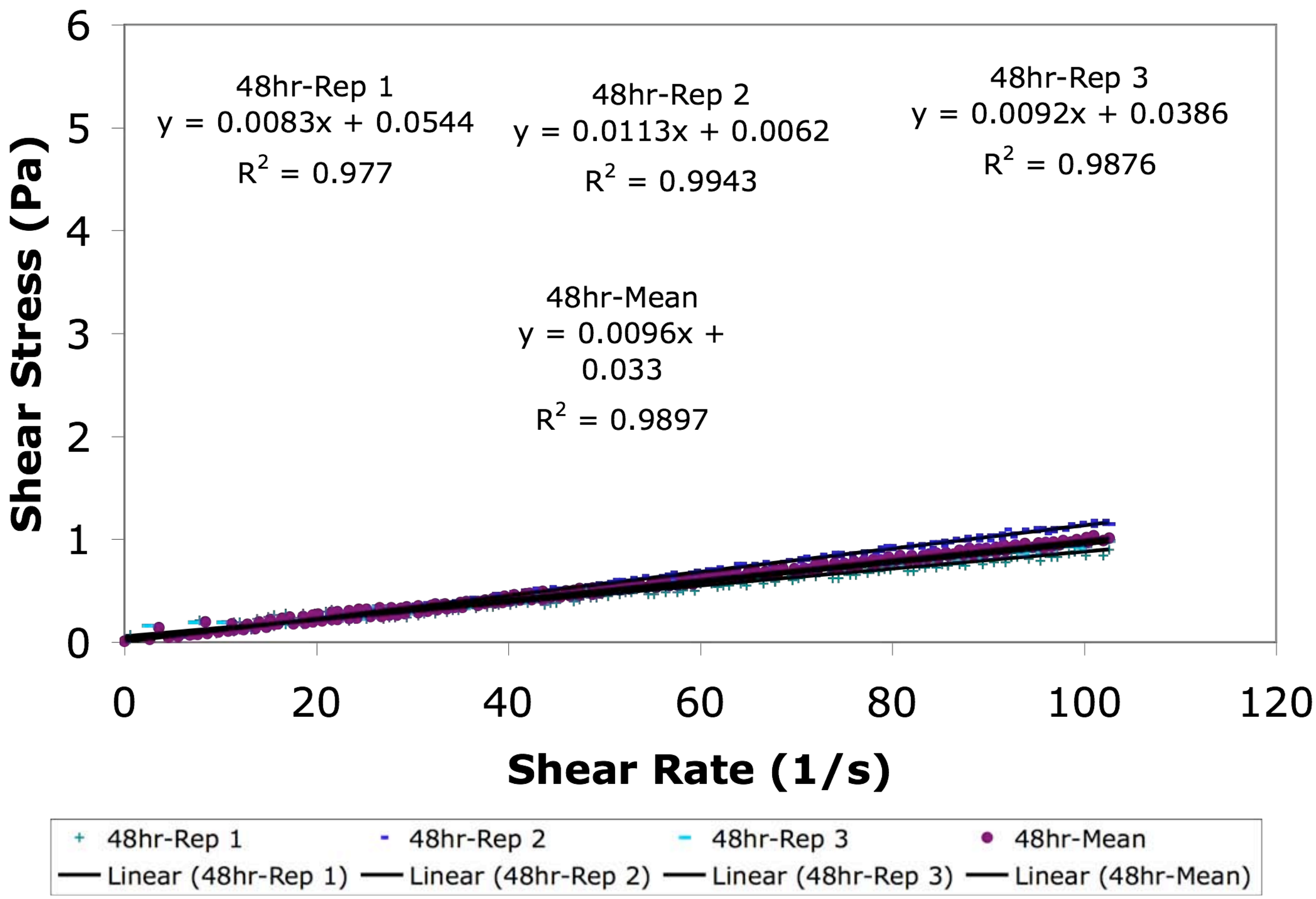
A-16. Fluid behavior for 1.000% HPMC at 25 ^{o}C.



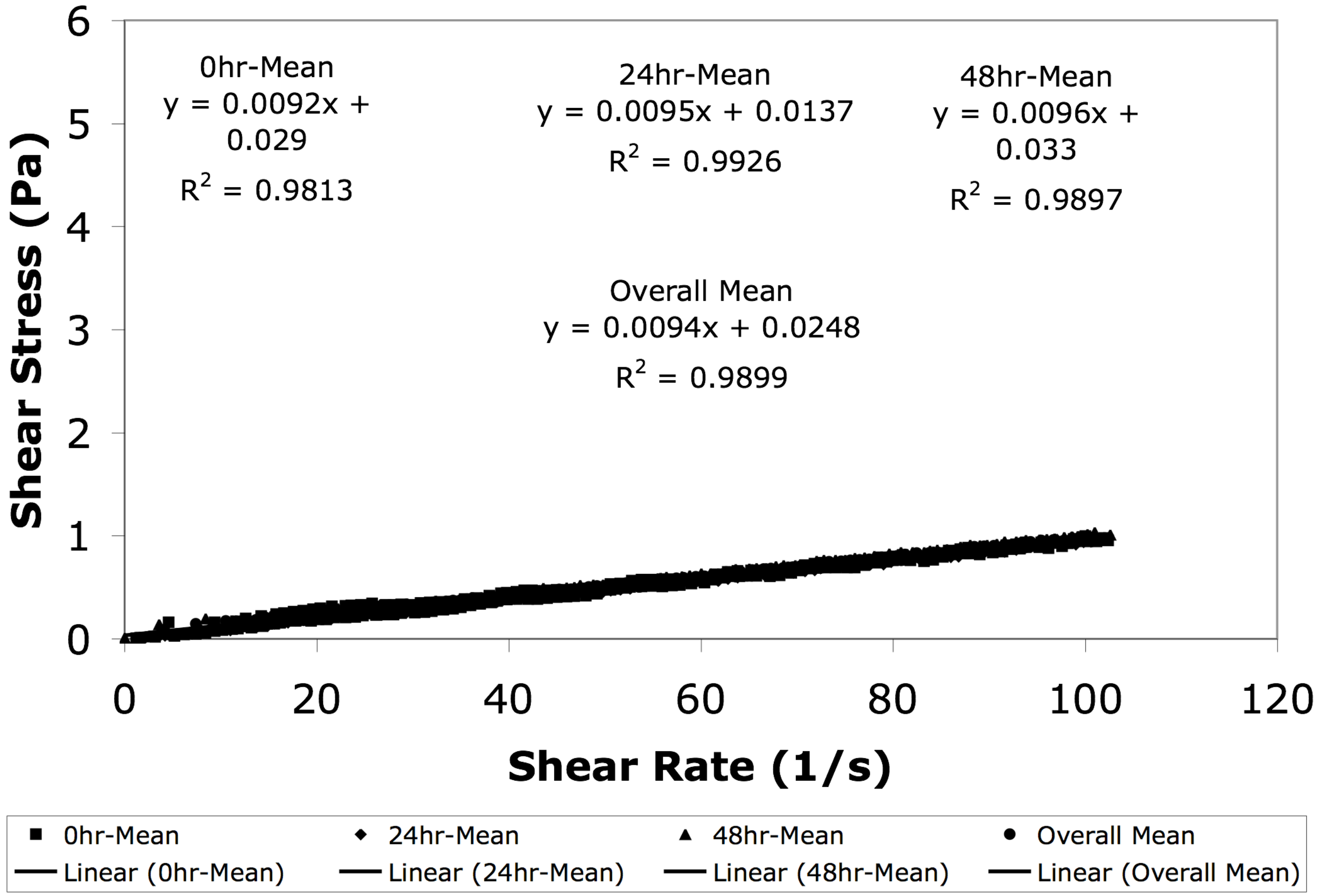
A-17. Fluid behavior for 2.000% HPMC at 0 h and 25 °C.



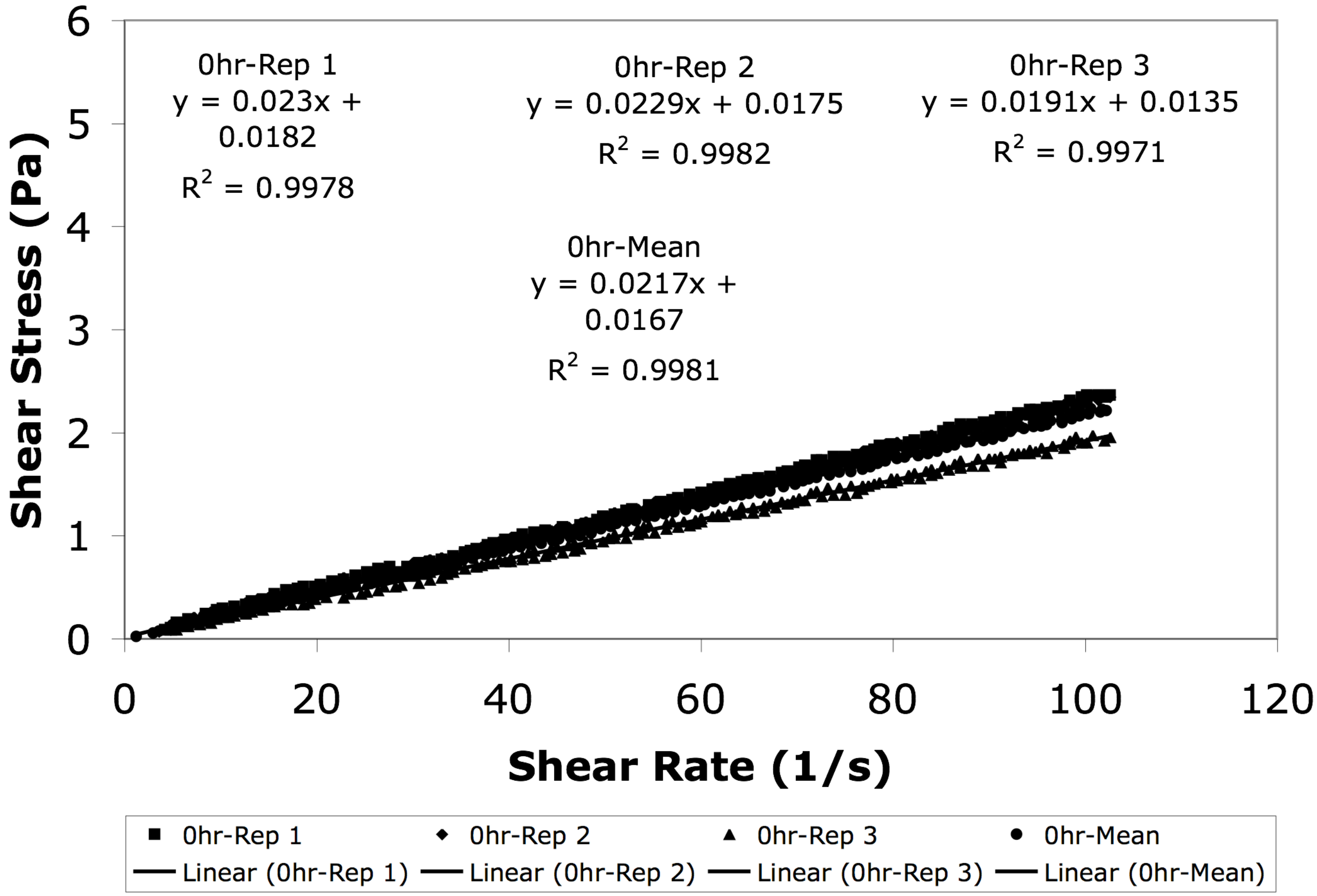
A-18. Fluid behavior for 2.000% HPMC at 24 h and 25 ^{o}C.



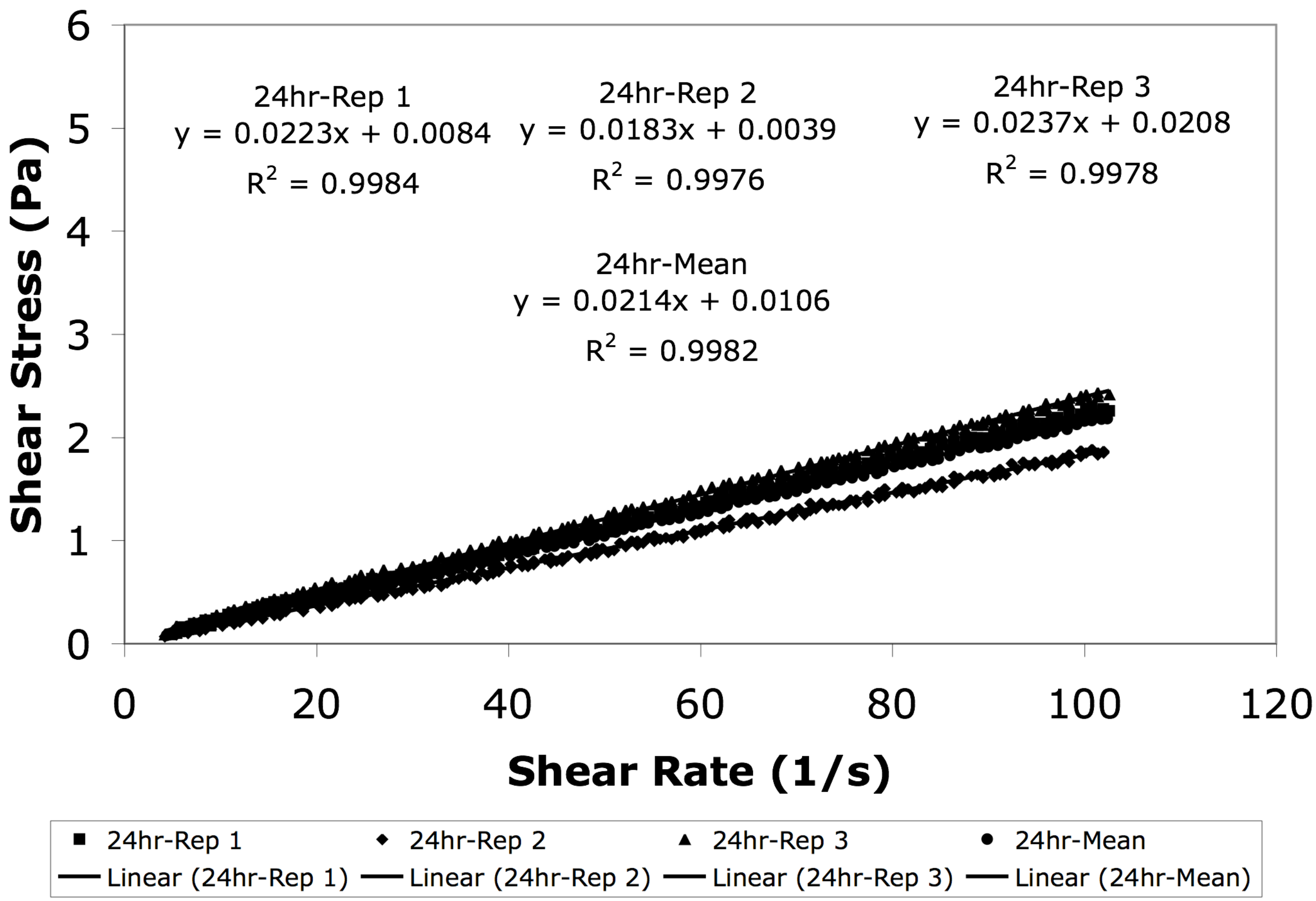
A-19. Fluid behavior for 2.000% HPMC at 48 h and 25 °C.



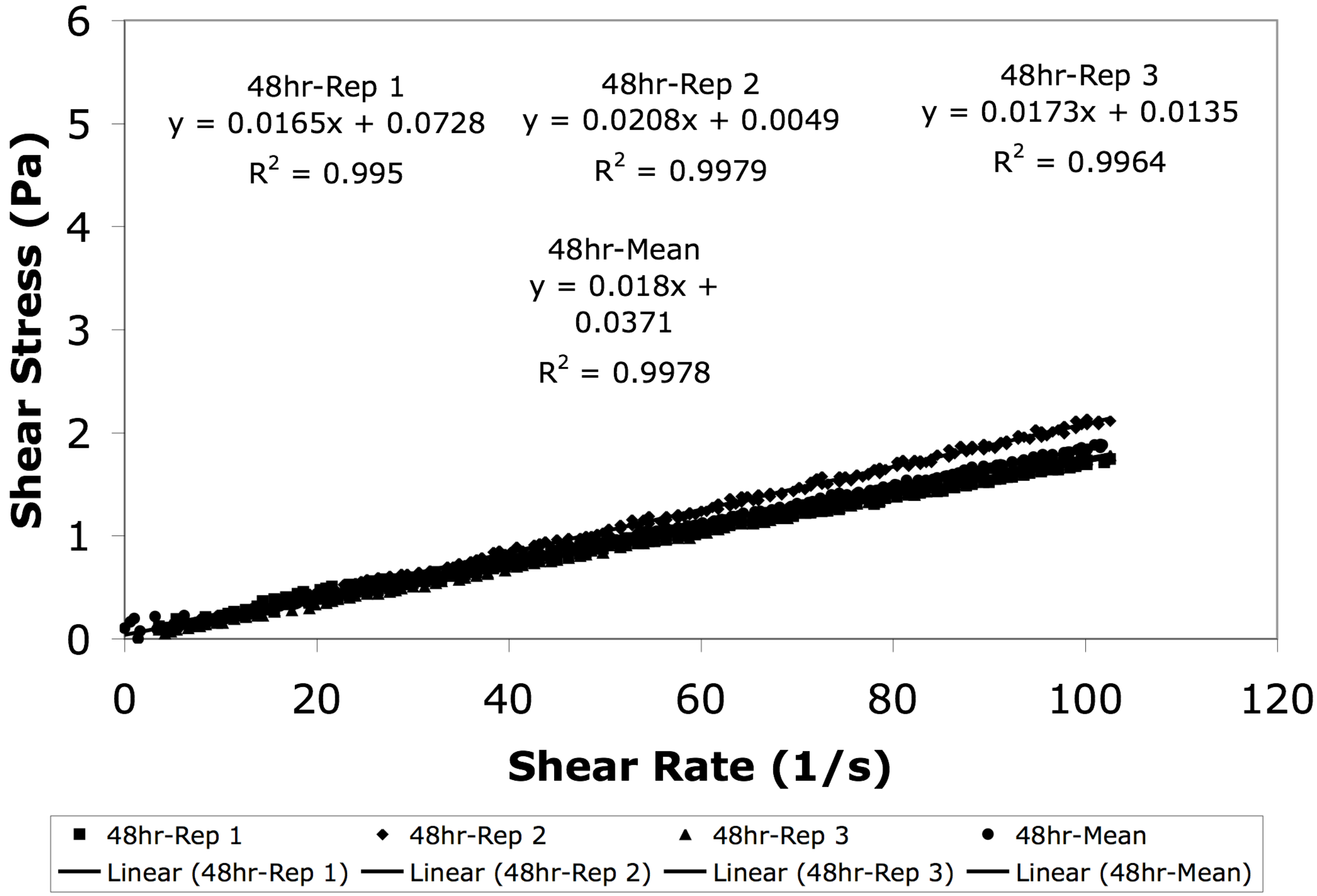
A-20. Fluid behavior for 2.000% HPMC at 25 ^{o}C.



A-21. Fluid behavior for 3.000% HPMC at 0 h and 25 °C.



A-22. Fluid behavior for 3.000% HPMC at 24 h and 25 ^{o}C.



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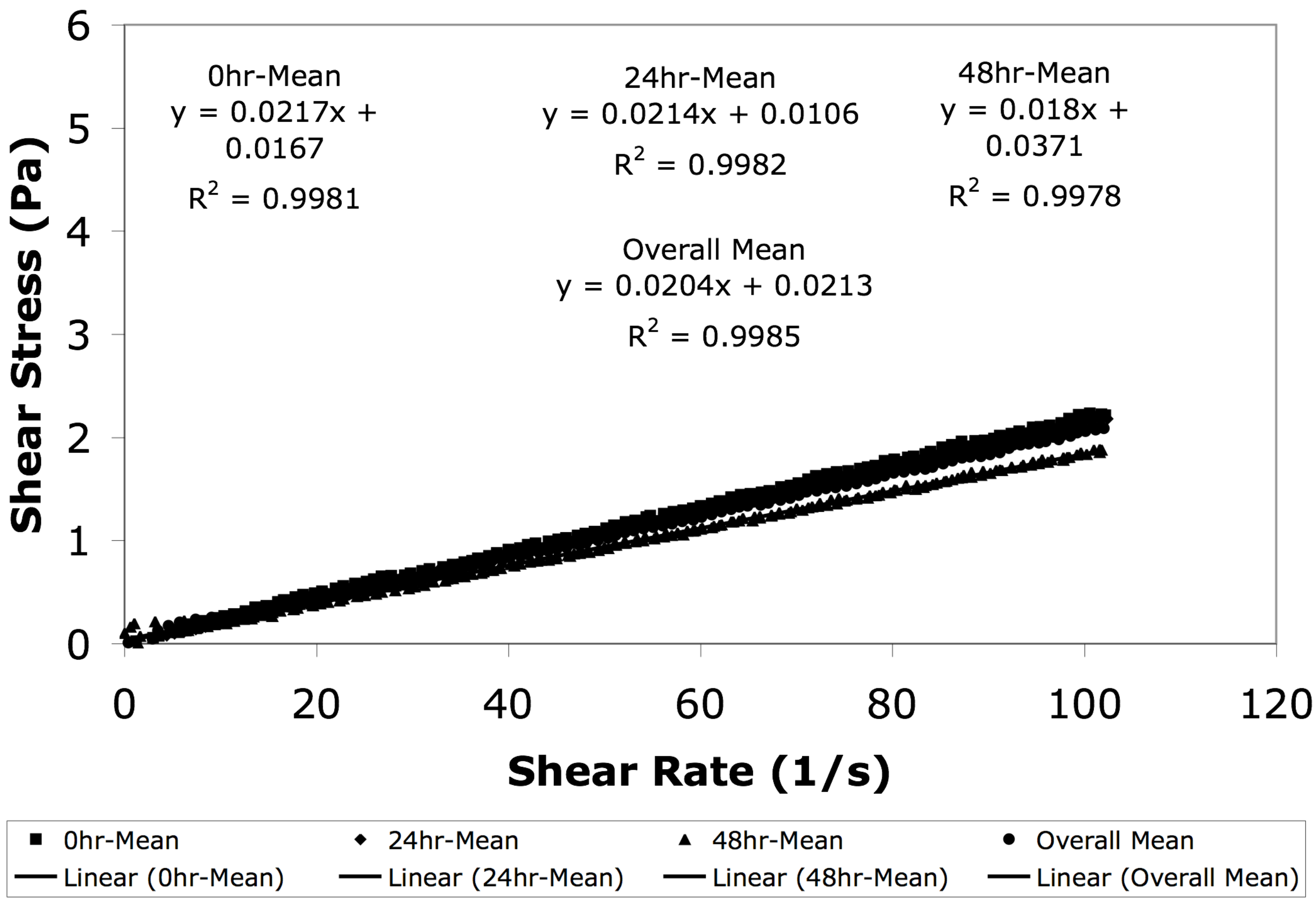
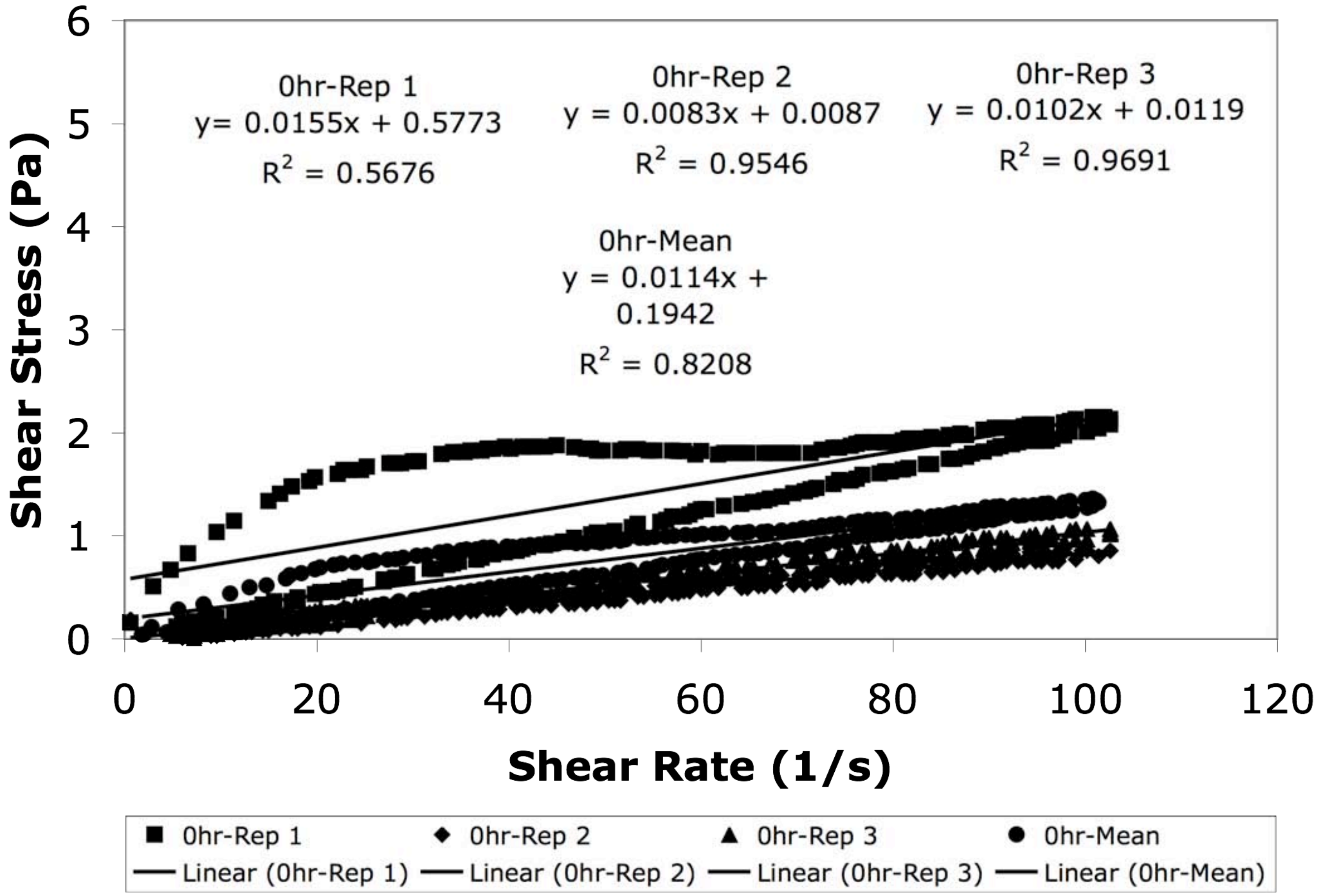
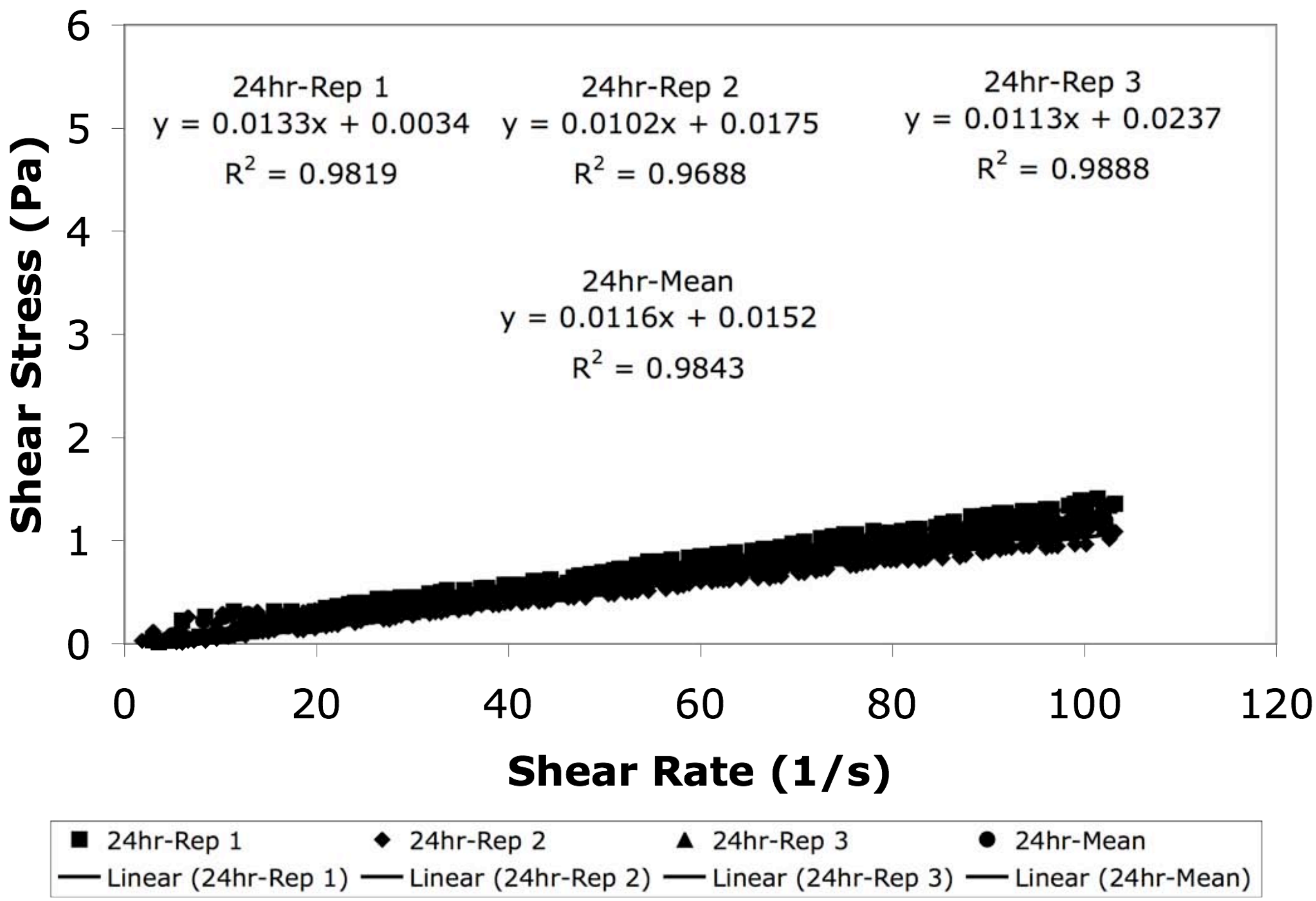


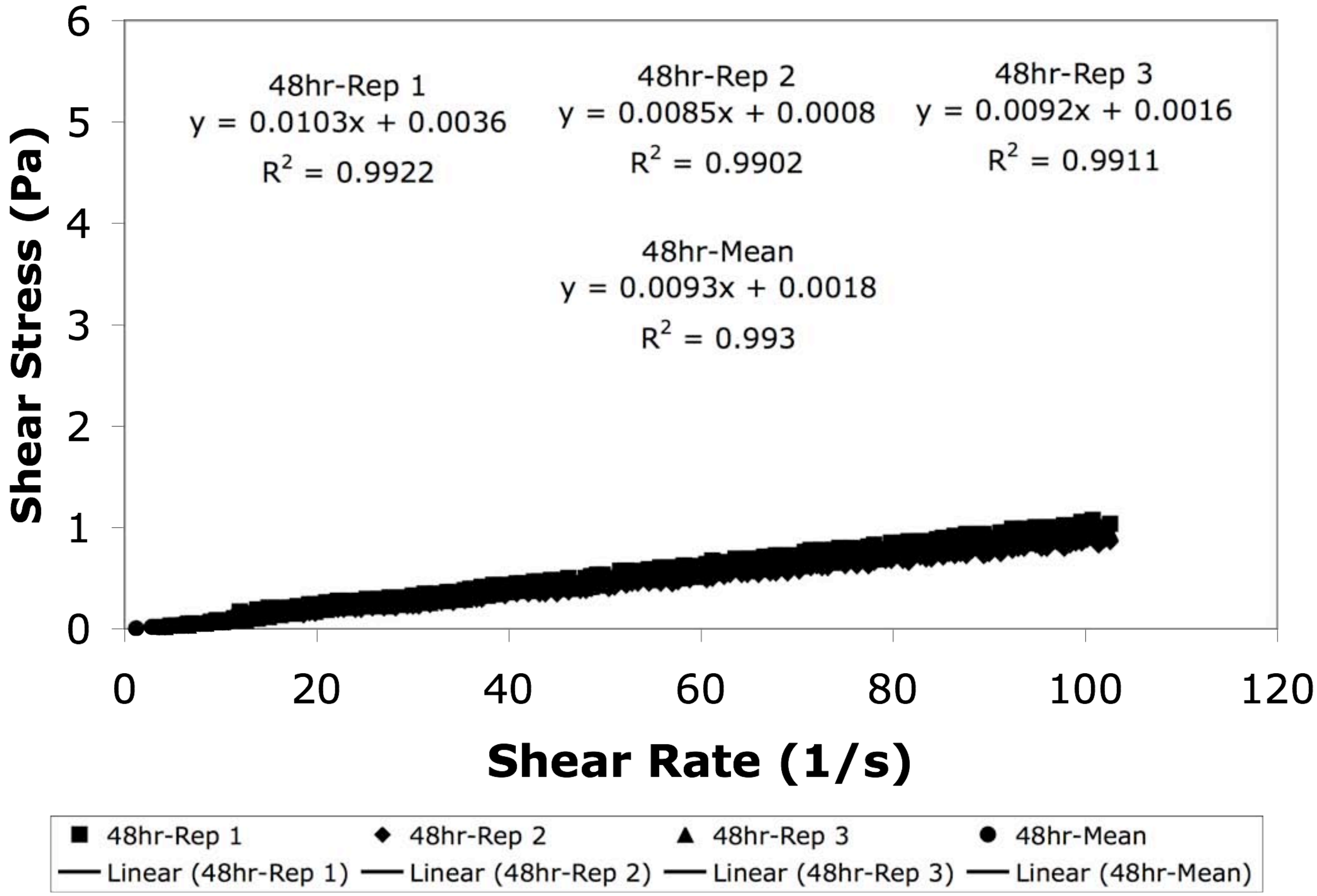
A-24. Fluid behavior for 3.000% HPMC at 25 ^{o}C.



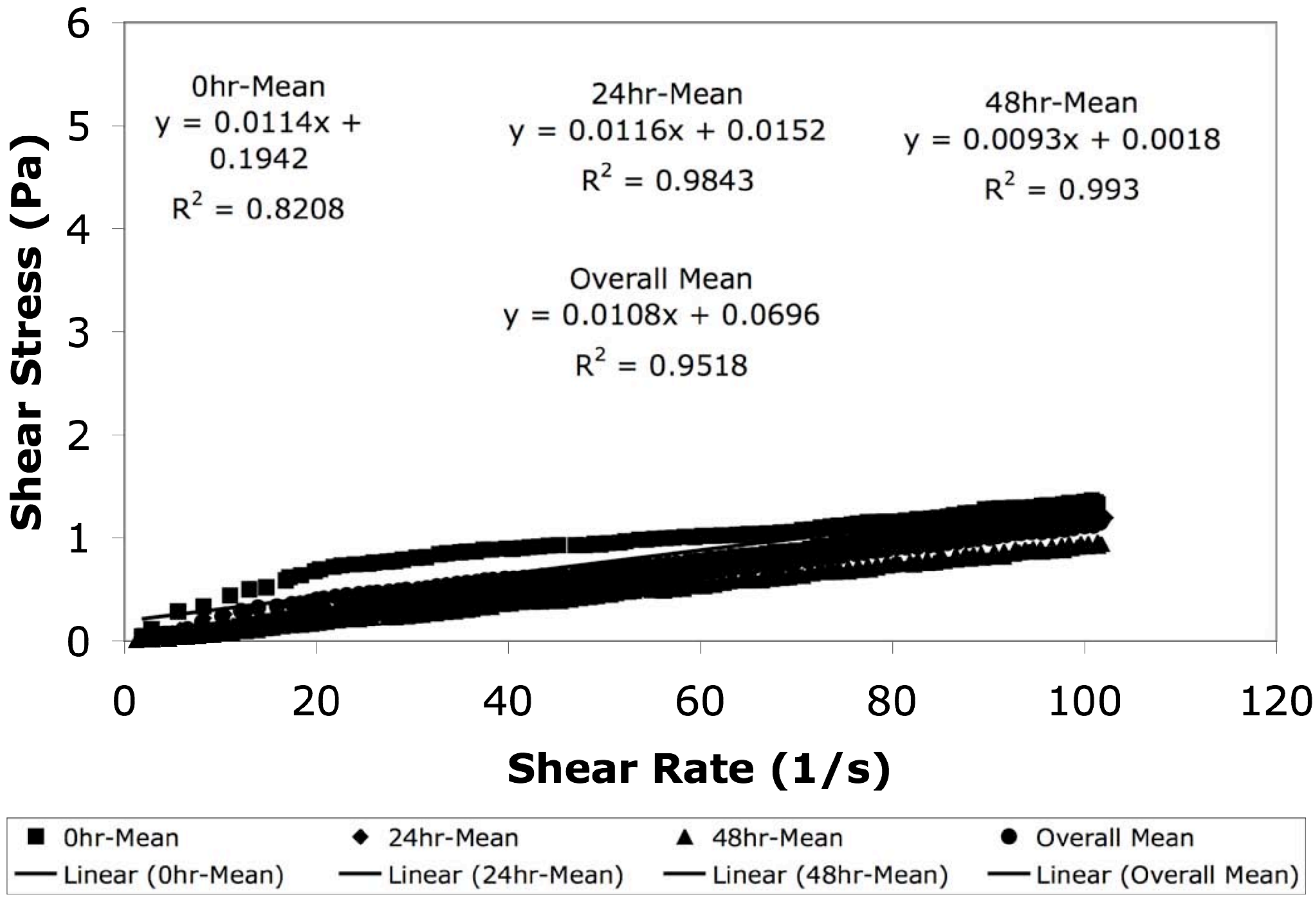
A-25. Fluid behavior for 1.000% SGMC at 0 h and 25 ^{o}C.



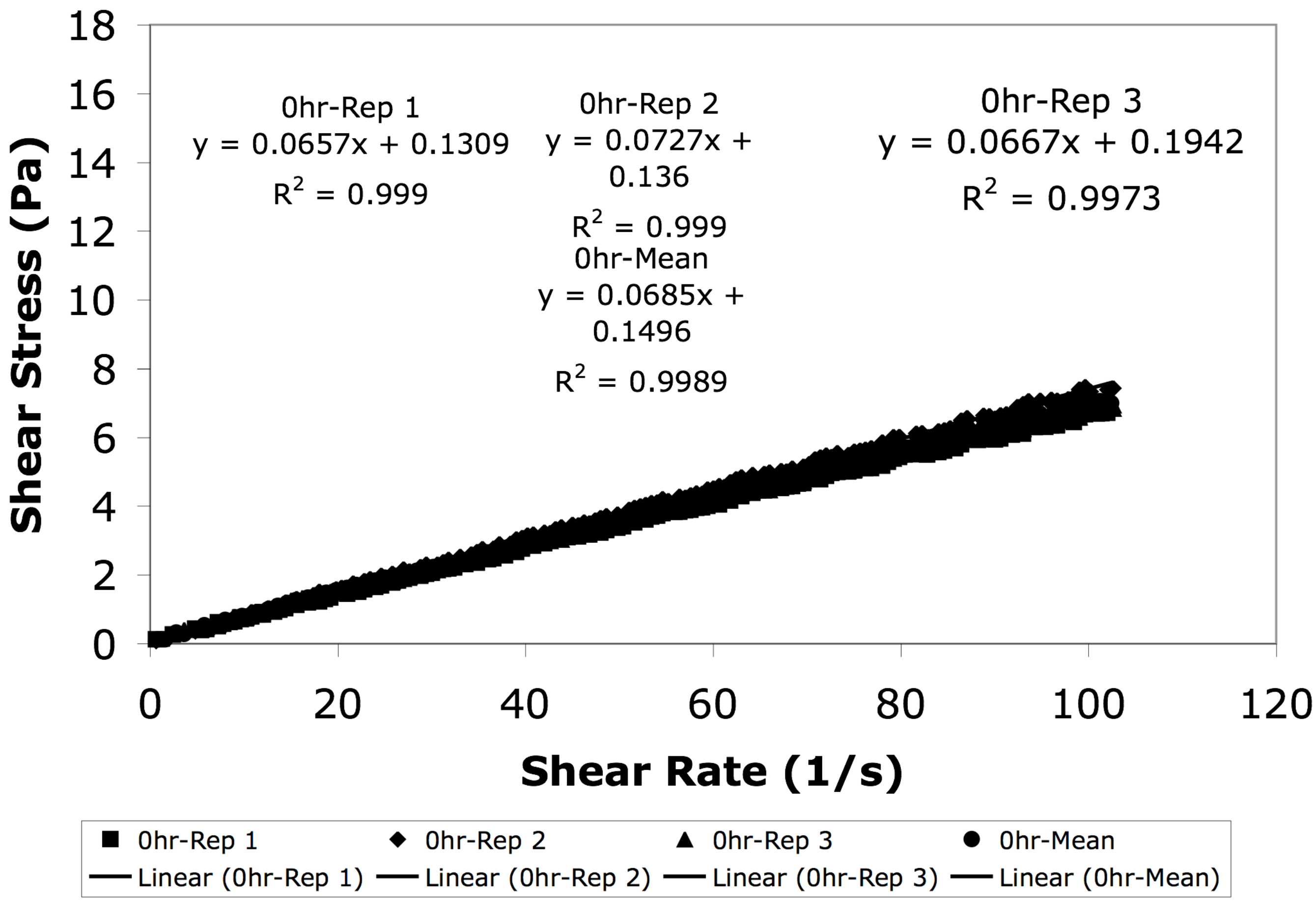
A-26. Fluid behavior for 1.000% SGMC at 24 h and 25 ^{o}C.



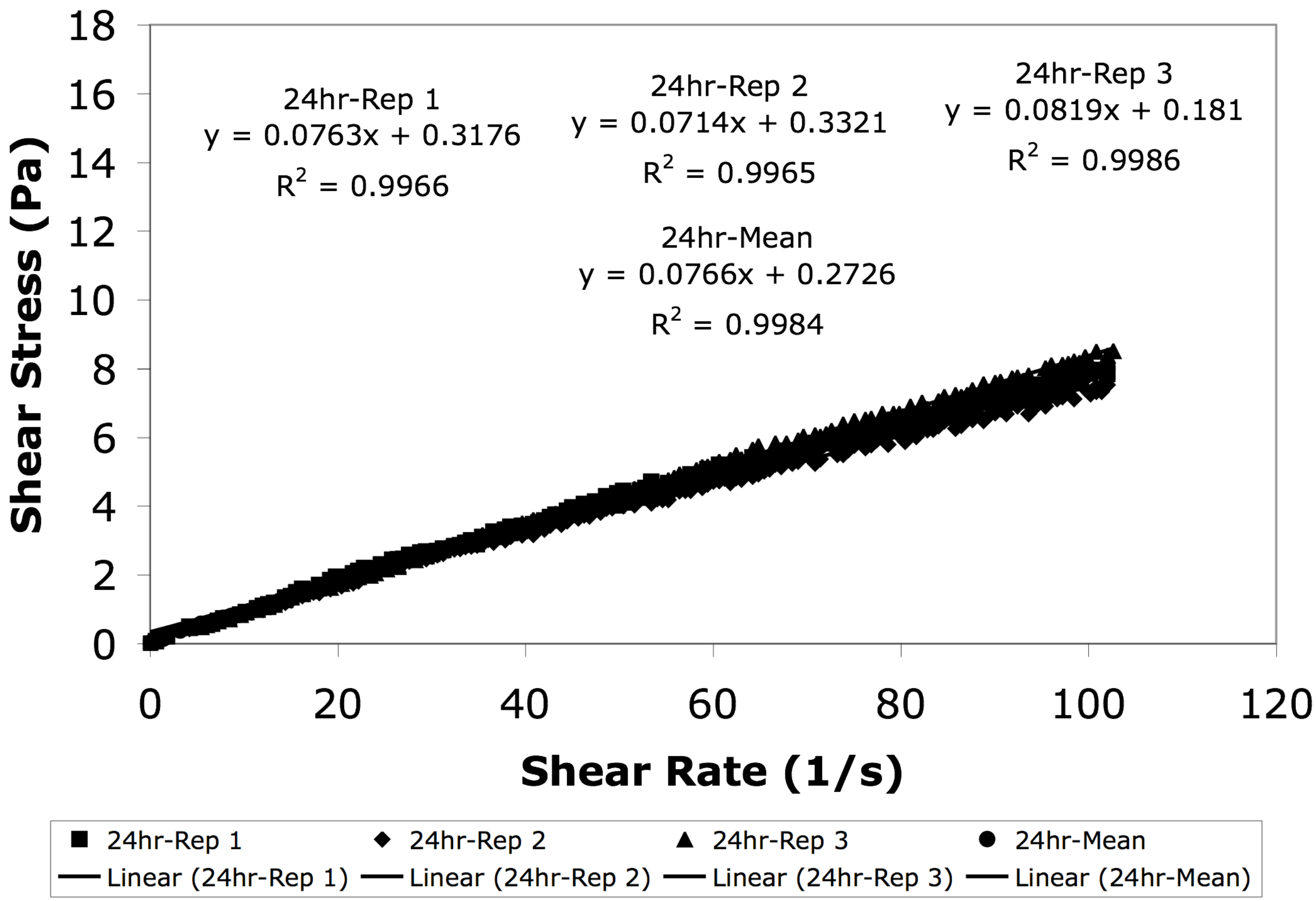
A-27. Fluid behavior for 1.000% SGMC at 48 h and 25 °C.



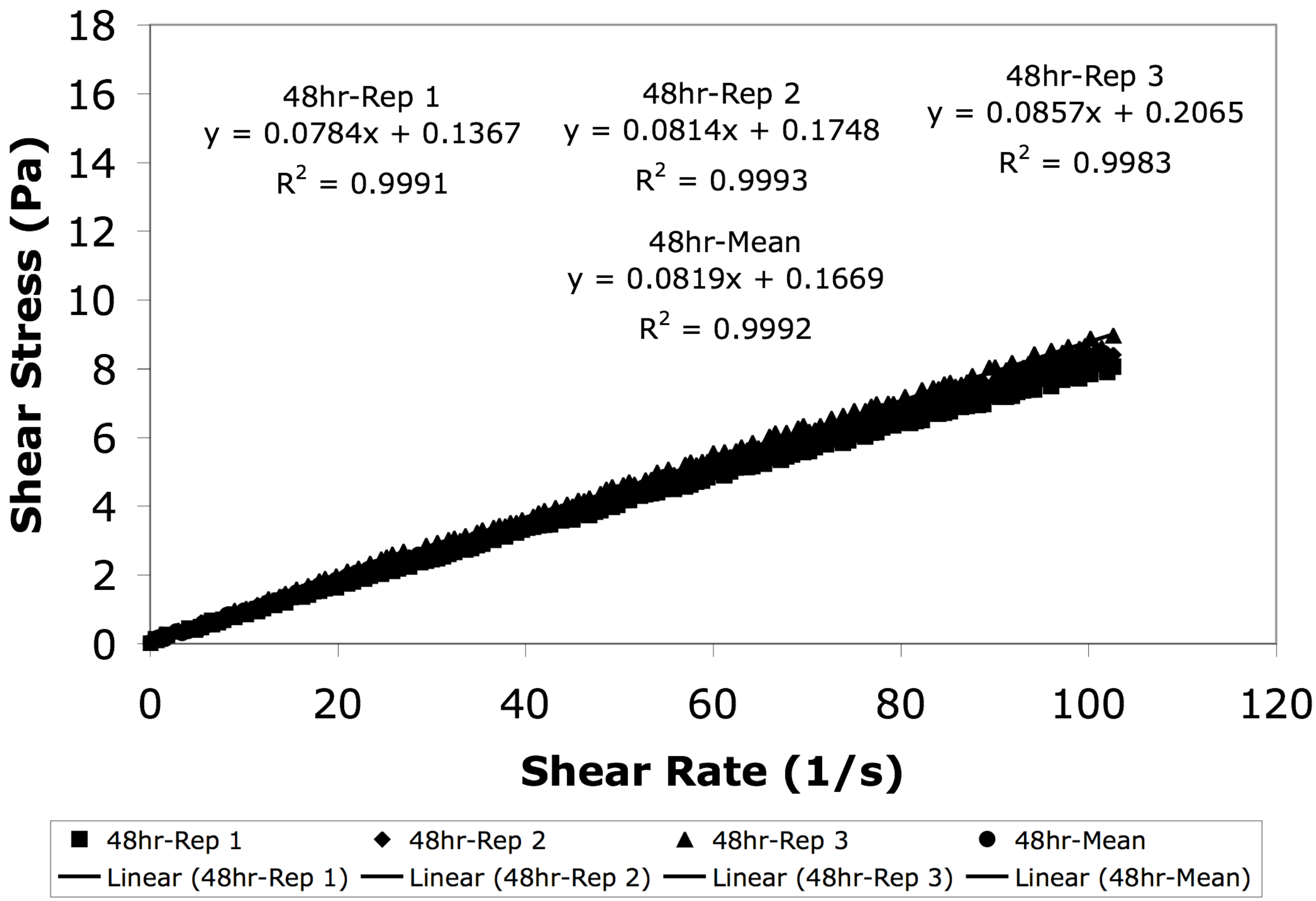
A-28. Fluid behavior for 1.000% SGMC at 25 ^{o}C.



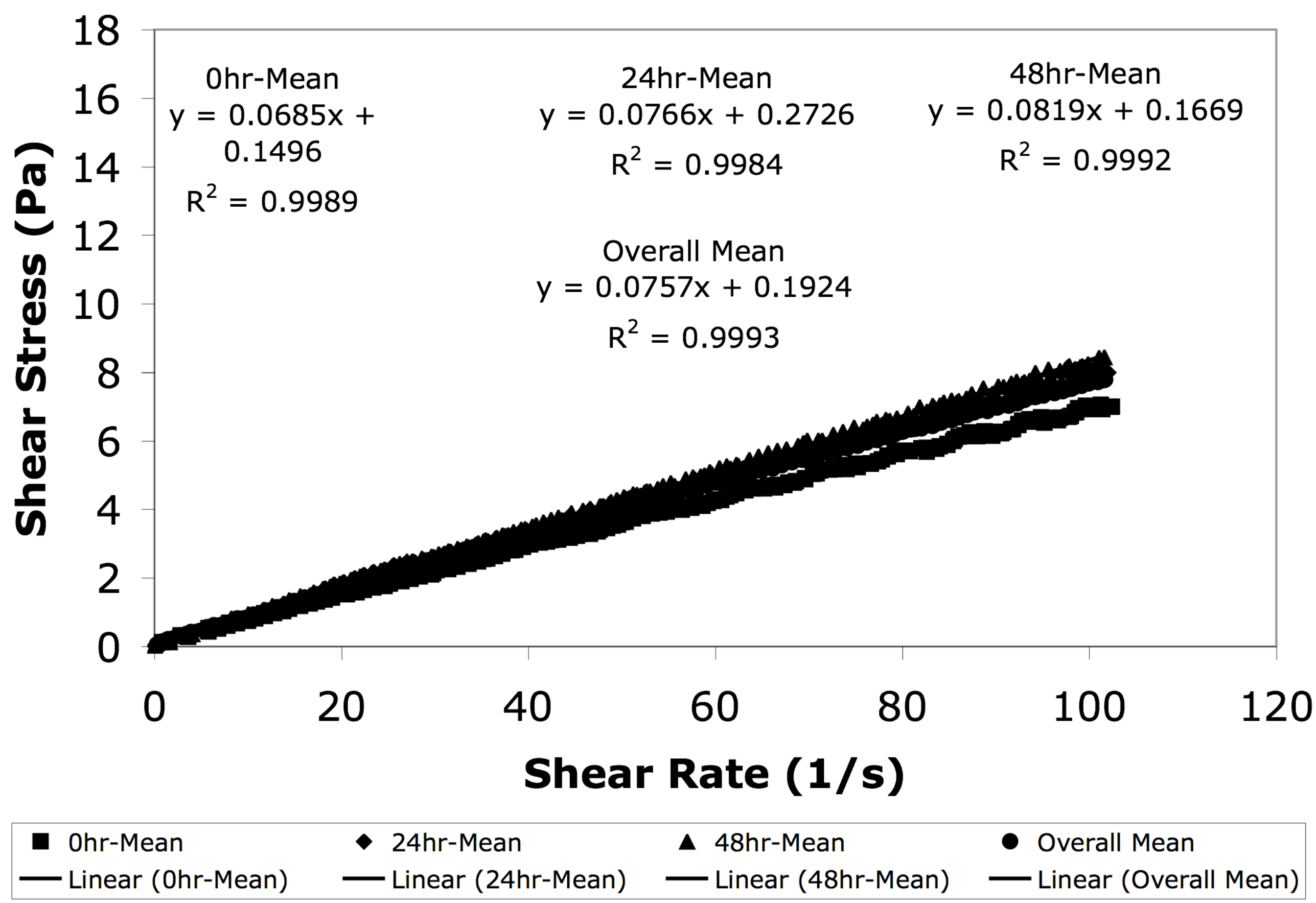
A-29. Fluid behavior for 2.000% SGMC at 0 h and 25 ^{o}C.



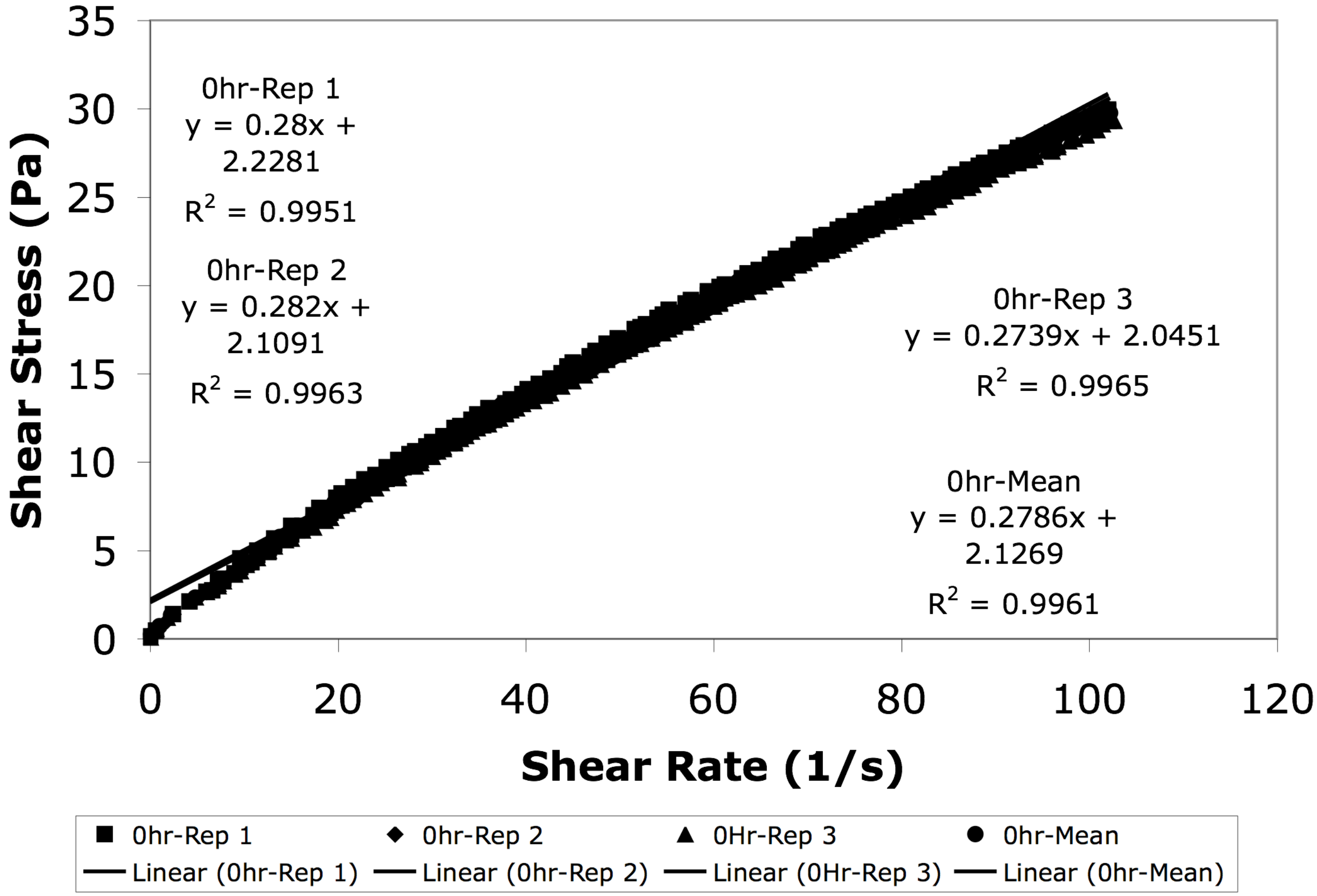
A-30. Fluid behavior for 2.000% SGMC at 24 h and 25 ^{o}C.



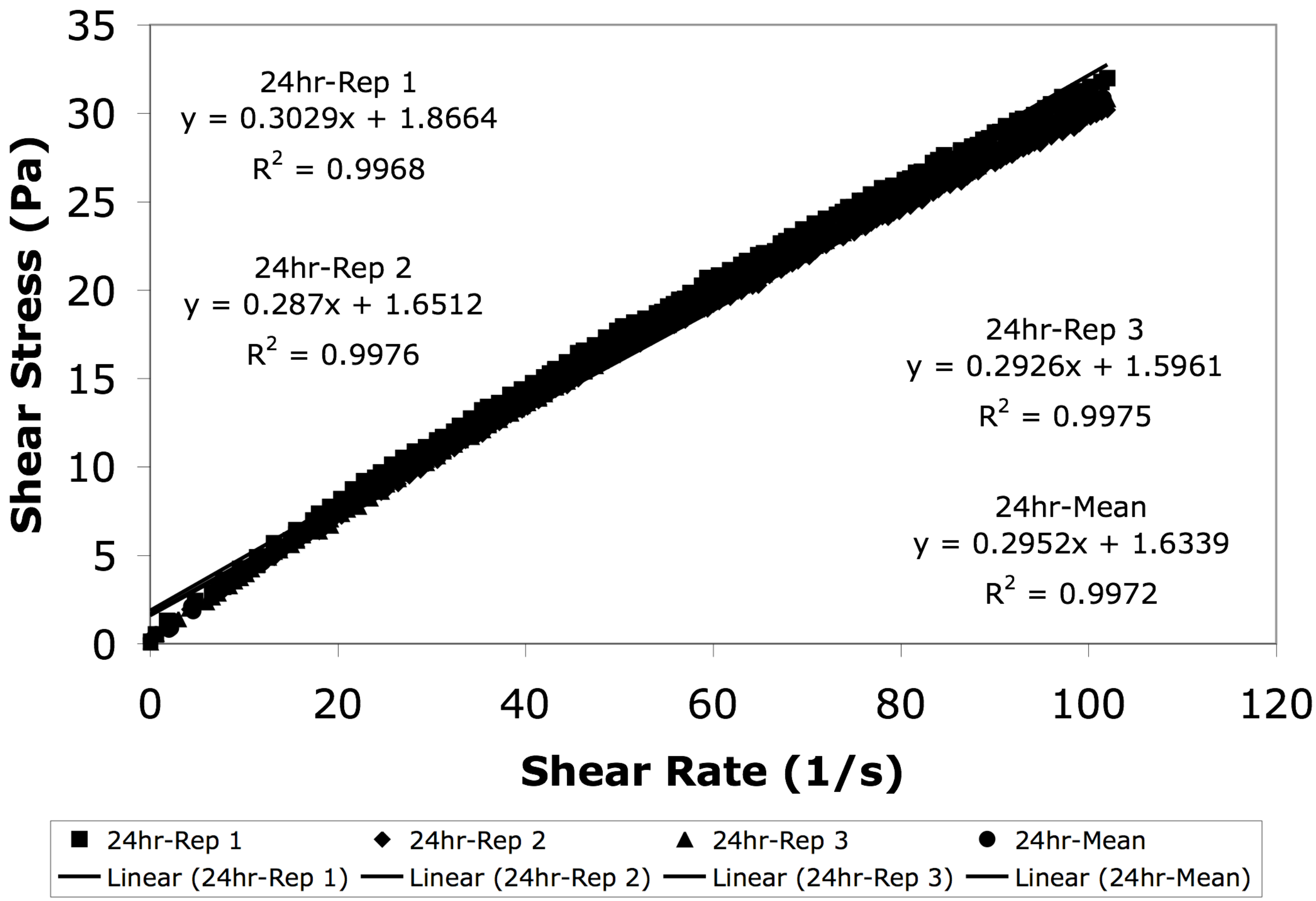
A-31. Fluid behavior for 2.000% SGMC at 48 h and 25 ^{o}C.



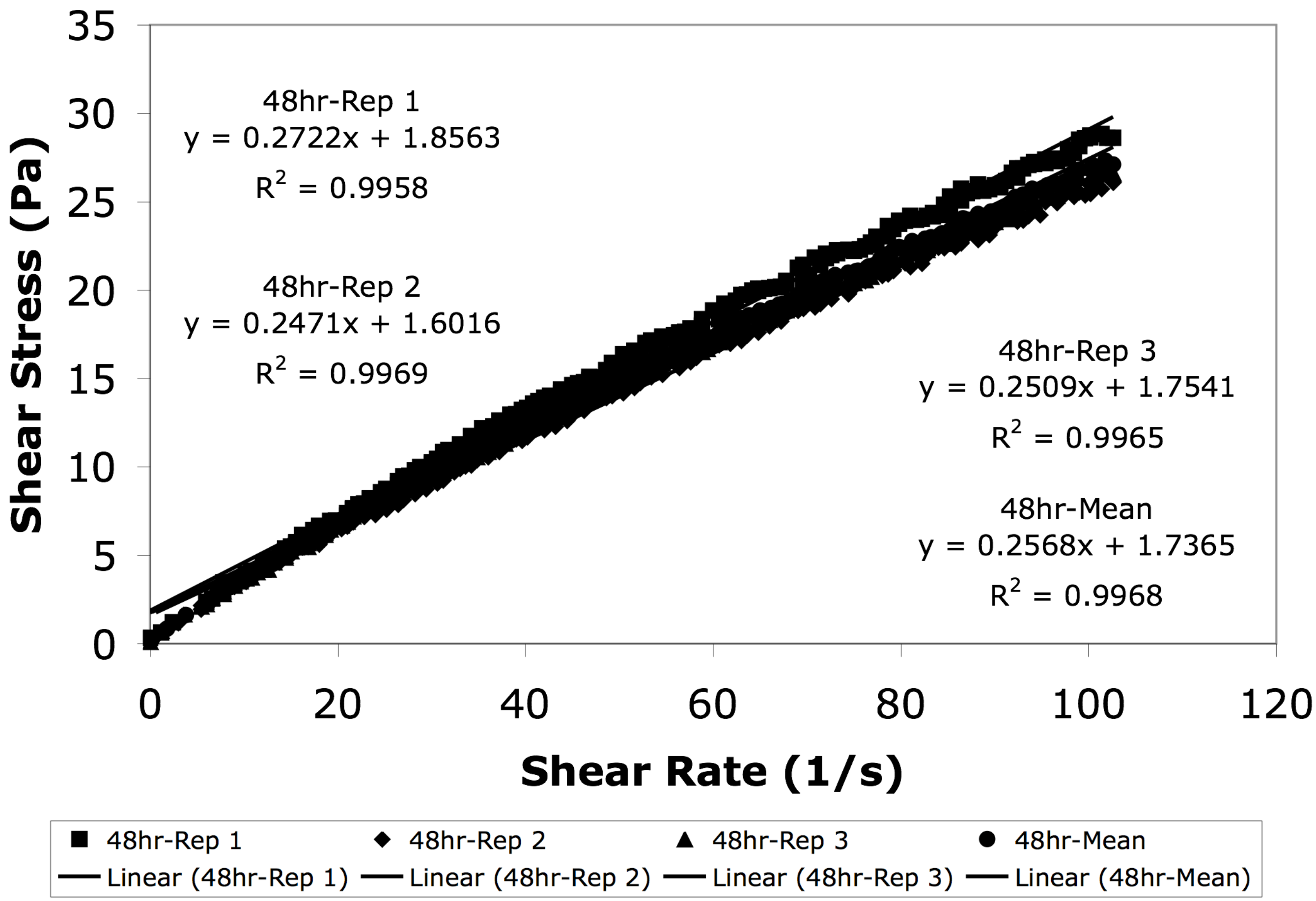
A-32. Fluid behavior for 2.000% SGMC at 25 °C.



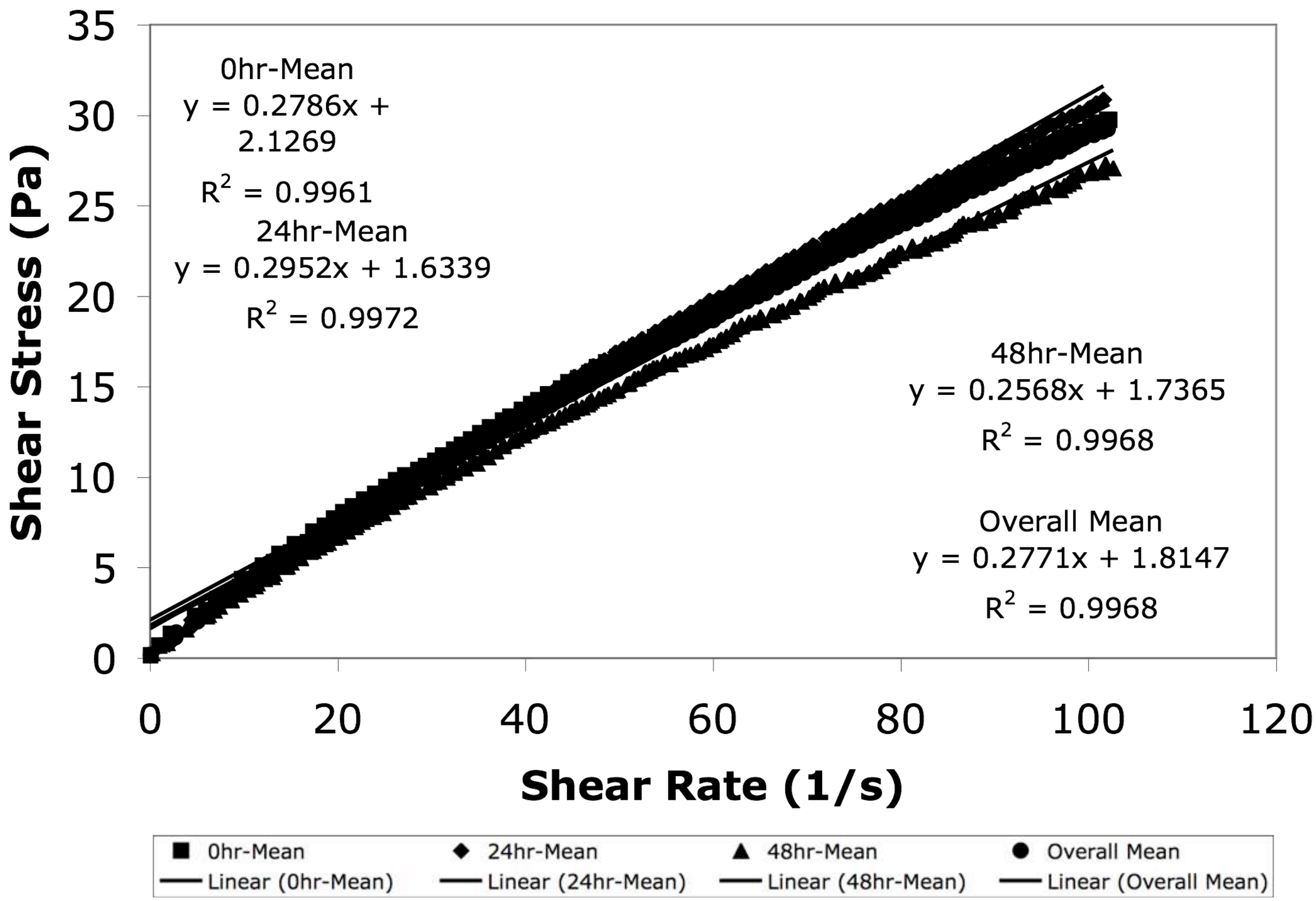
A-33. Fluid behavior for 3.000% SGMC at 0 h and 25 °C.



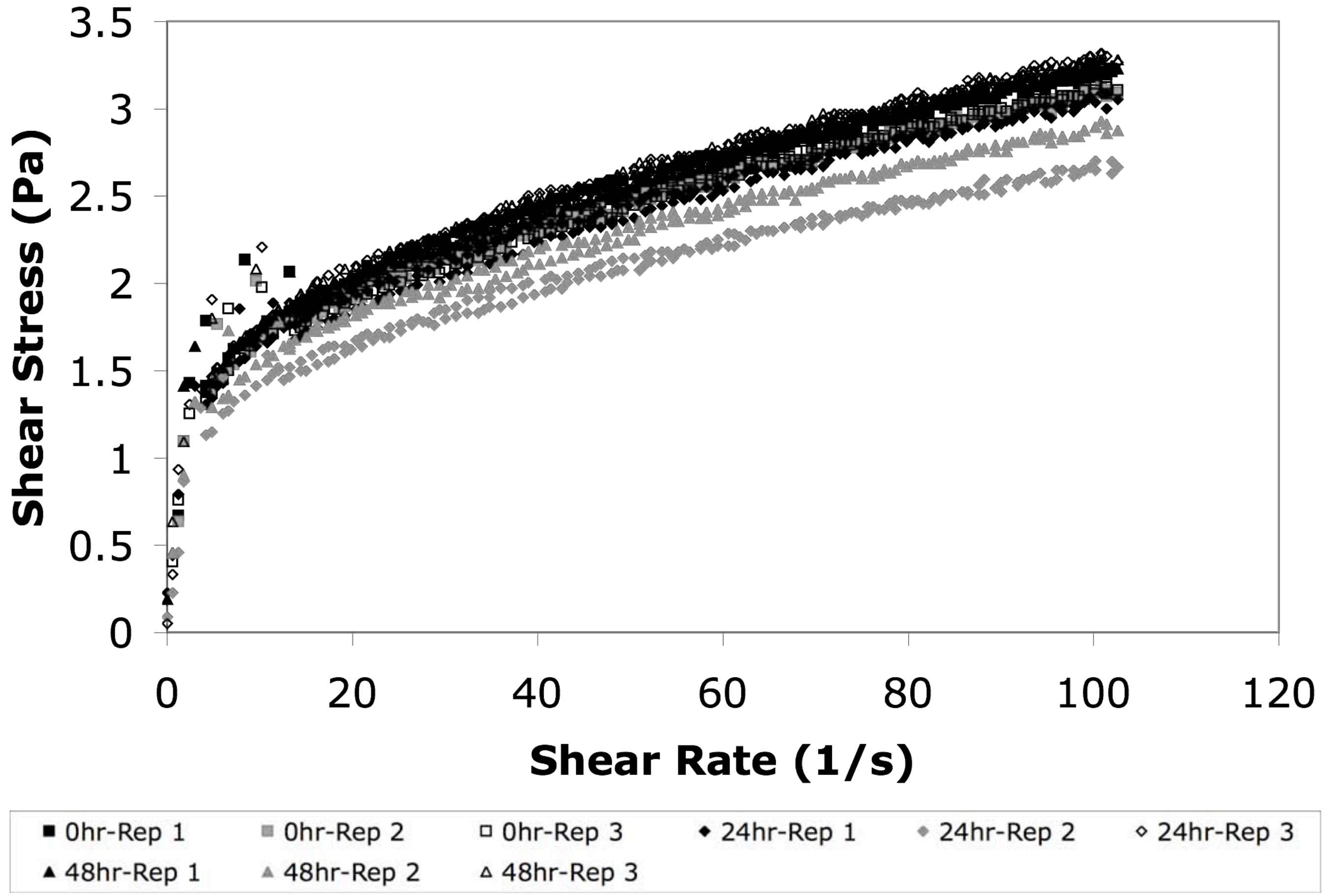
A-34. Fluid behavior for 3.000% SGMC at 24 h and 25 ^{o}C.



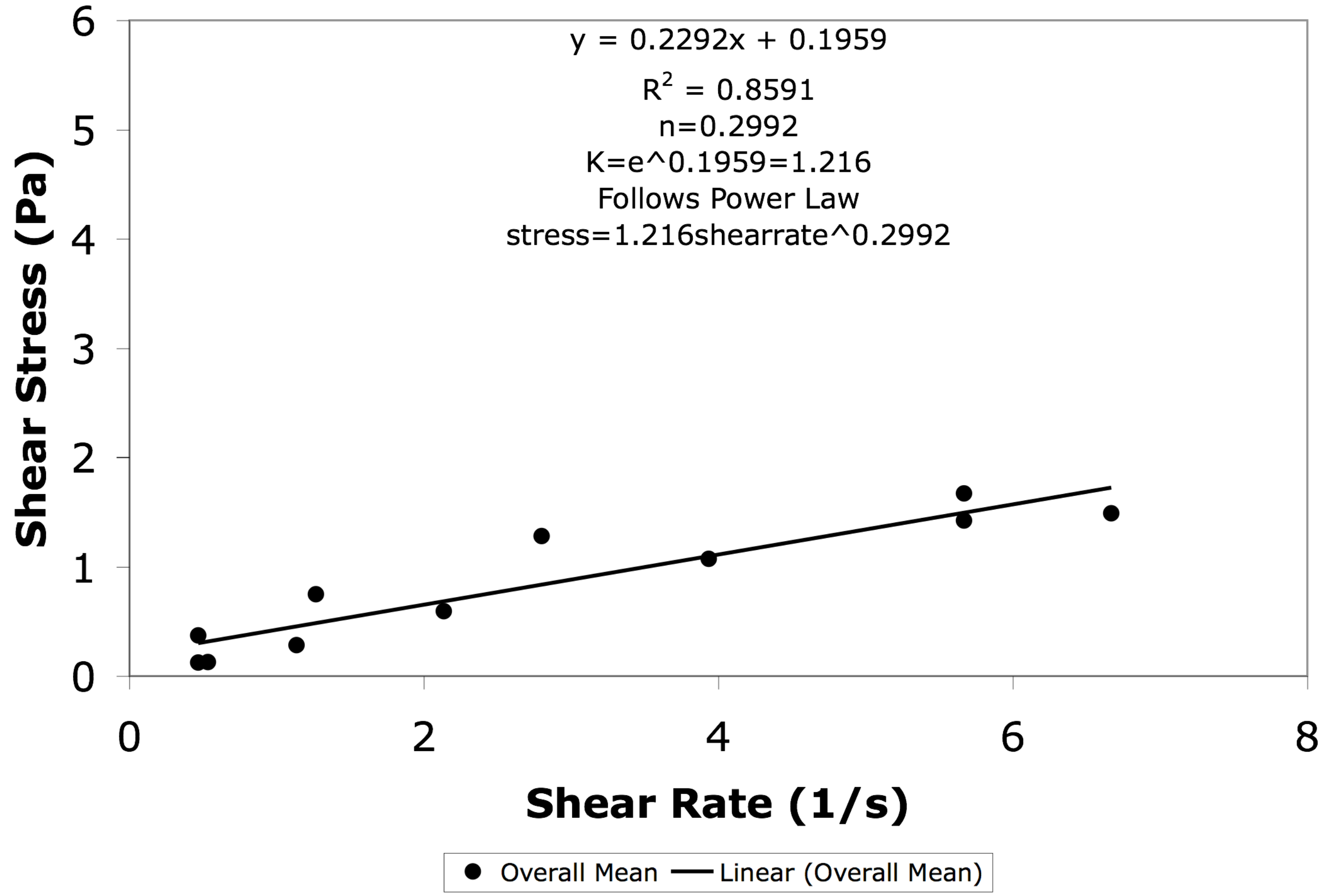
A-35. Fluid behavior for 3.000% SGMC at 48 h and 25 °C.



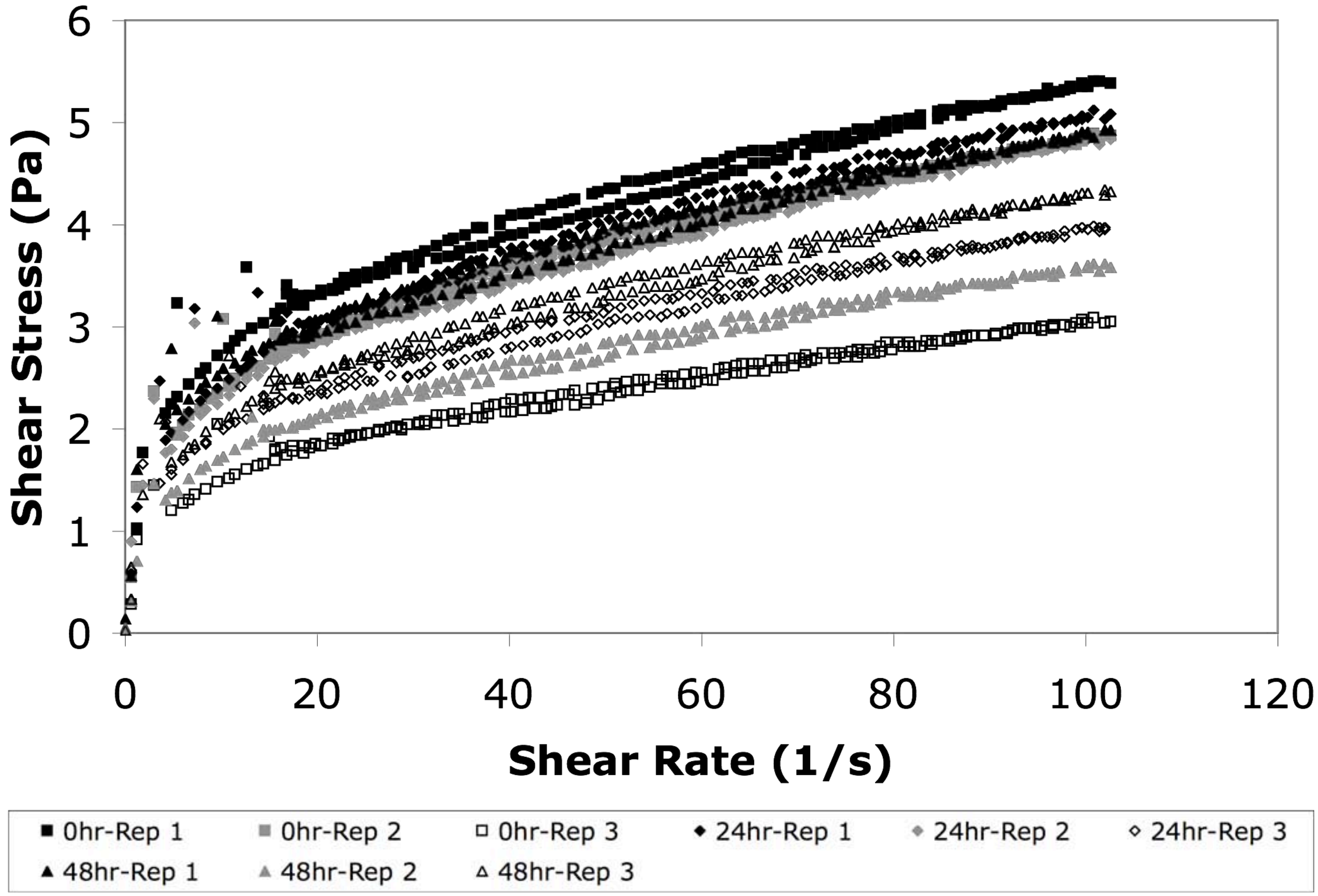
A-36. Fluid behavior for 3.000% SGMC at 25 °C.



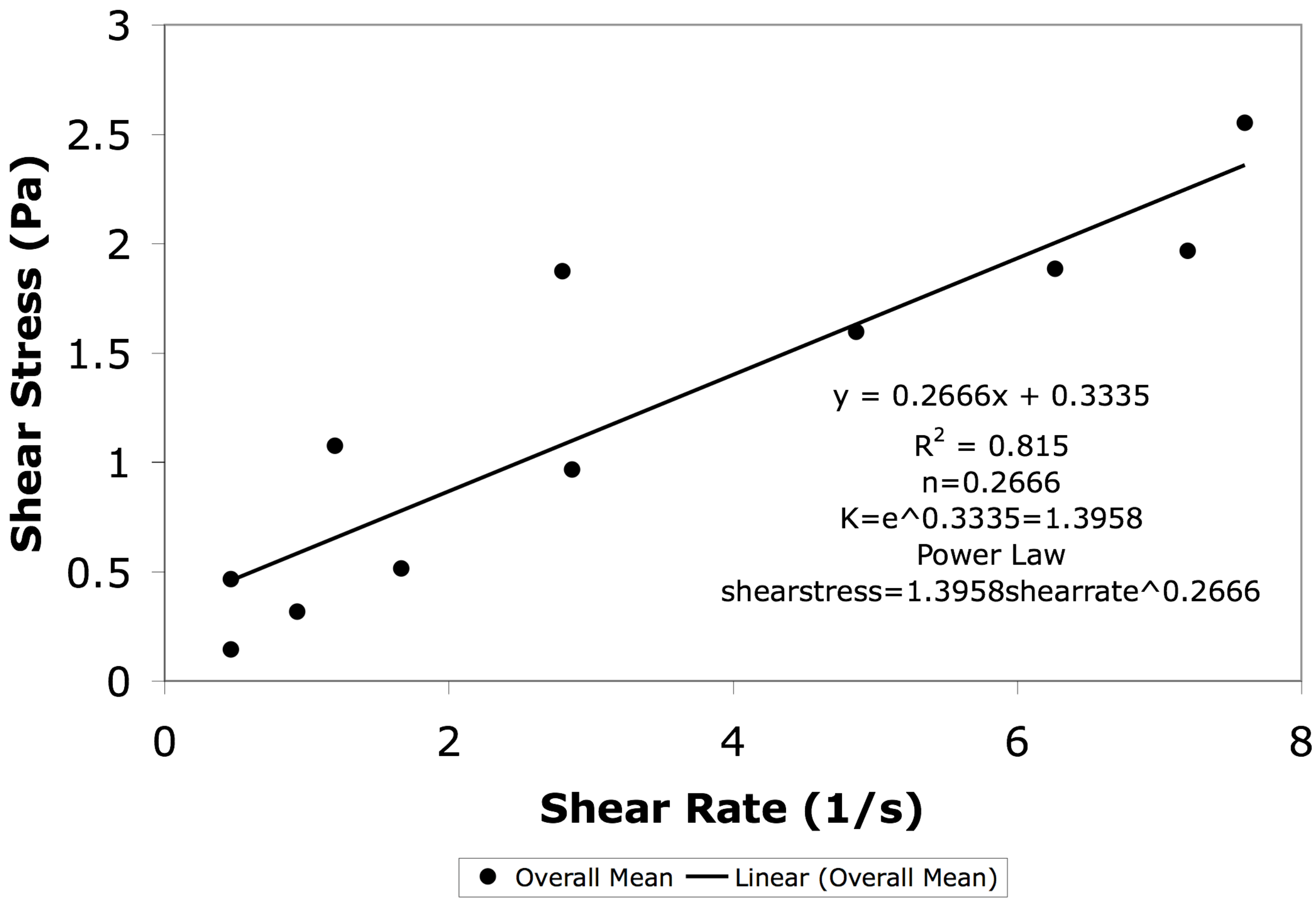
A-37. Fluid behavior for 0.250% XG at 0 h, 24 h, and 48 h and 25 ^{o}C.



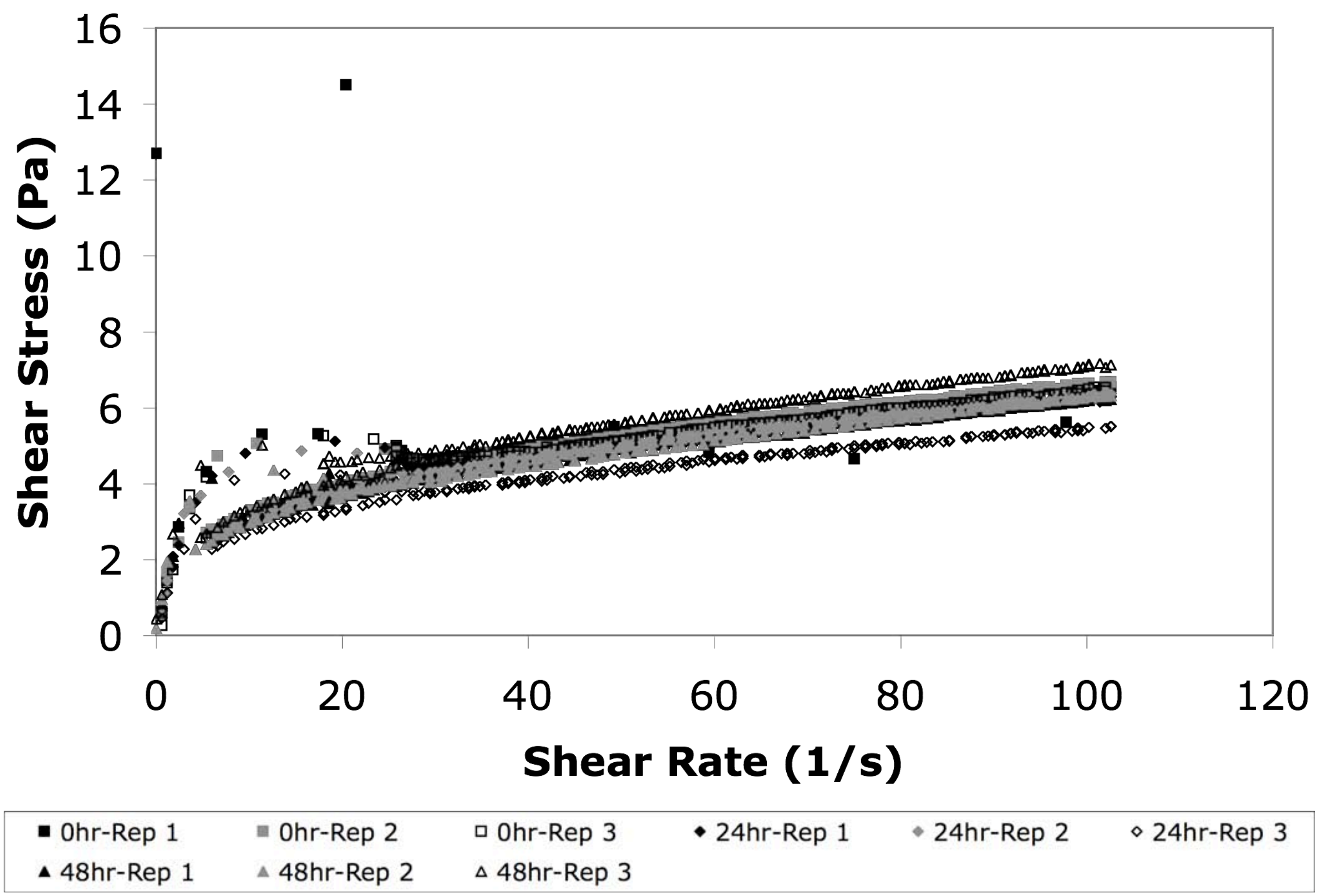
A-38. Mean linear shear-thinning determination of fluid behavior for 0.250% XG at 25 ^{o}C.



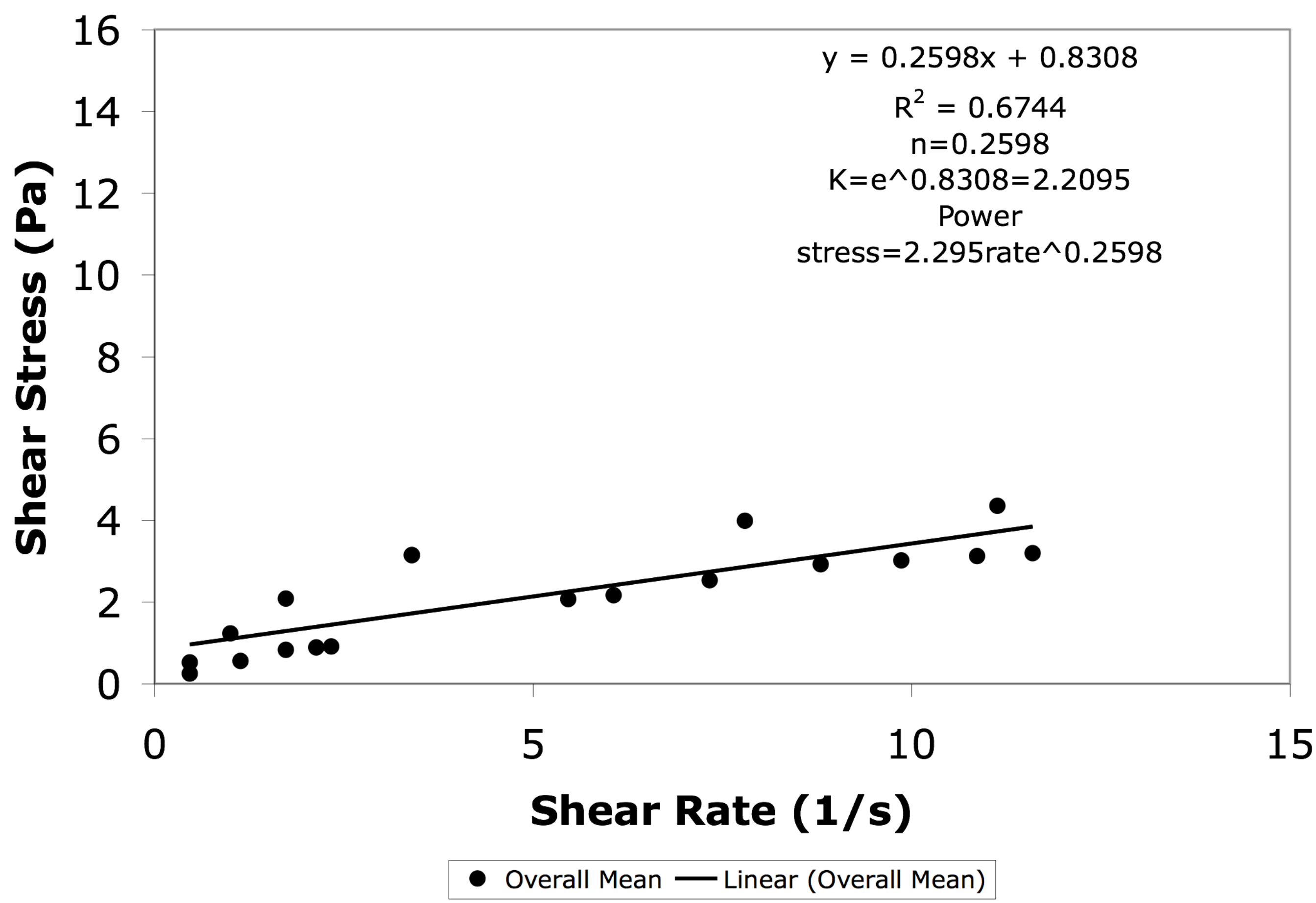
A-39. Fluid behavior for 0.500% XG at 0 h, 24 h, and 48 h and 25 ^{o}C.



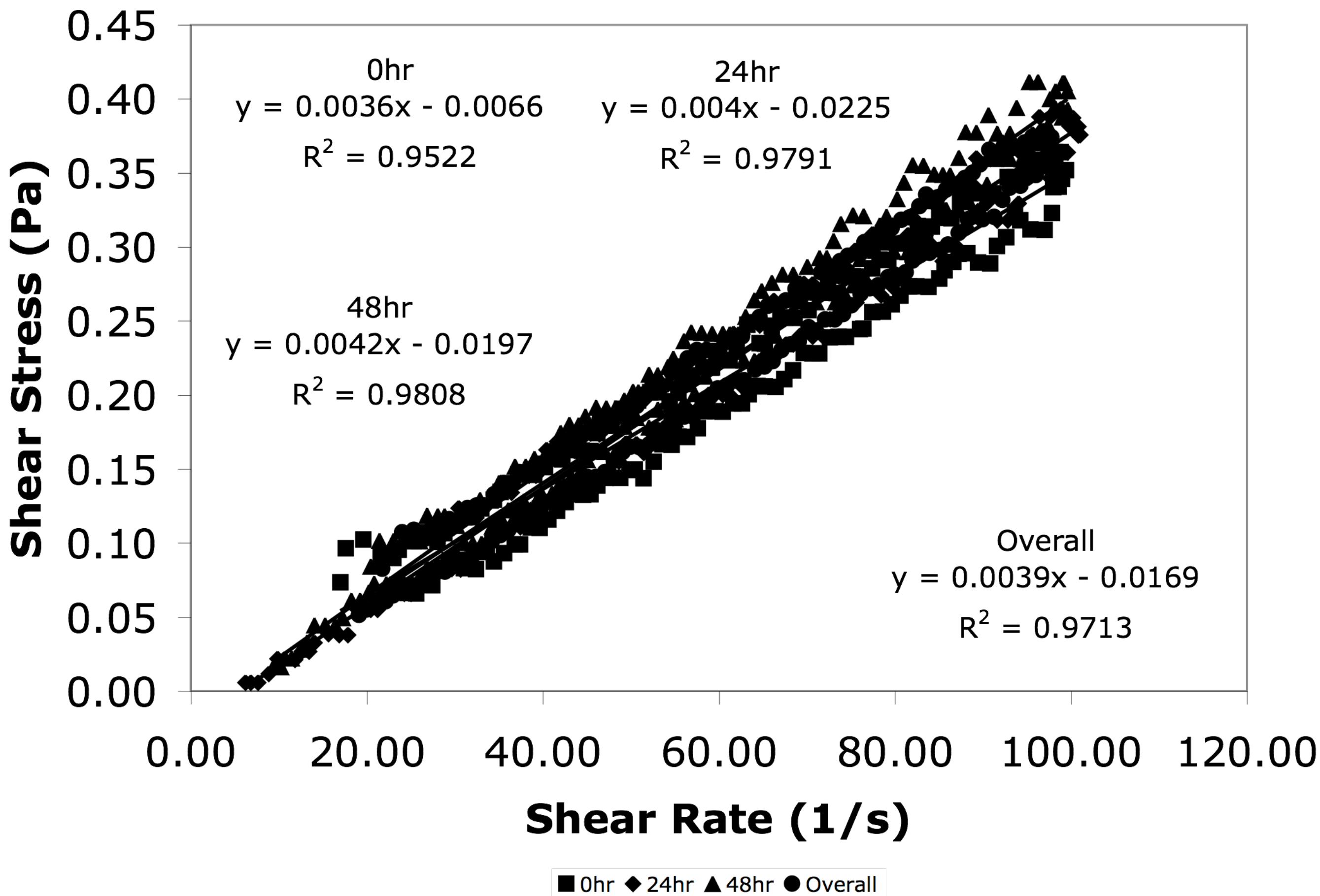
A-40. Mean linear shear-thinning determination of fluid behavior for 0.500% XG at 25 ^{o}C.



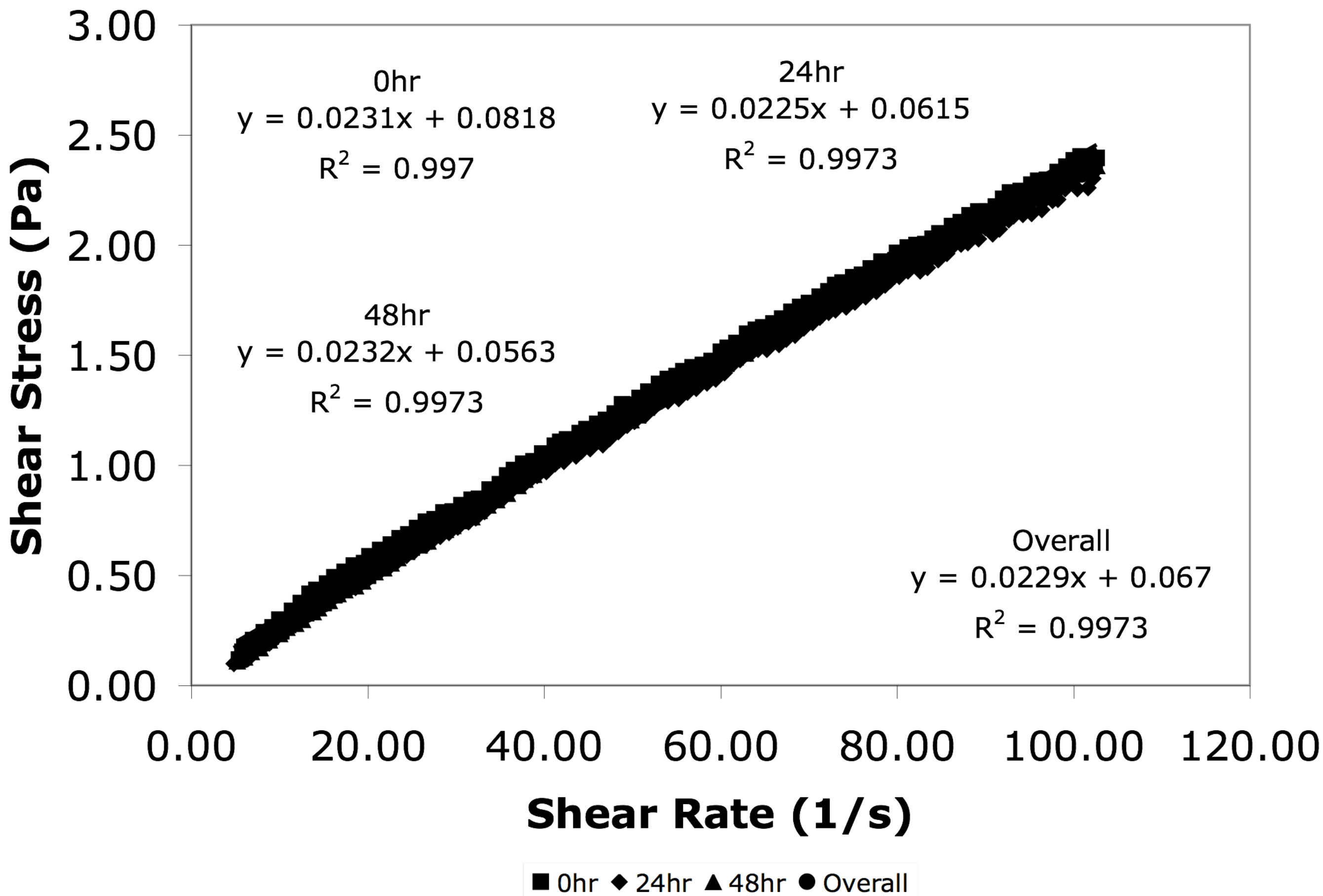
A-41. Fluid behavior for 0.750% XG at 0 h, 24 h, and 48 h and 25 ^{o}C.



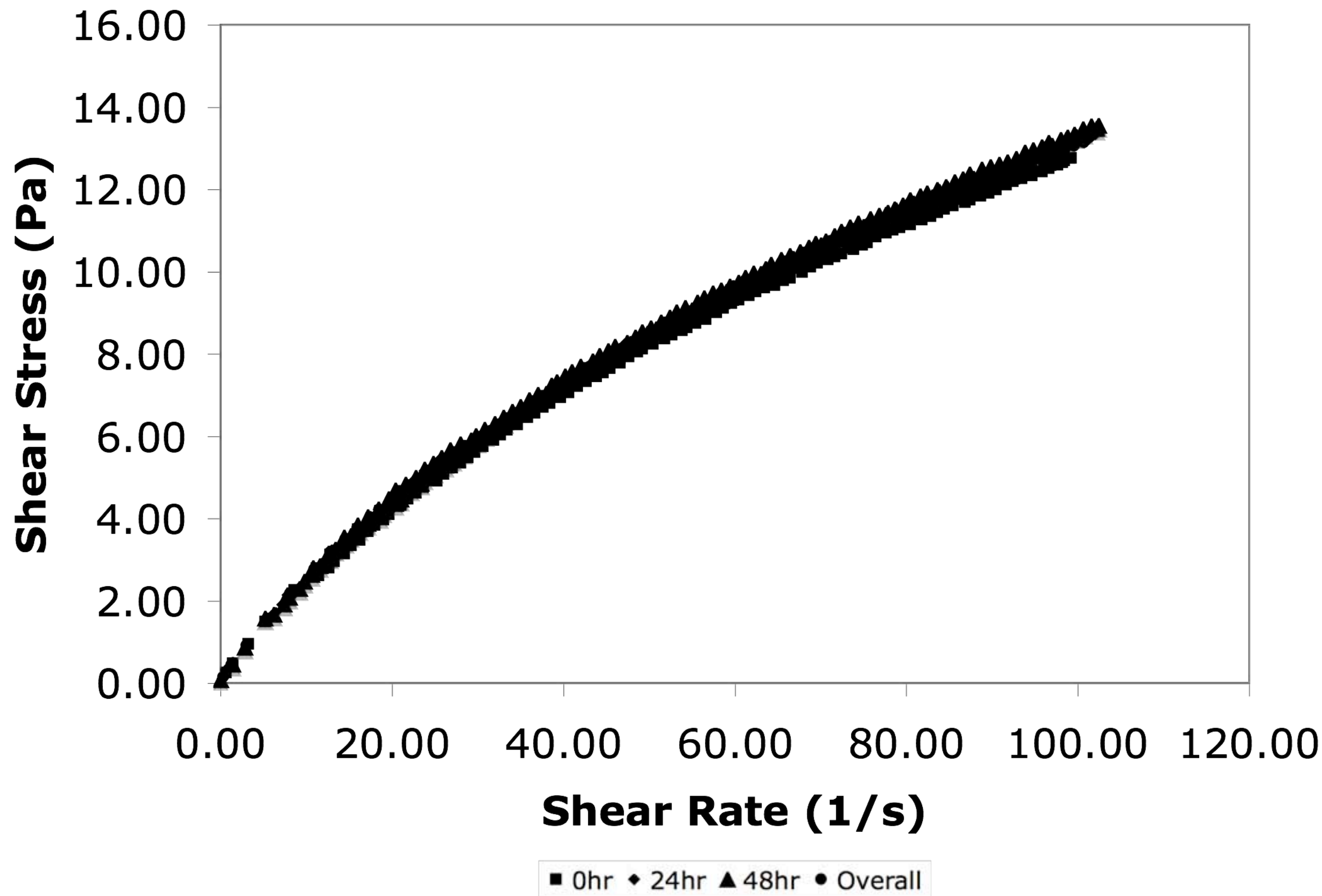
A-42. Mean linear shear-thinning determination of fluid behavior for 0.750% XG at 25 ^oC.



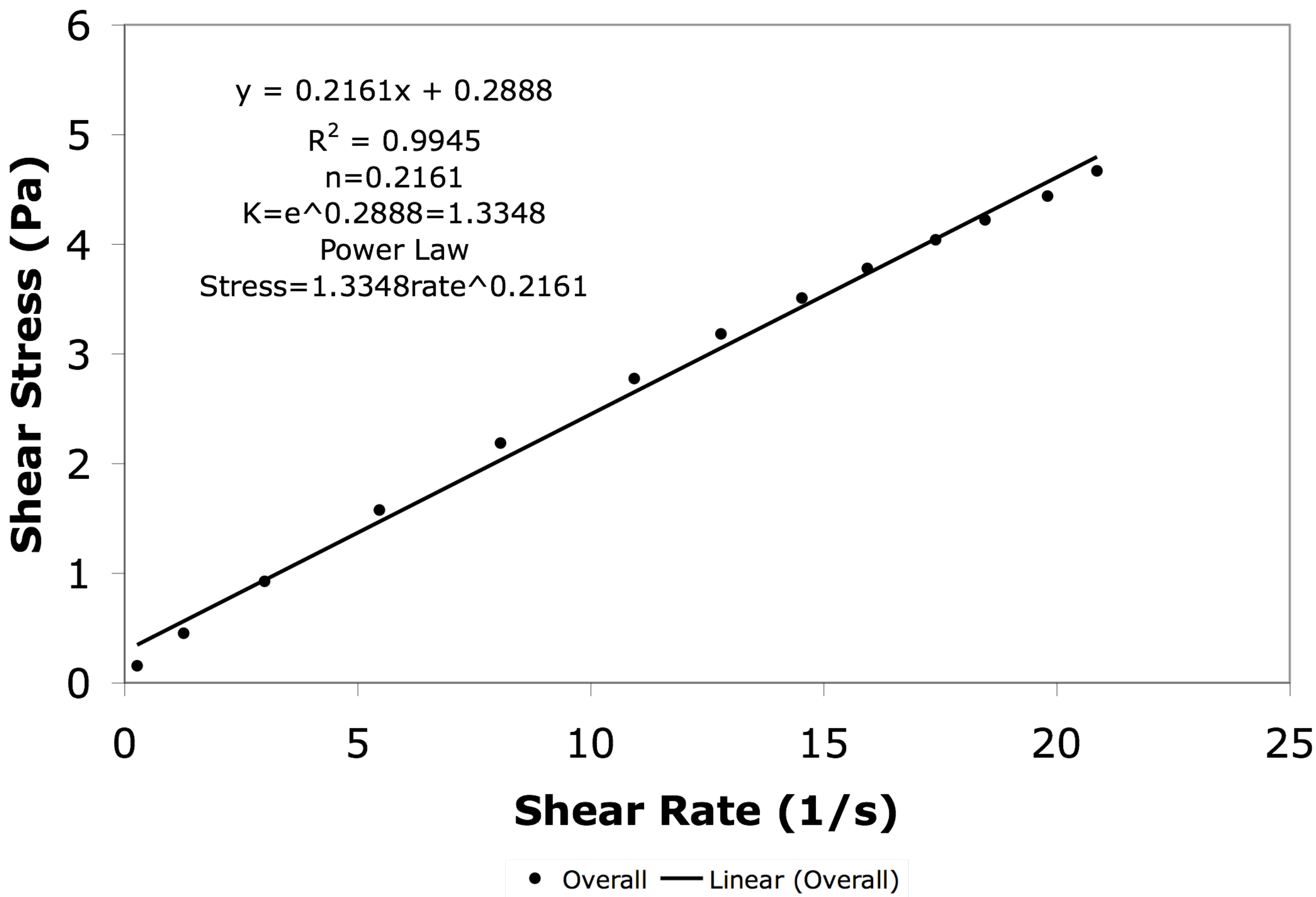
A-43. Fluid behavior for 0.125% KF at 25 °C.



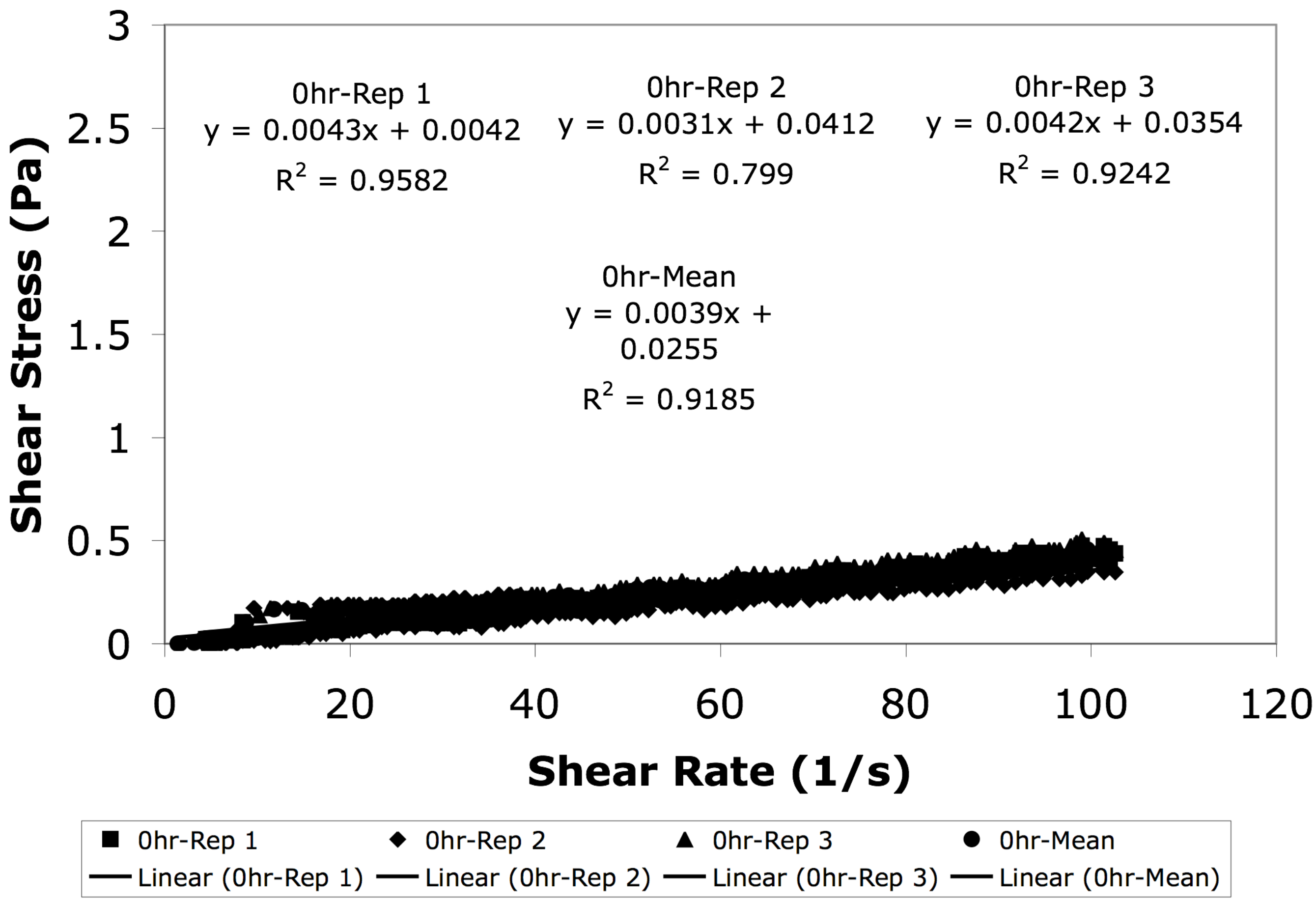
A-44. Fluid behavior for 0.250% KF at 25 °C.



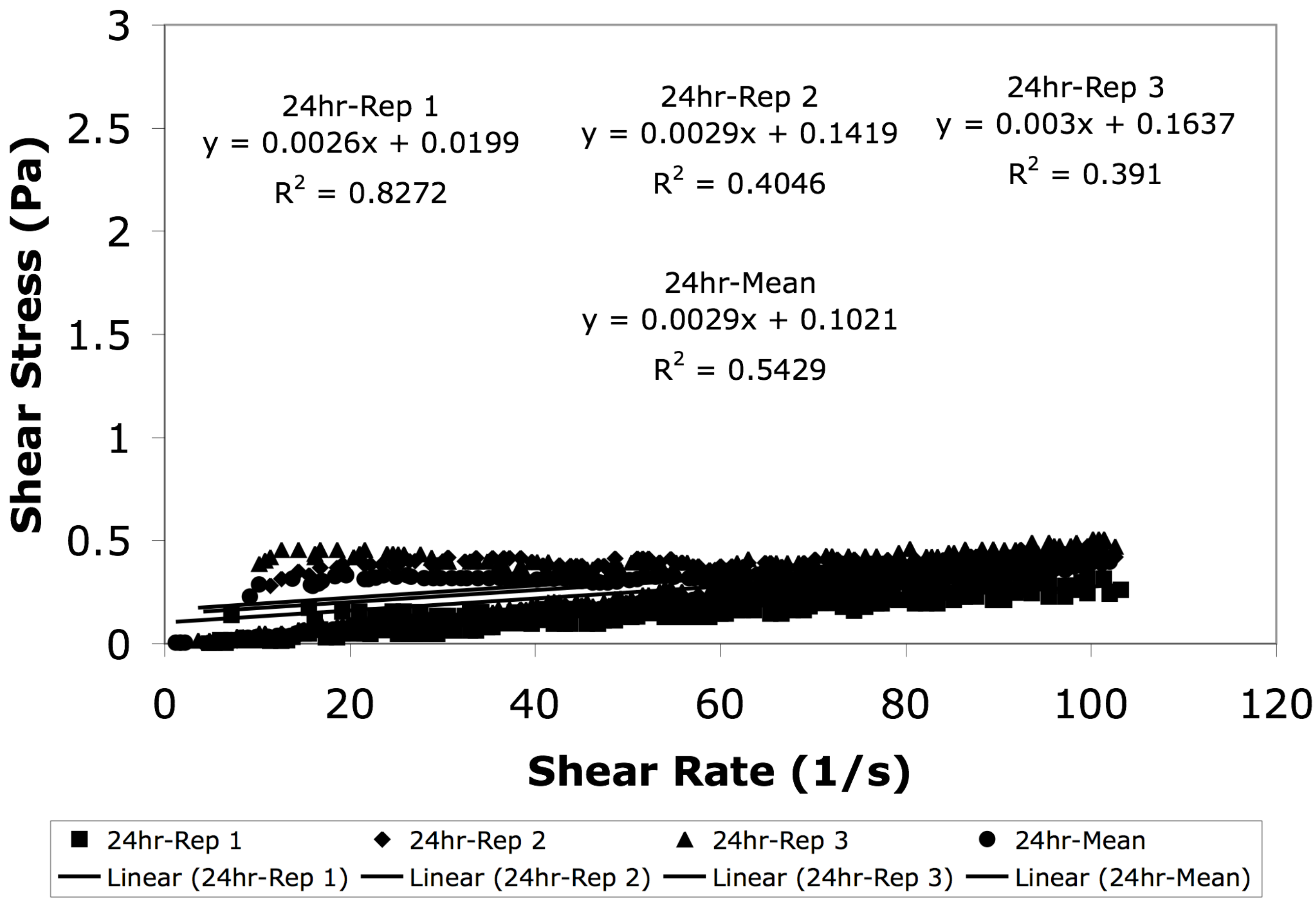
A-45. Fluid behavior for 0.500% KF at 0 h, 24 h, and 48 h and 25 ^{o}C.



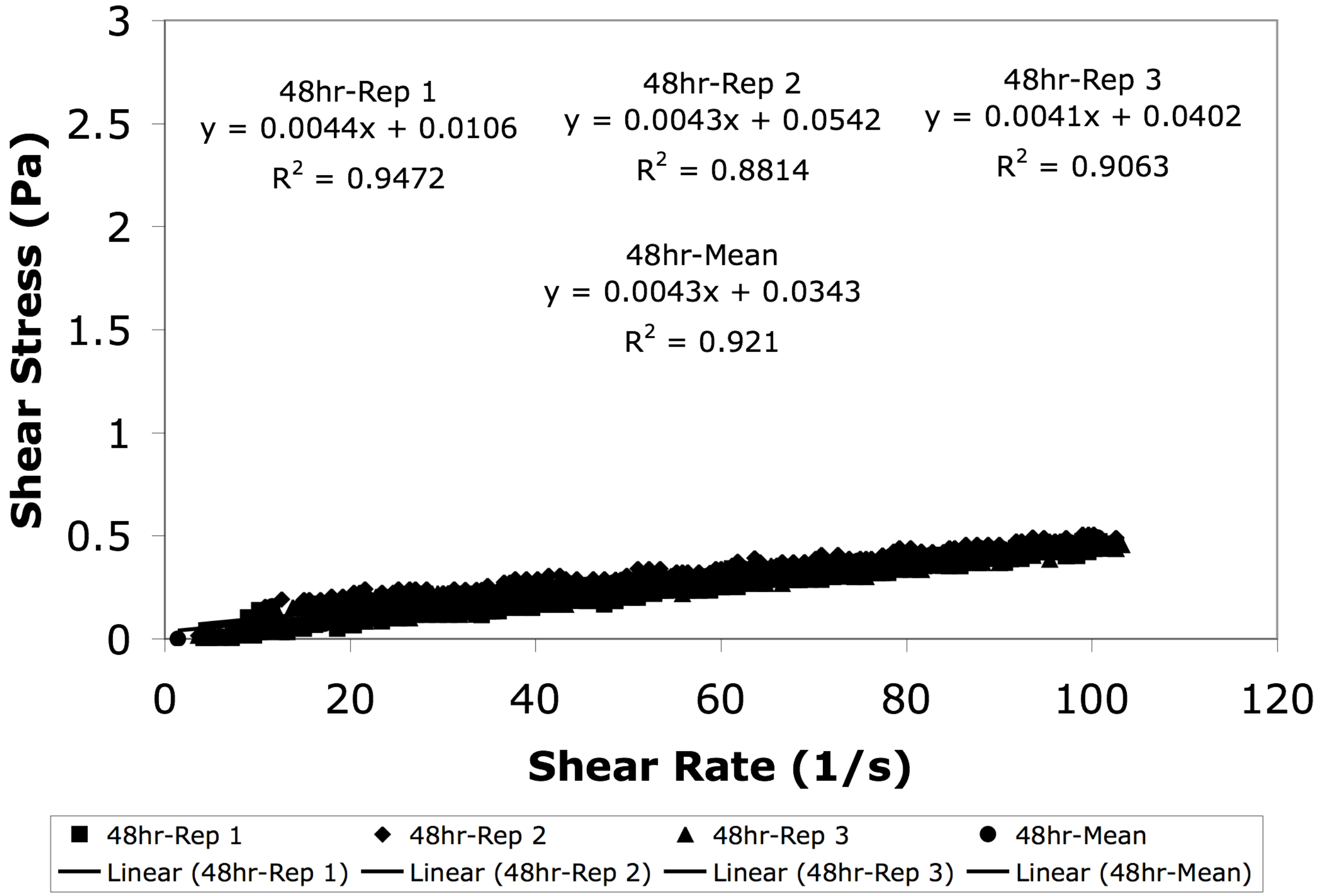
A-46. Mean linear shear-thinning determination of fluid behavior for 0.500% KF at 25 °C.



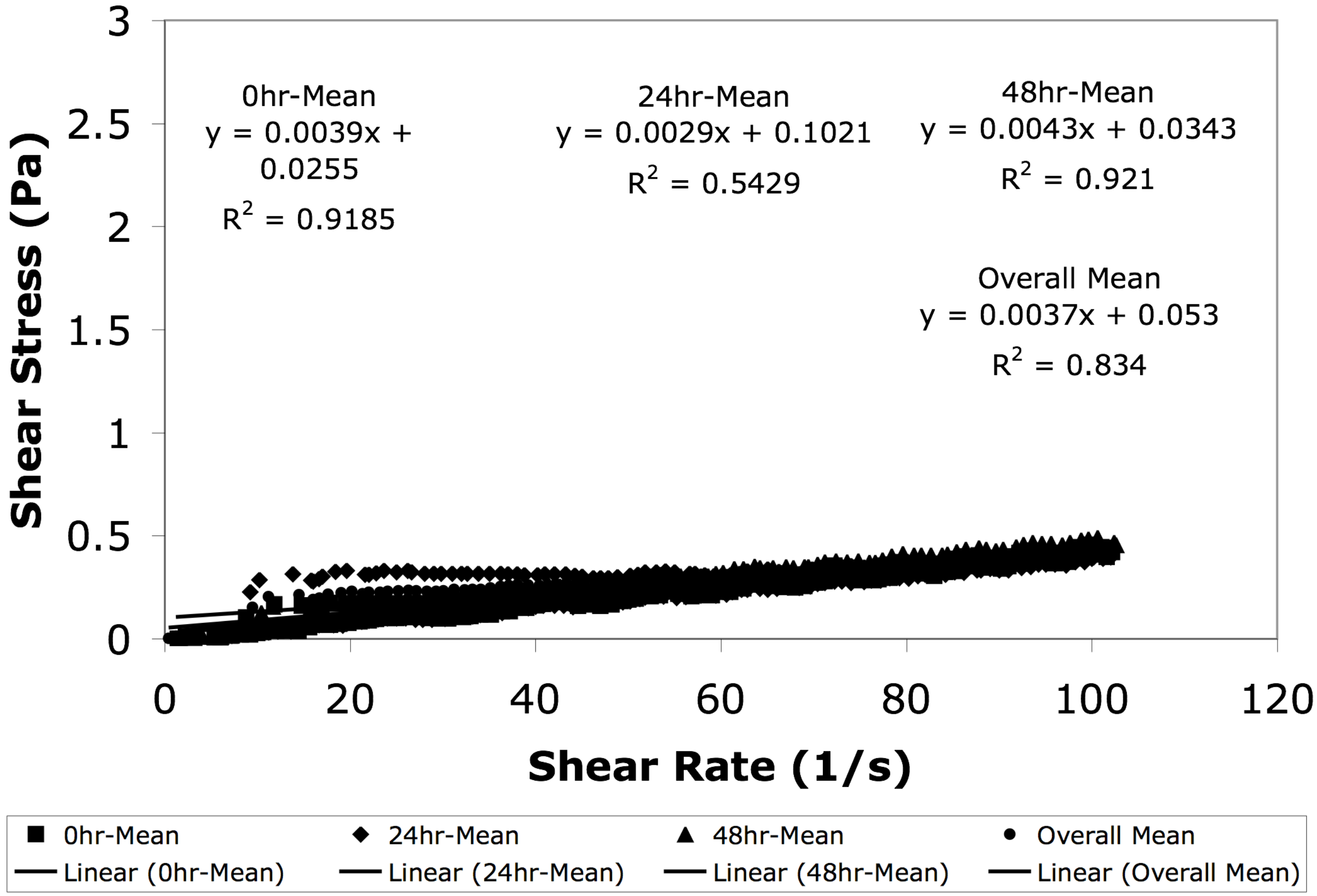
A-47. Fluid behavior for 0.250% GG at 0 h and 25 °C.



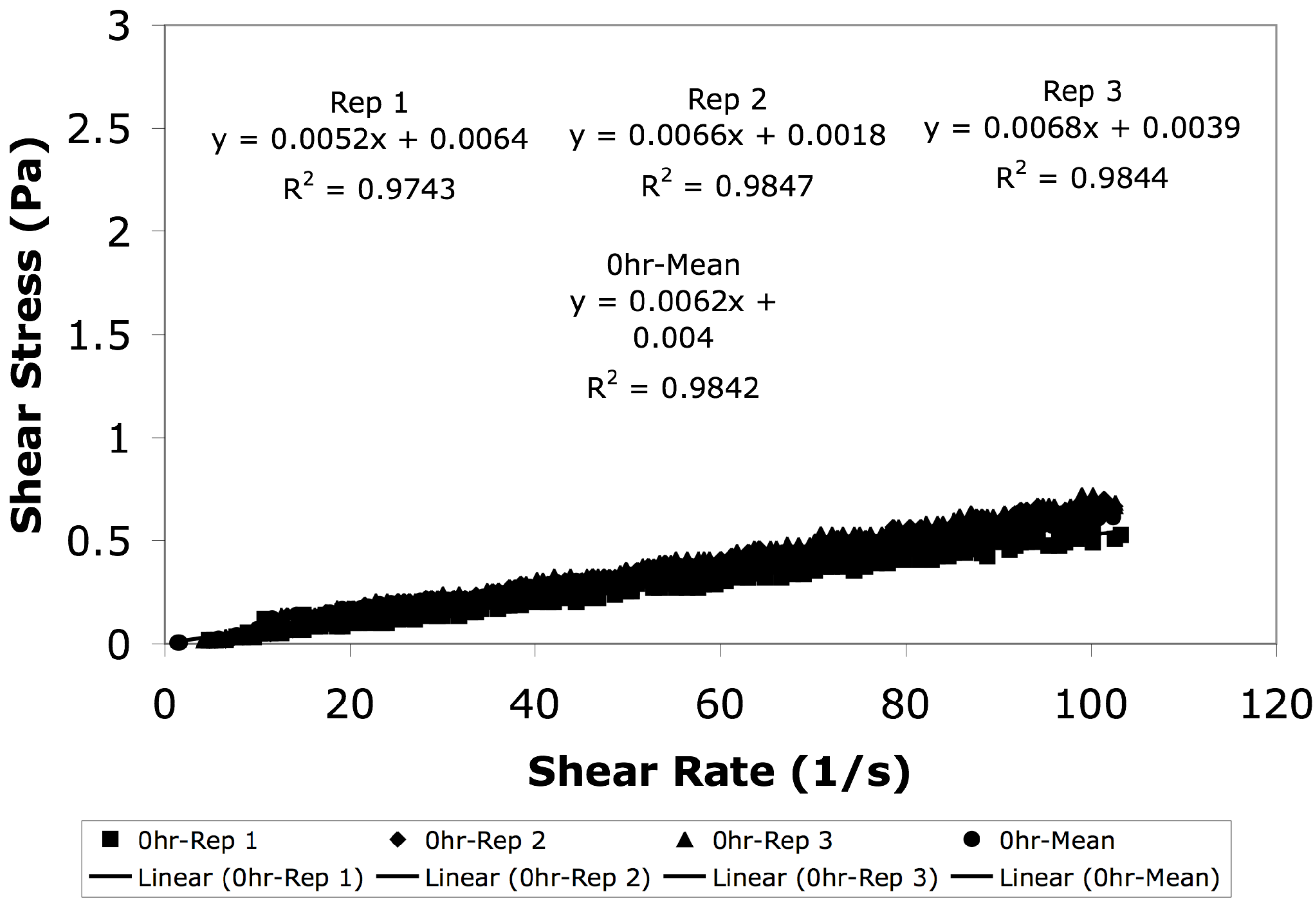
A-48. Fluid behavior for 0.250% GG at 24 h and 25 ^{o}C.



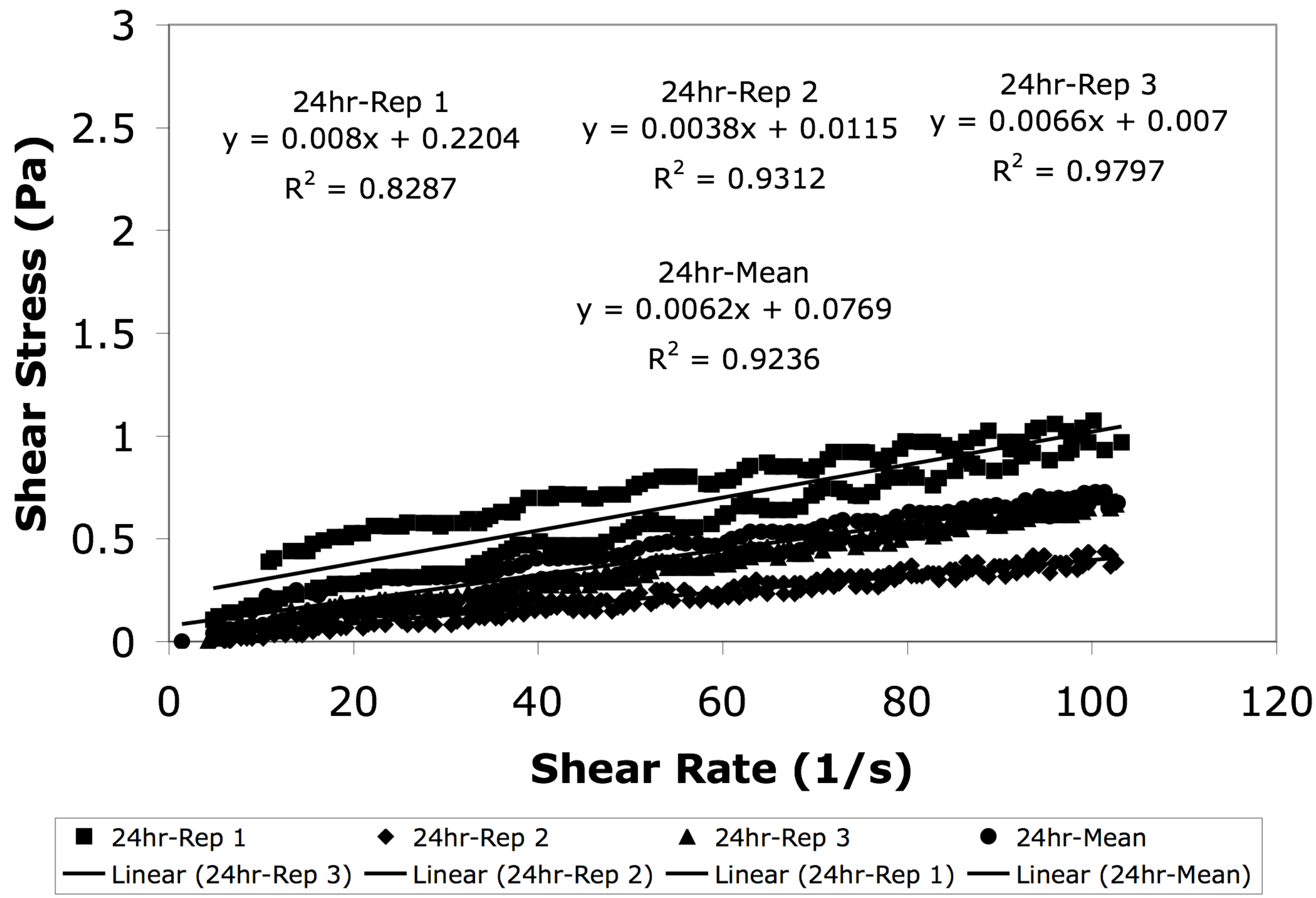
A-49. Fluid behavior for 0.250% GG at 48 h and 25 °C.



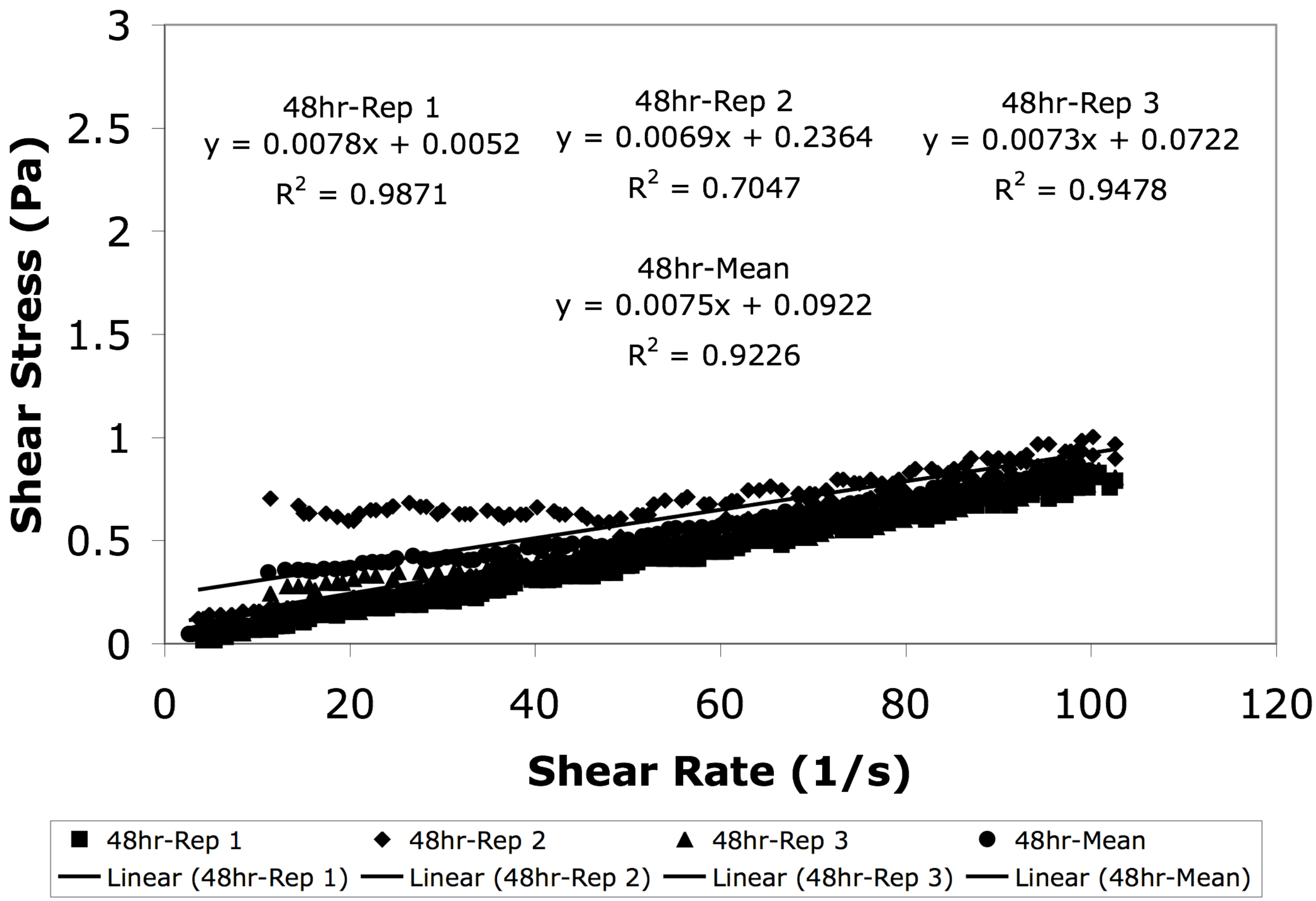
A-50. Fluid behavior for 0.250% GG at 25 ^{o}C.



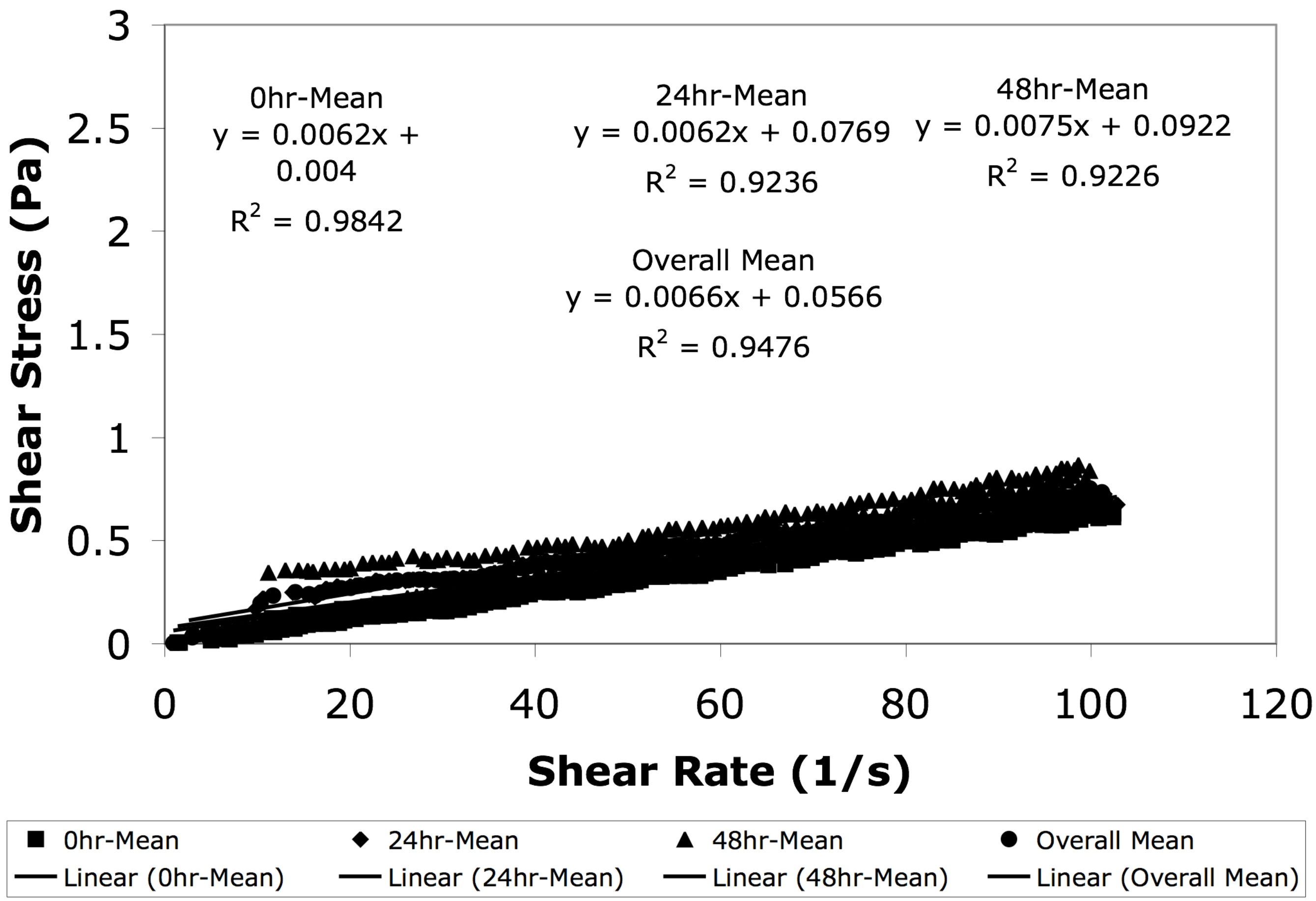
A-51. Fluid behavior for 0.500% GG at 0 h and 25 ^{o}C.



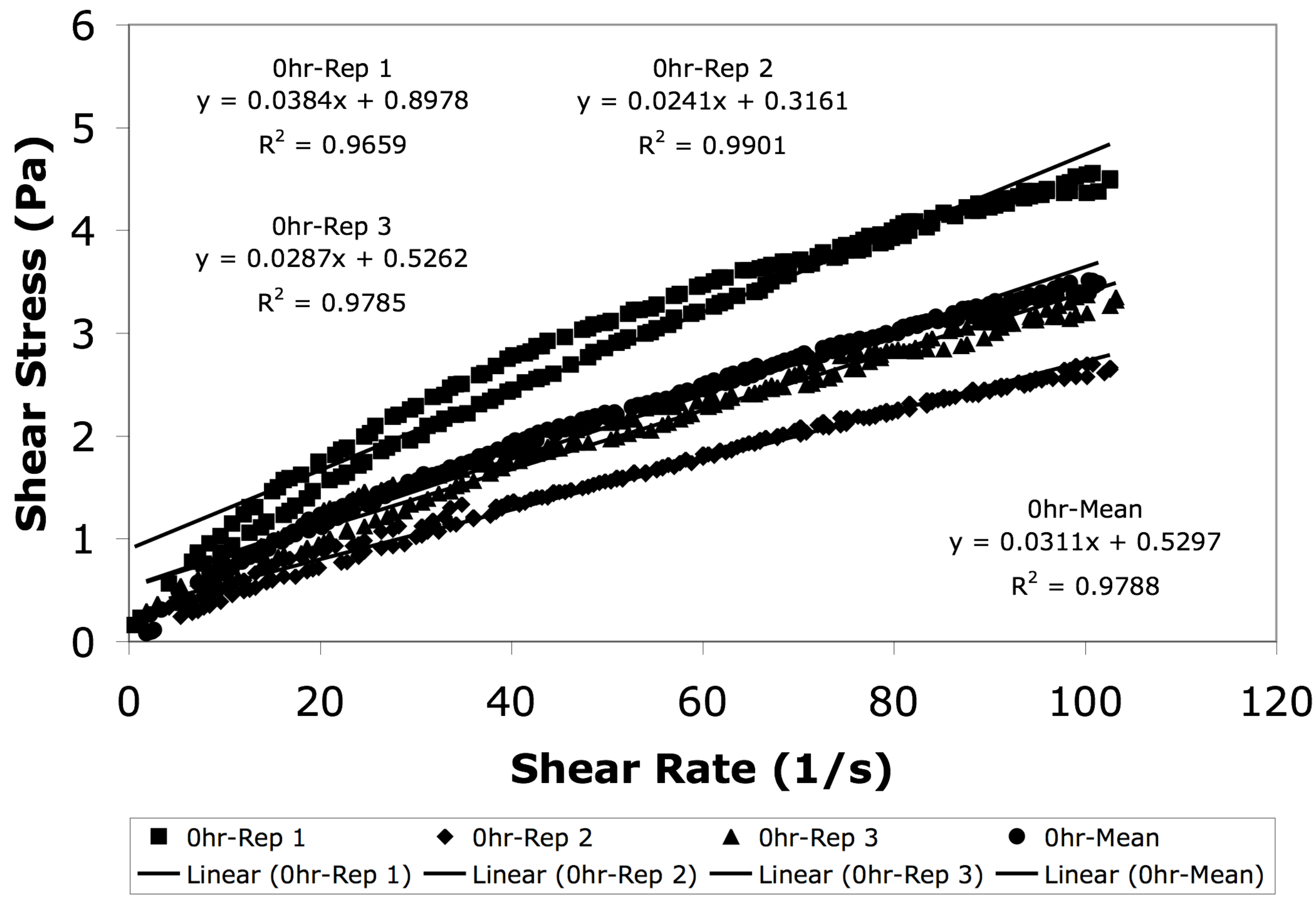
A-52. Fluid behavior for 2.000% SGMC at 24 h and 25 ^{o}C.



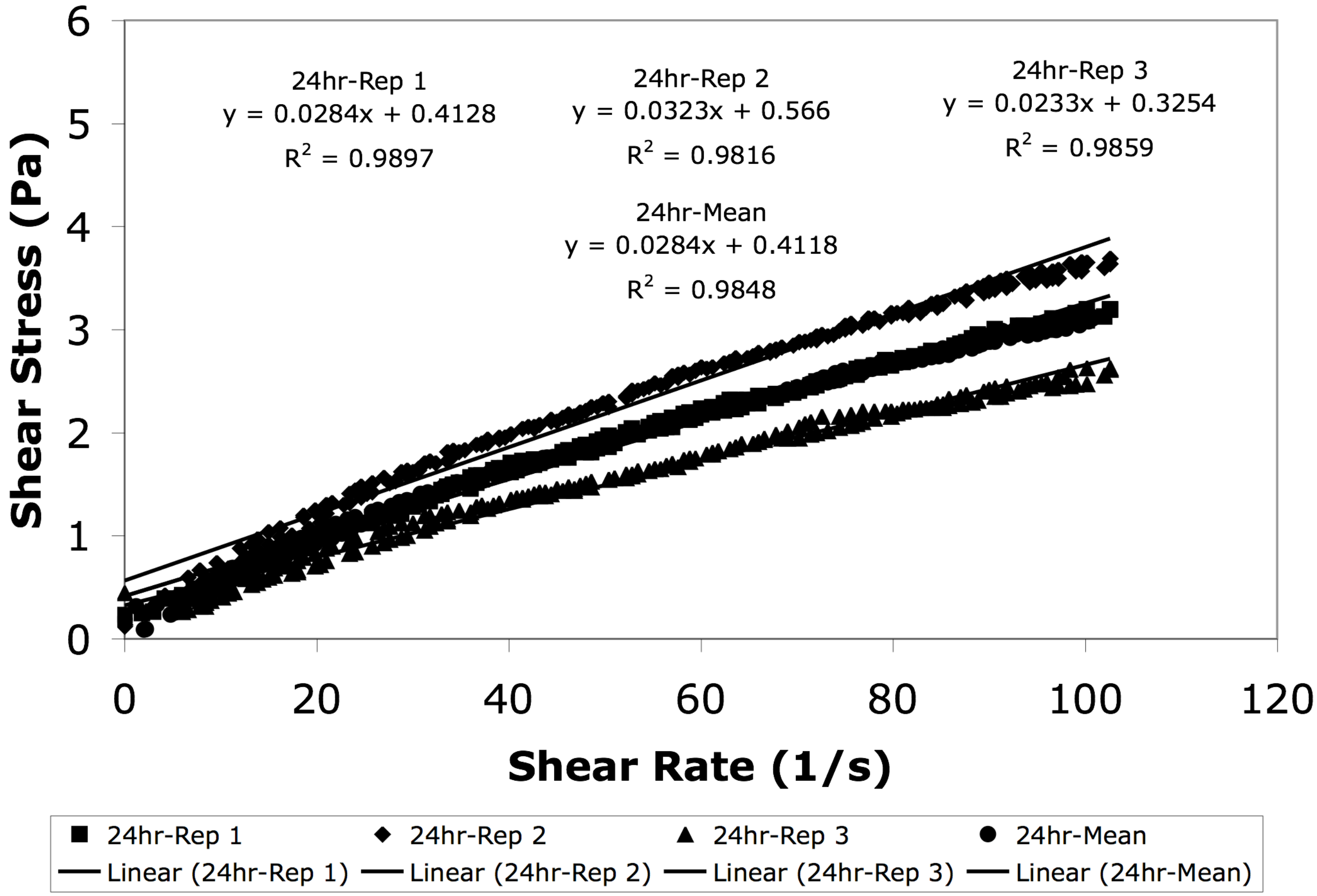
A-53. Fluid behavior for 0.500% GG at 48 h and 25 °C.



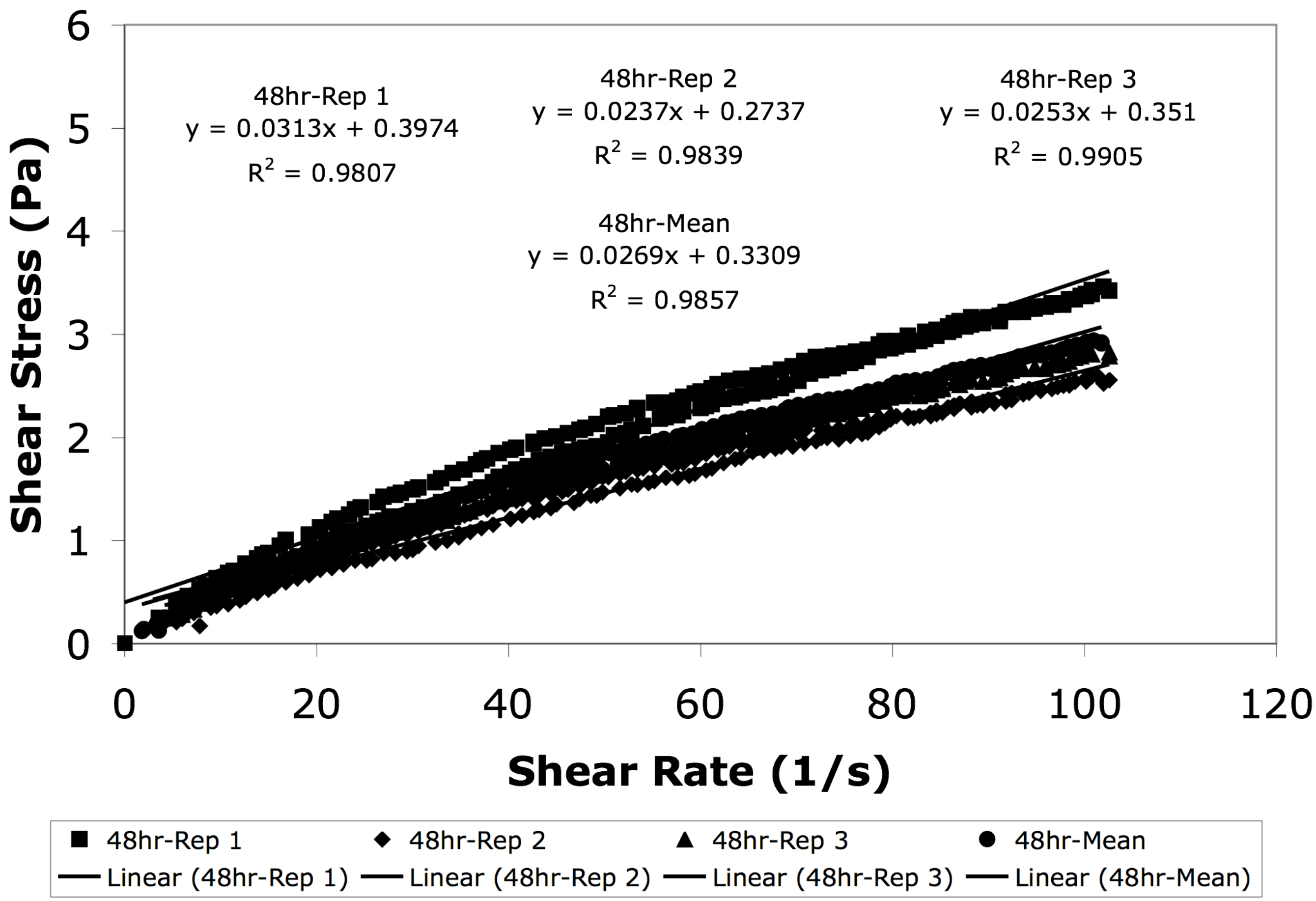
A-54. Fluid behavior for 0.500% GG at 25 ^{o}C.



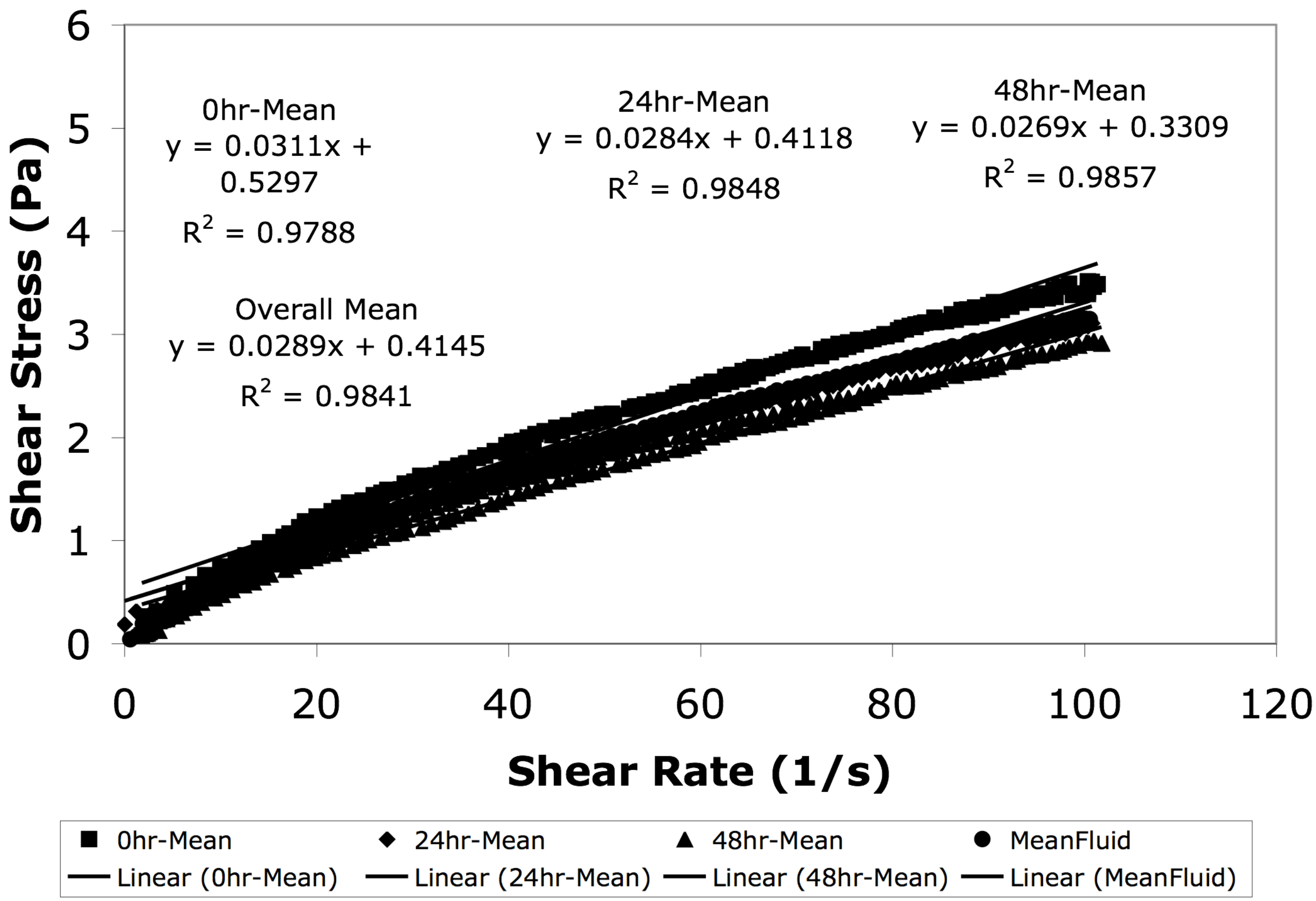
A-55. Fluid behavior for 0.750% GG at 0 h and 25 ^oC.



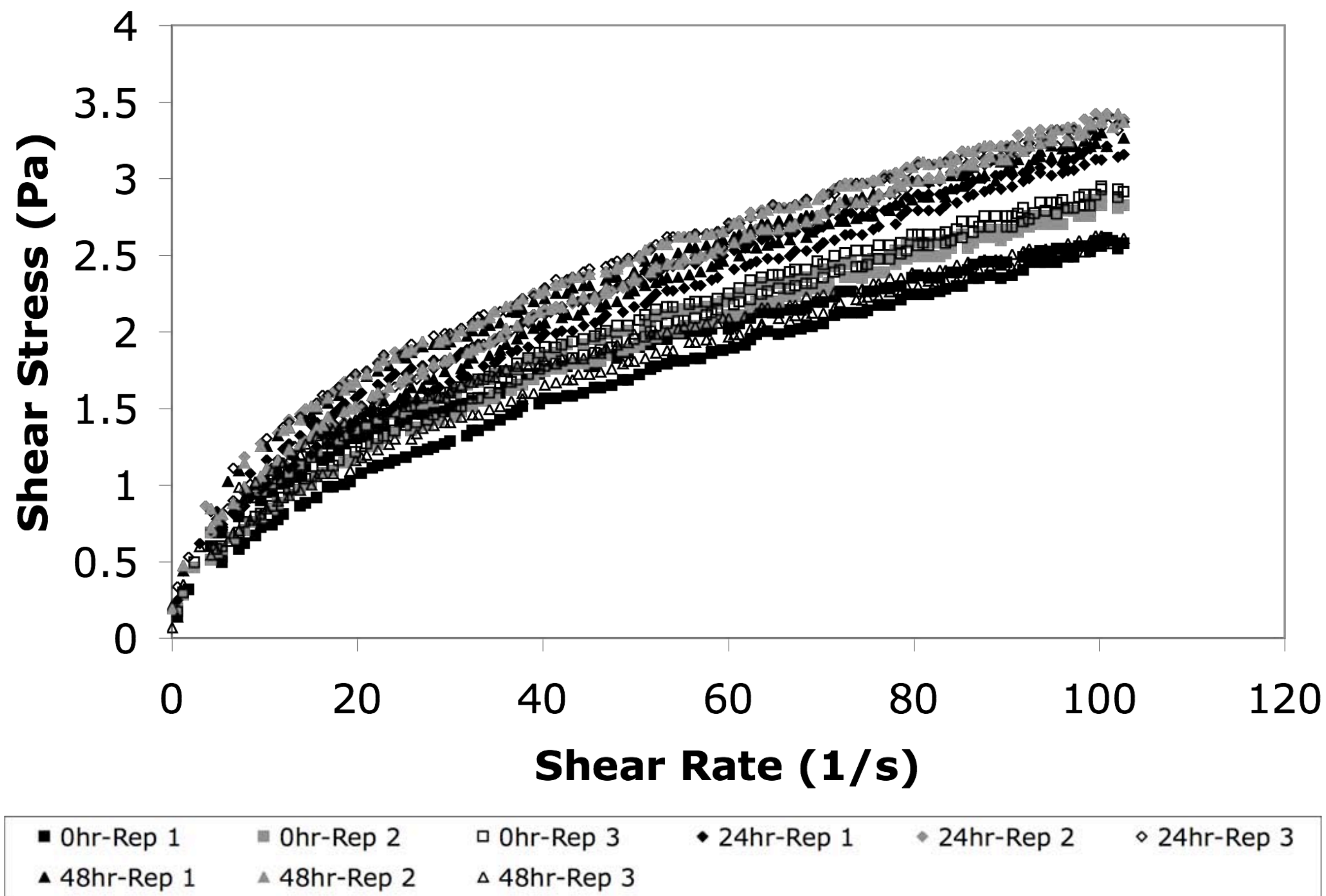
A-56. Fluid behavior for 0.750% GG at 24 h and 25 ^{o}C.



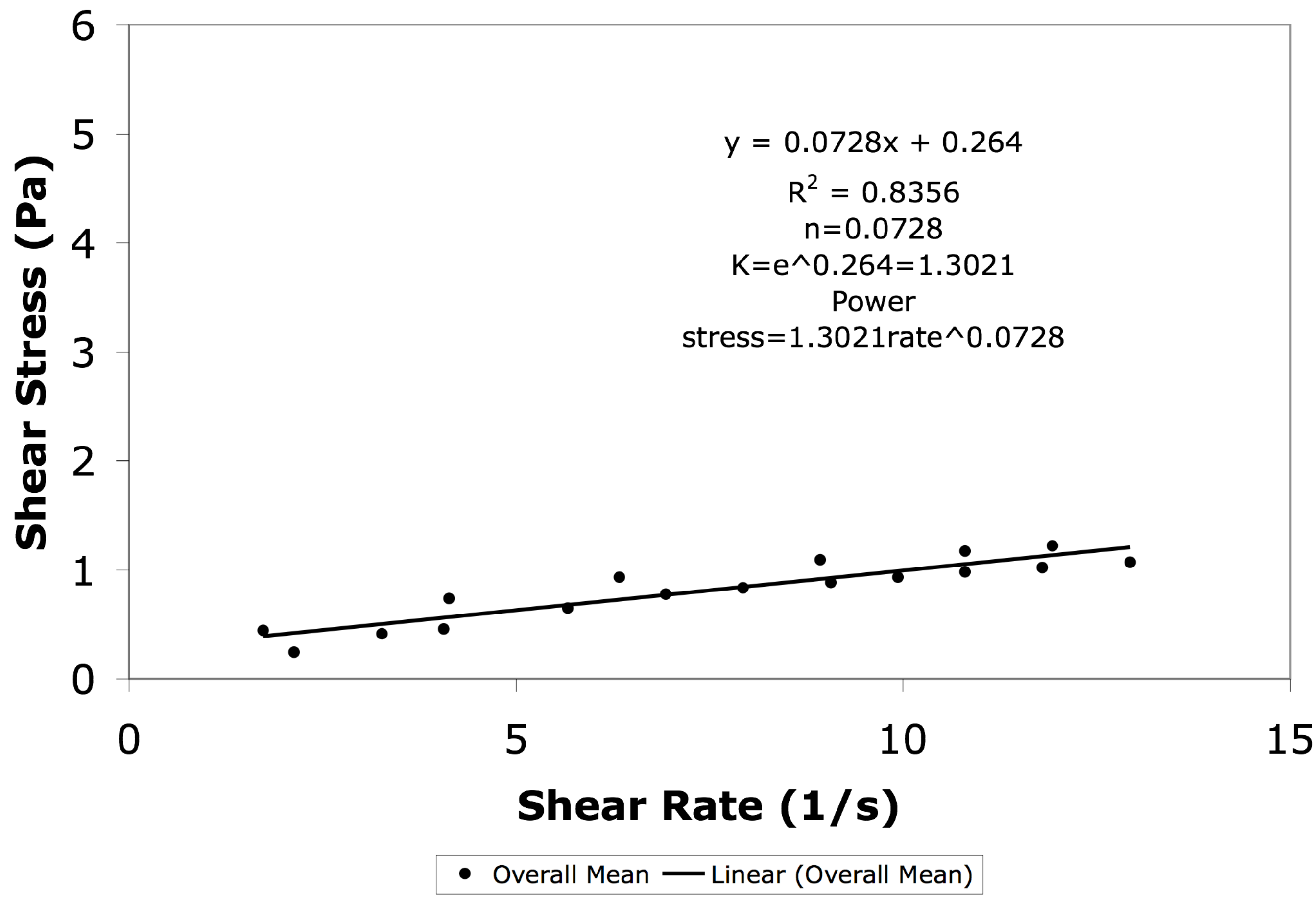
A-57. Fluid behavior for 0.750% GG at 48 h and 25 ^oC.



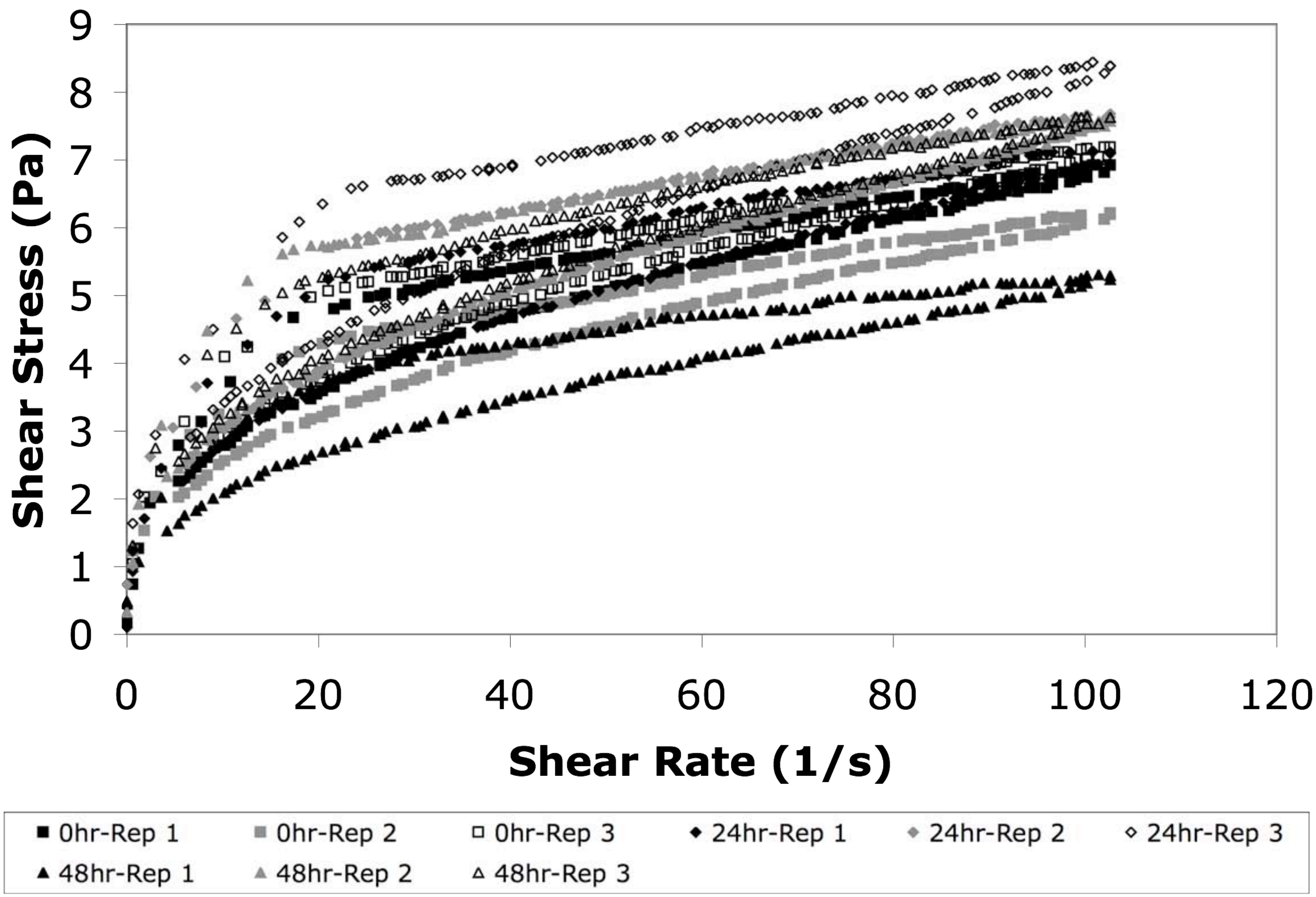
A-58. Fluid behavior for 0.750% GG at 25 ^{o}C.



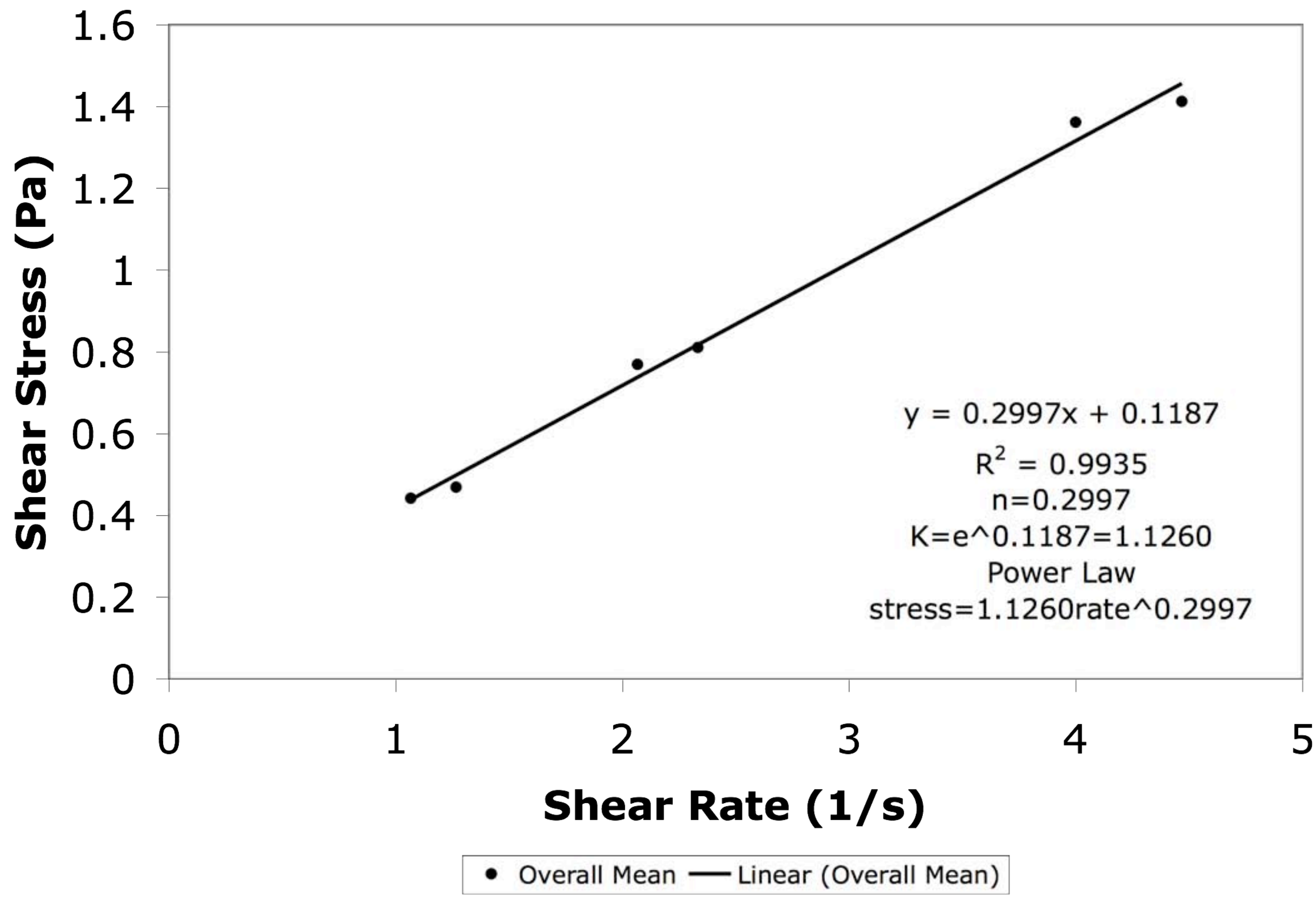
A-59. Fluid behavior for 0.0625% GGLT at 0 h, 24 h, and 48 h and 25 ^{o}C.



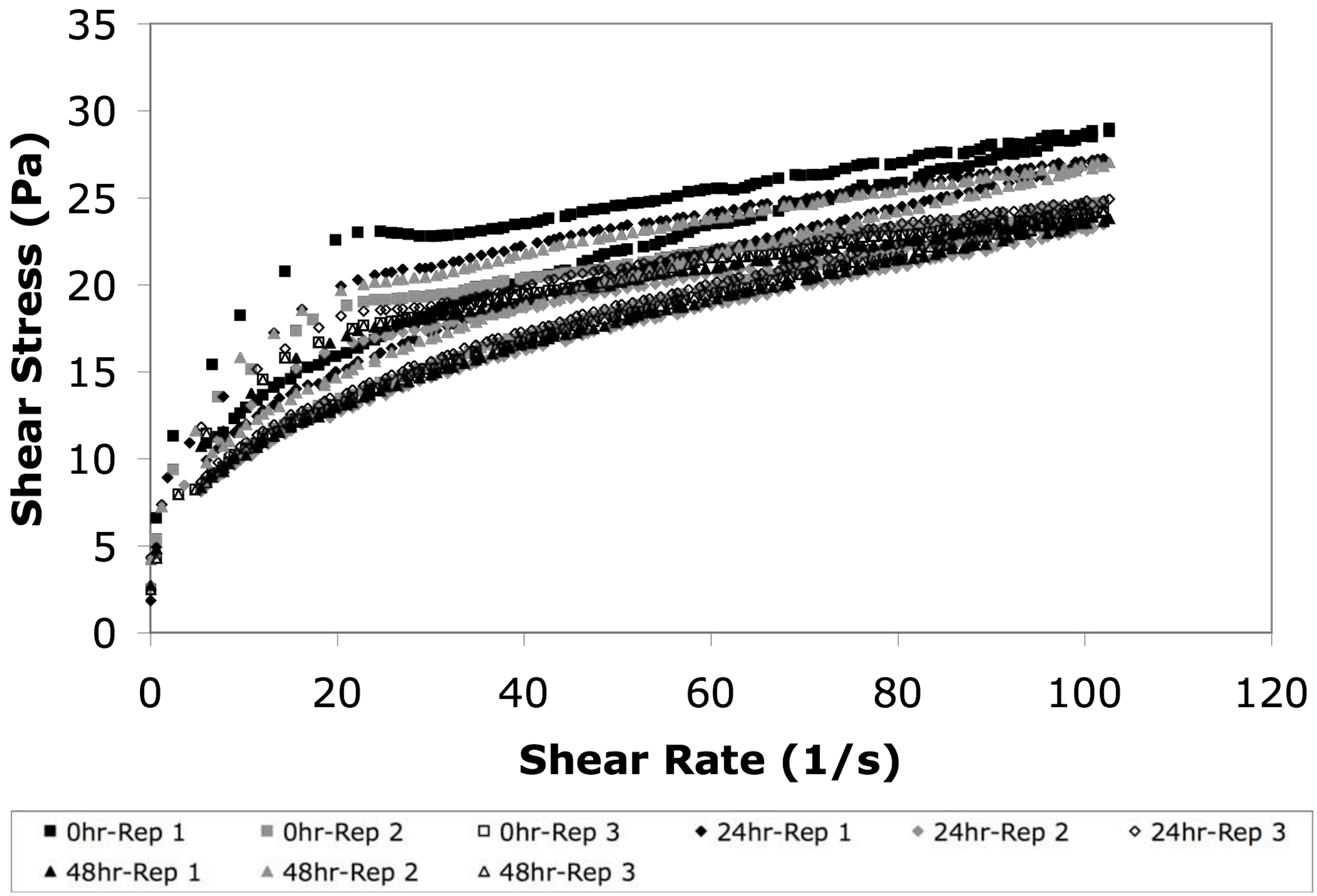
A-60. Mean linear shear-thinning determination of fluid behavior for 0.0625% GGLT at 25 ^{o}C.



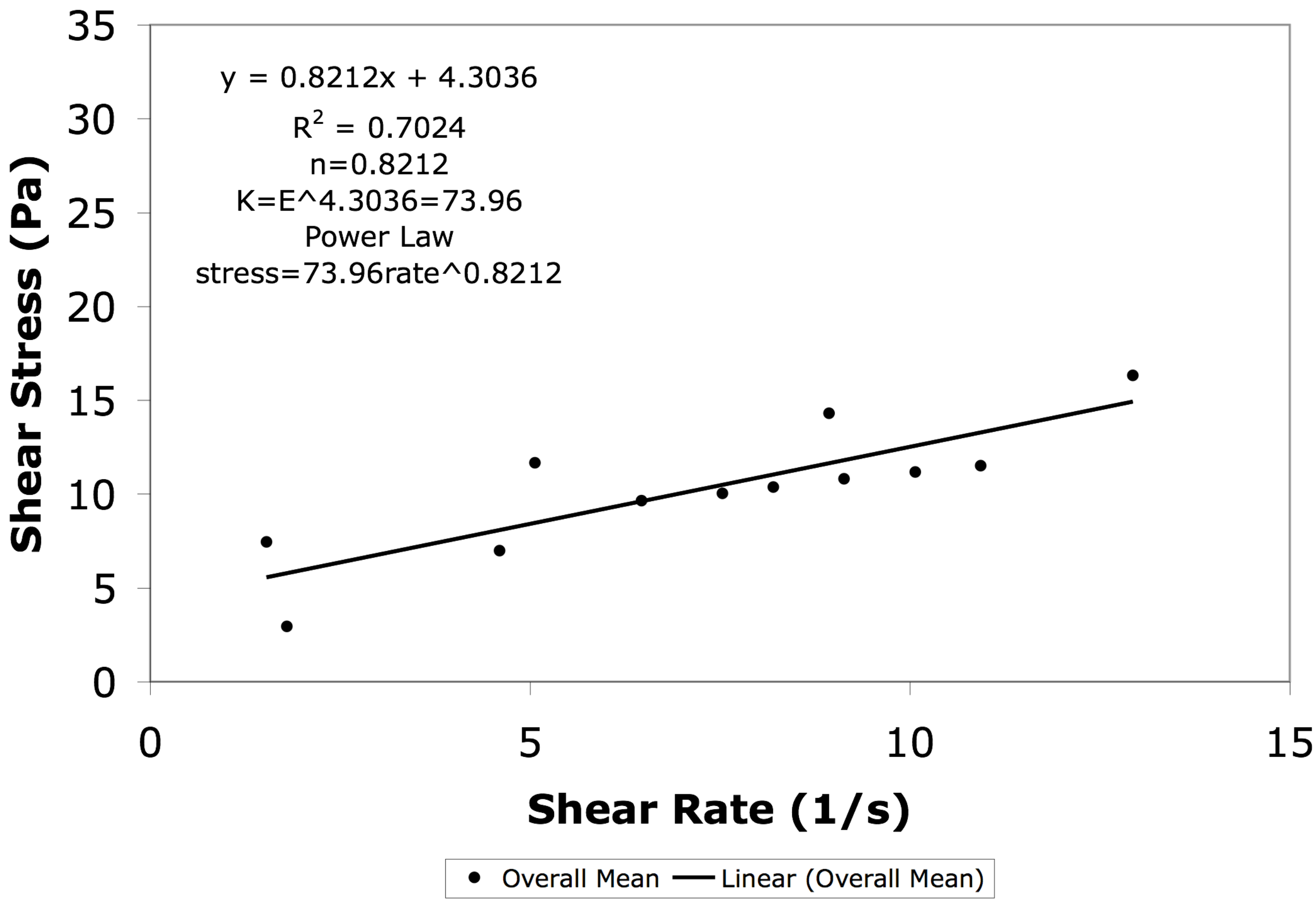
A-61. Fluid behavior for 0.125% GGLT at 0 h, 24 h, and 48 h and 25 ^{o}C.



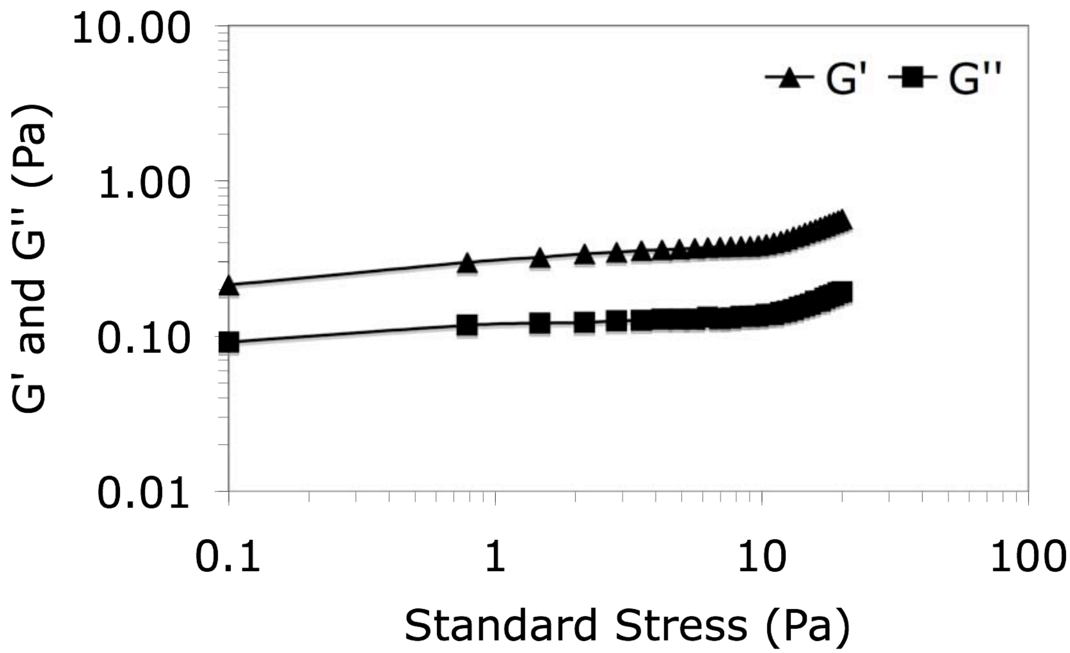
A-62. Mean linear shear-thinning determination of fluid behavior for 0.125% GGLT at 25 ^{o}C.



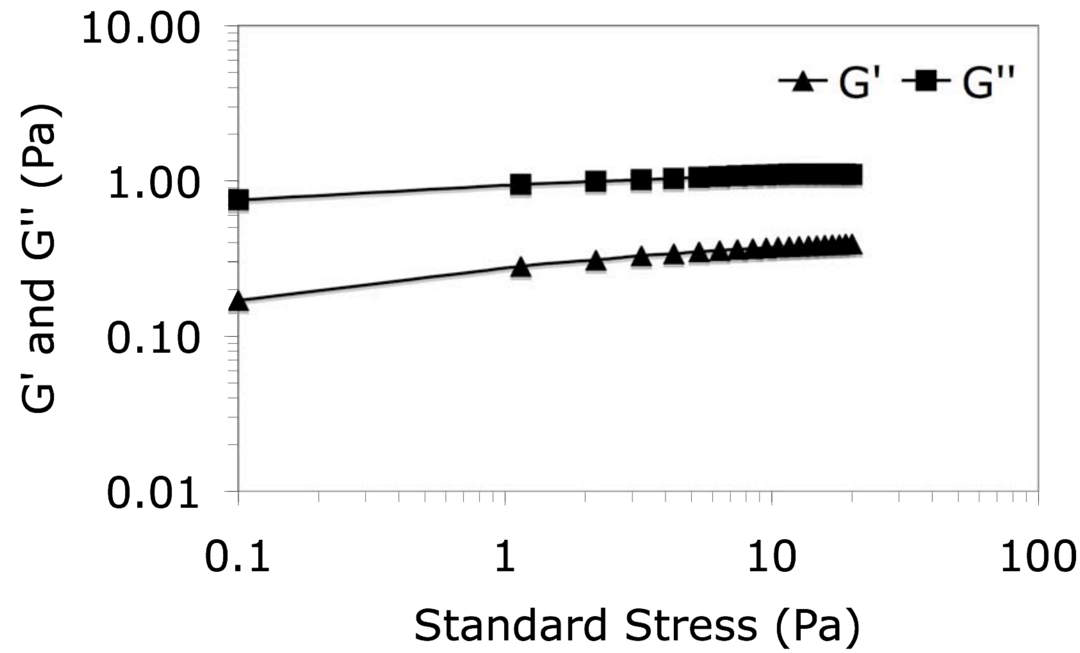
A-63. Fluid behavior for 0.250% GGLT at 0 h, 24 h, and 48 h and 25 ^{o}C.



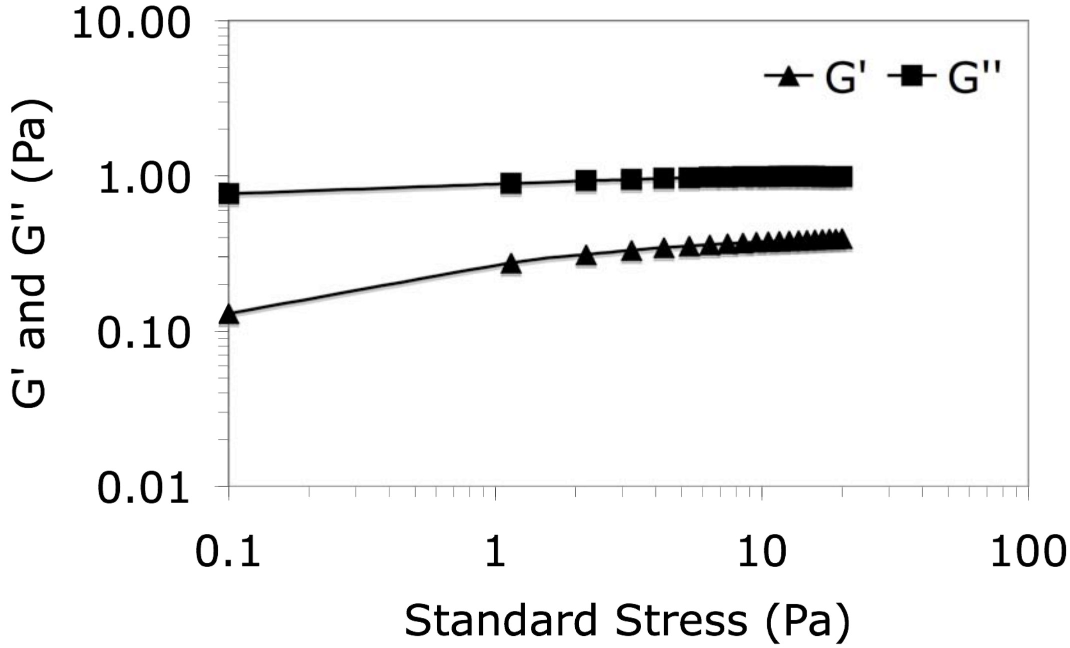
A-64. Mean linear shear-thinning determination of fluid behavior for 0.250% GGLT at 25 ^{o}C



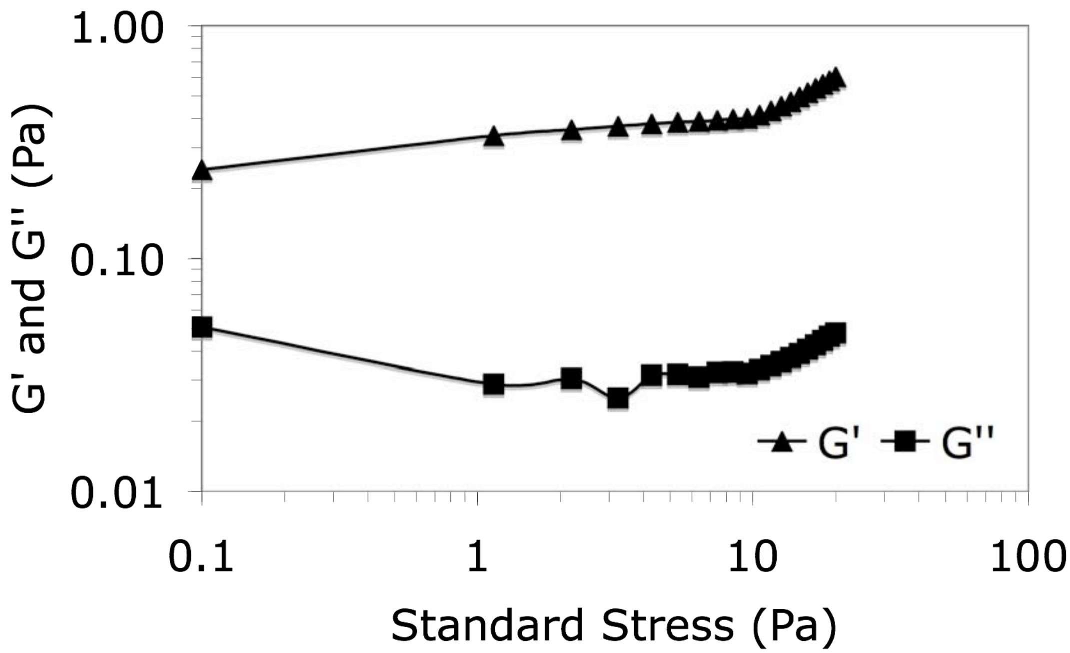
A-1. Stress sweep for determination of linear viscoelastic region of 1.000% MC at 1 Hz and 25 ^{o}C.



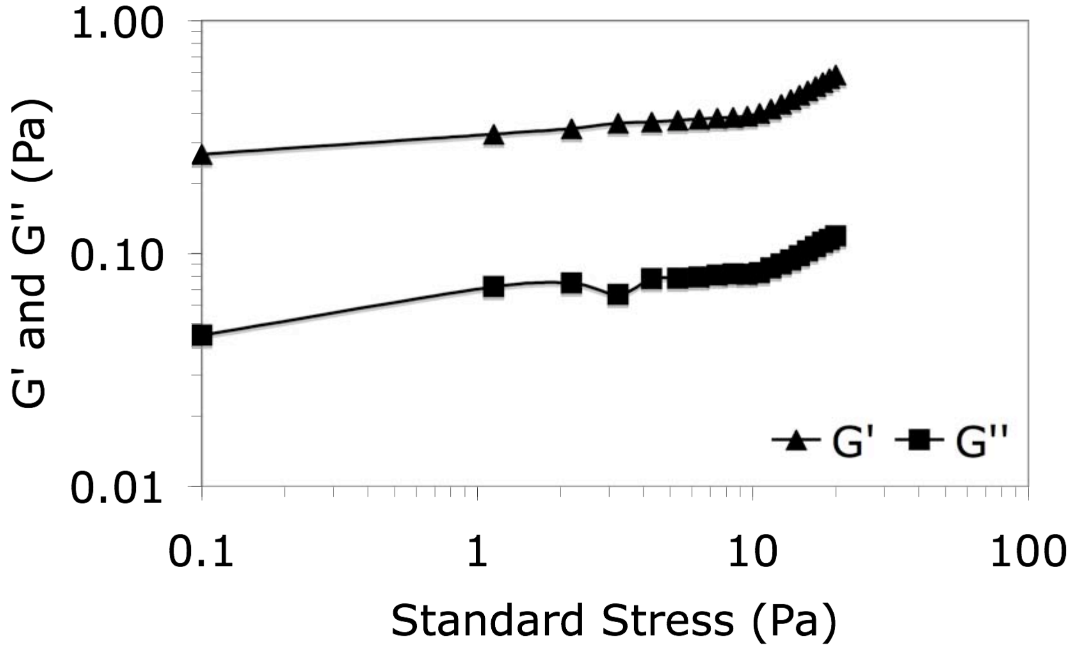
A-2. Stress sweep for determination of linear viscoelastic region of 2.000% MC at 1 Hz and 25 ^{o}C.



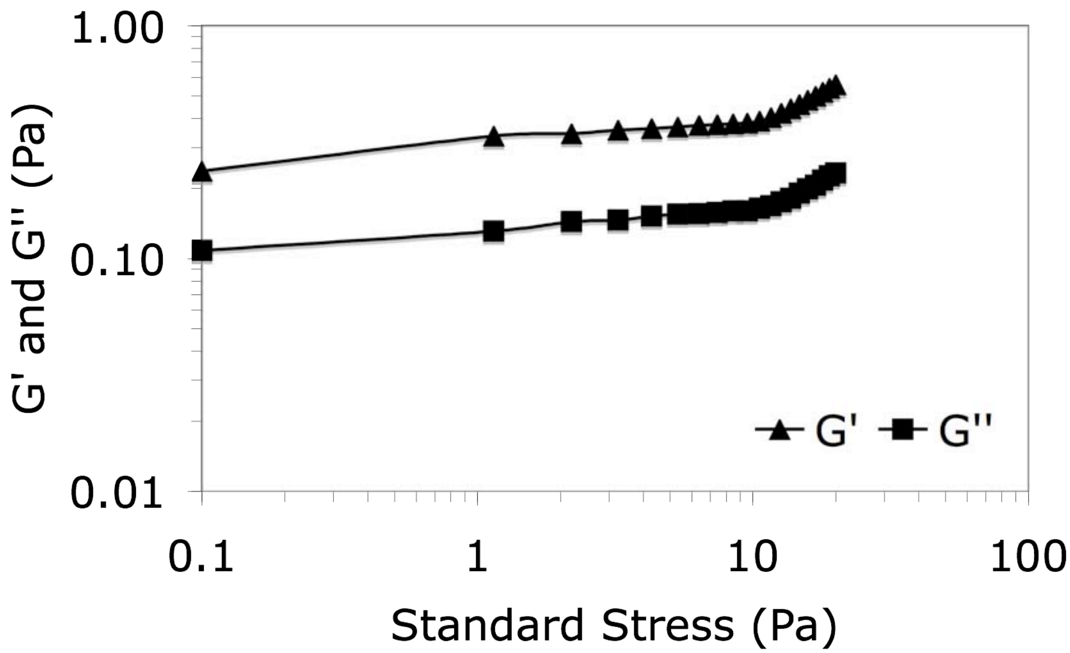
A-3. Stress sweep for determination of linear viscoelastic region of 3.000% MC at 1 Hz and 25 ^{o}C.



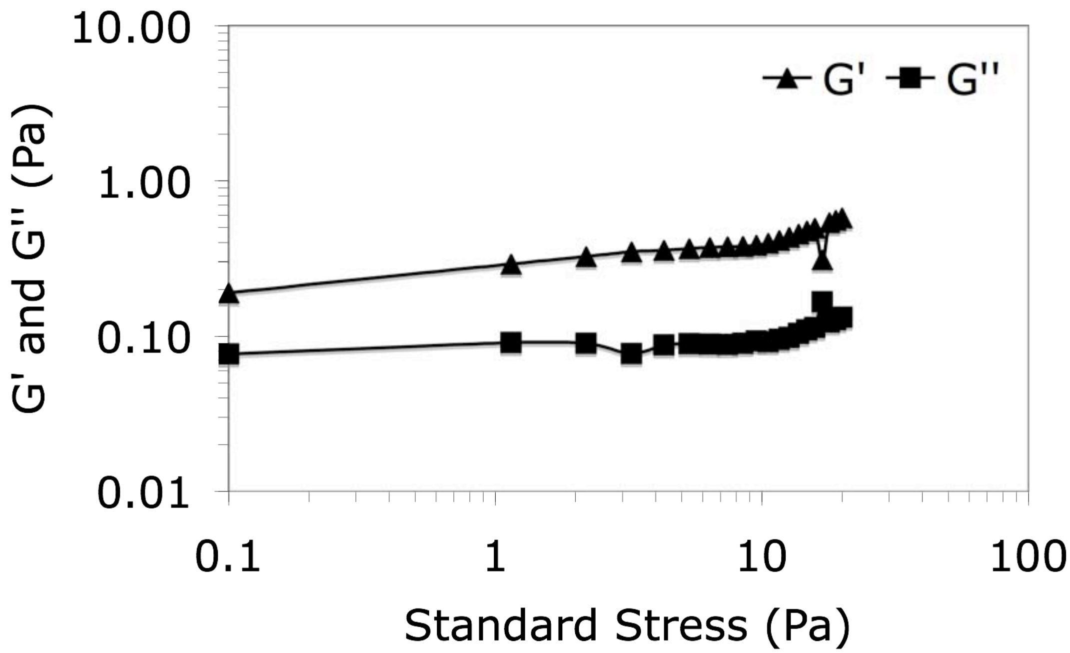
A-4. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC at 1 Hz and 25 ^{o}C.



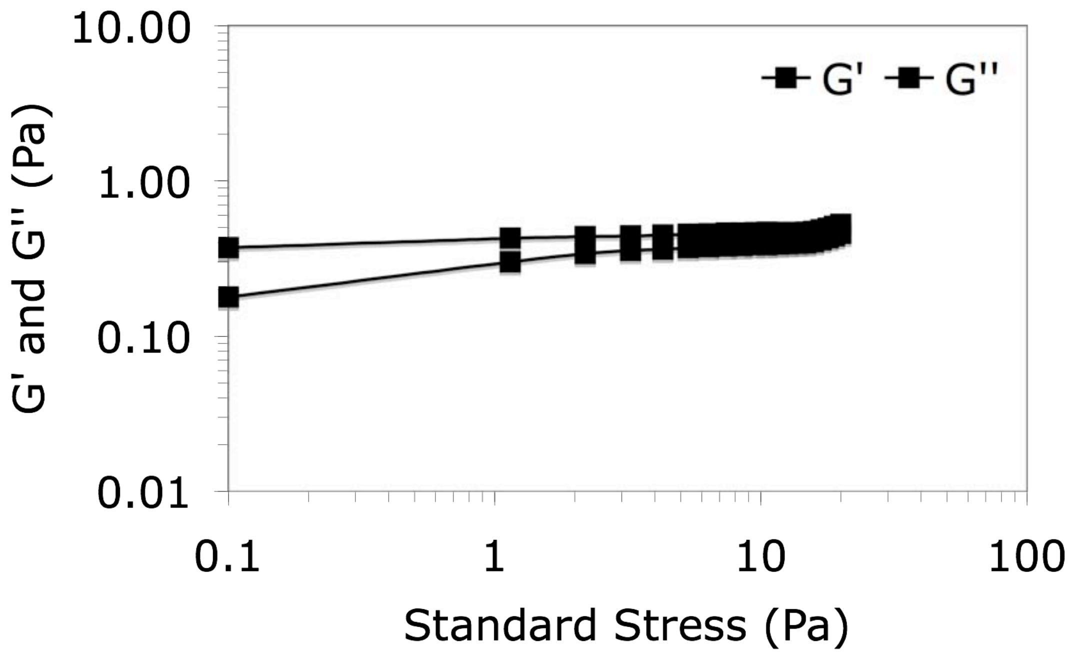
A-5. Stress sweep for determination of linear viscoelastic region of 2.000% HPMC at 1 Hz and 25 ^{o}C.



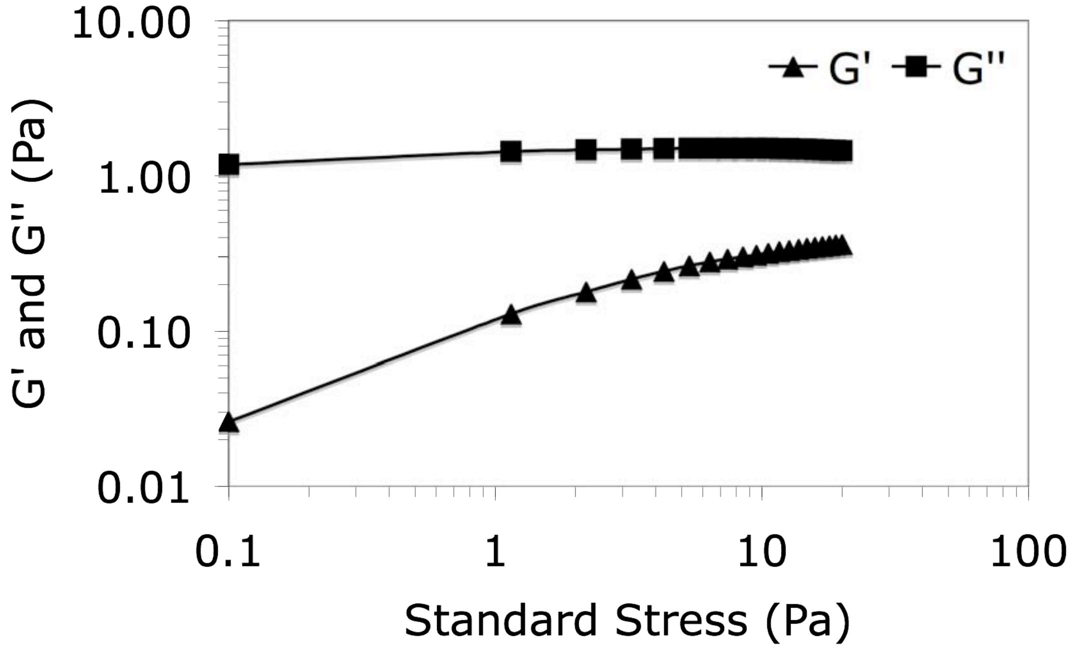
A-6. Stress sweep for determination of linear viscoelastic region of 3.000% HPMC at 1 Hz and 25 ^{o}C.



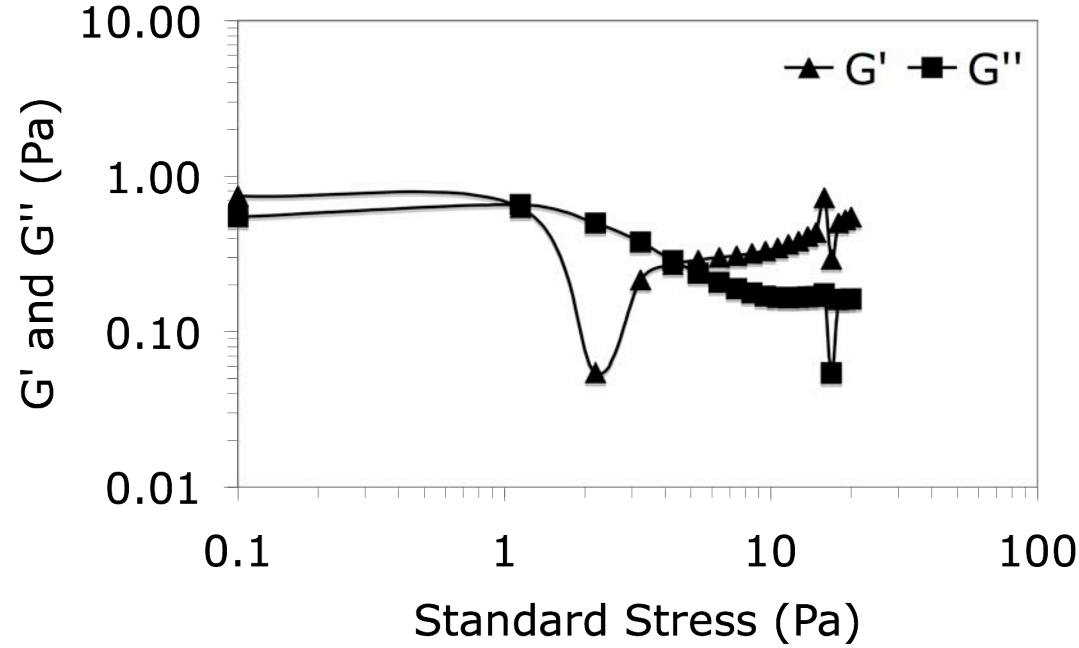
A-7. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC at 1 Hz and 25 ^{o}C.



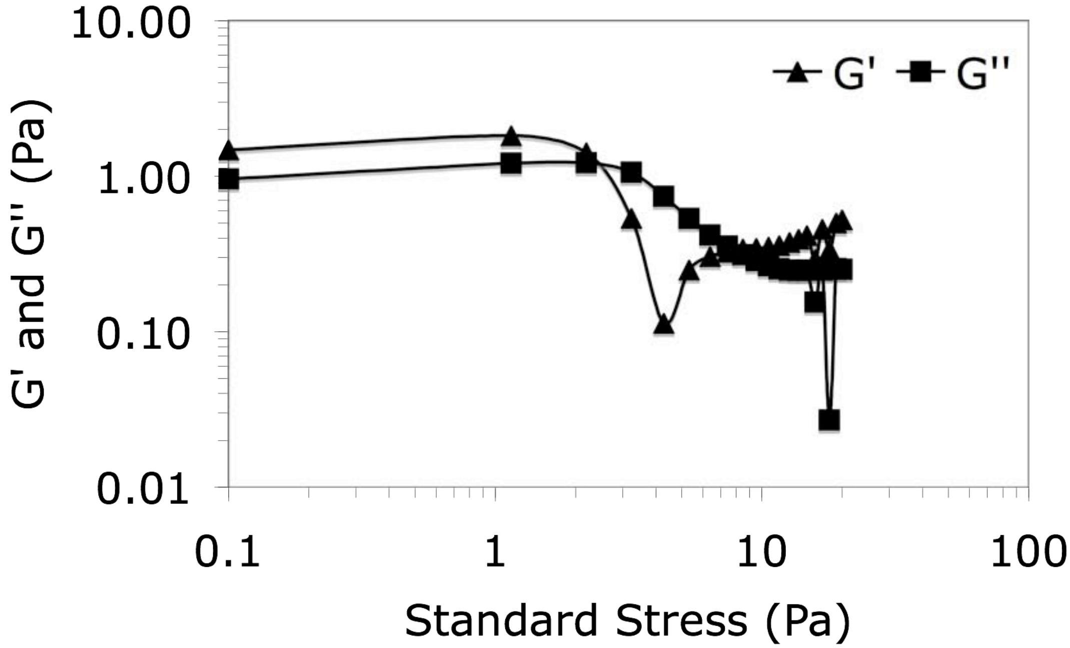
A-8. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC at 1 Hz and 25 °C.



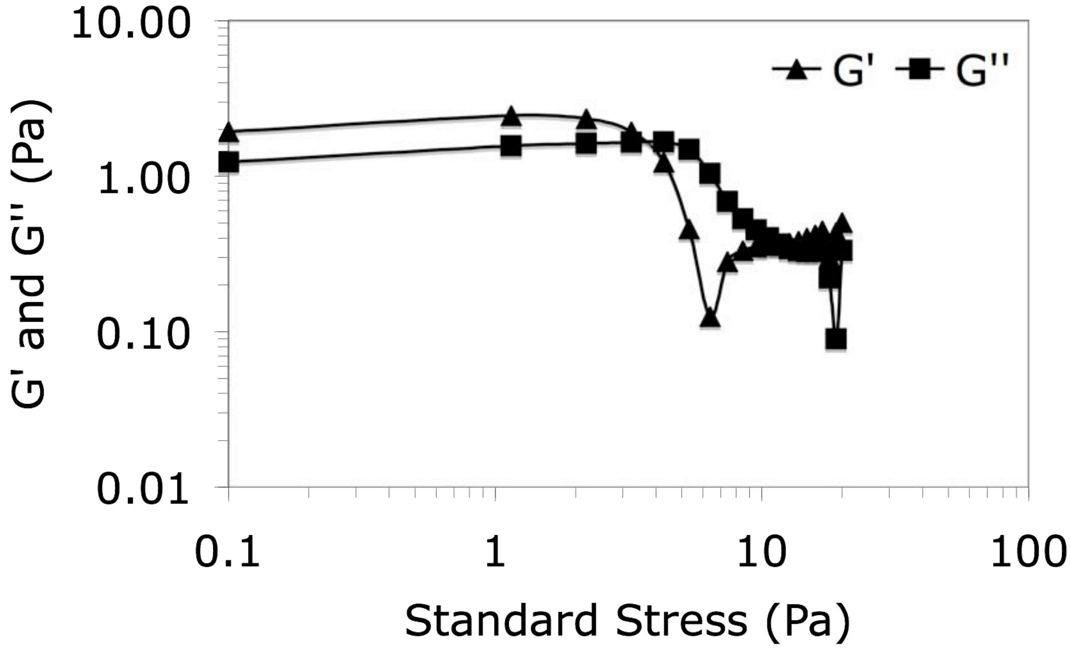
A-9. Stress sweep for determination of linear viscoelastic region of 3.000% SGMC at 1 Hz and 25 °C.



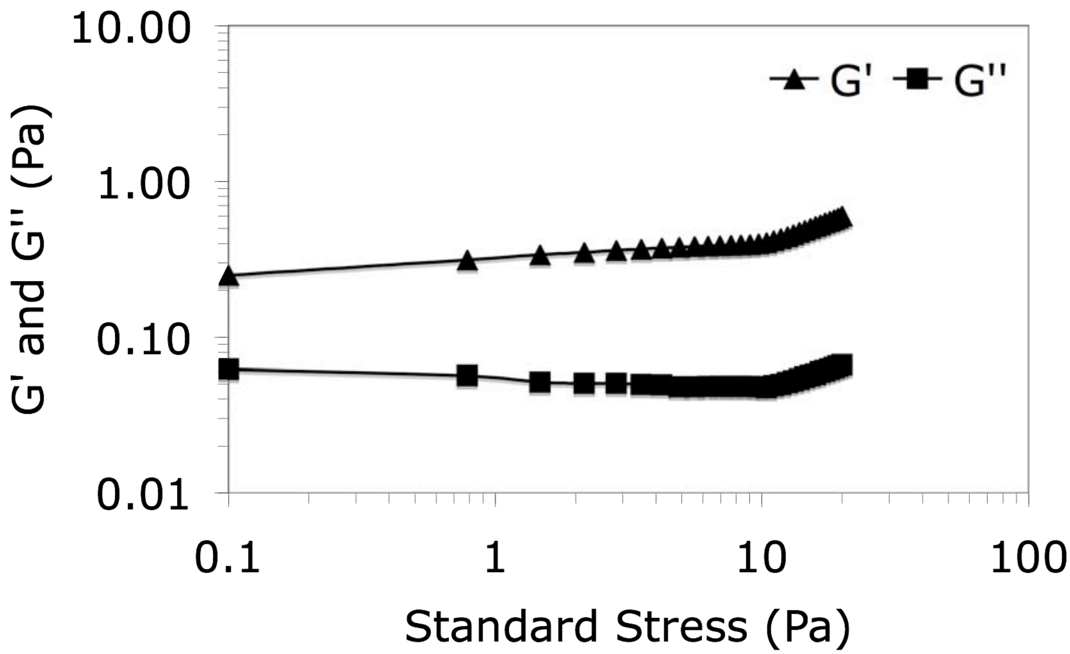
A-10. Stress sweep for determination of linear viscoelastic region of 0.250% XG at 1 Hz and 25 °C.



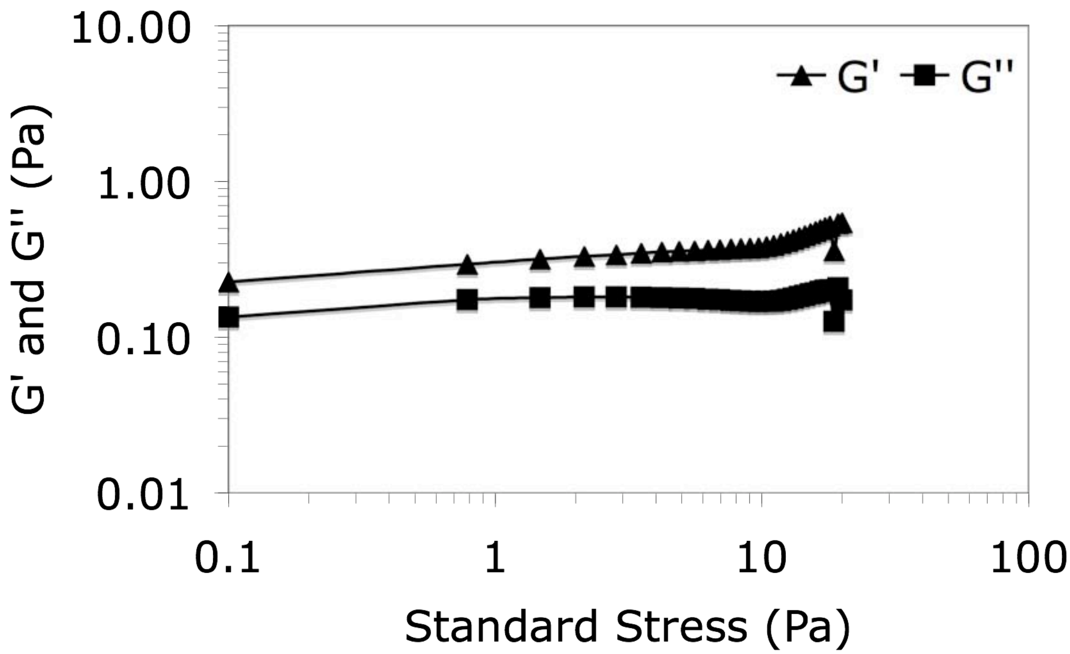
A-11. Stress sweep for determination of linear viscoelastic region of 0.500% XG at 1 Hz and 25 ^{o}C.



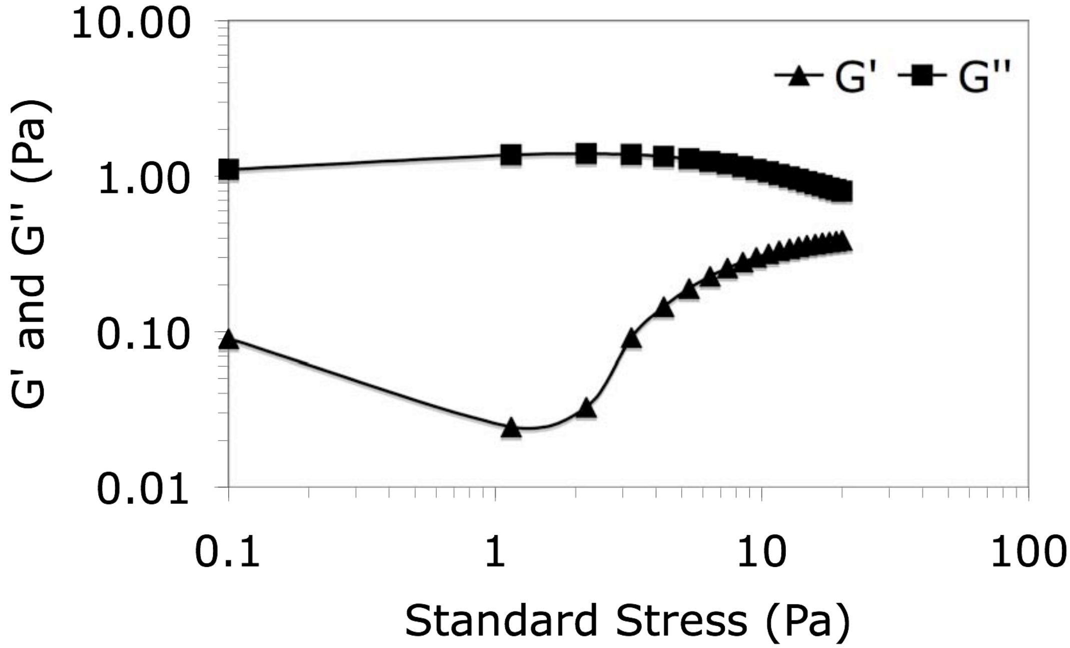
A-12. Stress sweep for determination of linear viscoelastic region of 0.750% XG at 1 Hz and 25 ^{o}C.



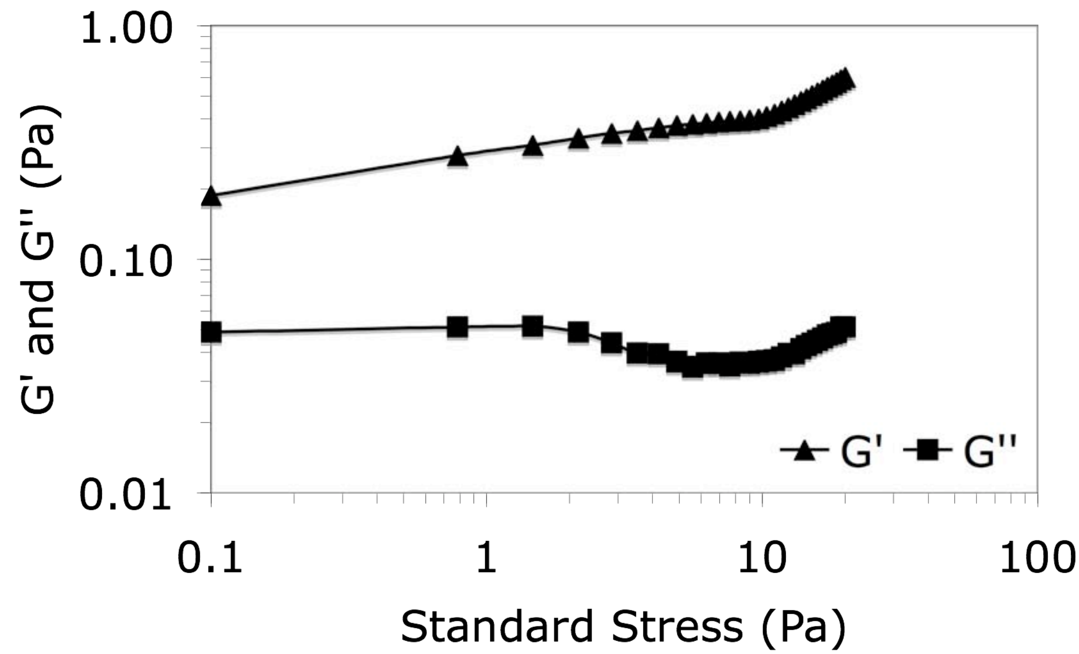
A-13. Stress sweep for determination of linear viscoelastic region of 0.125% KF at 1 Hz and 25 °C.



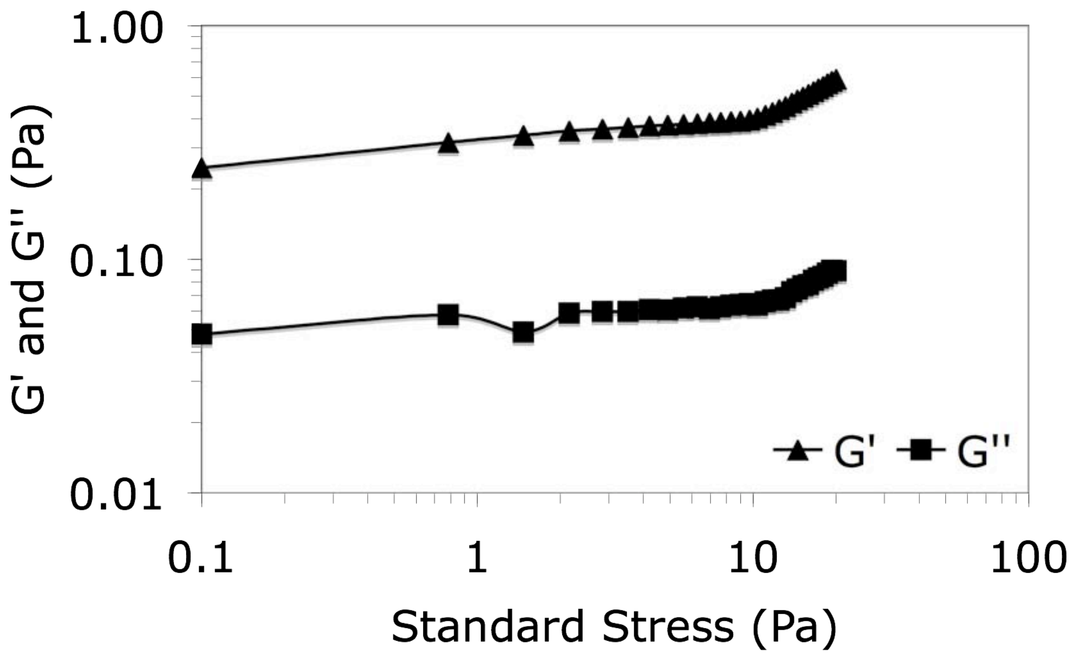
A-14. Stress sweep for determination of linear viscoelastic region of 0.250% KF at 1 Hz and 25 °C.



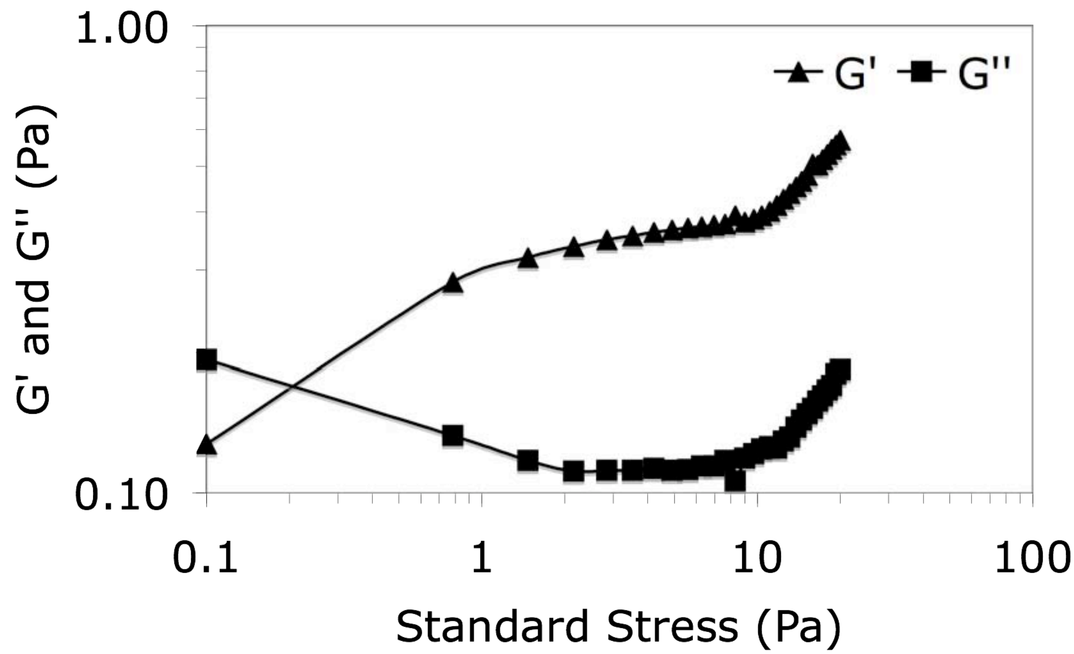
A-15. Stress sweep for determination of linear viscoelastic region of 0.750% KF at 1 Hz and 25 ^{o}C.



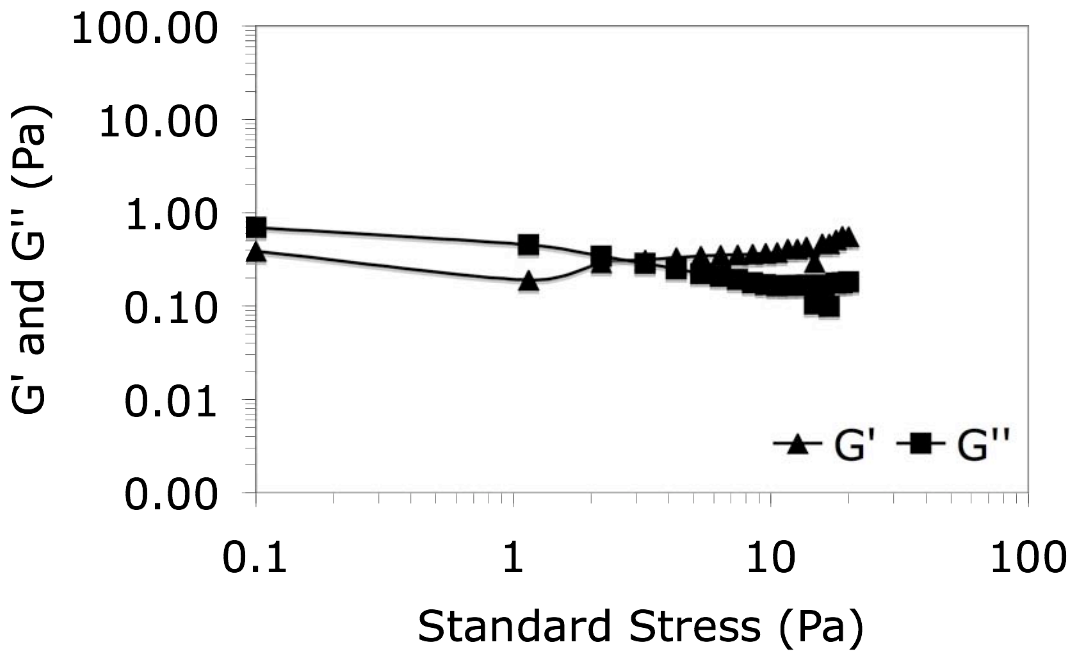
A-16. Stress sweep for determination of linear viscoelastic region of 0.250% GG at 1 Hz and 25 ^{o}C.



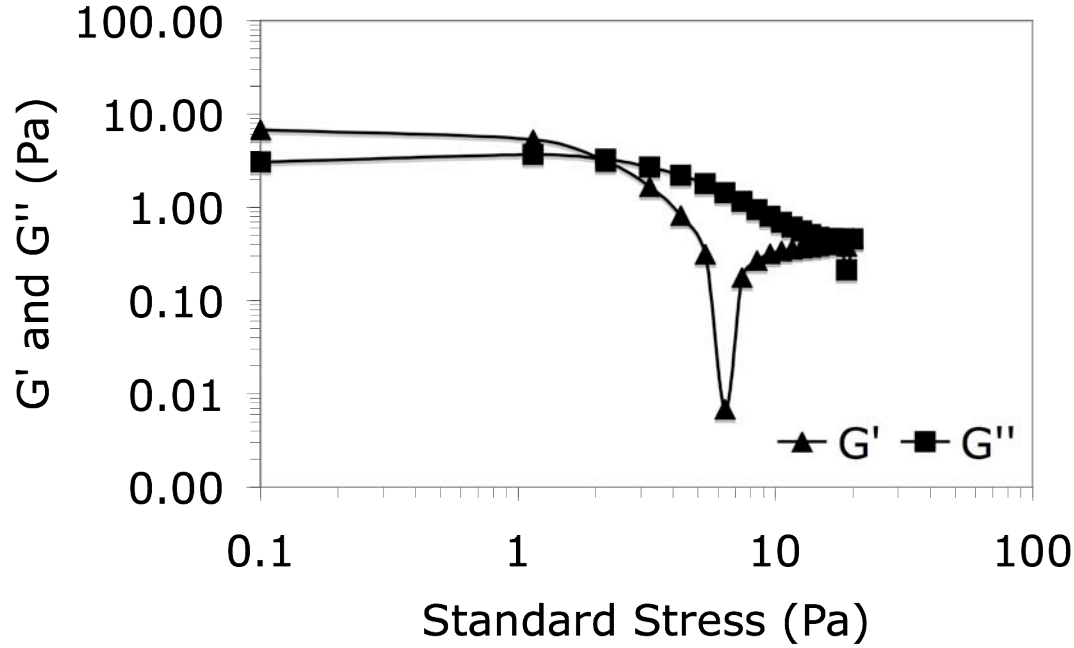
A-17. Stress sweep for determination of linear viscoelastic region of 0.500% GG at 1 Hz and 25 ^{o}C.



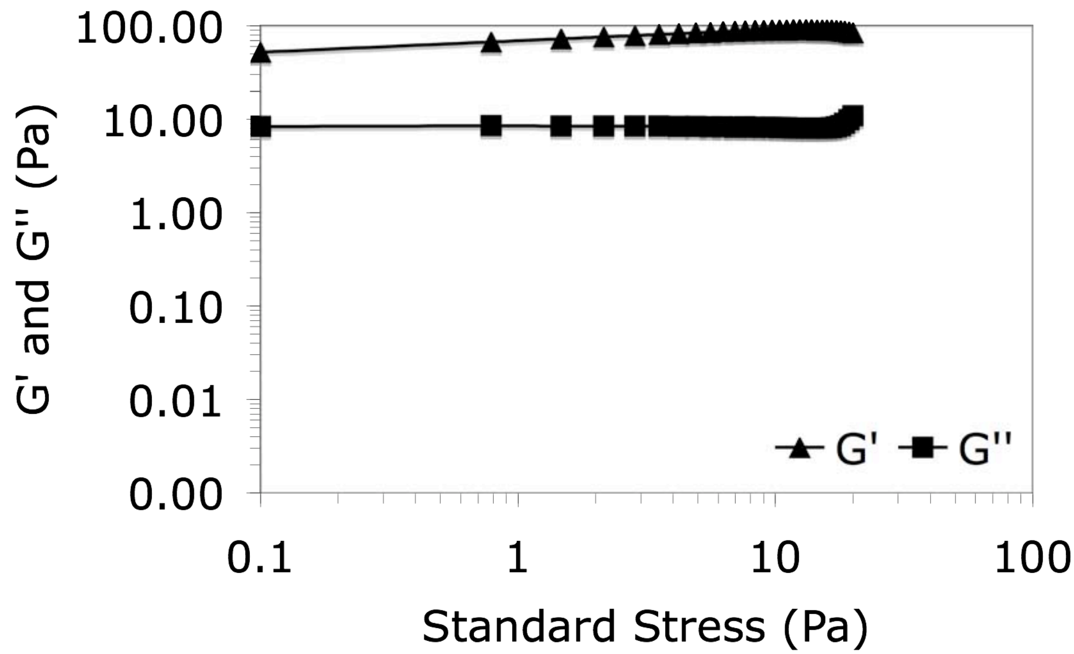
A-18. Stress sweep for determination of linear viscoelastic region of 0.750% GG at 1 Hz and 25 ^oC.



A-19. Stress sweep for determination of linear viscoelastic region of 0.0625% GGLT at 1 Hz and 25 ^oC.

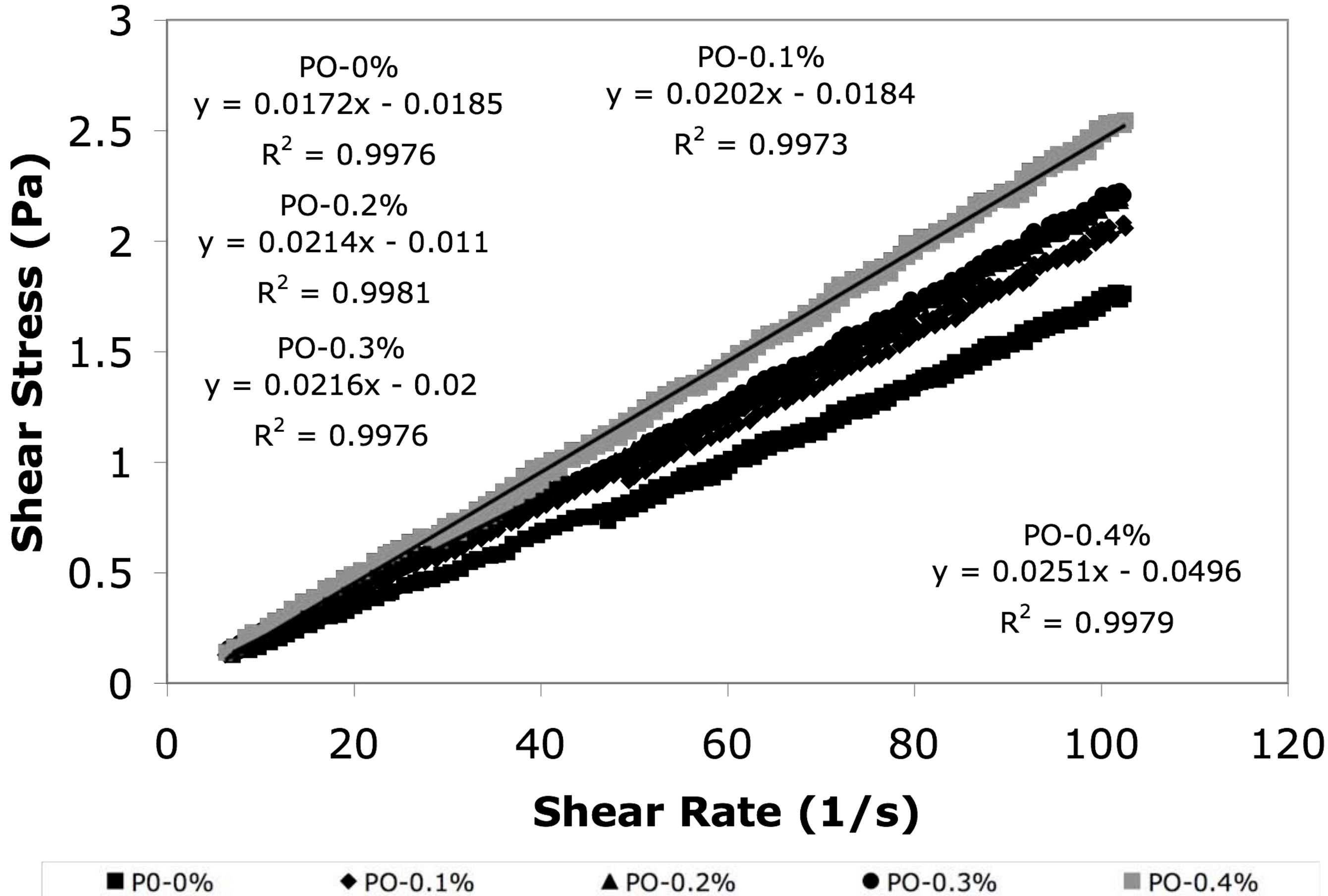


A-20. Stress sweep for determination of linear viscoelastic region of 0.125% GGLT at 1 Hz and 25 ^oC.

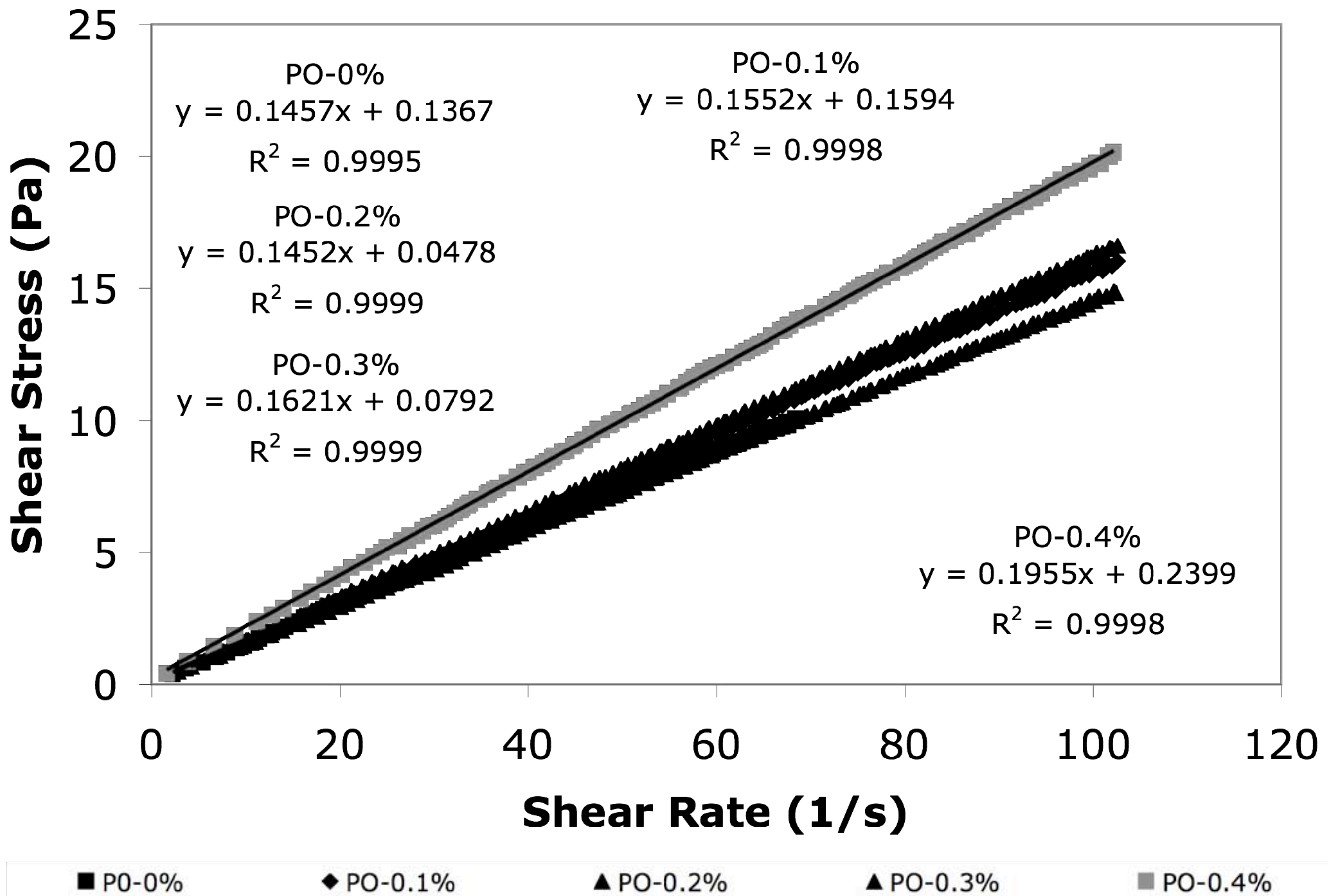


A-21. Stress sweep for determination of linear viscoelastic region of 0.205% GGLT at 1 Hz and 25 ^{o}C.

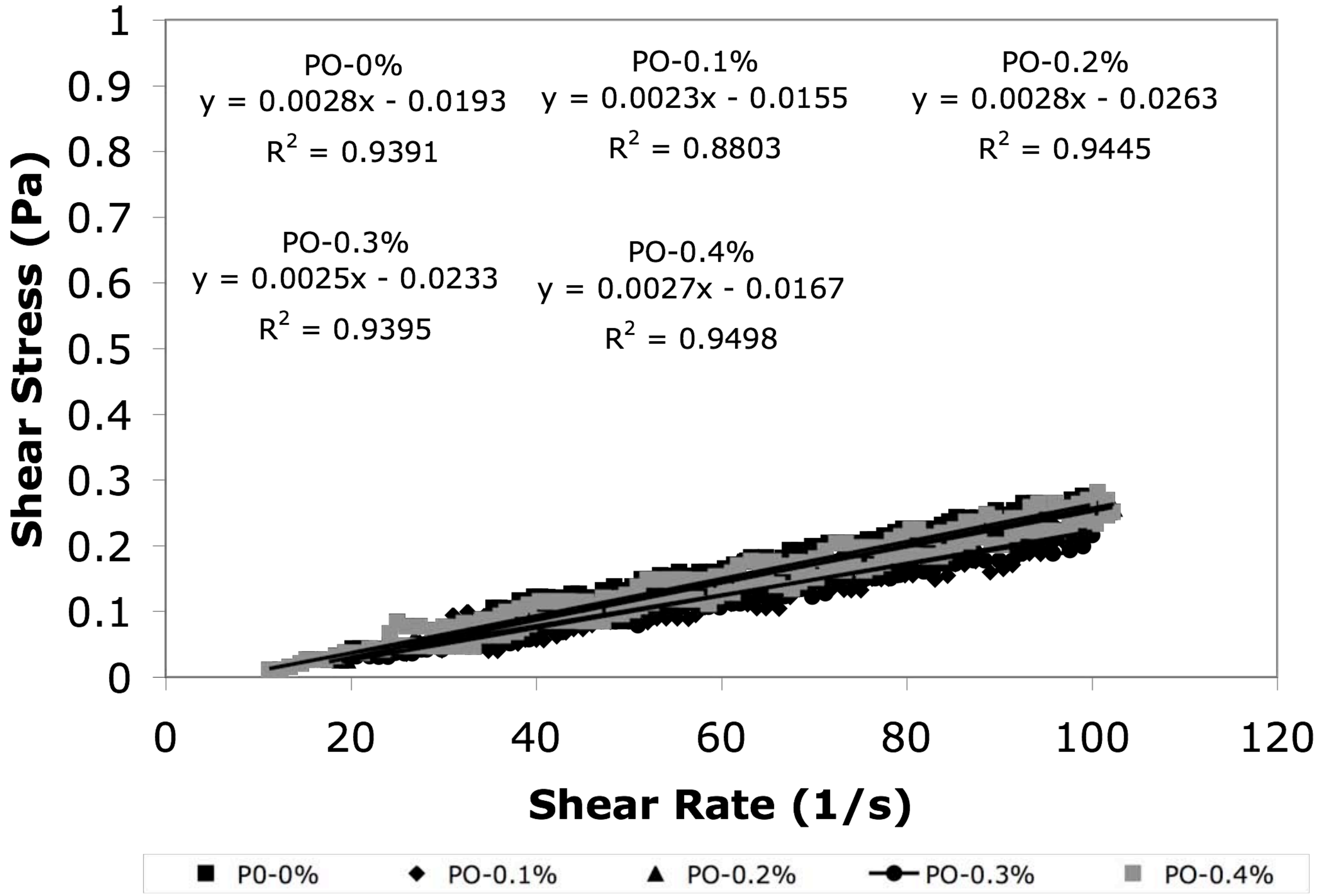
APPENDIX B



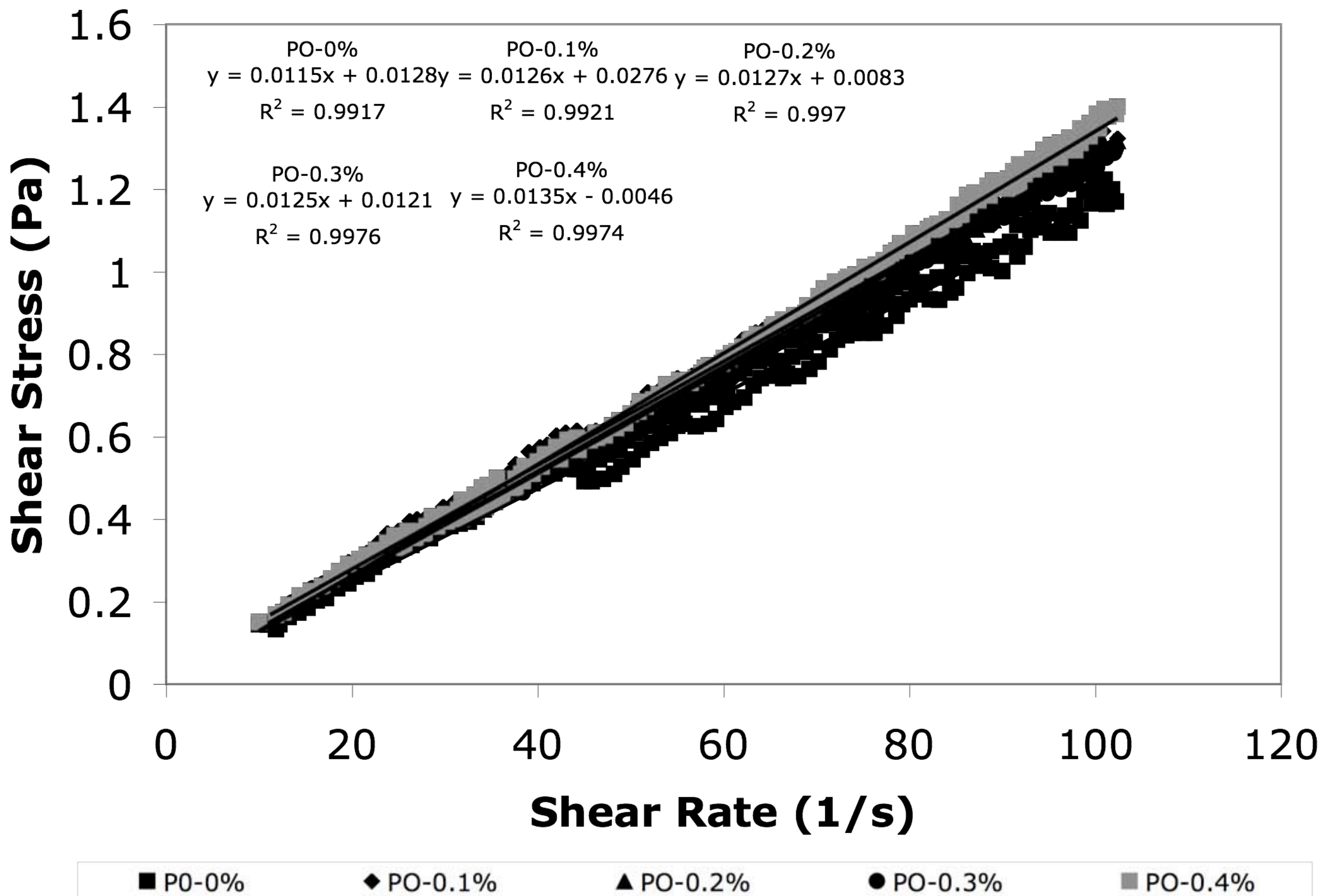
B-1. Fluid behavior for 1.000% MC with 0.000%, 0.100%, 0.200%, 0.300%, and 0.400% sodium phosphate at 25 °C.



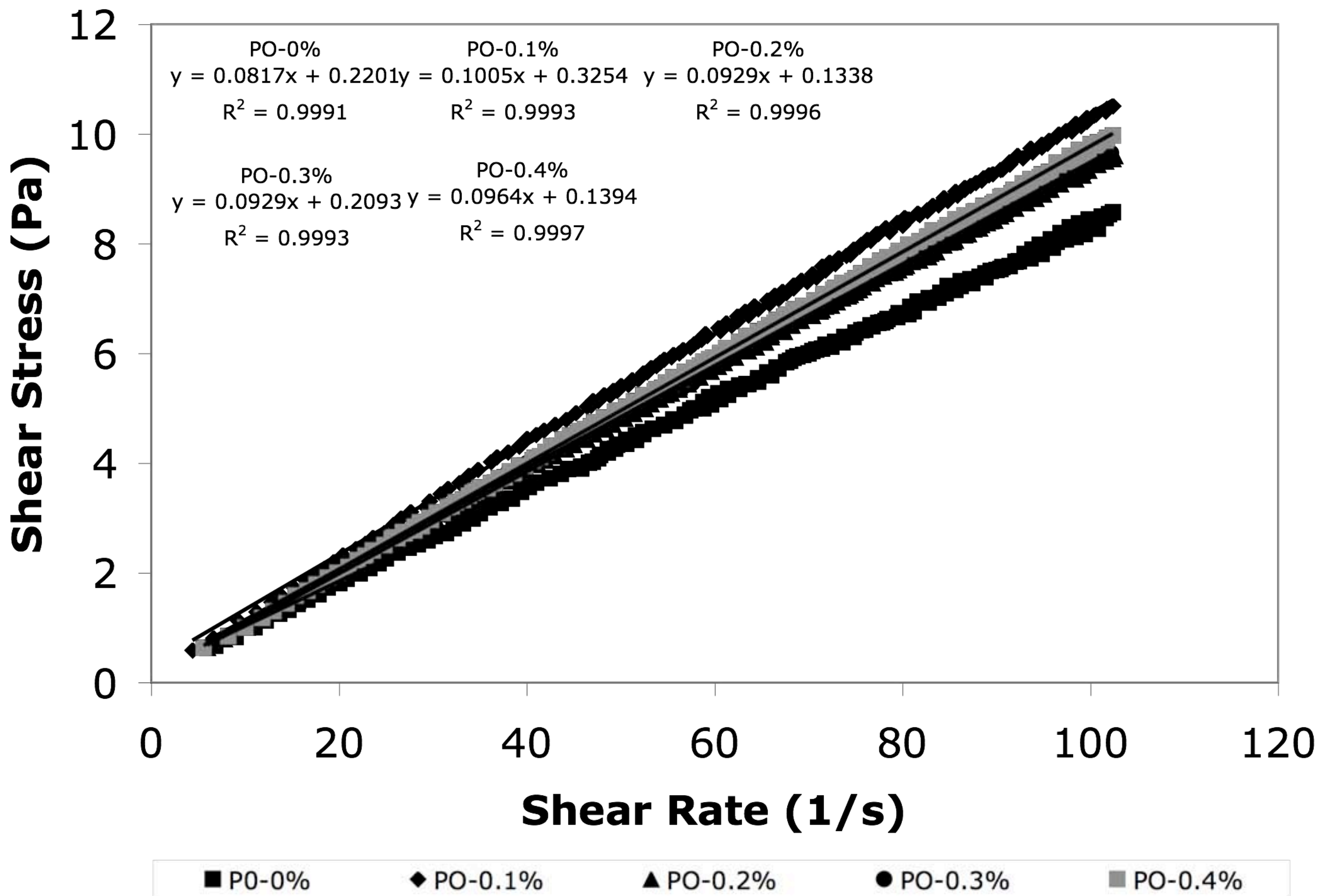
B-2. Fluid behavior for 2.000% MC with 0.000%, 0.100%, 0.200%, 0.300%, and 0.400% sodium phosphate at 25 ^{o}C.



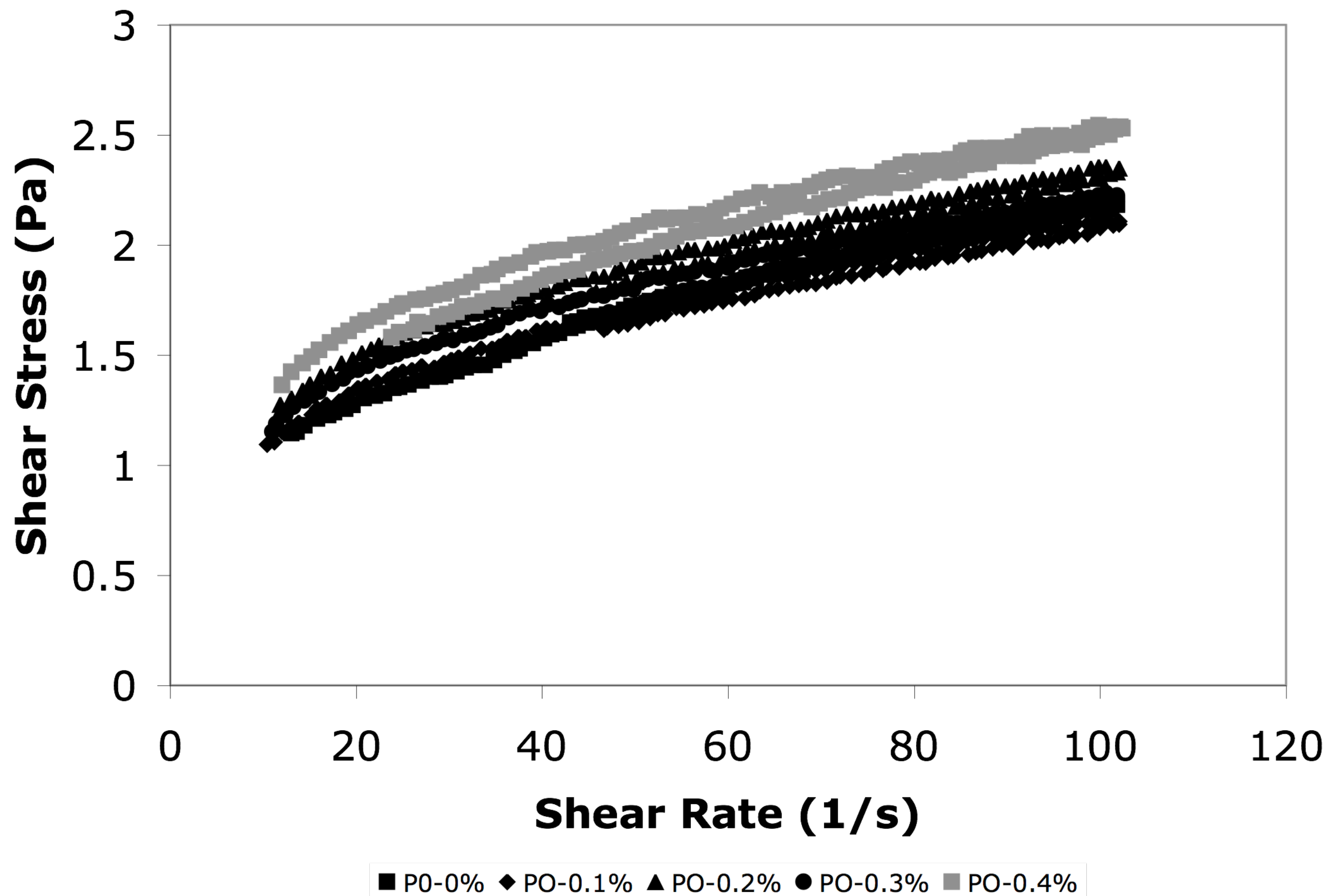
B-3. Fluid behavior for 1.000% HPMC with 0.000%, 0.100%, 0.200%, 0.300%, and 0.400% sodium phosphate at 25 °C.



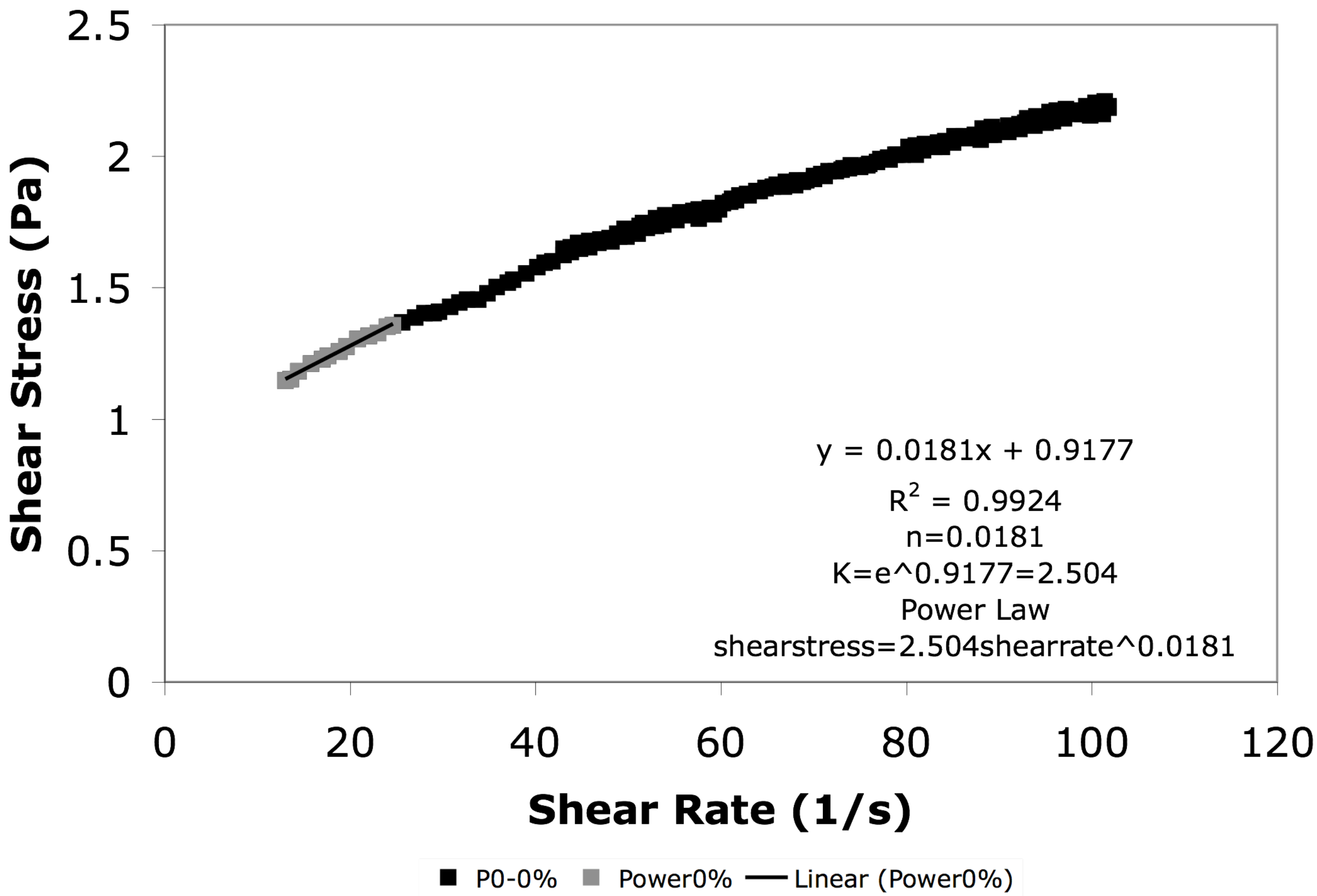
B-4. Fluid behavior for 1.000% SGMC with 0.000%, 0.100%, 0.200%, 0.300%, and 0.400% sodium phosphate at 25 °C.



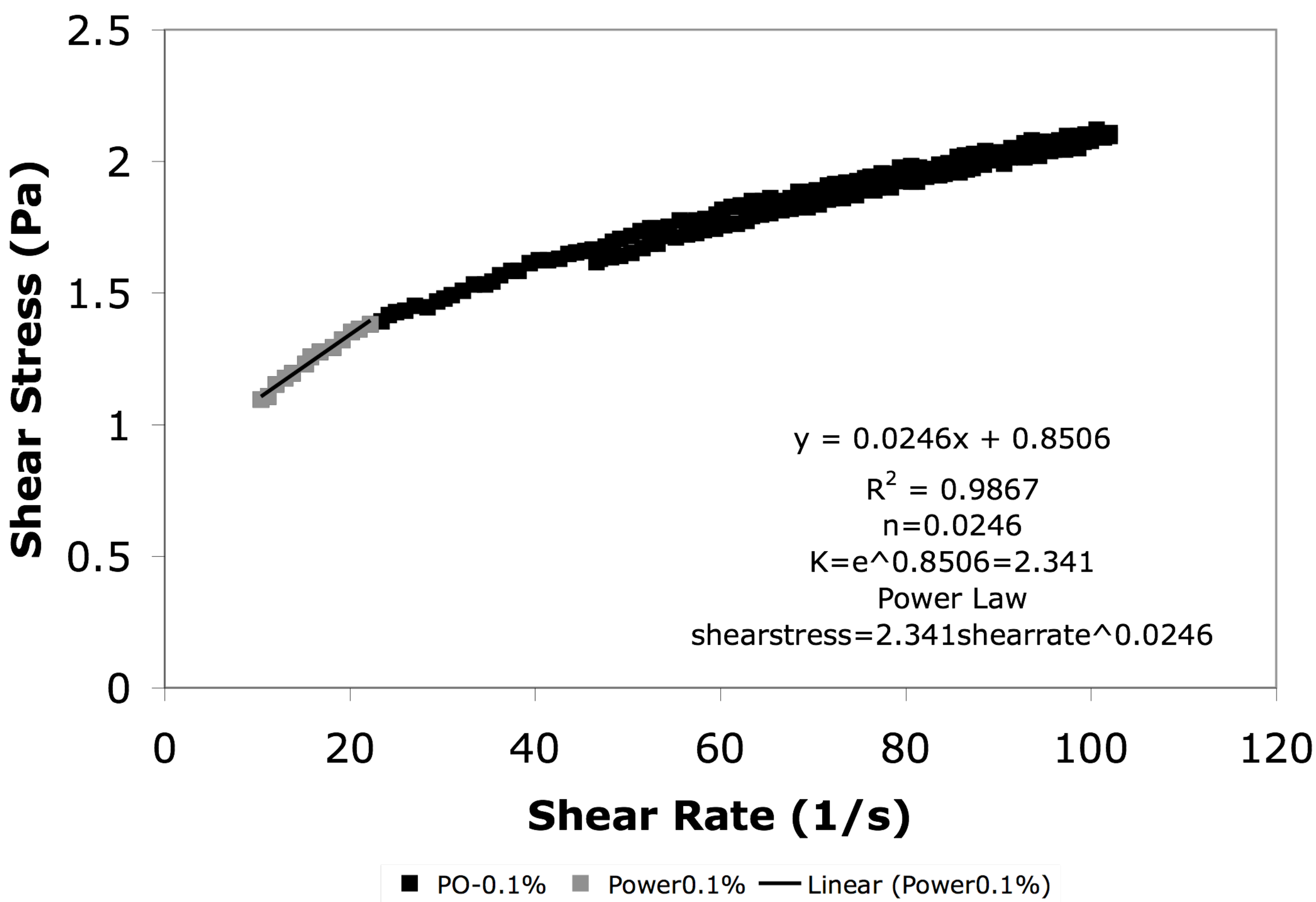
B-5. Fluid behavior for 2.000% SGMC with 0.000%, 0.100%, 0.200%, 0.300%, and 0.400% sodium phosphate at 25 ^{o}C.



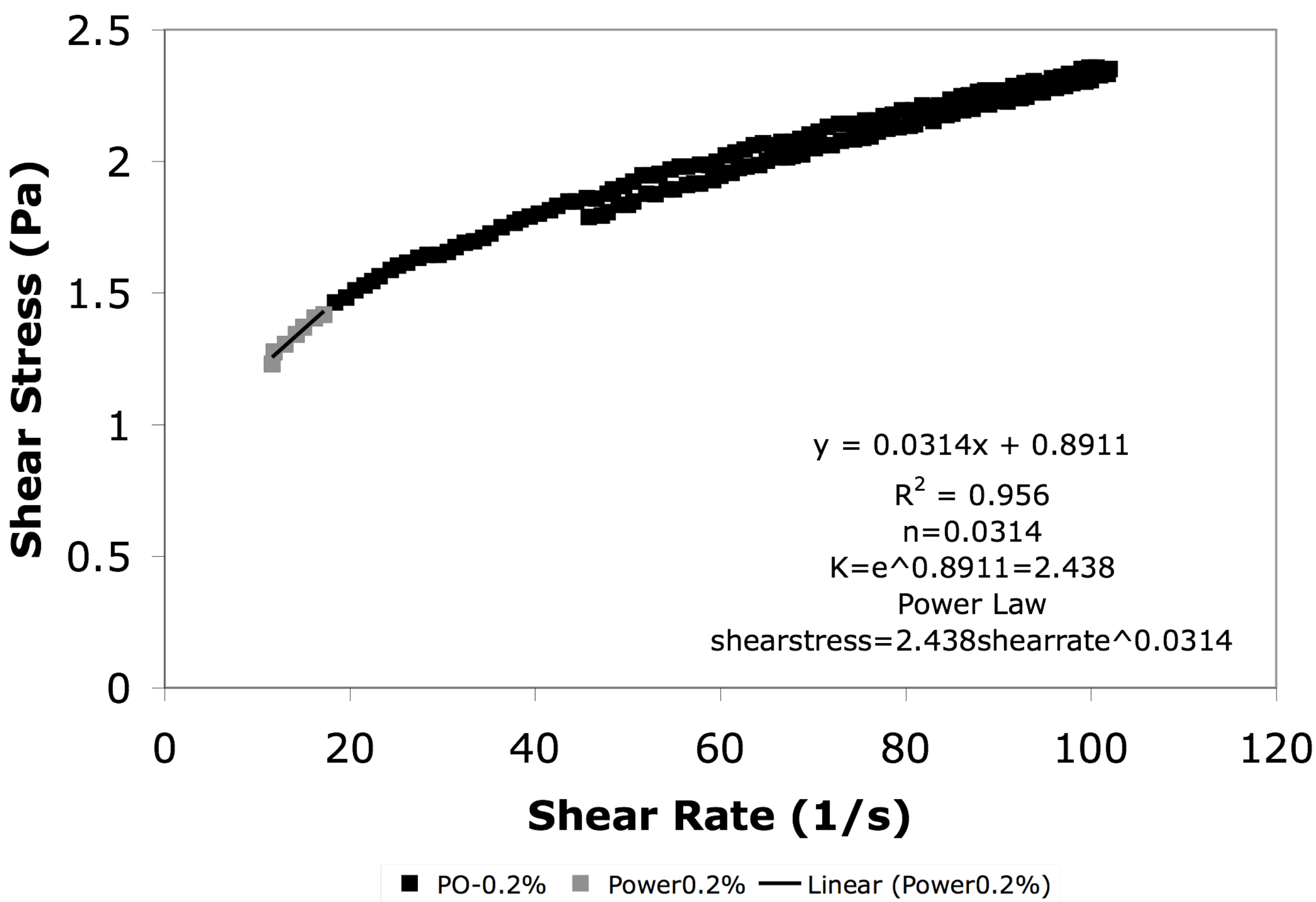
B-6. Fluid behavior for 0.250% XG with 0.000%, 0.100%, 0.200%, 0.300%, and 0.400% sodium phosphate at 25 °C.



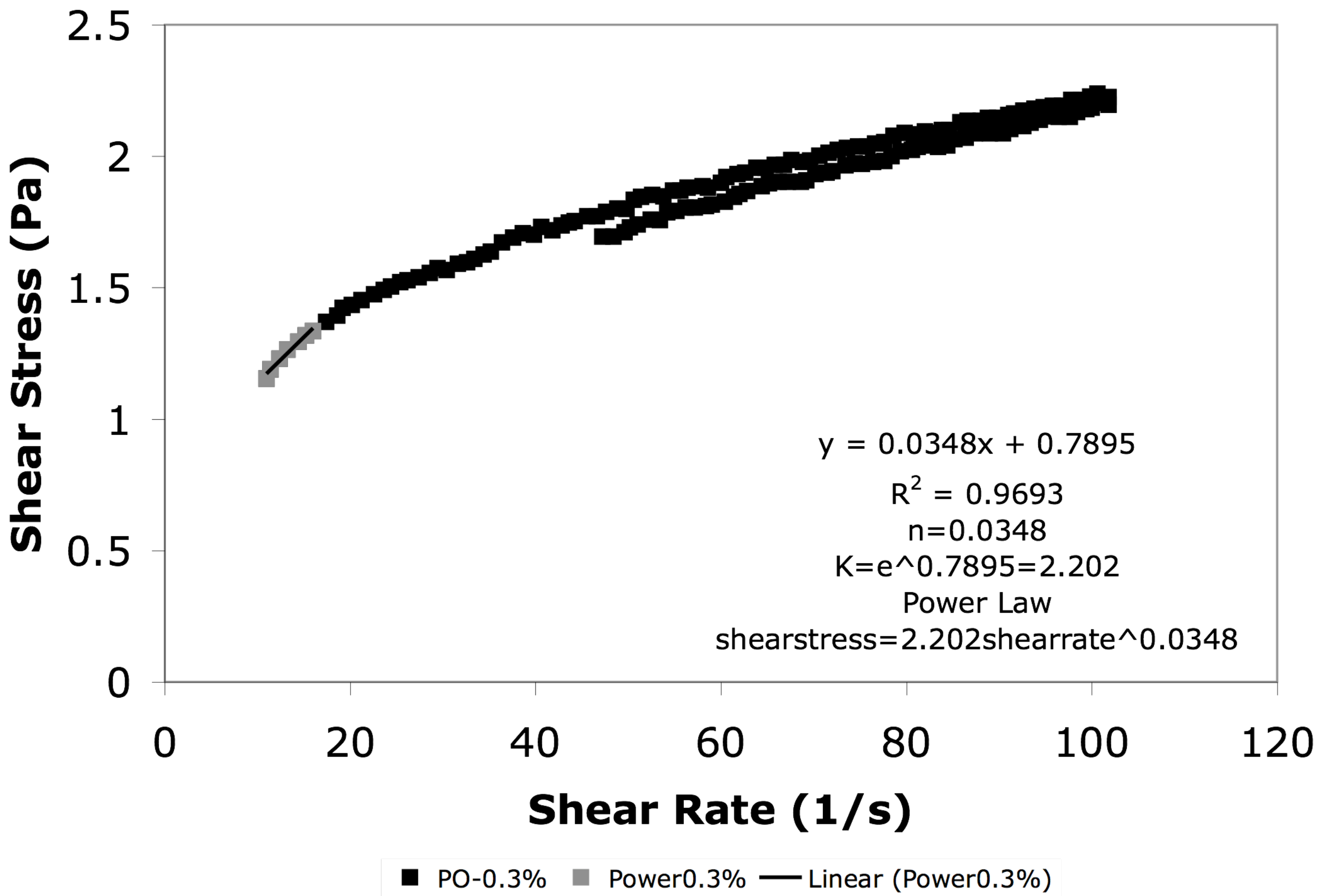
B-7. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 0.000% sodium phosphate at 25 ^{o}C.



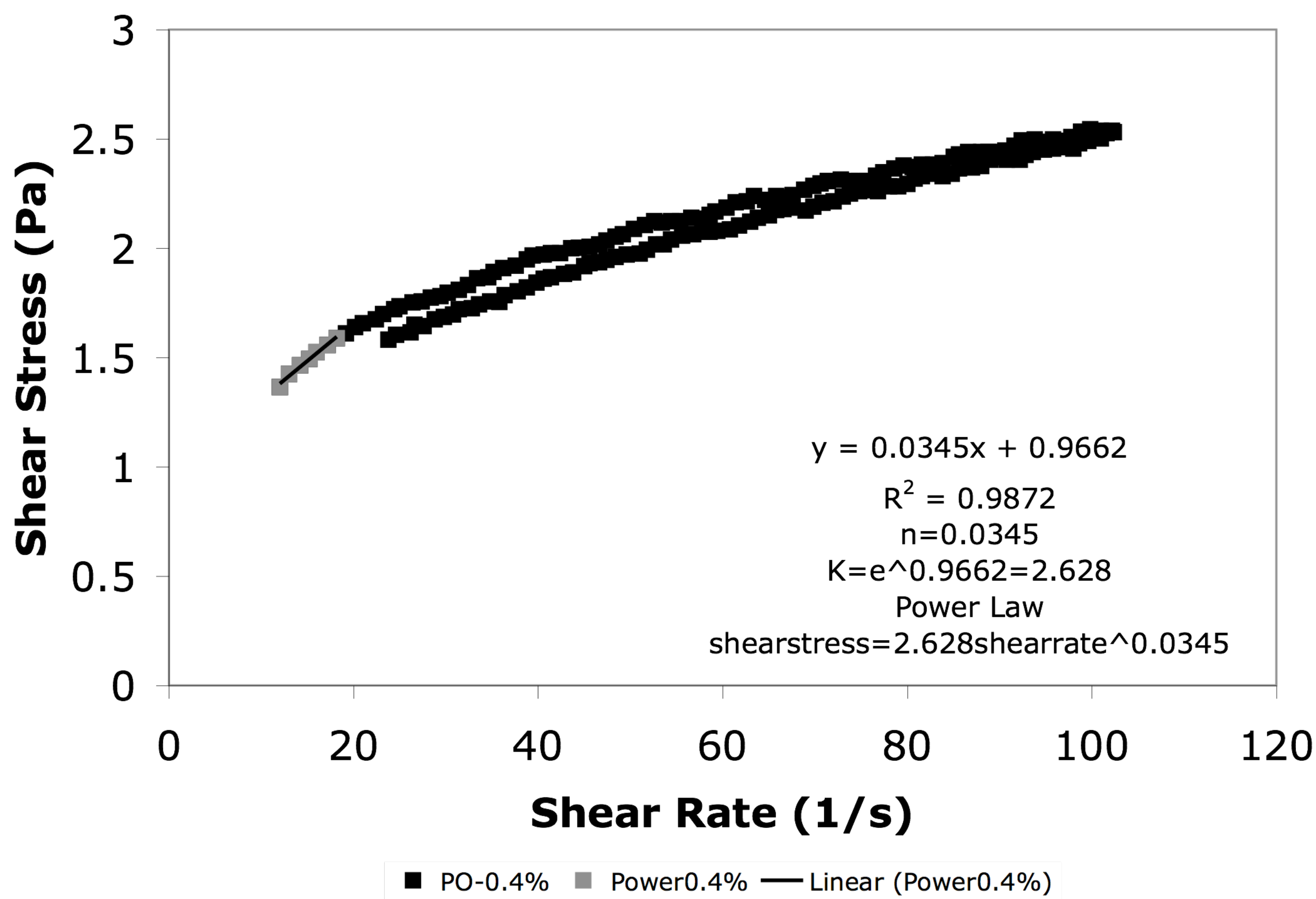
B-8. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 0.100% sodium phosphate at 25 °C.



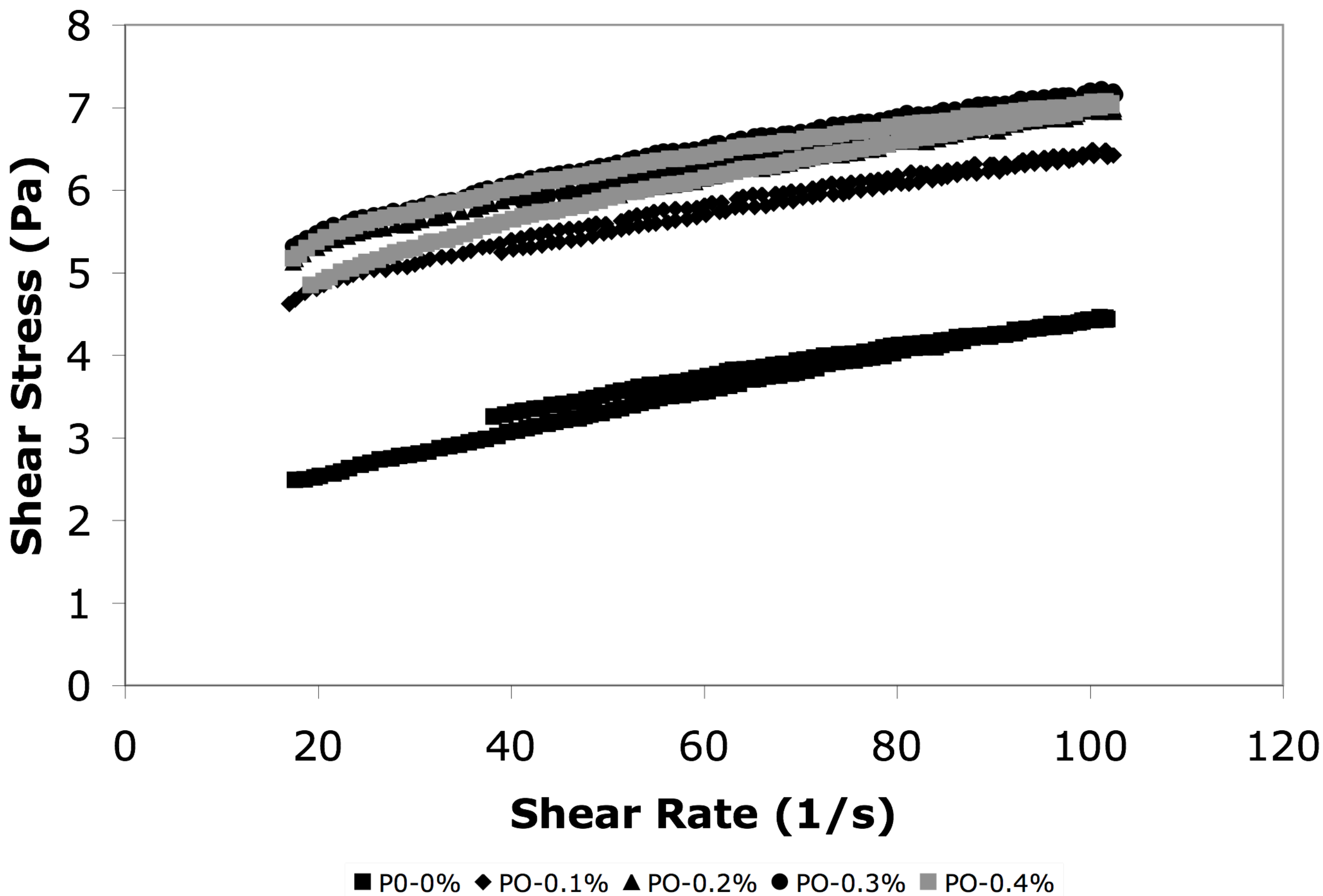
B-9. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 0.200% sodium phosphate at 25 ^{o}C.



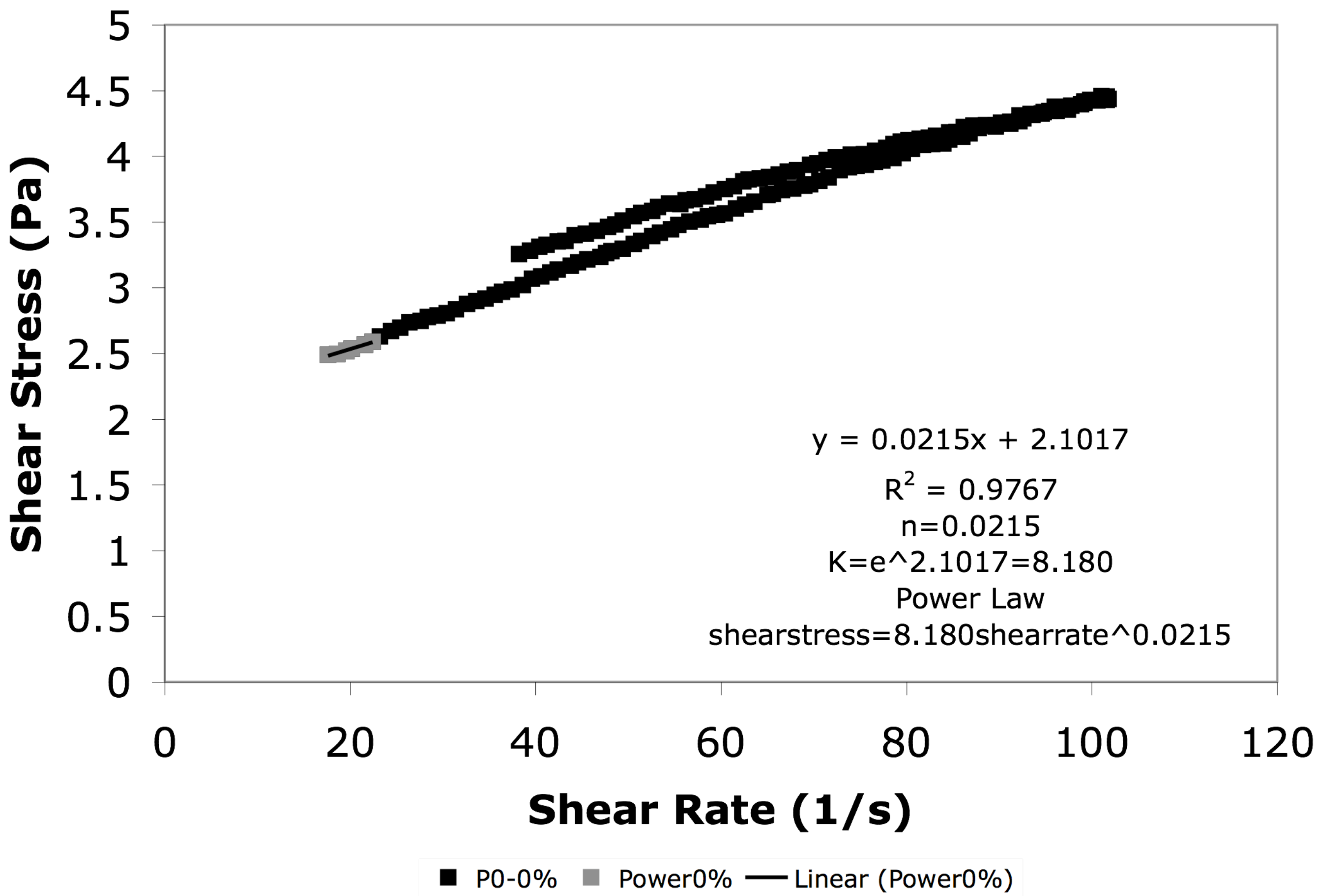
B-10. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 0.300% sodium phosphate at 25 °C.



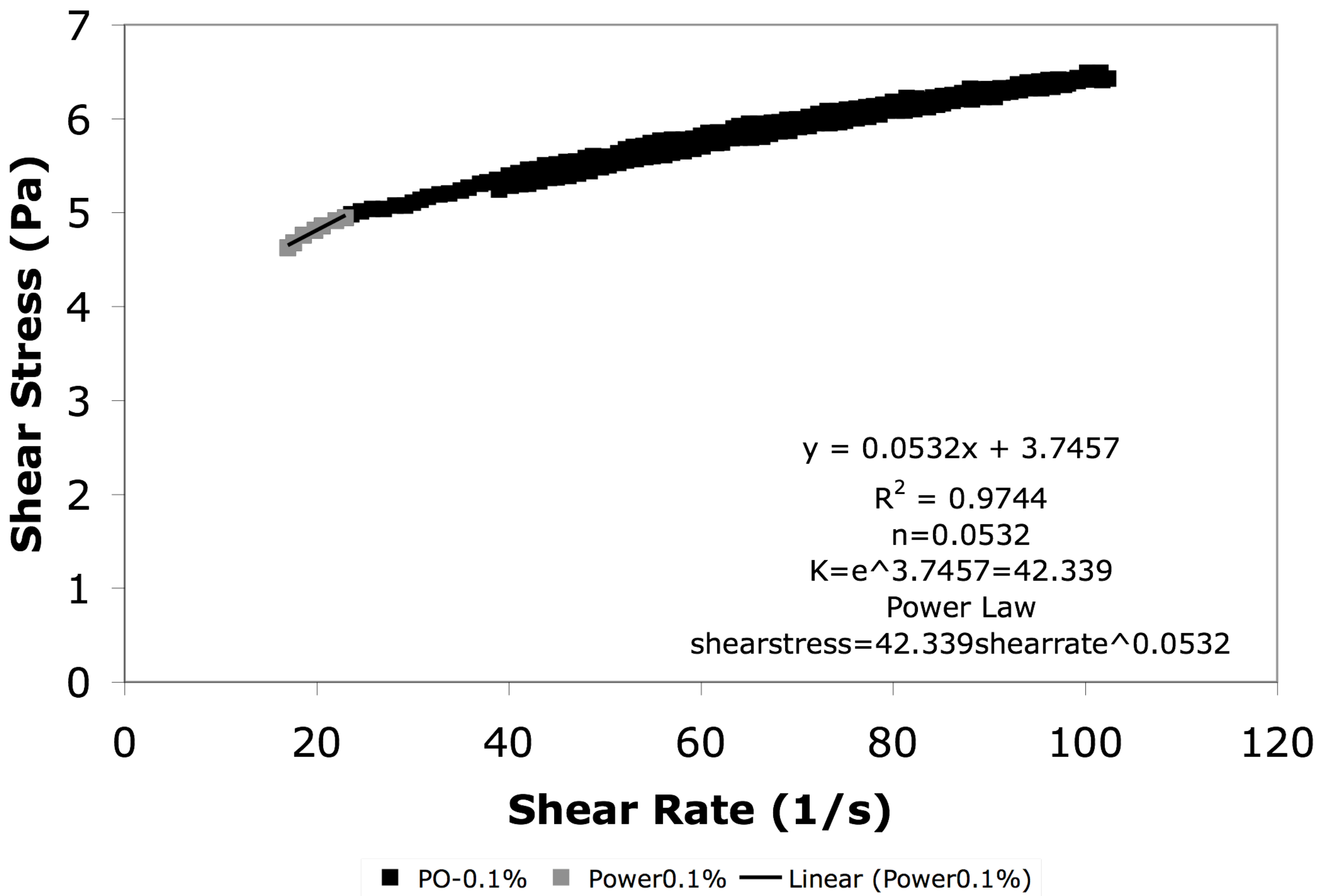
B-11. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 0.400% sodium phosphate at 25 ^{o}C.



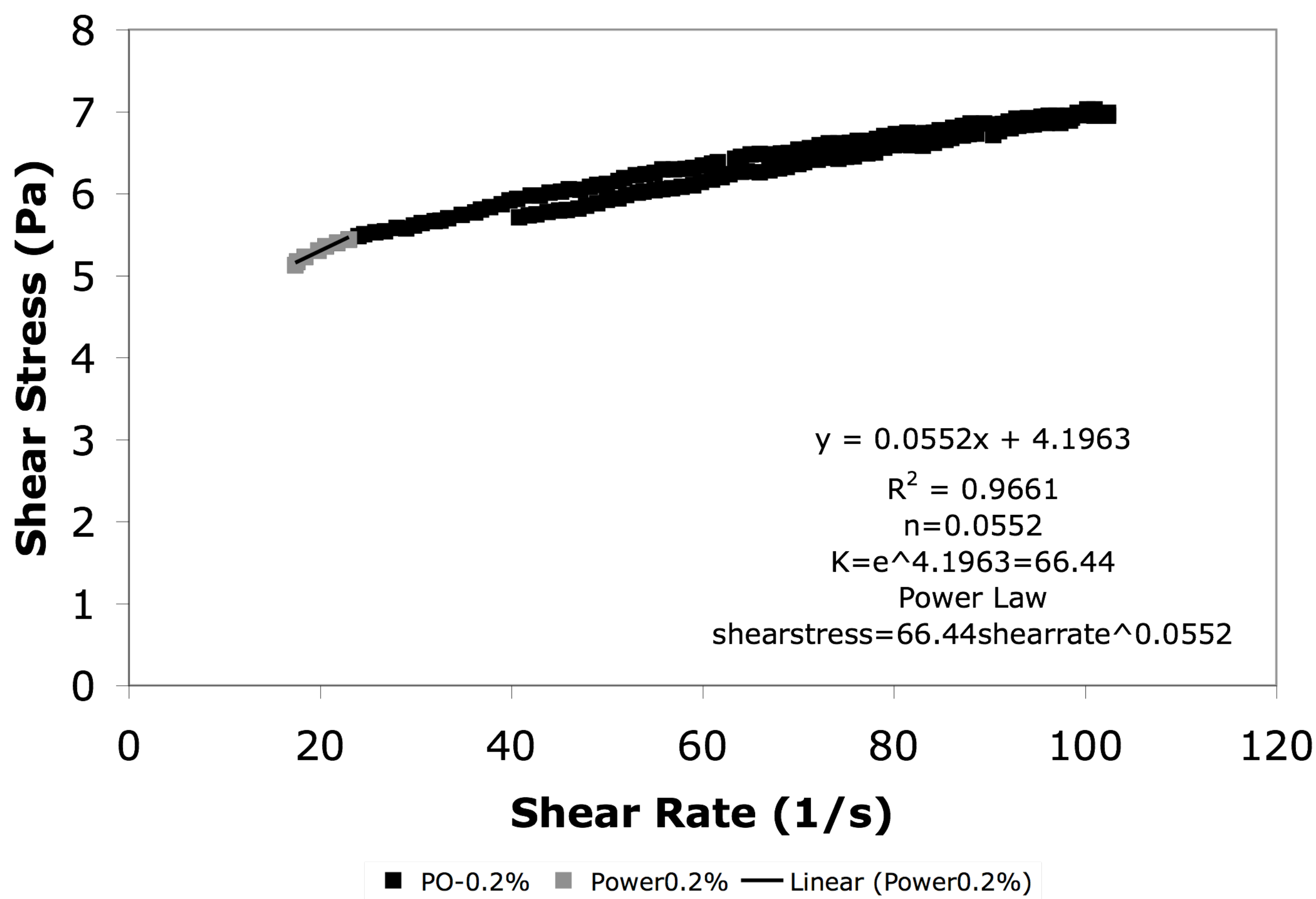
B-12. Fluid behavior for 0.500% XG with 0.000%, 0.100%, 0.200%, 0.300%, and 0.400% sodium phosphate at 25 °C.



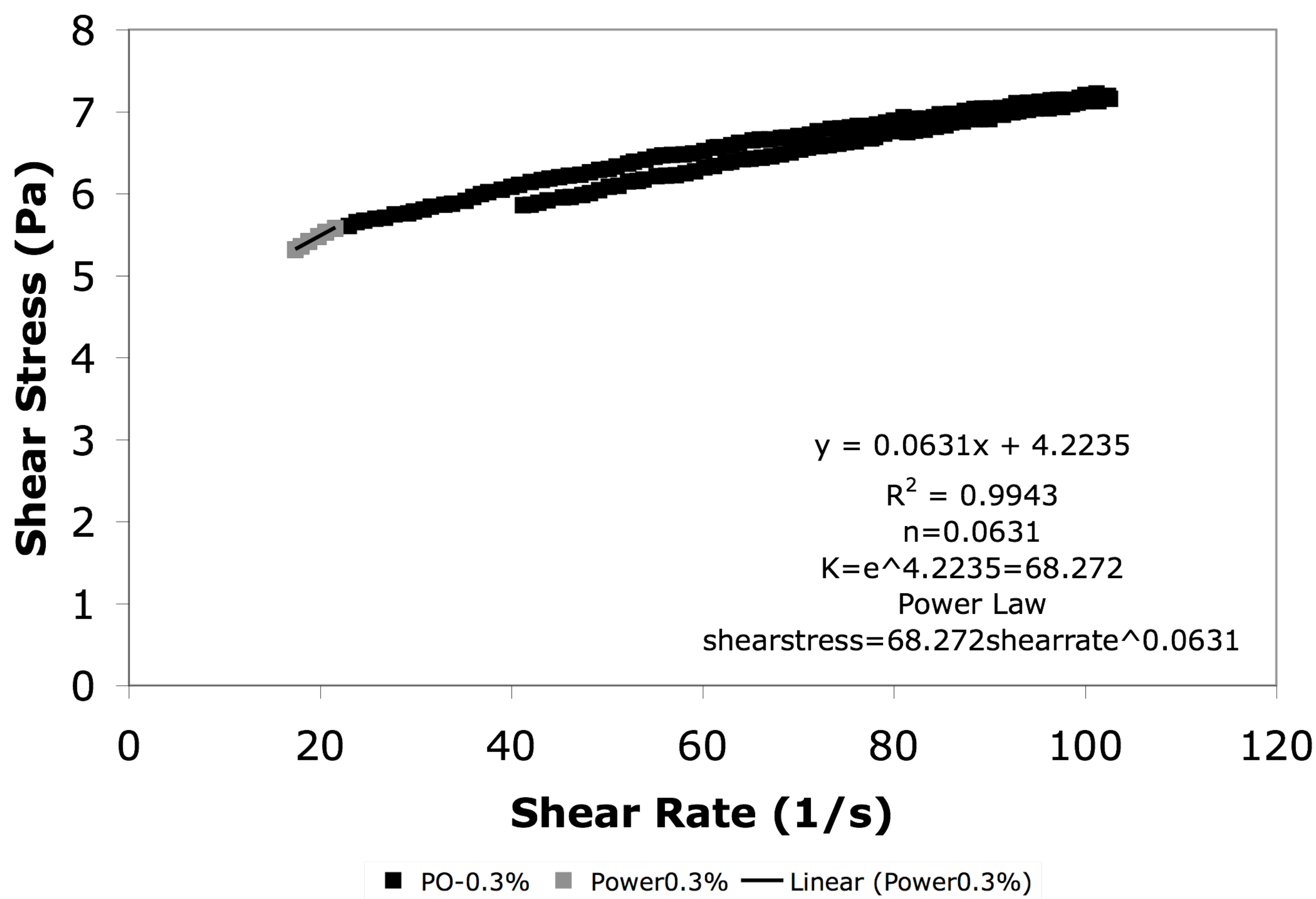
B-13. Mean linear shear-thinning determination of fluid behavior for 0.500% XG with 0.000% sodium phosphate at 25 ^{o}C.



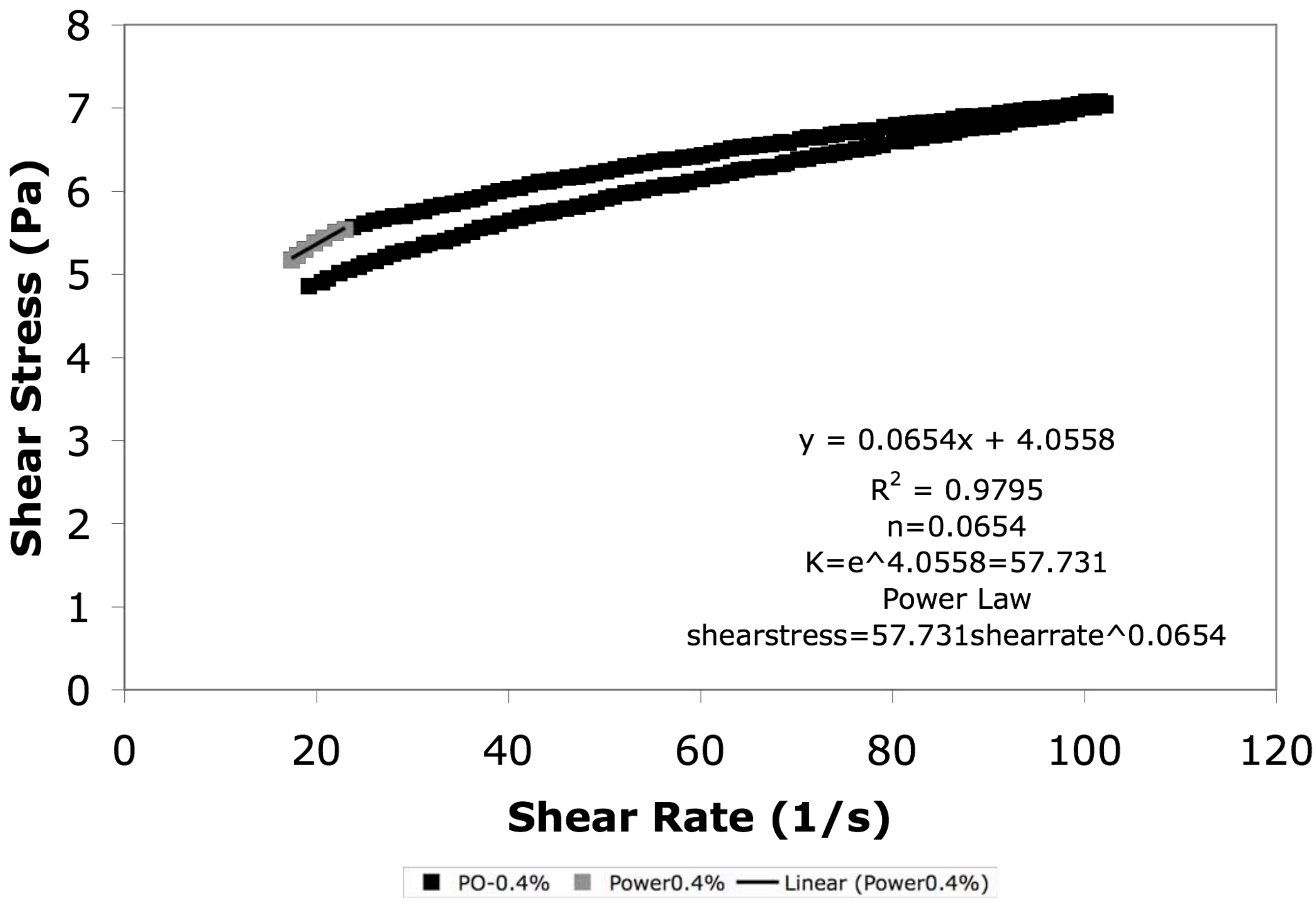
B-14. Mean linear shear-thinning determination of fluid behavior for 0.500% XG with 0.100% sodium phosphate at 25 ^{o}C.



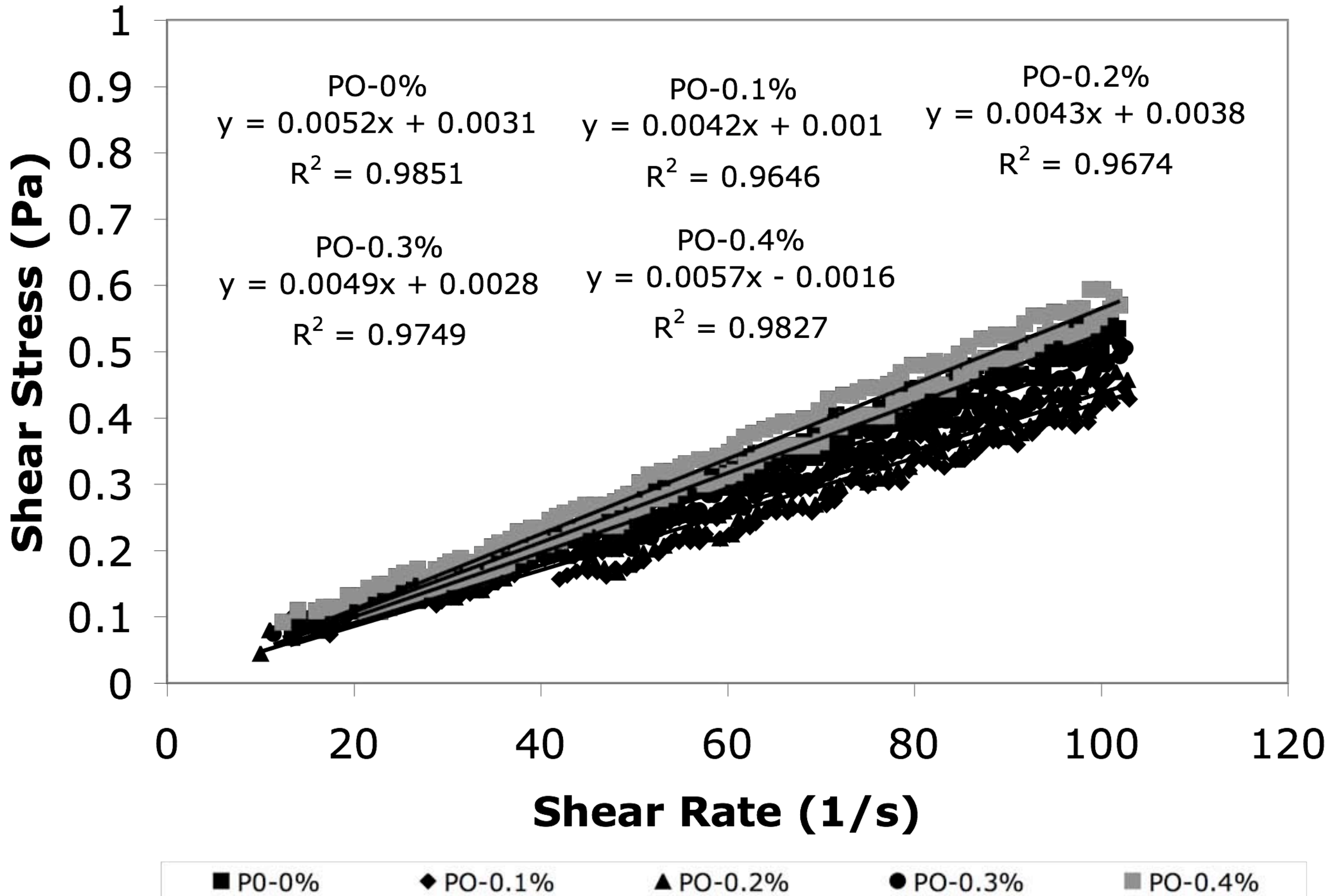
B-15. Mean linear shear-thinning determination of fluid behavior for 0.500% XG with 0.200% sodium phosphate at 25 ^{o}C.



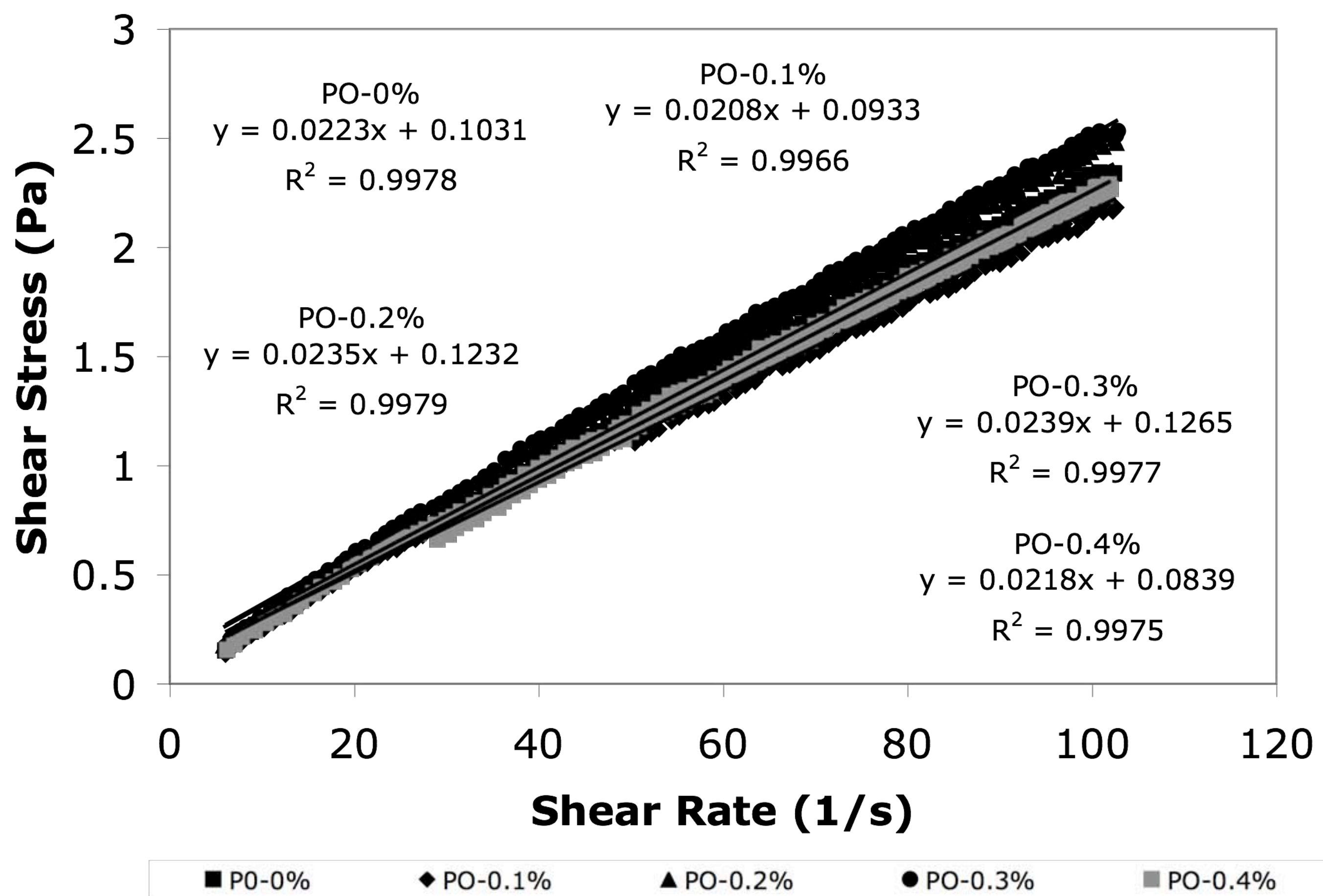
B-16. Mean linear shear-thinning determination of fluid behavior for 0.500% XG with 0.300% sodium phosphate at 25 ^{o}C.



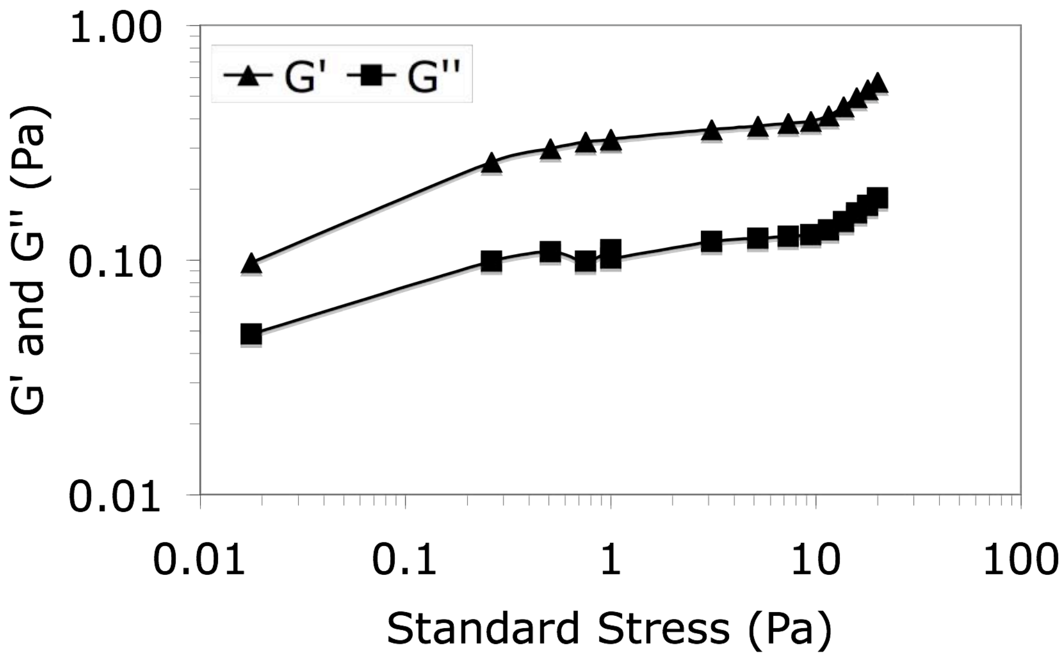
B-17. Mean linear shear-thinning determination of fluid behavior for 0.500% XG with 0.400% sodium phosphate at 25 ^{o}C.



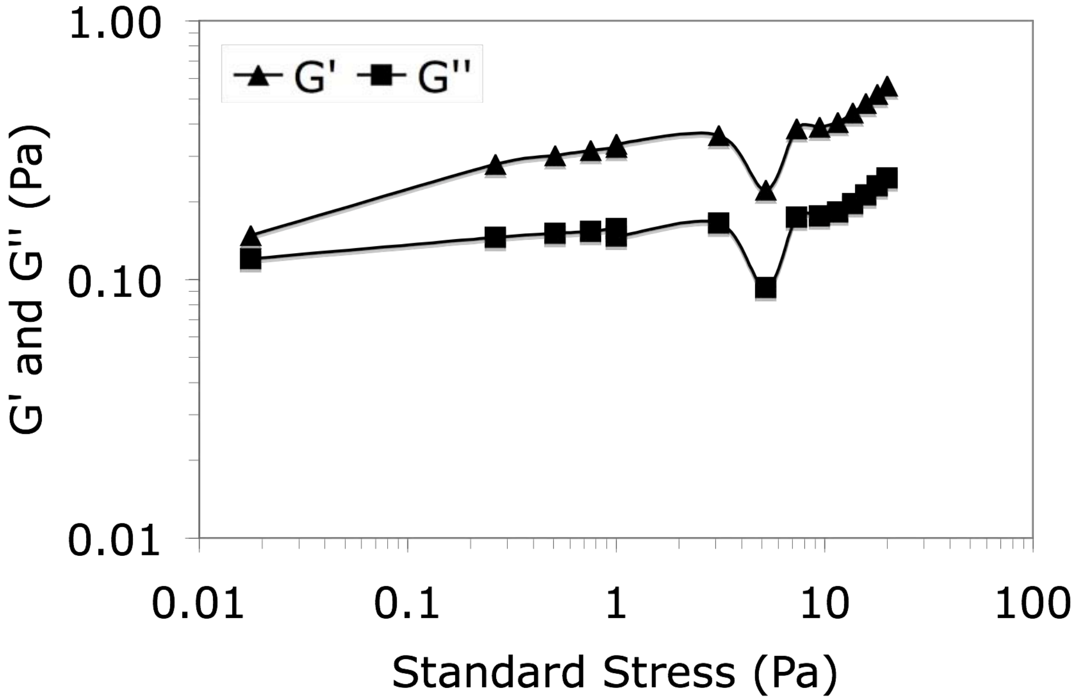
B-18. Fluid behavior for 0.125% KF with 0.000%, 0.100%, 0.200%, 0.300%, and 0.400% sodium phosphate at 25 °C.



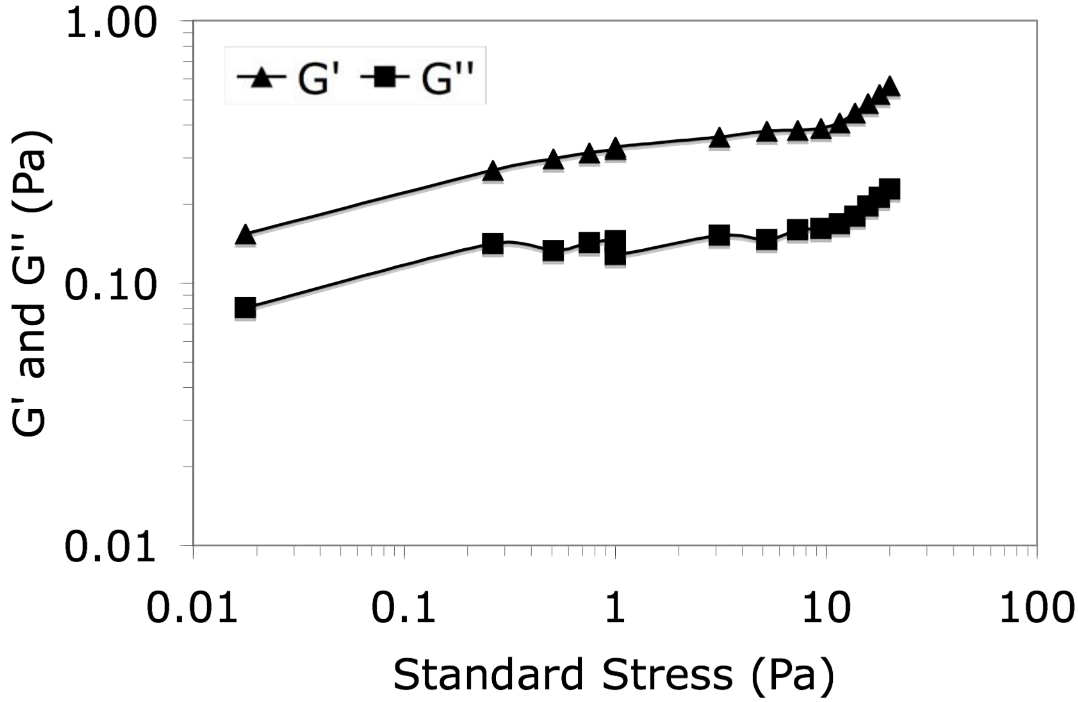
B-19. Fluid behavior for 0.250% KF with 0.000%, 0.100%, 0.200%, 0.300%, and 0.400% sodium phosphate at 25 ^{o}C.



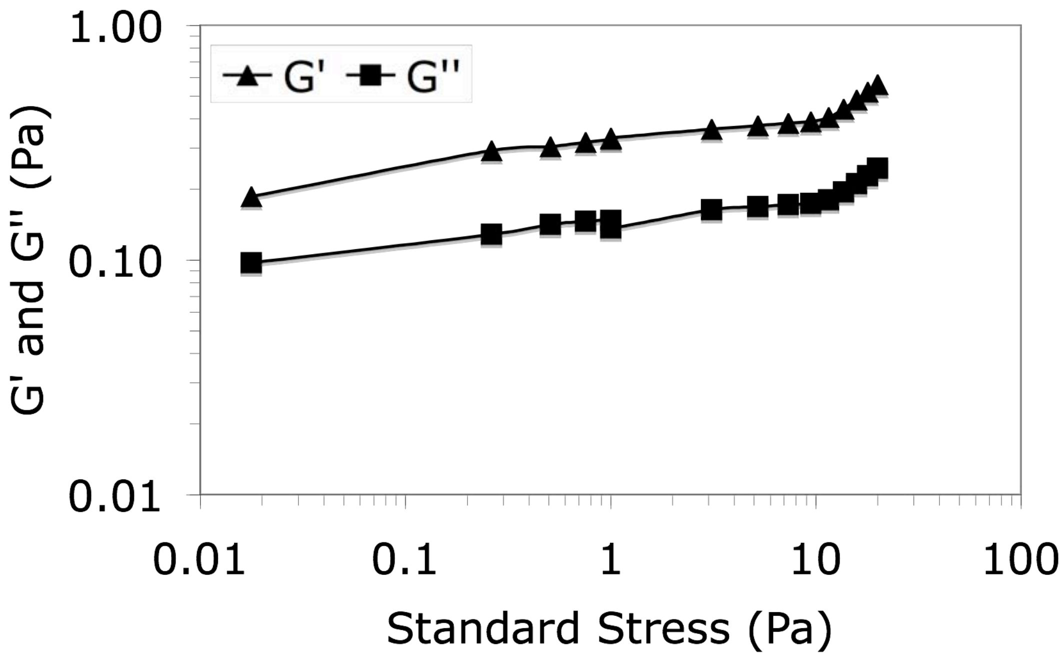
B-1. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 0.1% SP at 1 Hz and 25 ^{o}C.



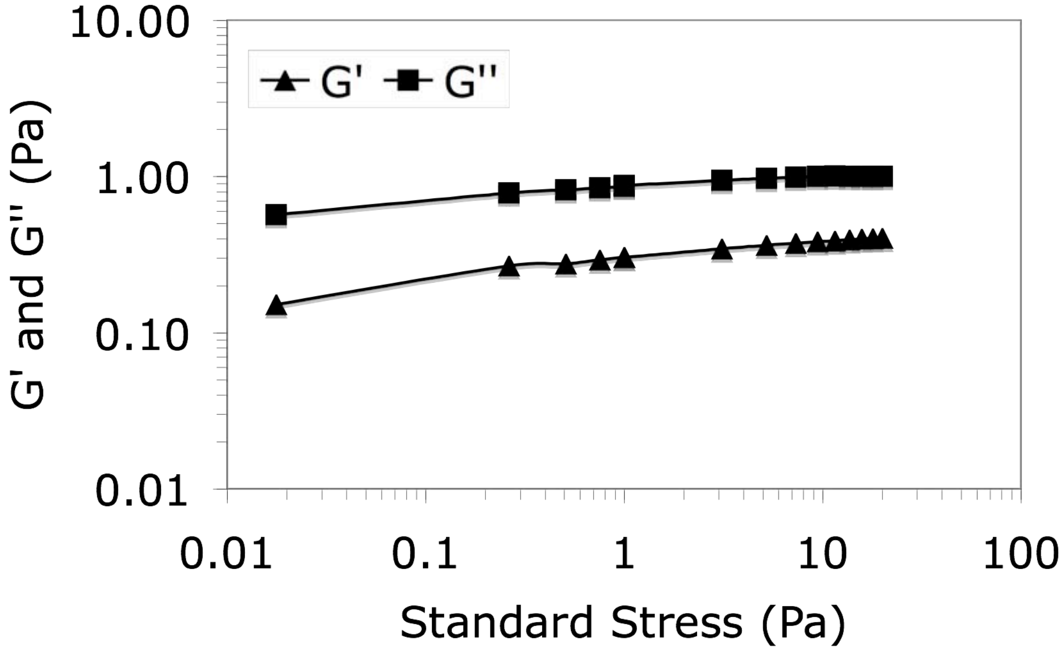
B-2. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 0.2% SP at 1 Hz and 25 ^{o}C.



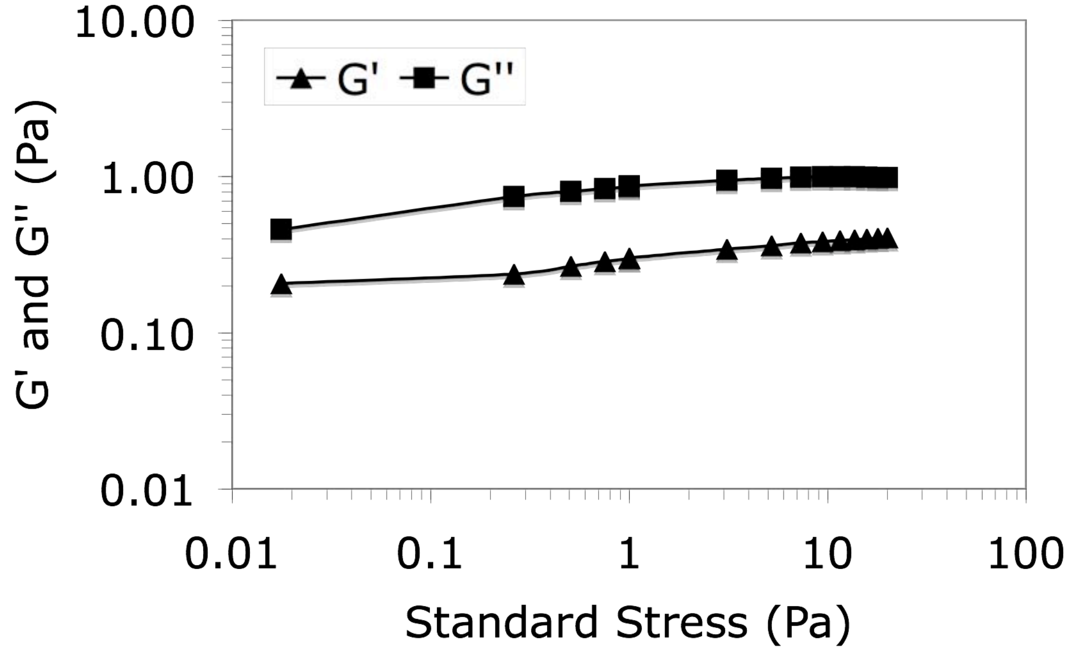
B-3. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 0.3% SP at 1 Hz and 25 ^{o}C.



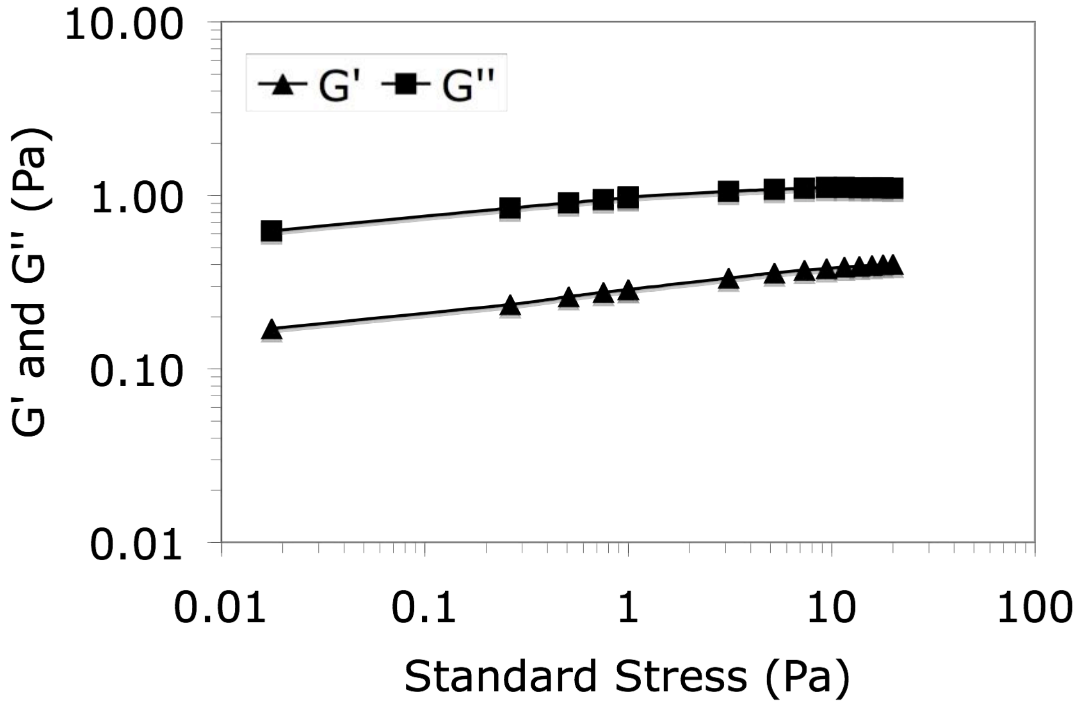
B-4. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 0.4% SP at 1 Hz and 25 ^{o}C.



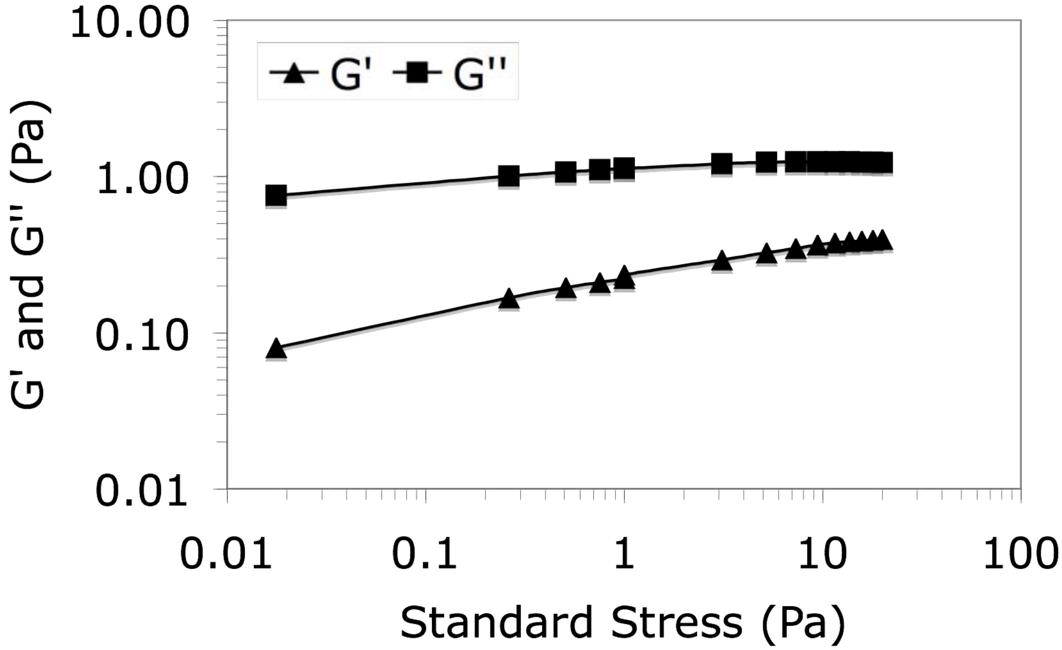
B-5. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 0.1% SP at 1 Hz and 25 ^{o}C.



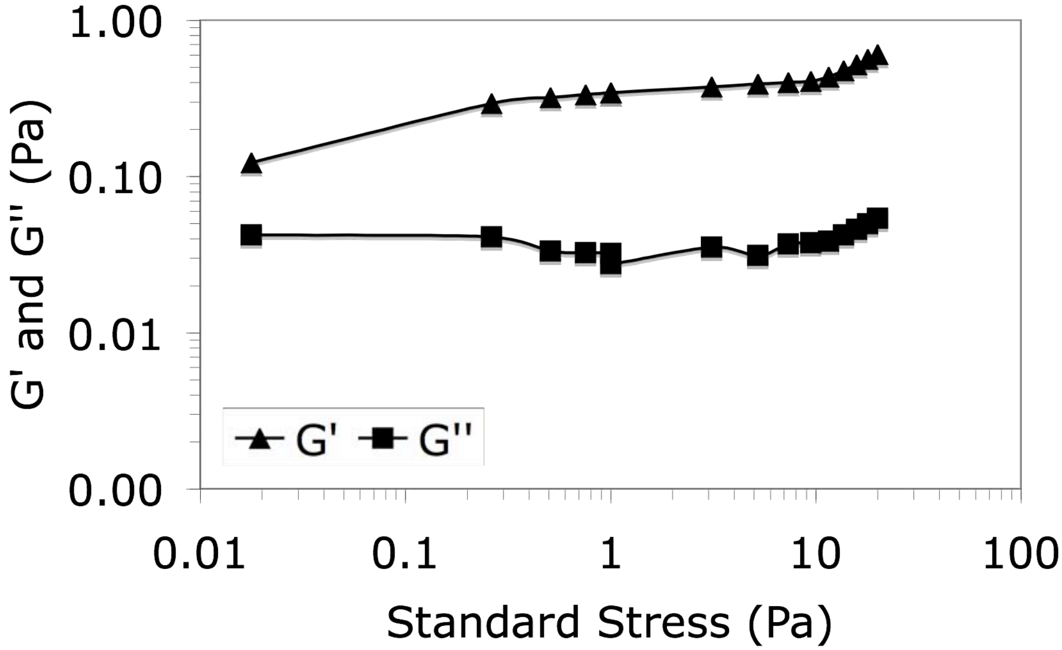
B-6. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 0.2% SP at 1 Hz and 25 ^{o}C.



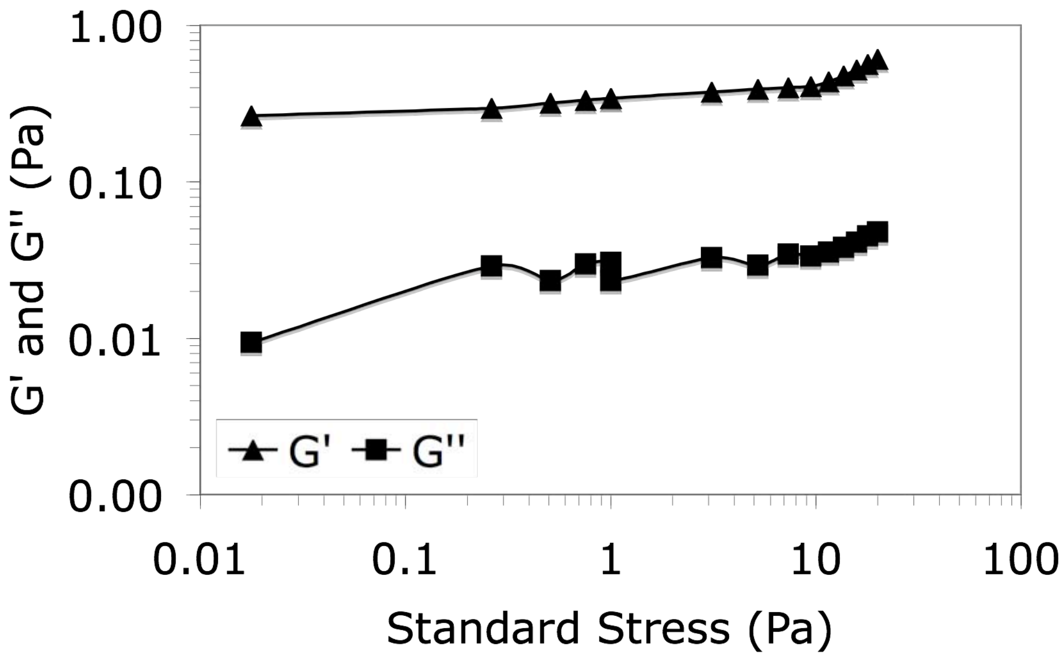
B-7. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 0.3% SP at 1 Hz and 25 ^{o}C.



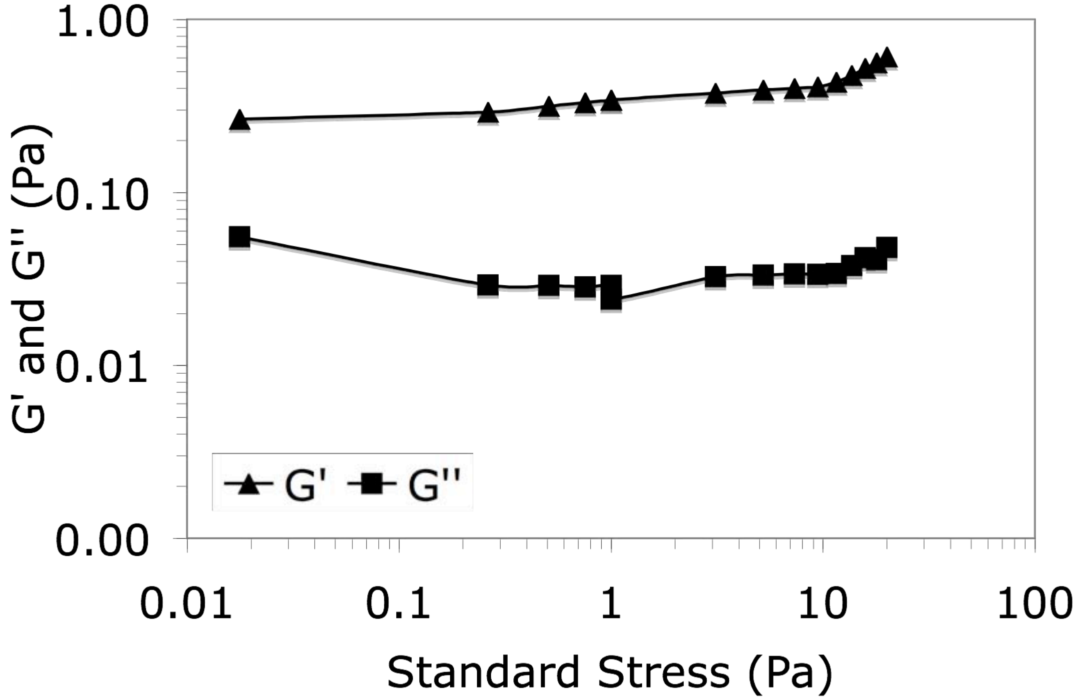
B-8. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 0.4% SP at 1 Hz and 25 ^{o}C.



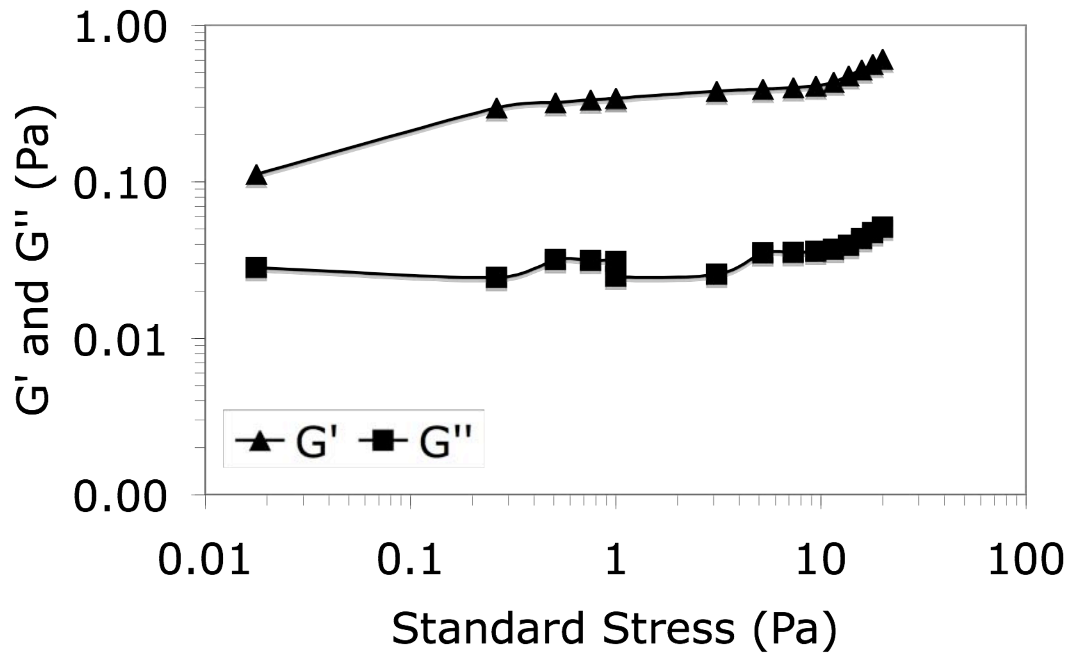
B-9. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 0.1% SP at 1 Hz and 25 ^{o}C.



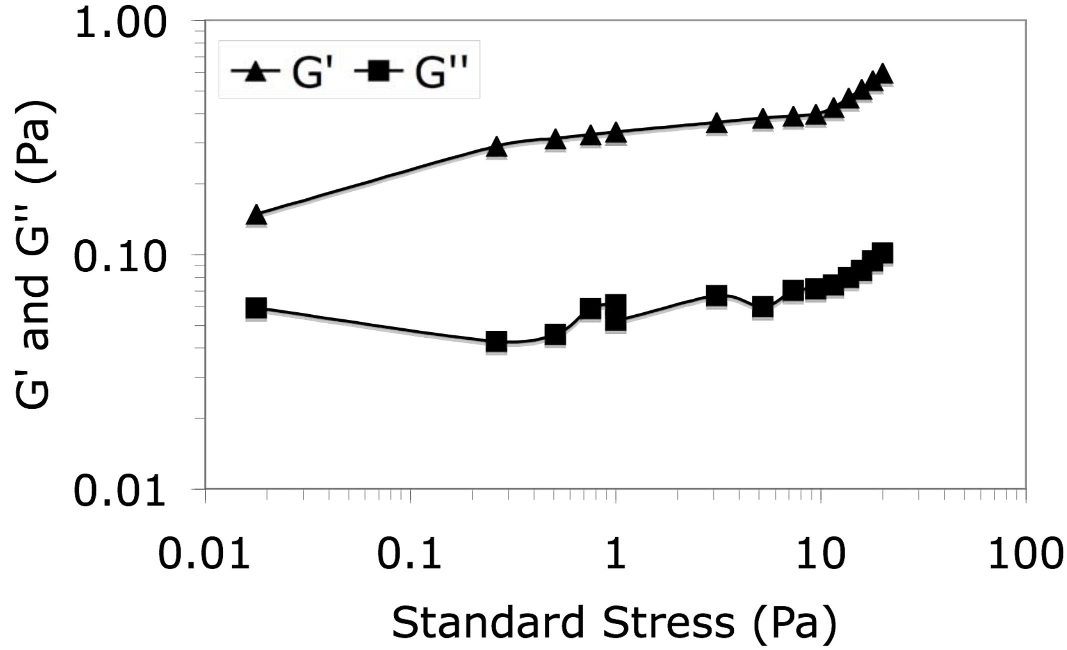
B-10. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 0.2% SP at 1 Hz and 25 ^{o}C.



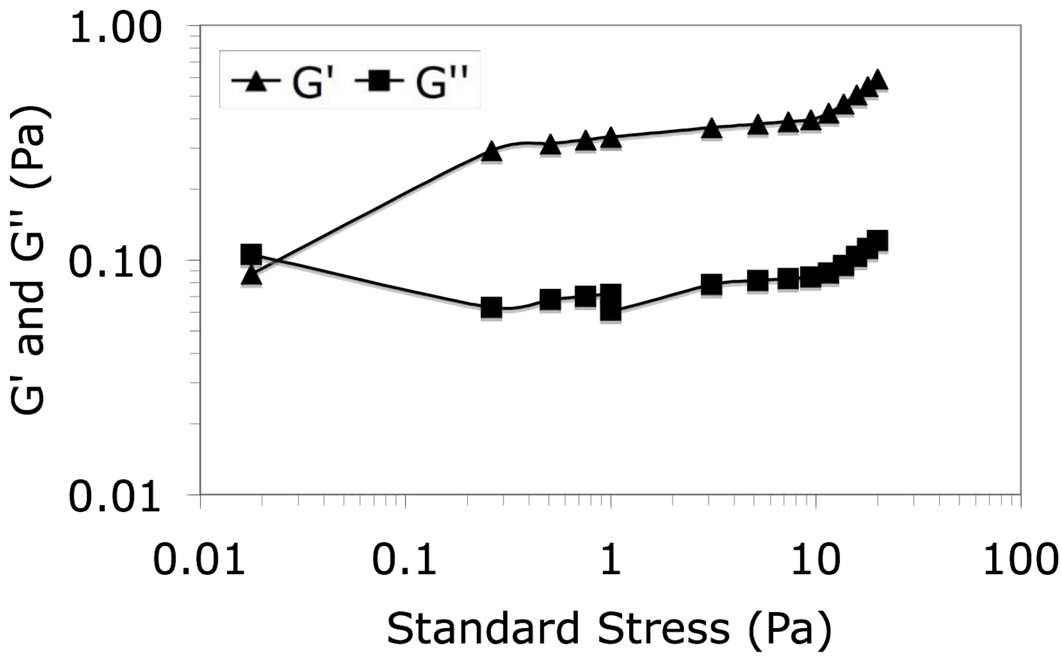
B-11. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 0.3% SP at 1 Hz and 25 ^{o}C.



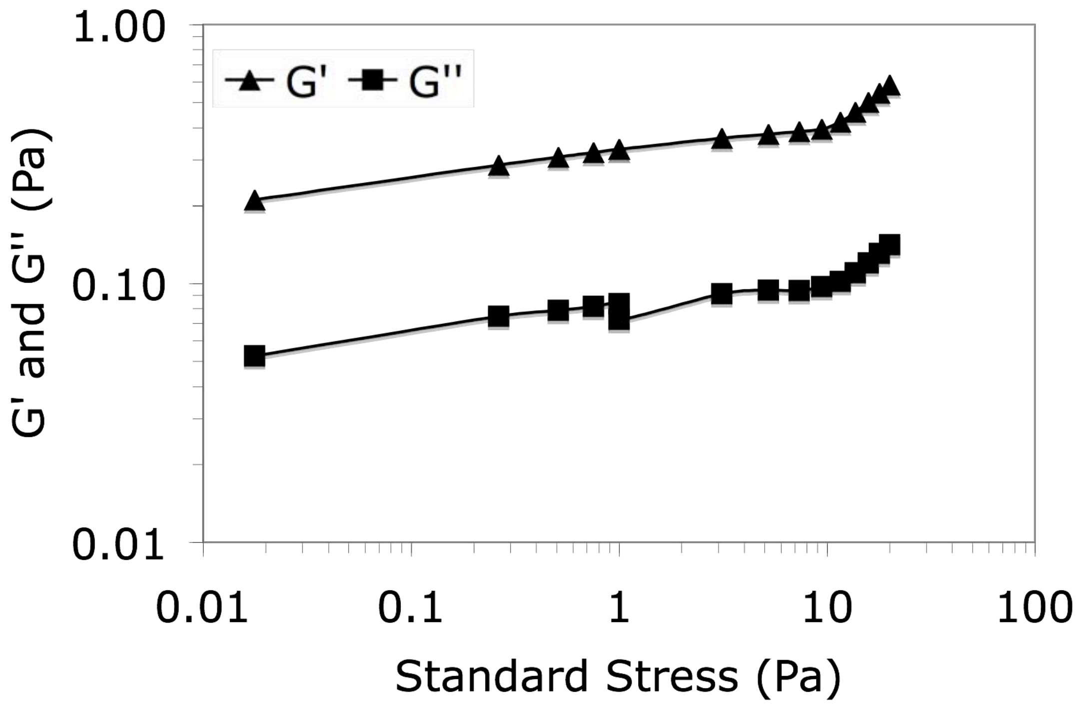
B-12. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 0.4% SP at 1 Hz and 25 °C.



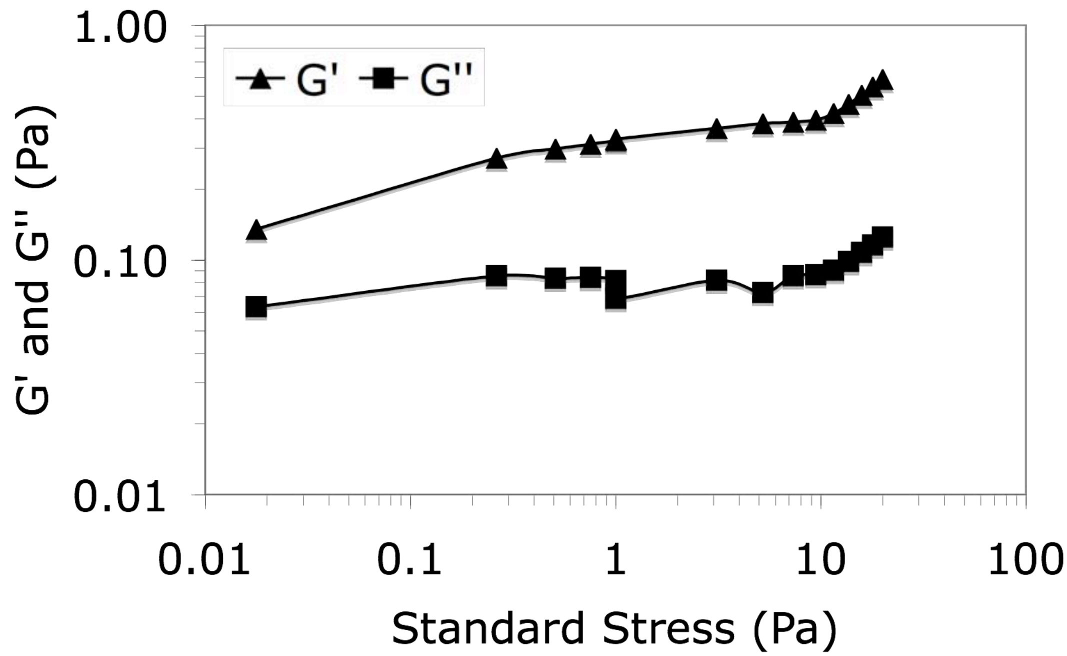
B-13. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 0.1% SP at 1 Hz and 25 ^{o}C.



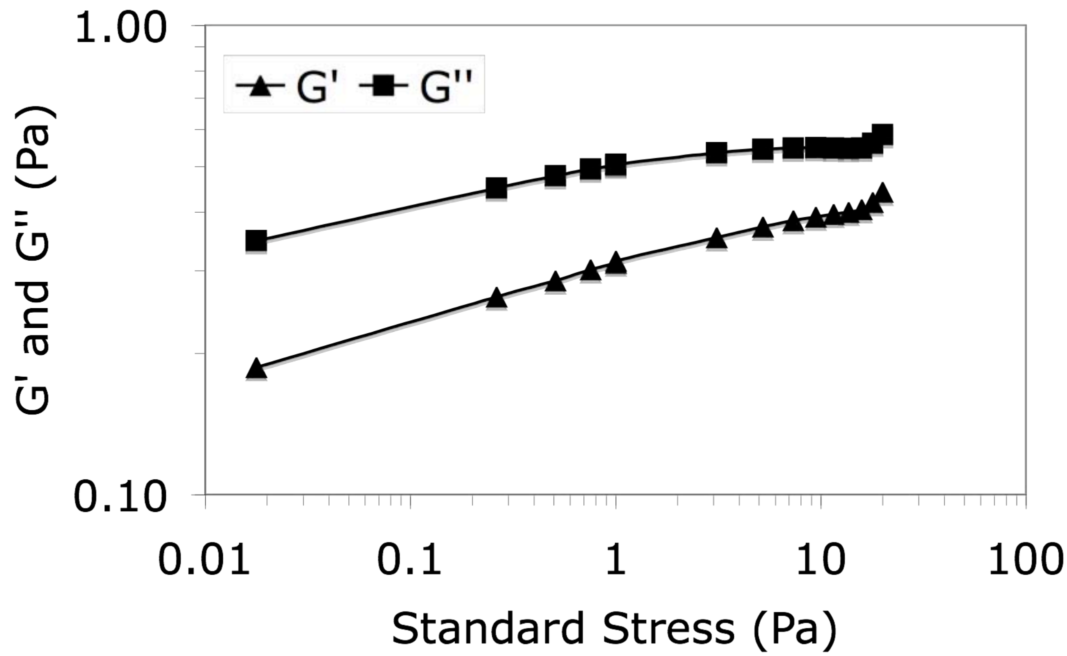
B-14. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 0.2% SP at 1 Hz and 25 ^{o}C.



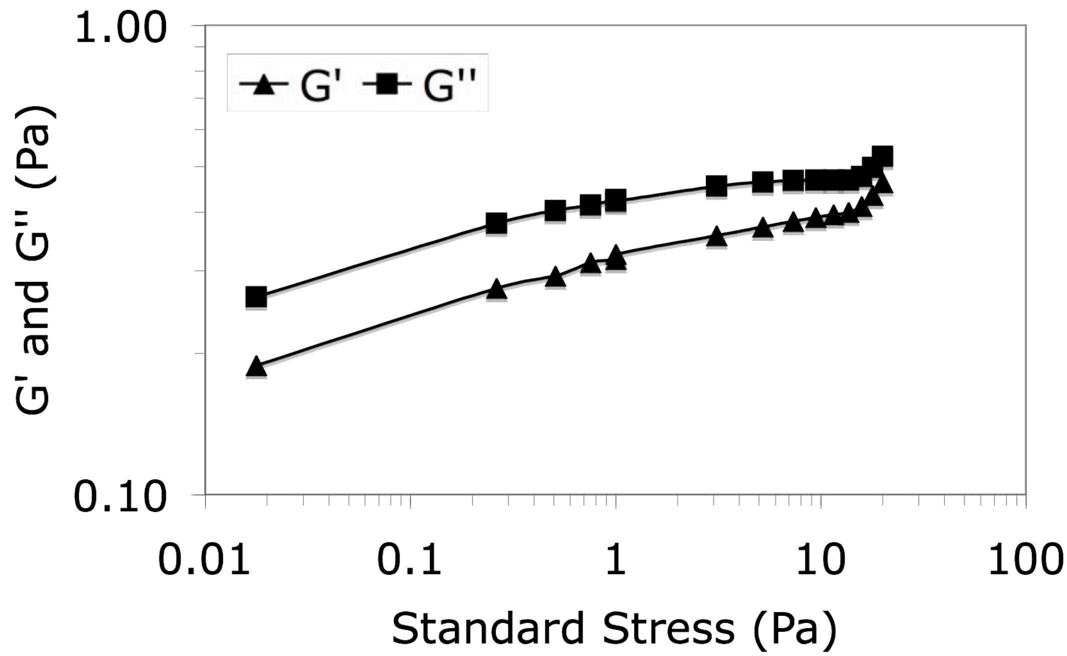
B-15. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 0.3% SP at 1 Hz and 25 ^{o}C.



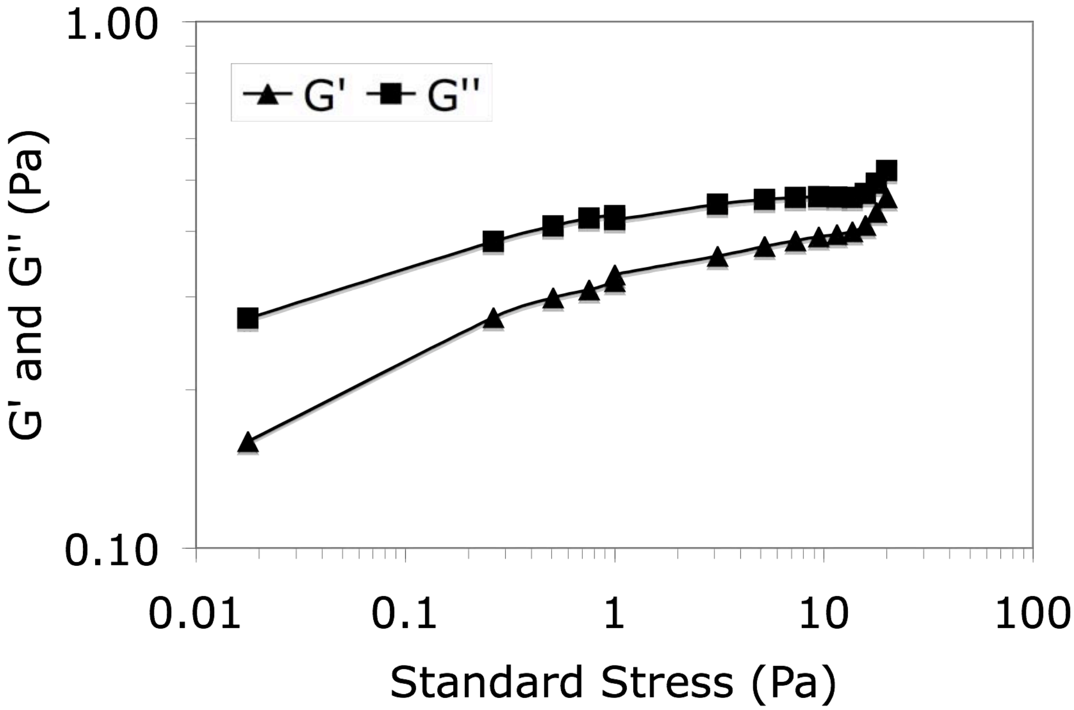
B-16. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 0.4% SP at 1 Hz and 25 ^{o}C.



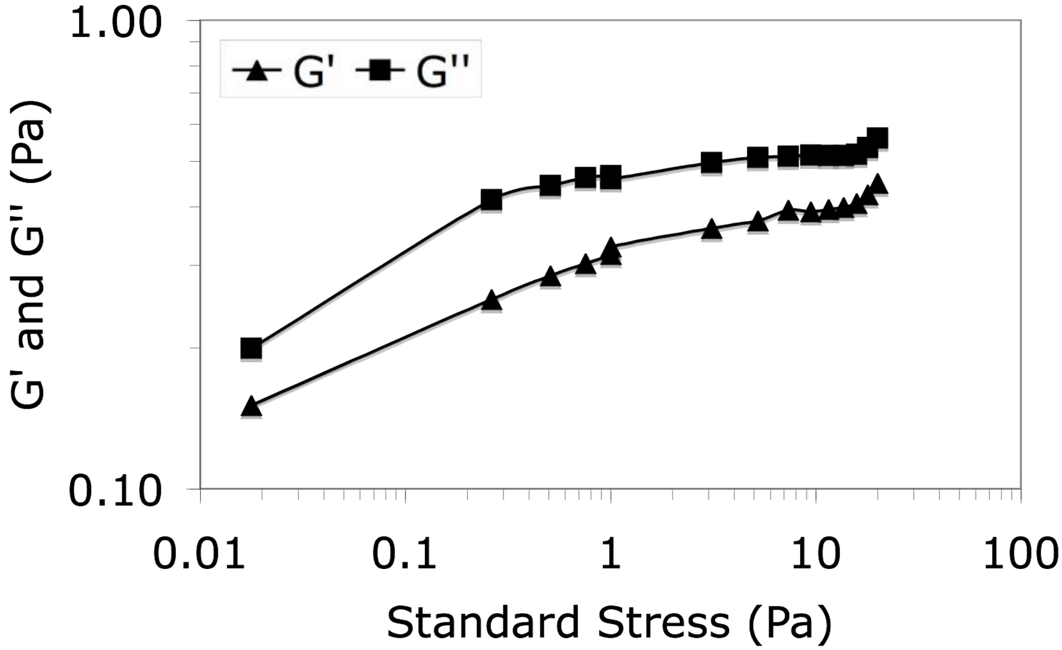
B-17. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 0.1% SP at 1 Hz and 25 °C.



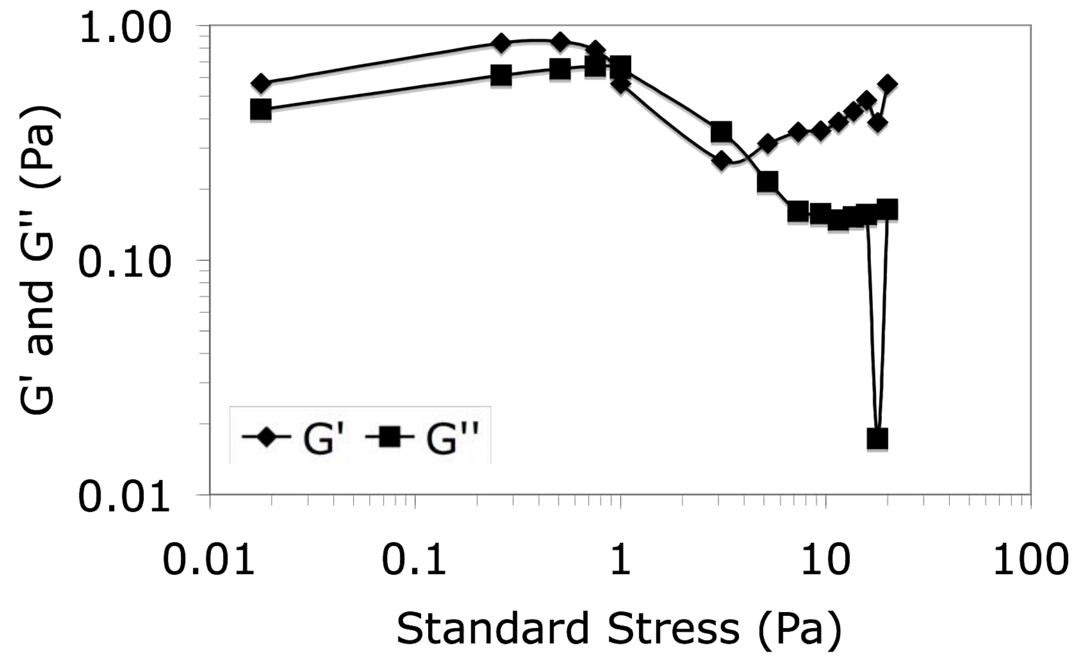
B-18. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 0.2% SP at 1 Hz and 25 ^{o}C.



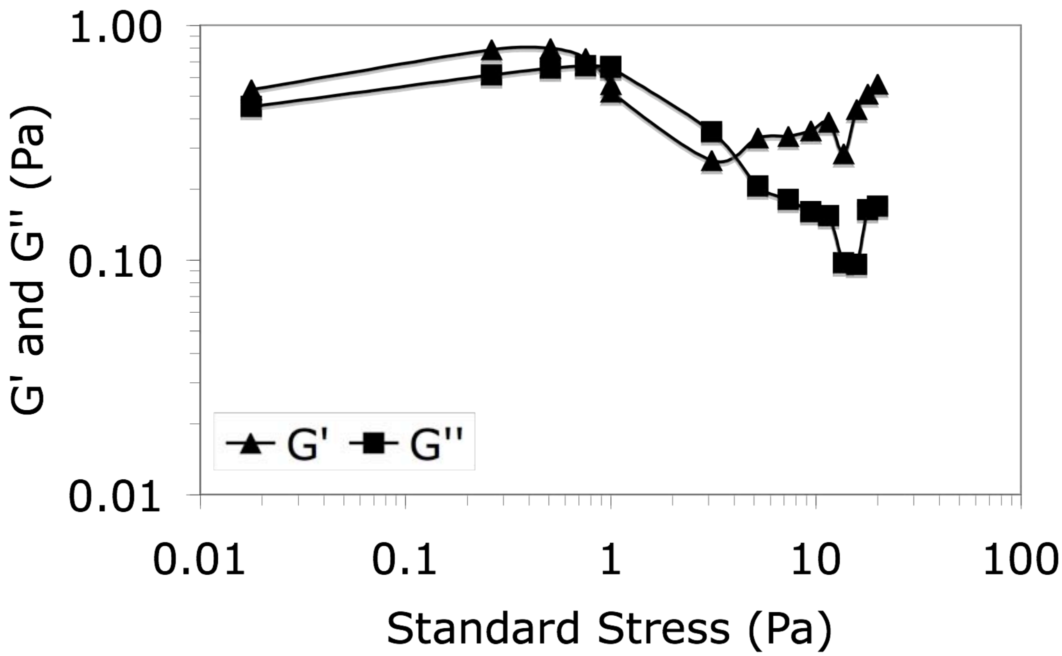
B-19. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 0.3% SP at 1 Hz and 25 °C.



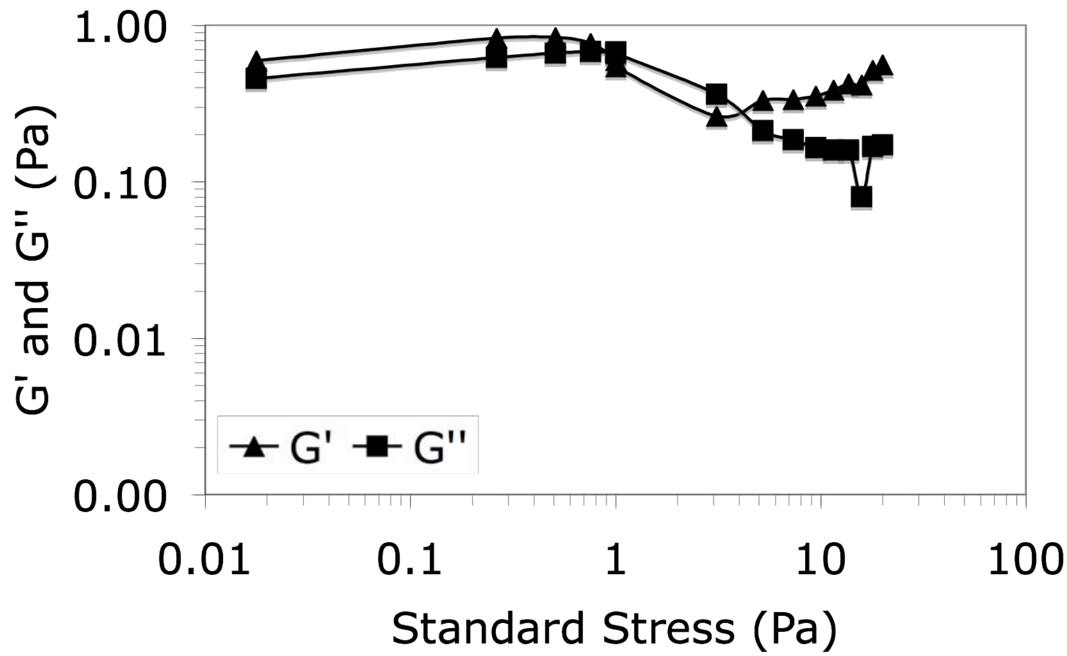
B-20. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 0.4% SP at 1 Hz and 25 ^{o}C.



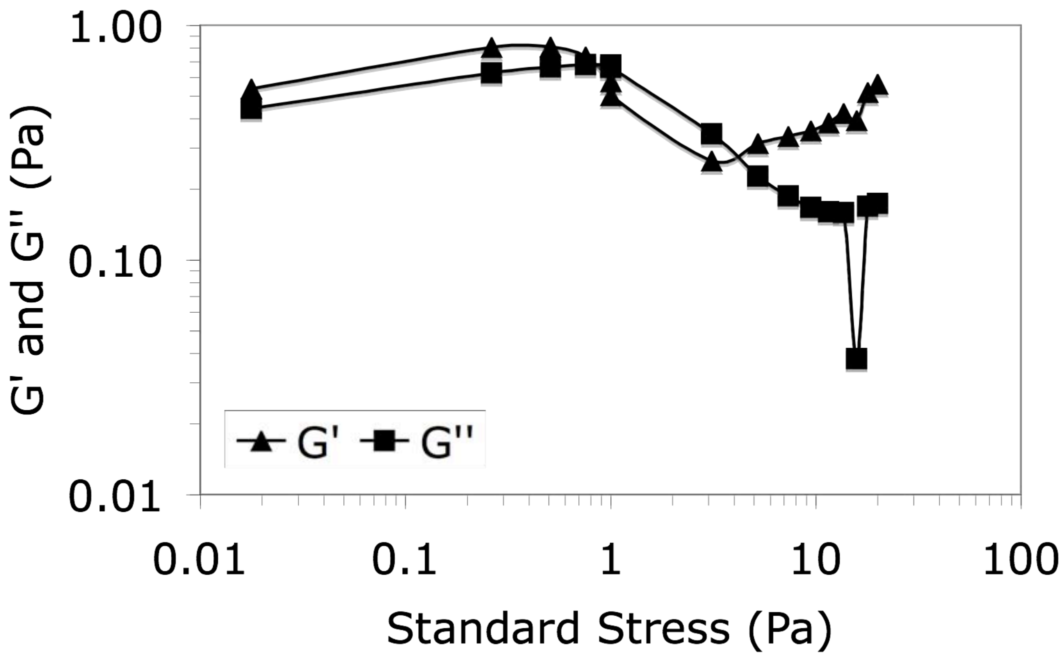
B-21. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 0.1% SP at 1 Hz and 25 ^{o}C.



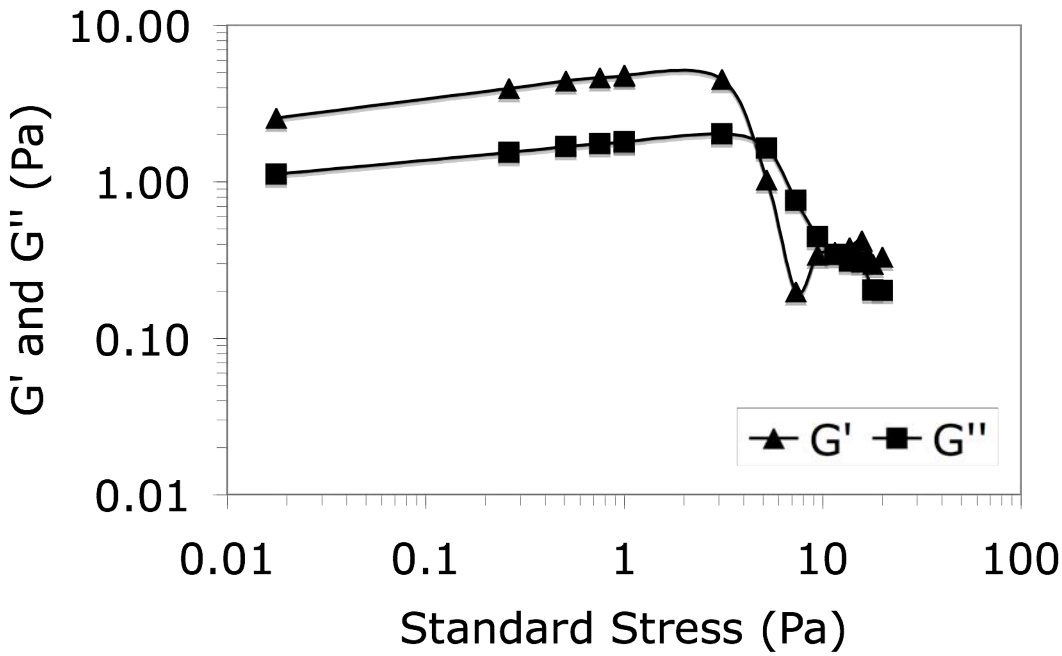
B-22. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 0.2% SP at 1 Hz and 25 °C.



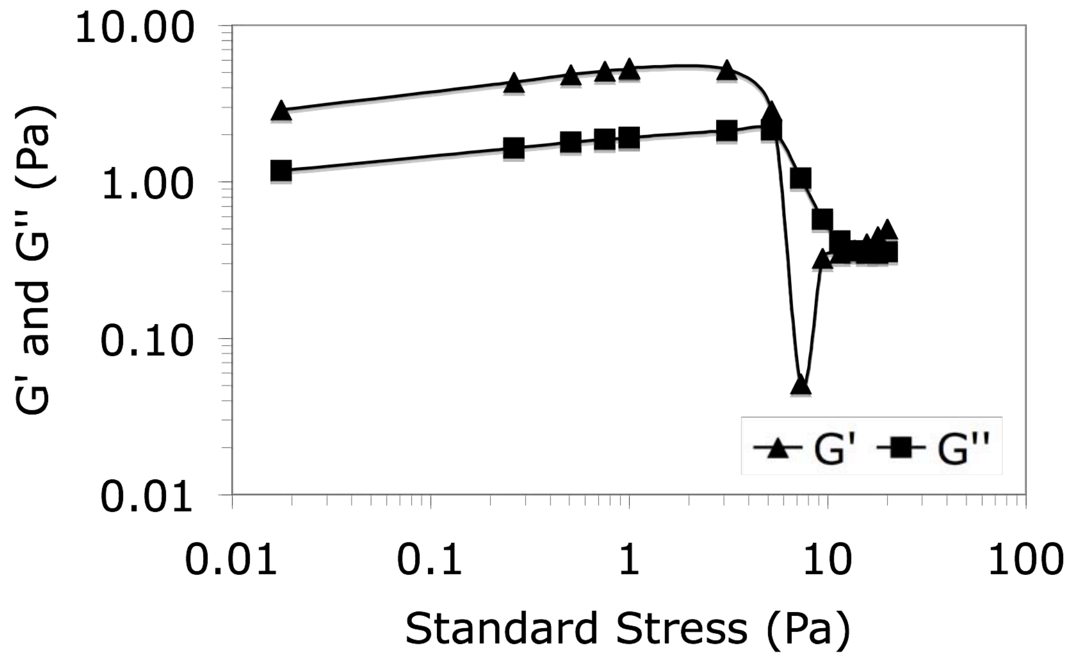
B-23. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 0.3% SP at 1 Hz and 25 ^{o}C.



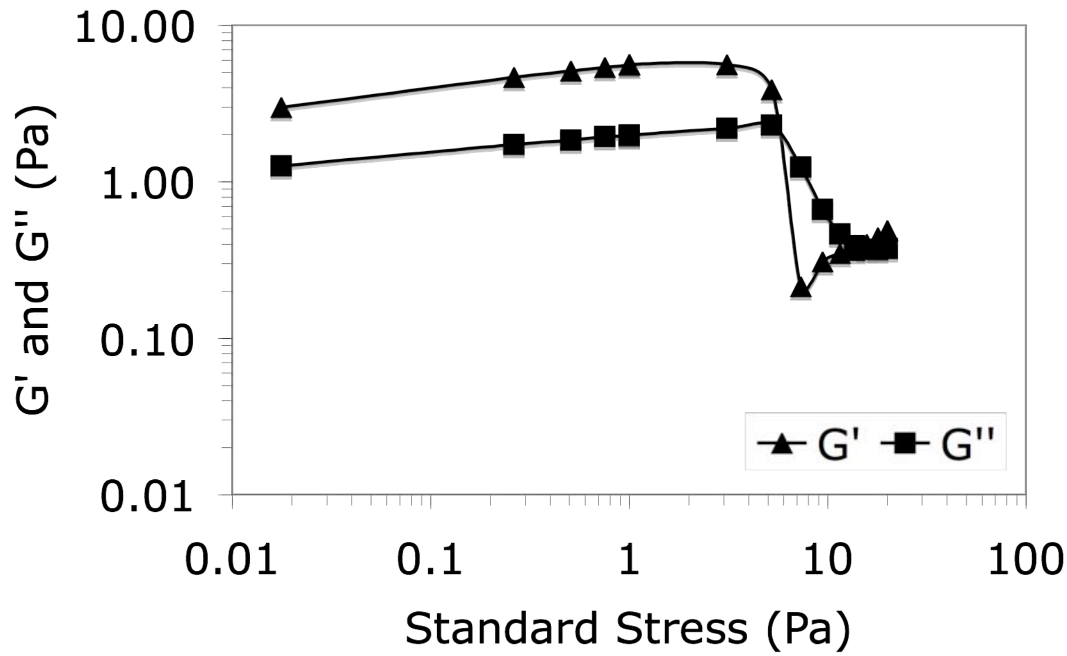
B-24. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 0.4% SP at 1 Hz and 25 ^{o}C.



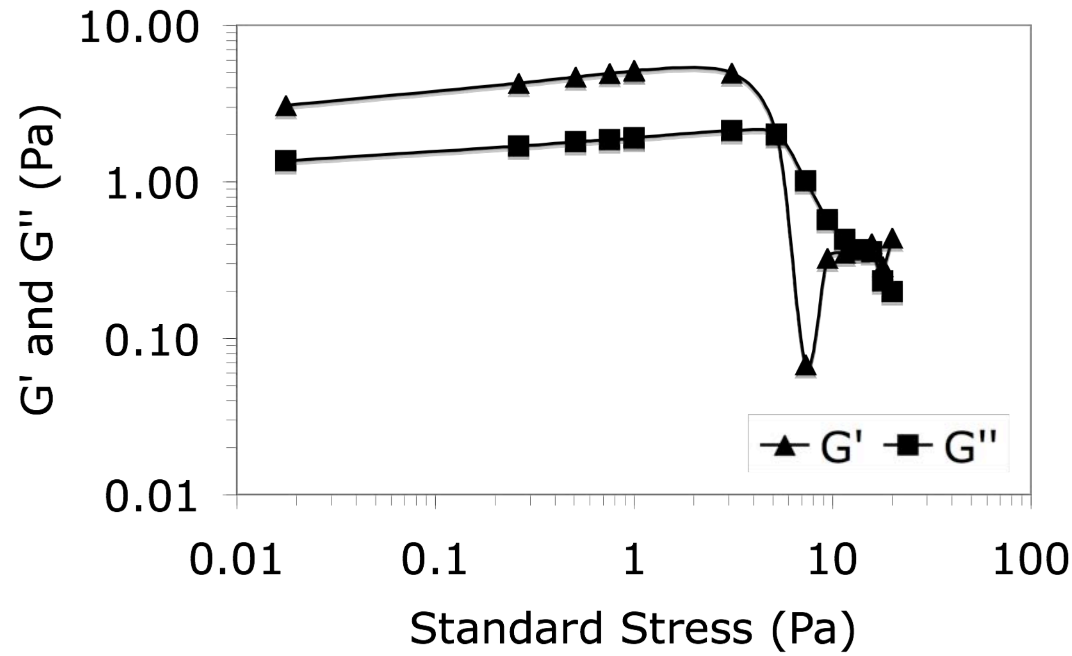
B-25. Stress sweep for determination of linear viscoelastic region of 0.500% XG with 0.1% SP at 1 Hz and 25 ^{o}C.



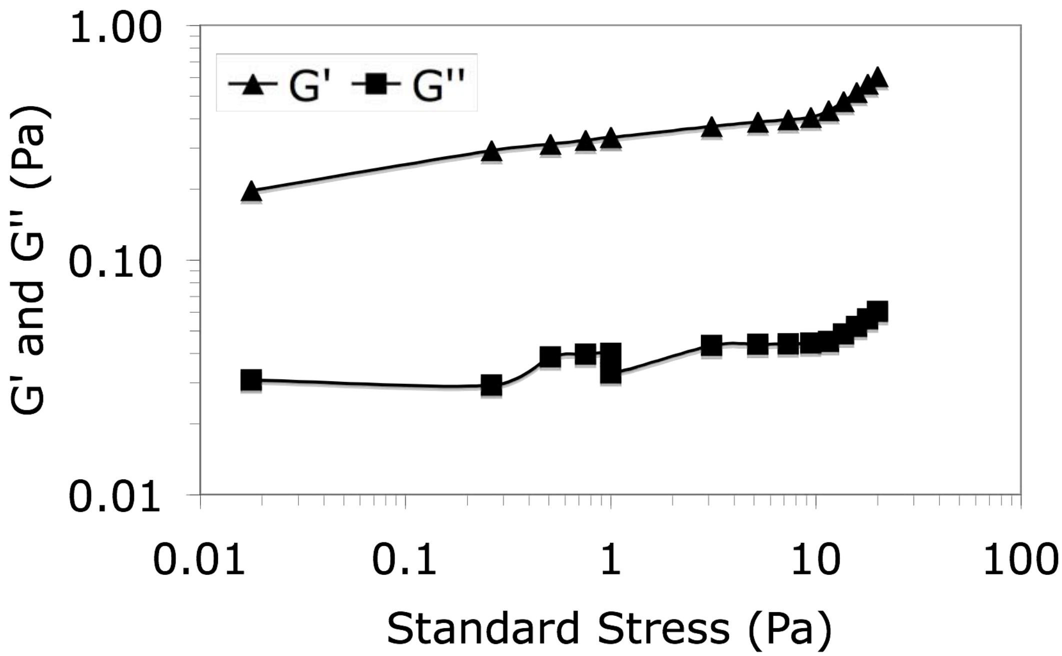
B-26. Stress sweep for determination of linear viscoelastic region of 0.500% XG with 0.2% SP at 1 Hz and 25 ^{o}C.



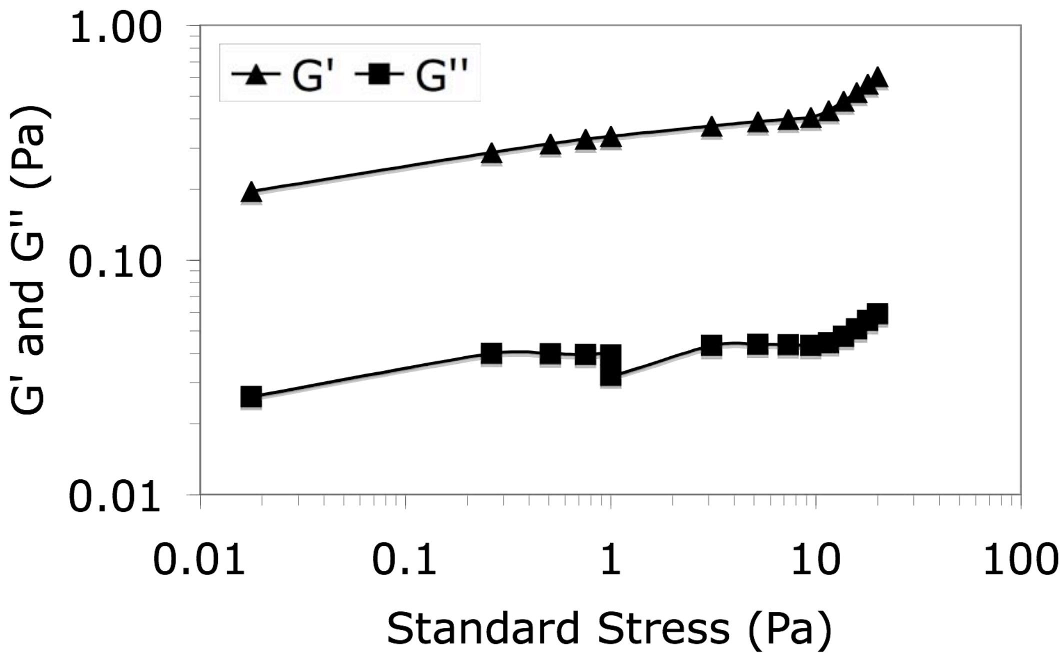
B-27. Stress sweep for determination of linear viscoelastic region of 0.500% XG with 0.3% SP at 1 Hz and 25 ^{o}C.



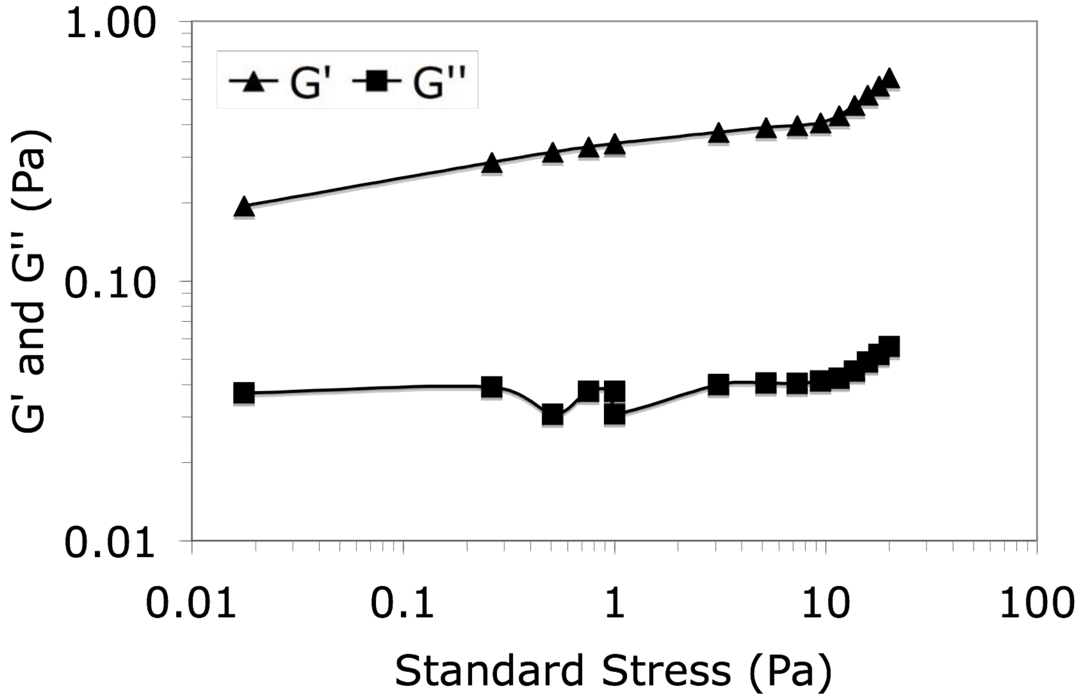
B-28. Stress sweep for determination of linear viscoelastic region of 0.500% XG with 0.4% SP at 1 Hz and 25 ^{o}C.



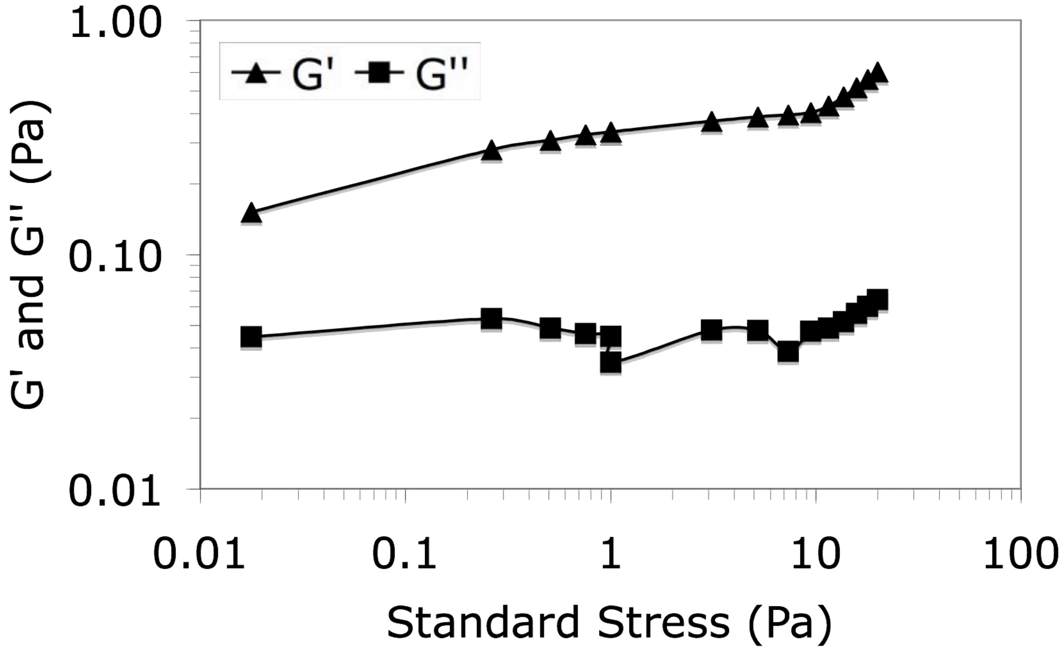
B-29. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 0.1% SP at 1 Hz and 25 ^{o}C.



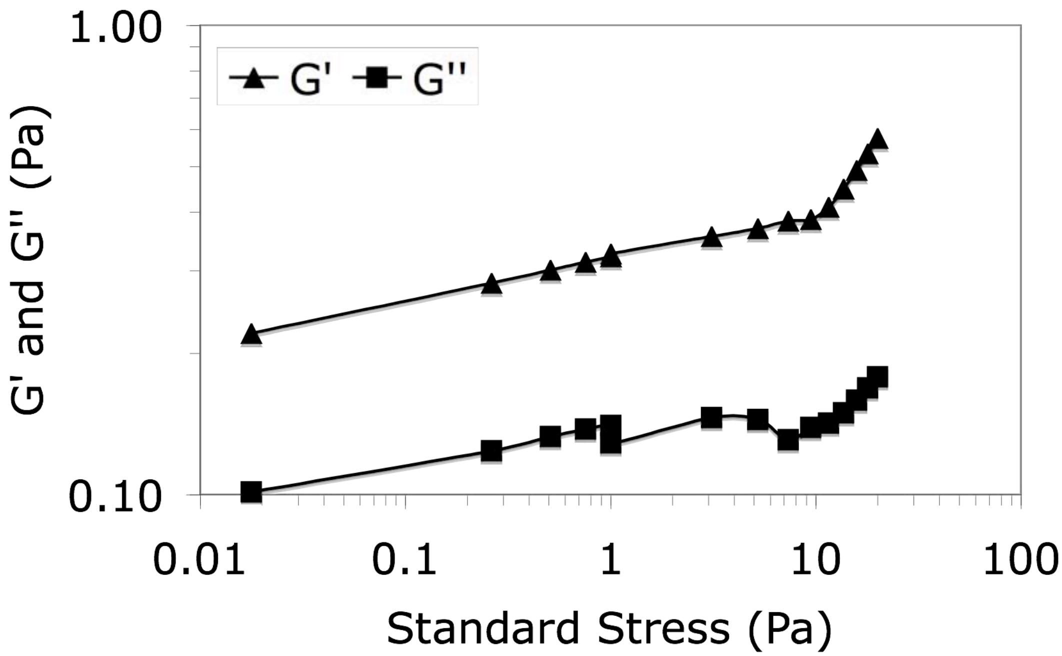
B-30. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 0.2% SP at 1 Hz and 25 ^{o}C.



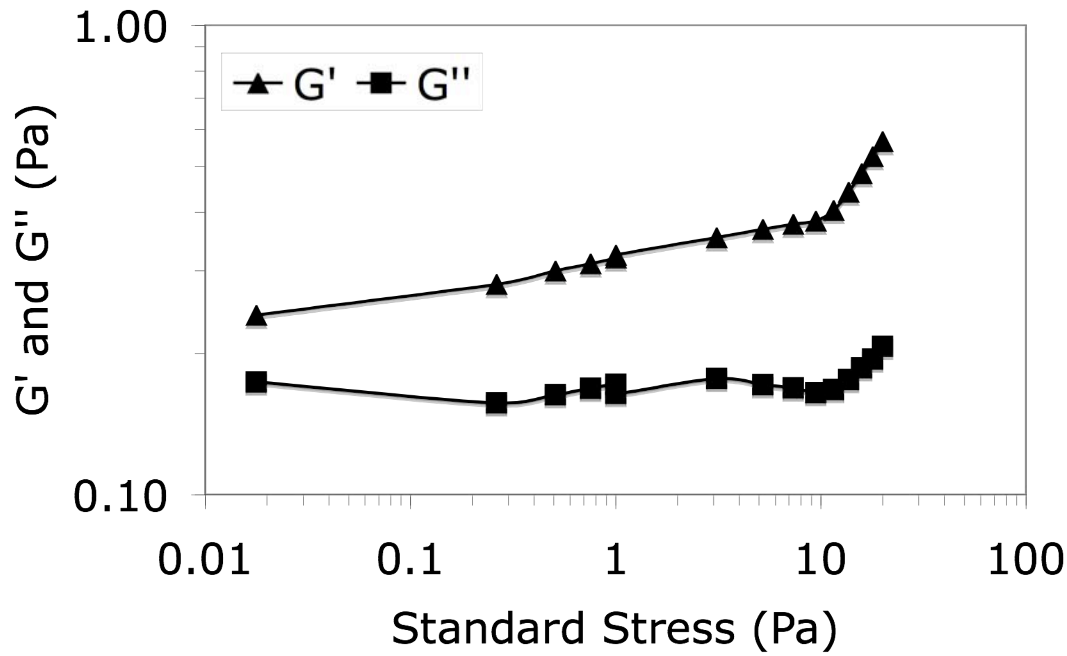
B-31. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 0.3% SP at 1 Hz and 25 ^oC.



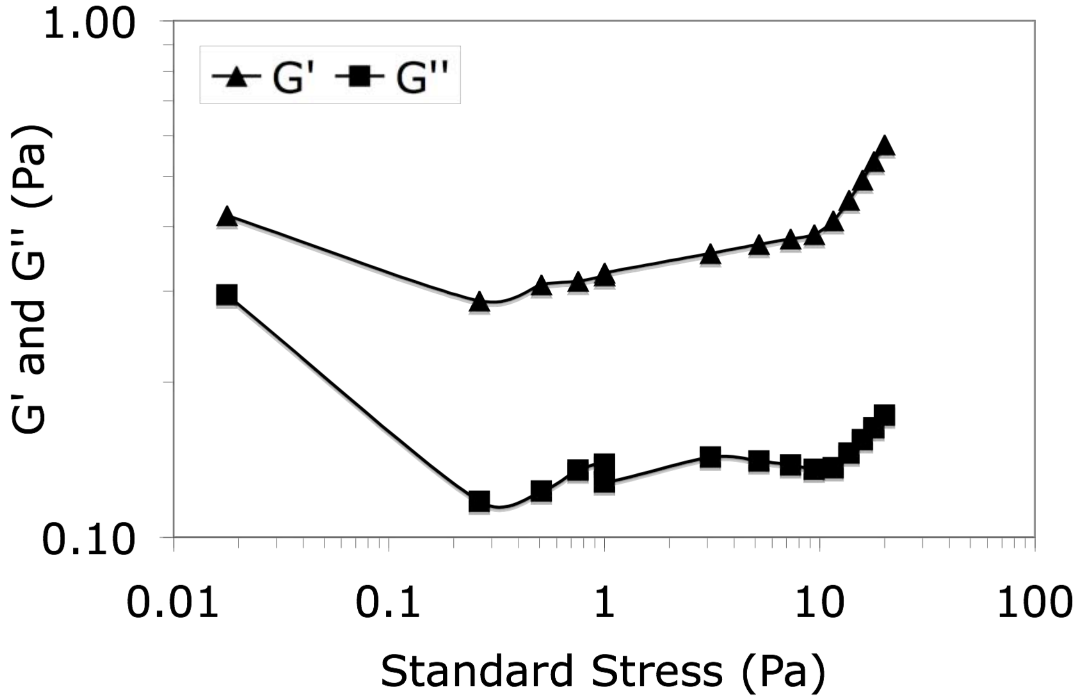
B-32. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 0.4% SP at 1 Hz and 25 ^{o}C.



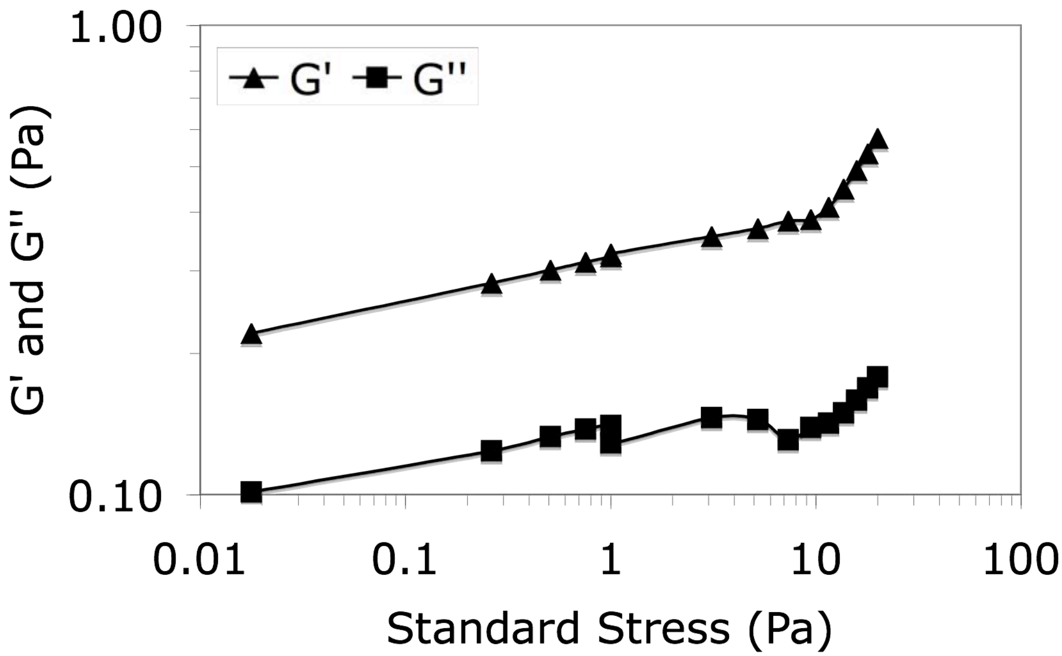
B-33. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 0.1% SP at 1 Hz and 25 ^{o}C.



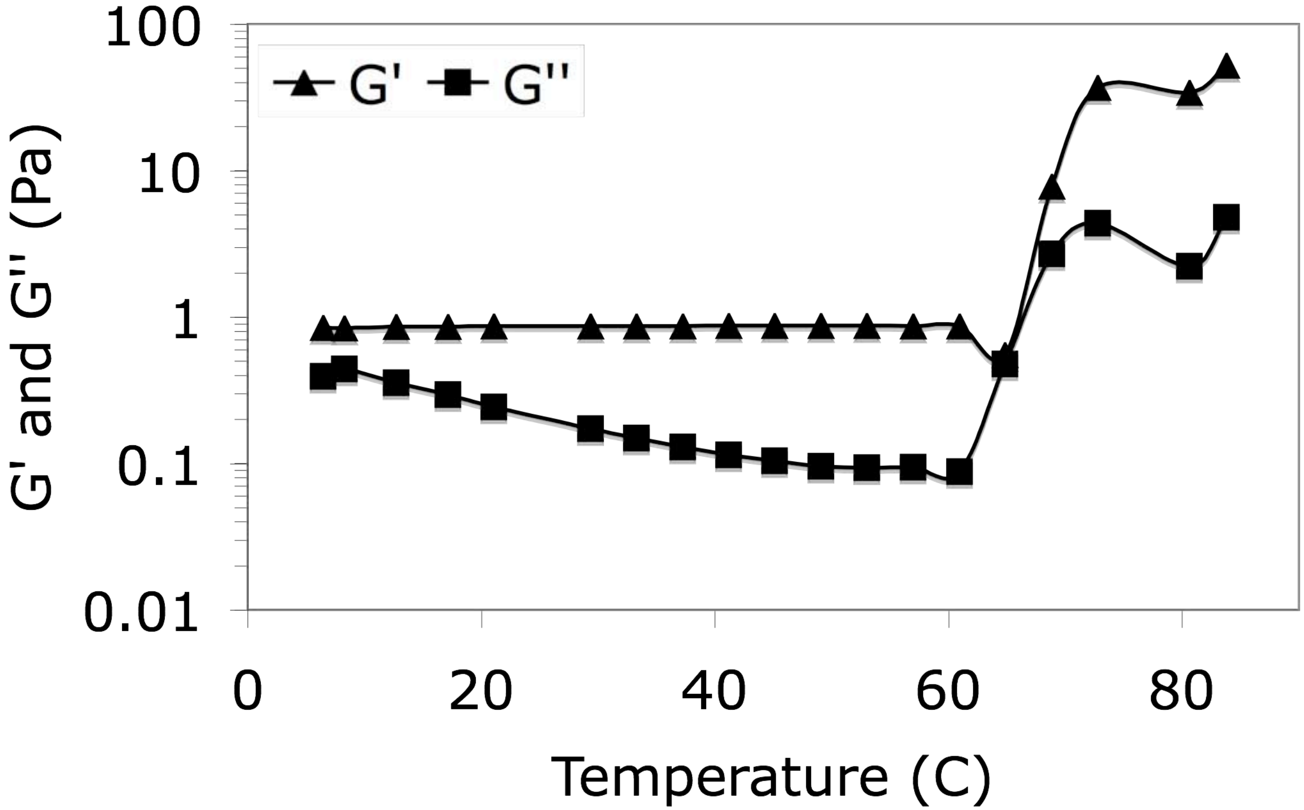
B-34. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 0.2% SP at 1 Hz and 25 ^{o}C.



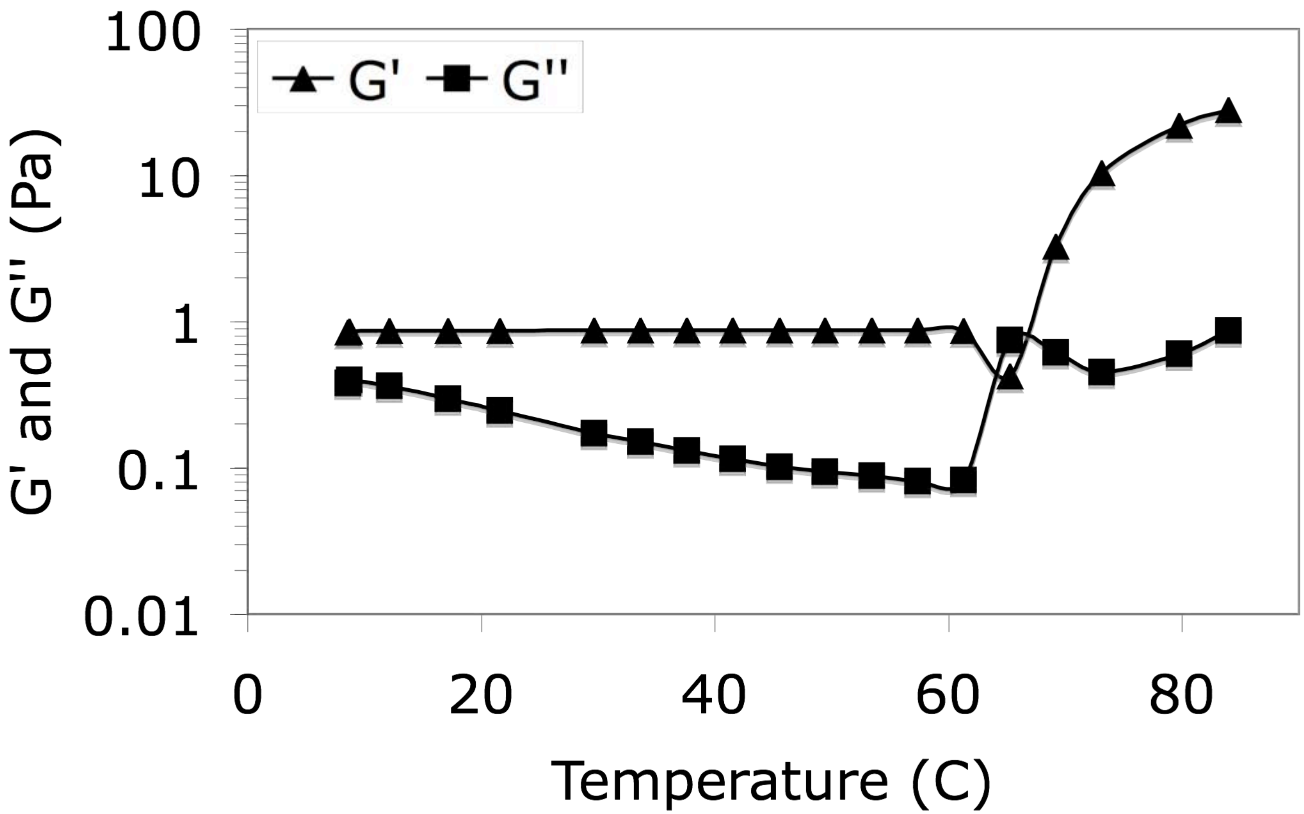
B-35. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 0.3% SP at 1 Hz and 25 °C.



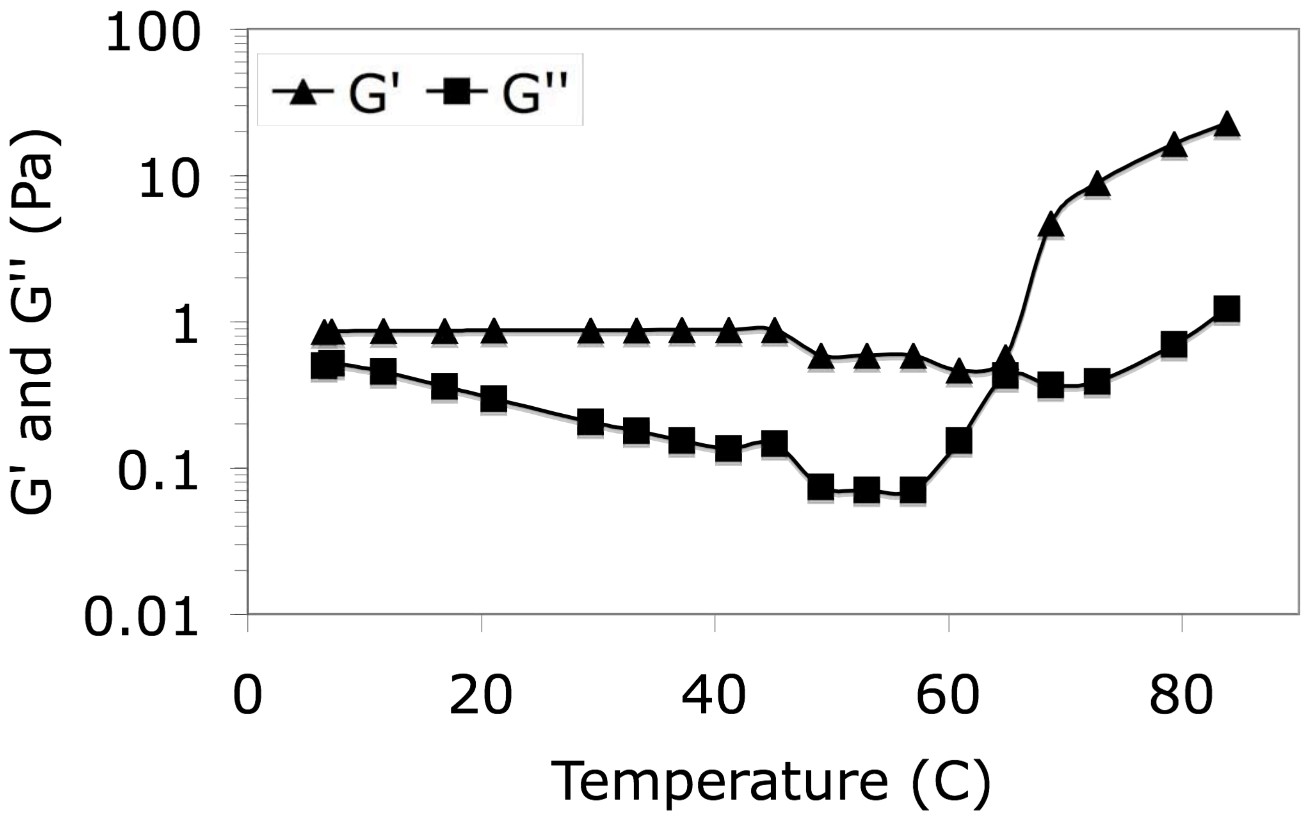
B-36. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 0.4% SP at 1 Hz and 25 ^{o}C.



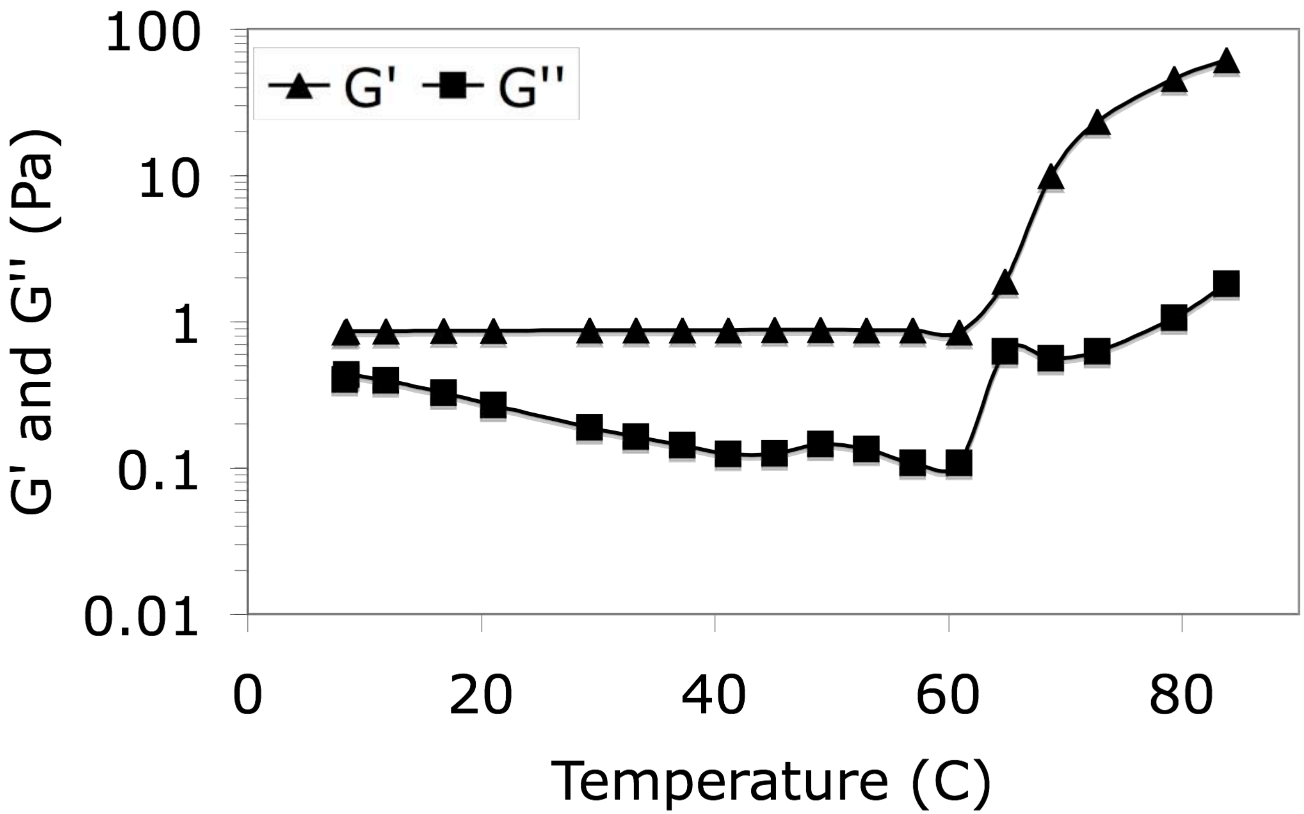
B-56. Dynamic testing of 1.000% MC with 0.000% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



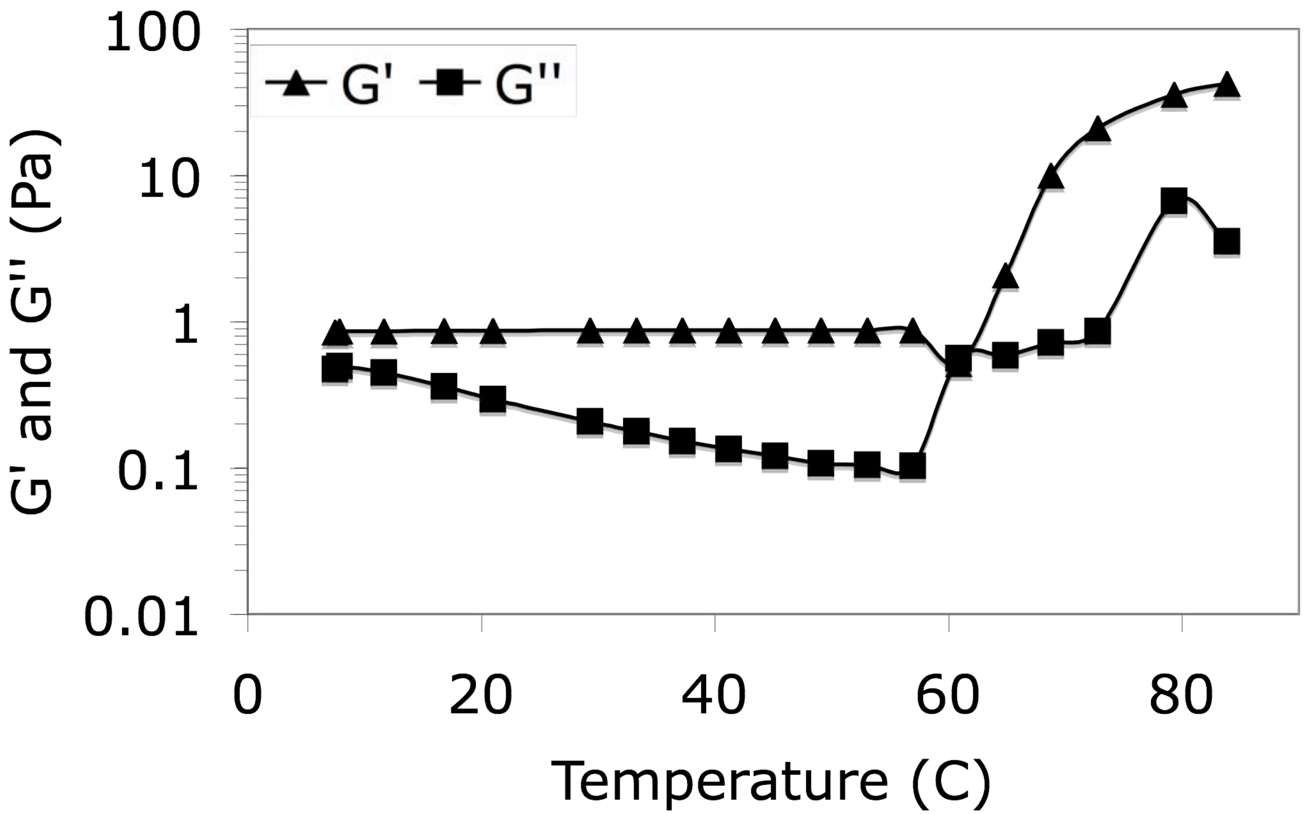
B-57. Dynamic testing of 1.000% MC with 0.100% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



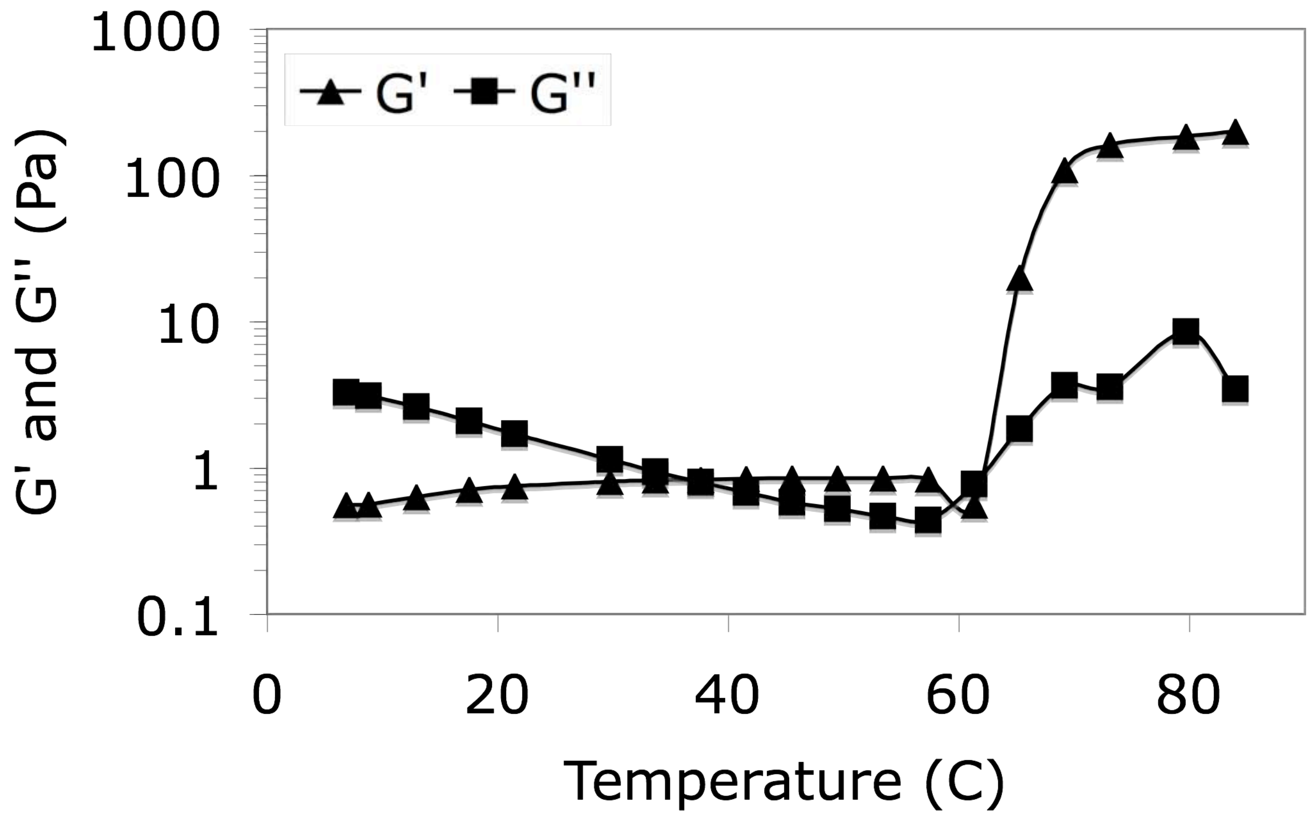
B-58. Dynamic testing of 1.000% MC with 0.200% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



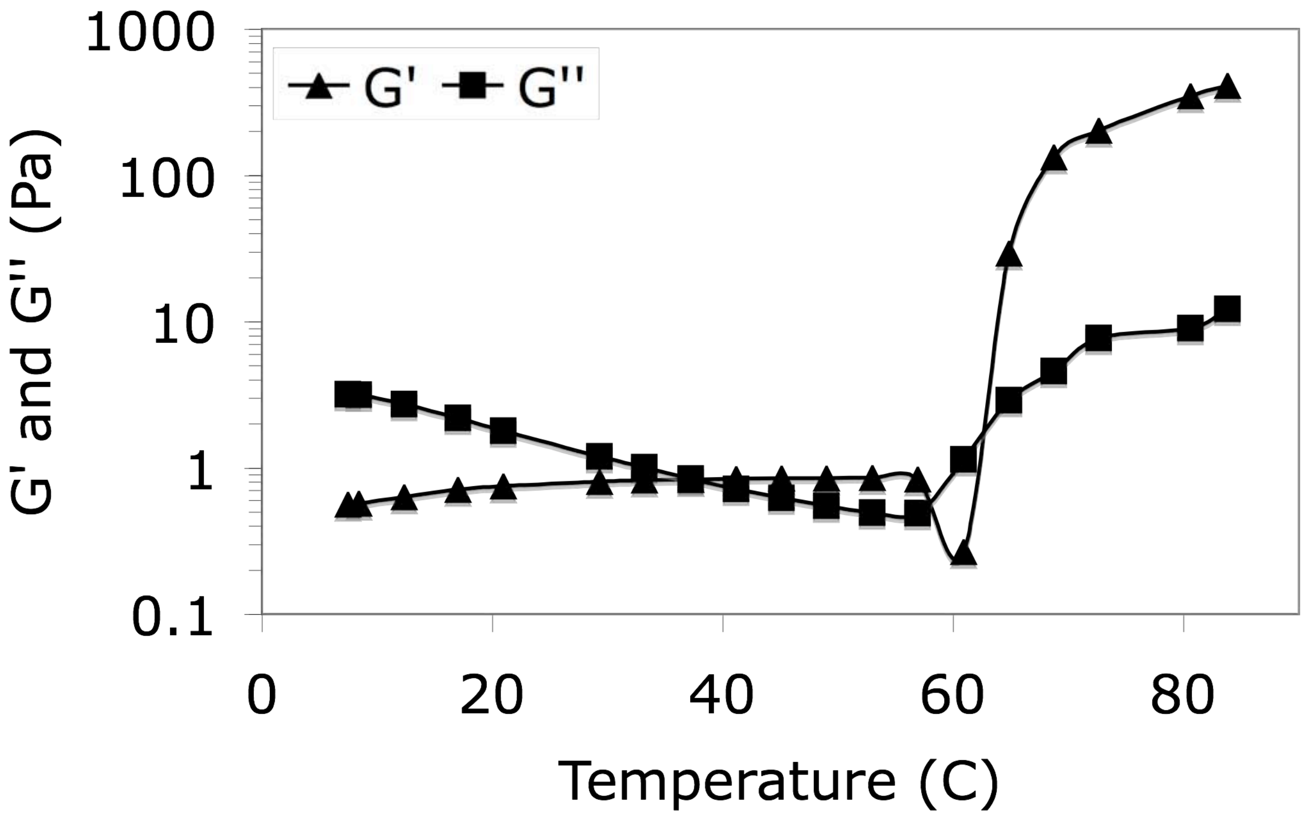
B-59. Dynamic testing of 1.000% MC with 0.300% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



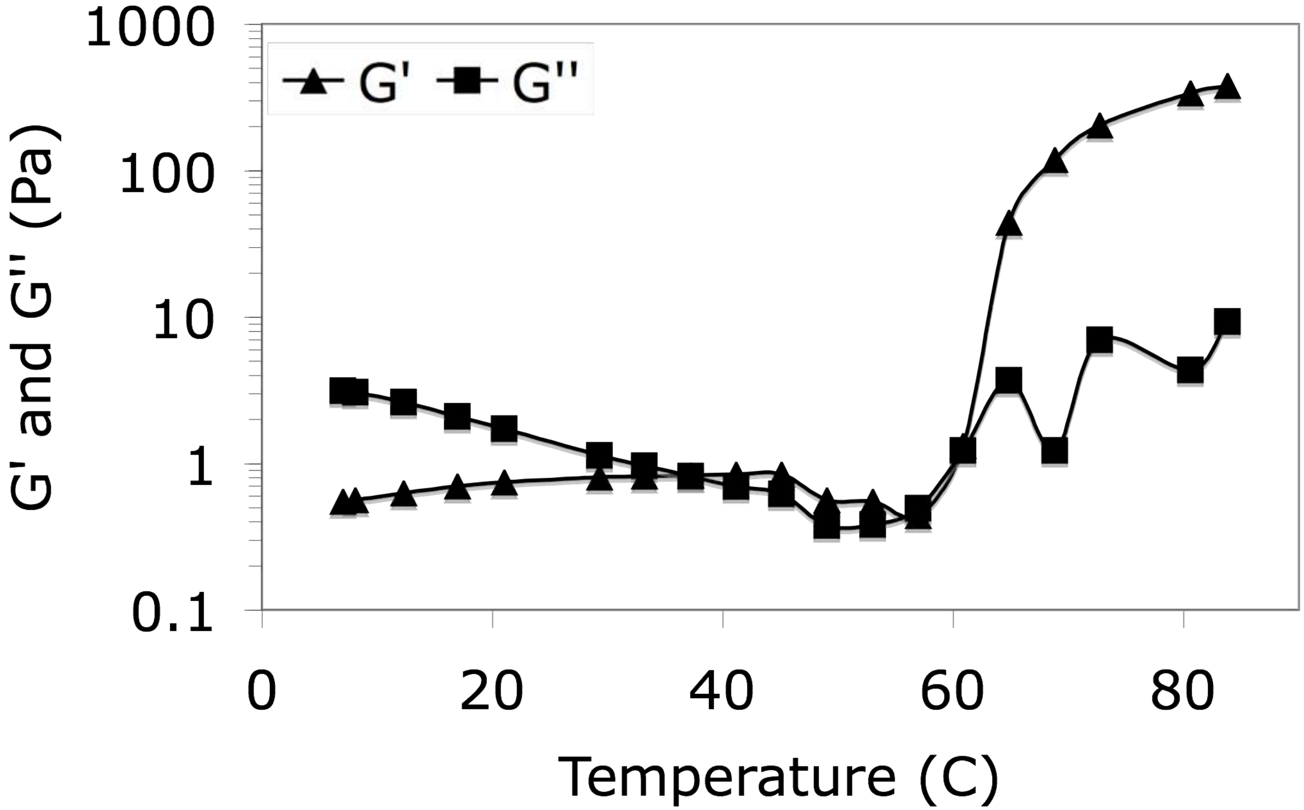
B-60. Dynamic testing of 1.000% MC with 0.400% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



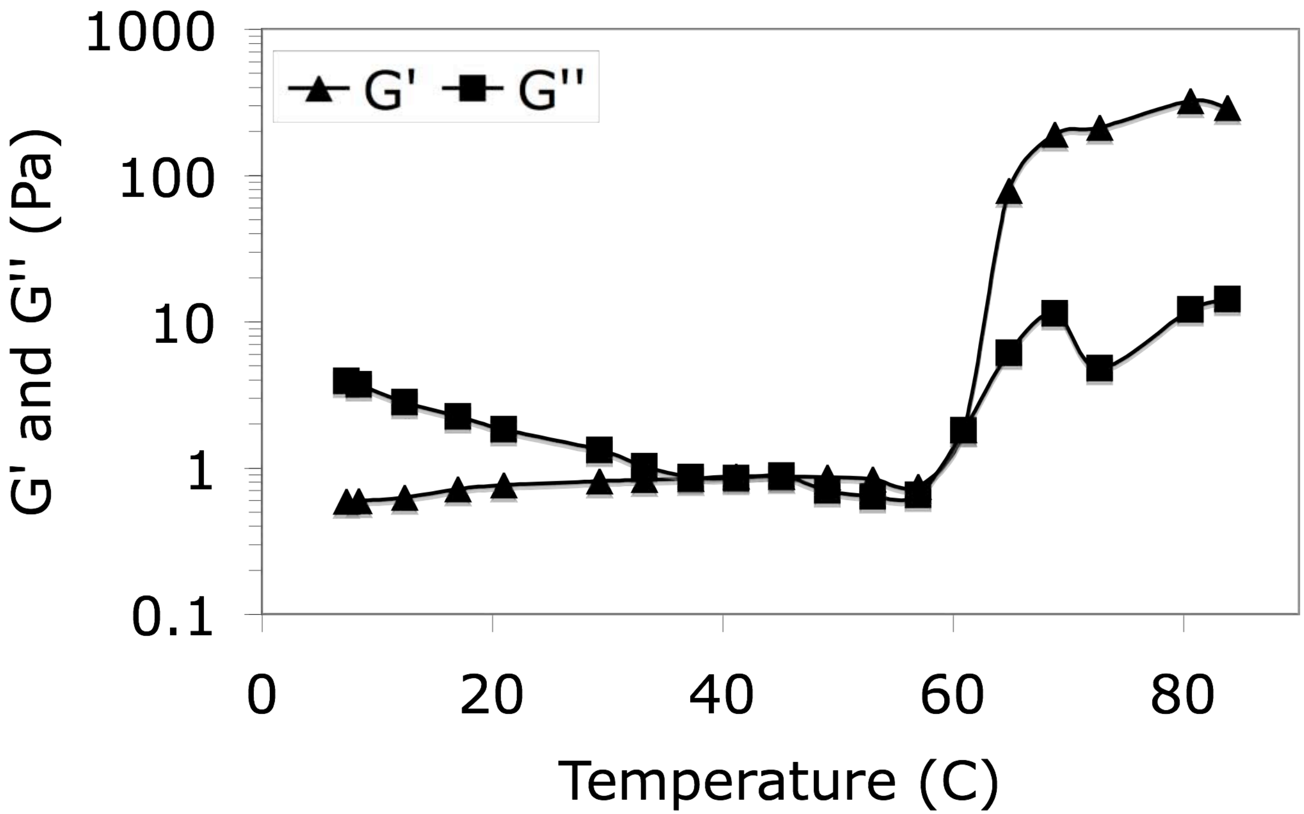
B-61. Dynamic testing of 2.000% MC with 0.000% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



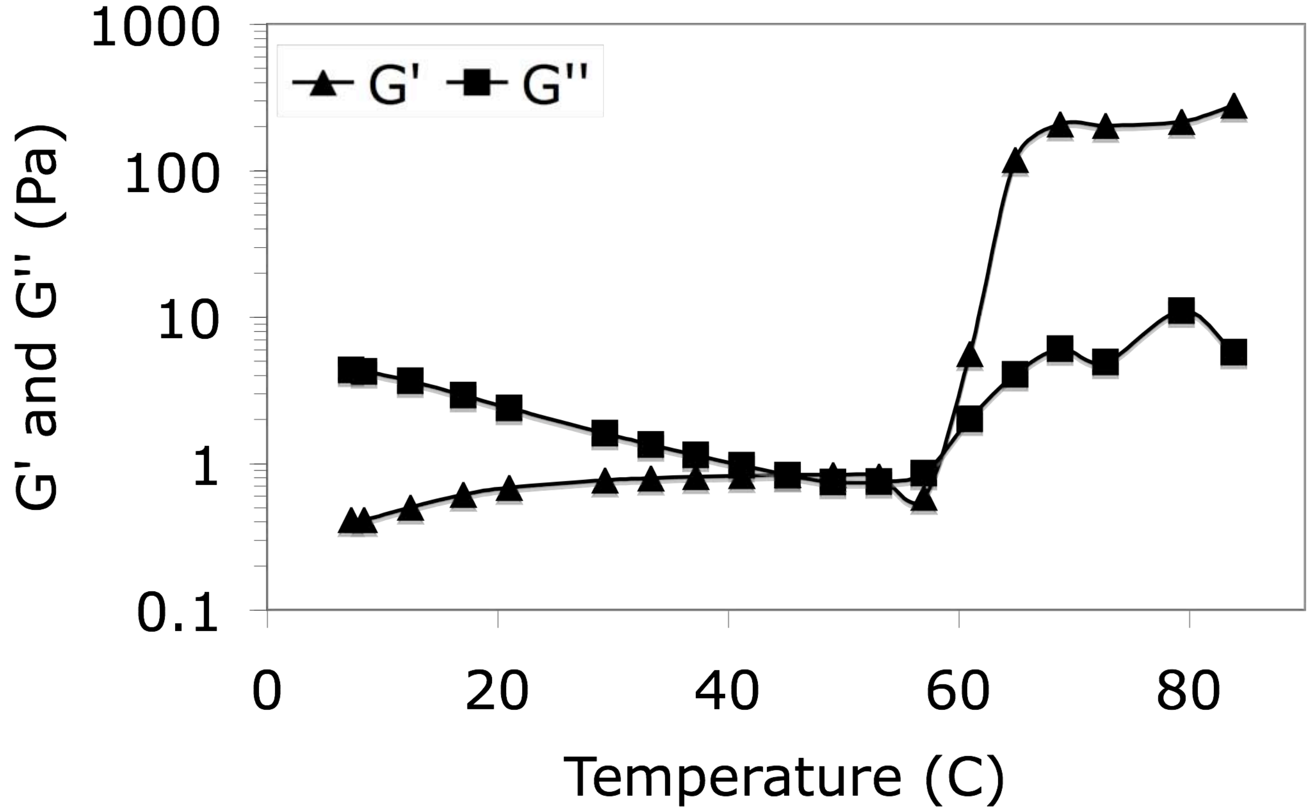
B-62. Dynamic testing of 2.000% MC with 0.100% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



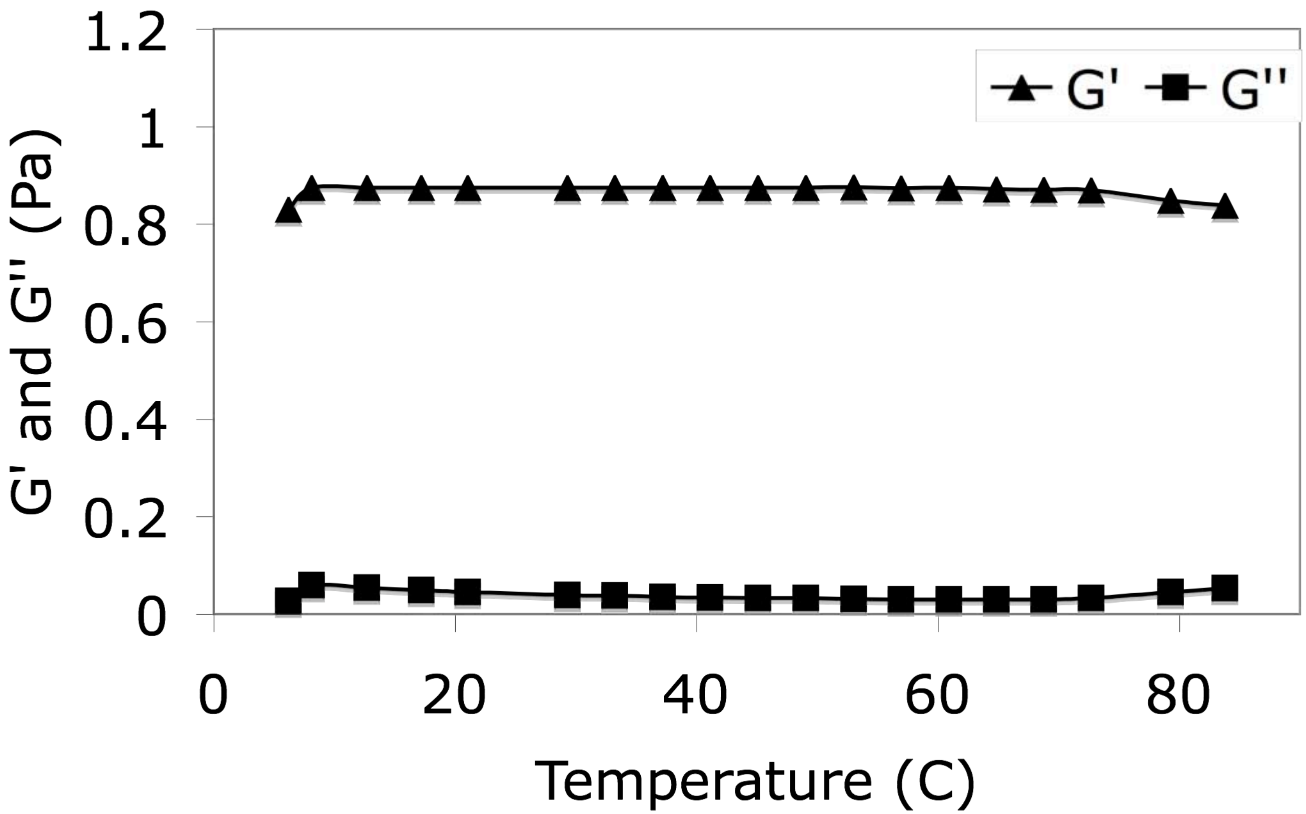
B-63. Dynamic testing of 2.000% MC with 0.200% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



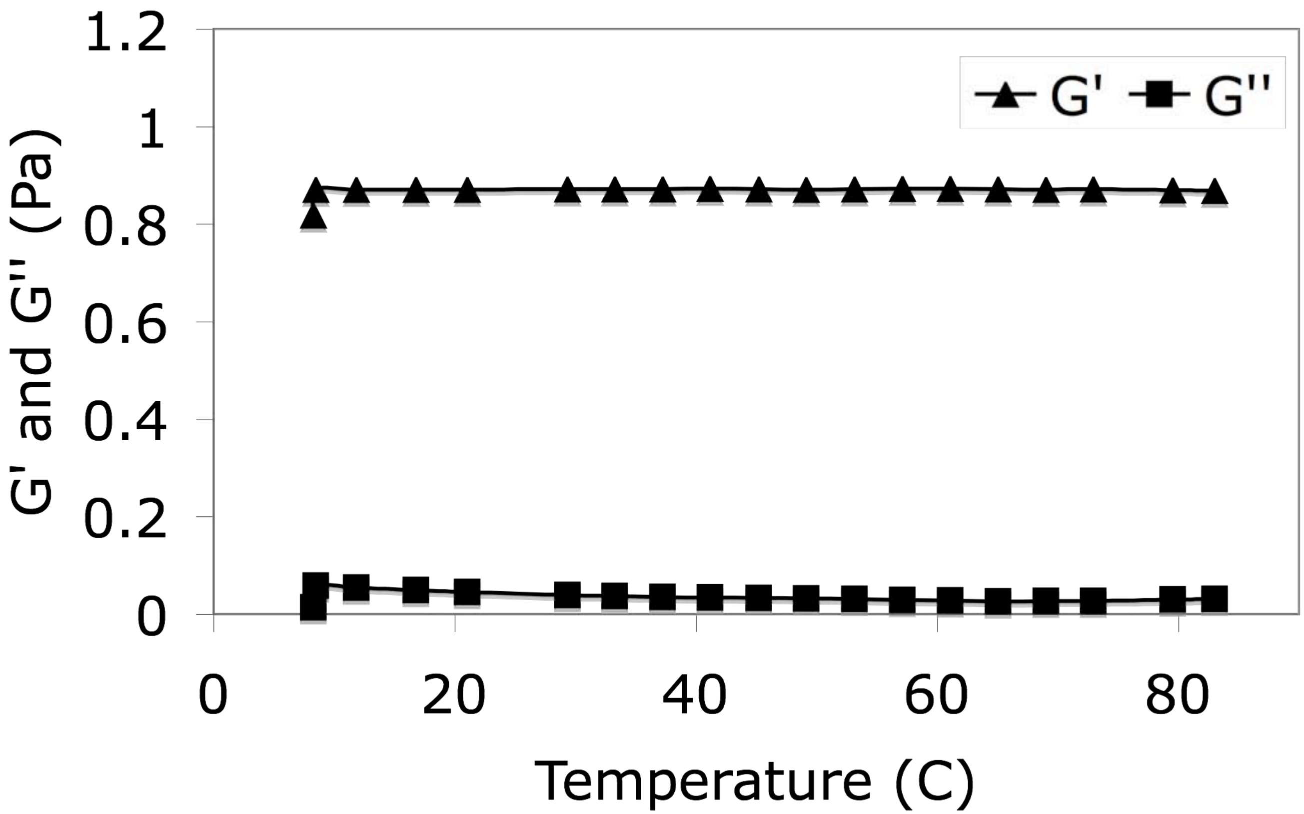
B-64. Dynamic testing of 2.000% MC with 0.300% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



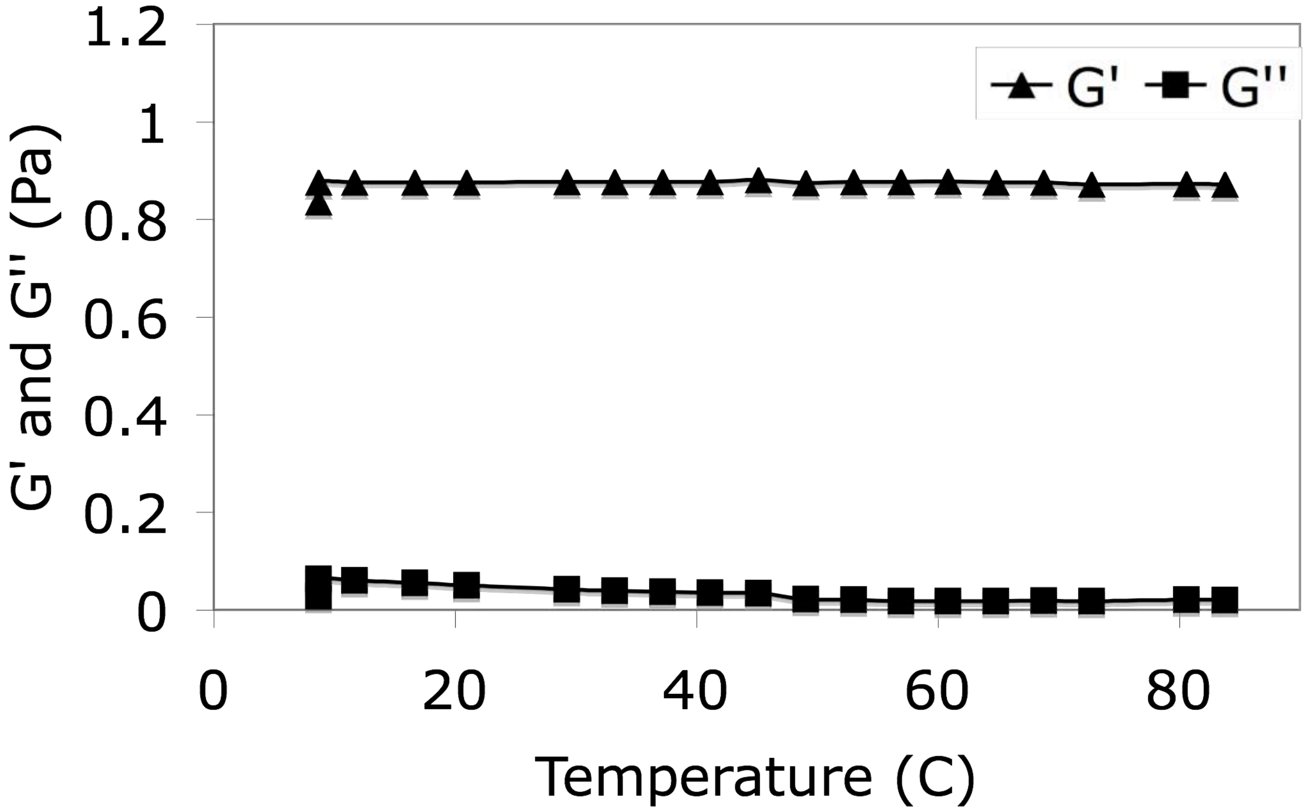
B-65. Dynamic testing of 2.000% MC with 0.400% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



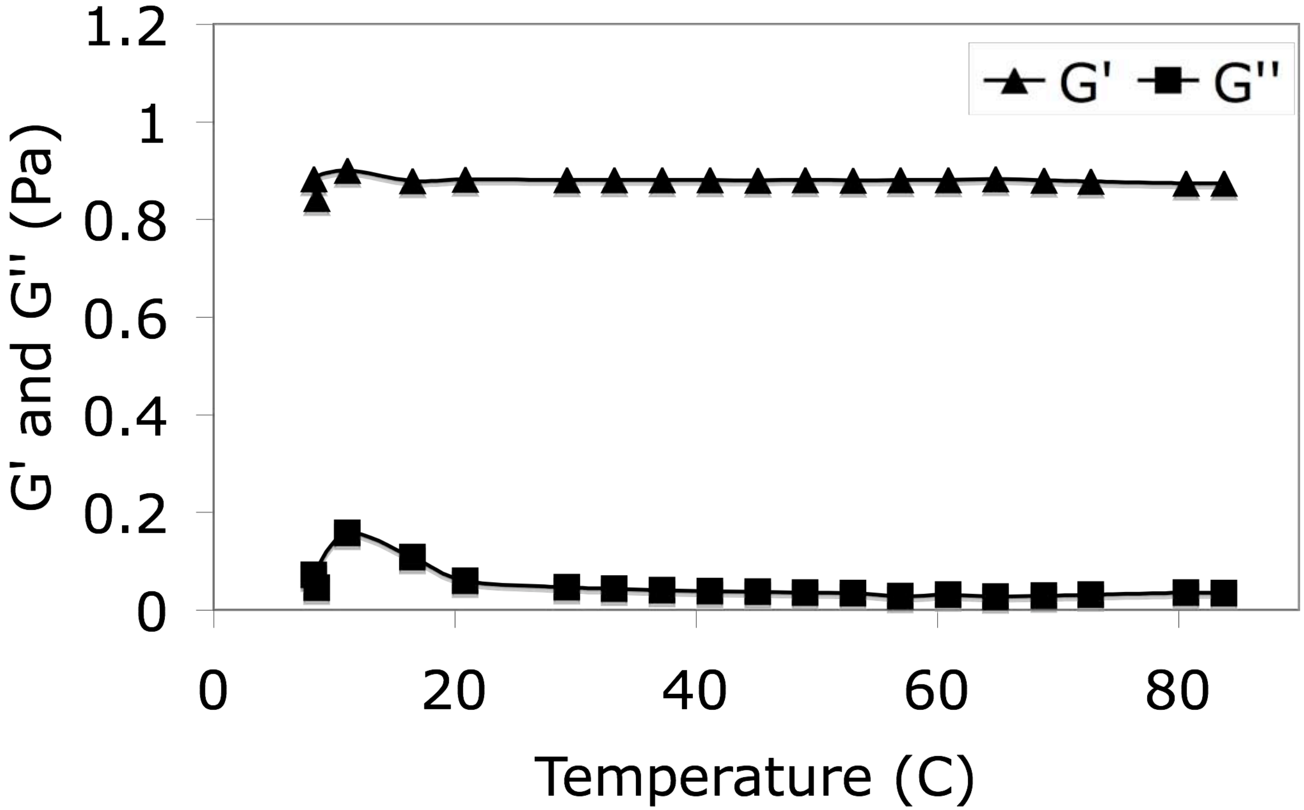
B-66. Dynamic testing of 1.000% HPMC with 0.000% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



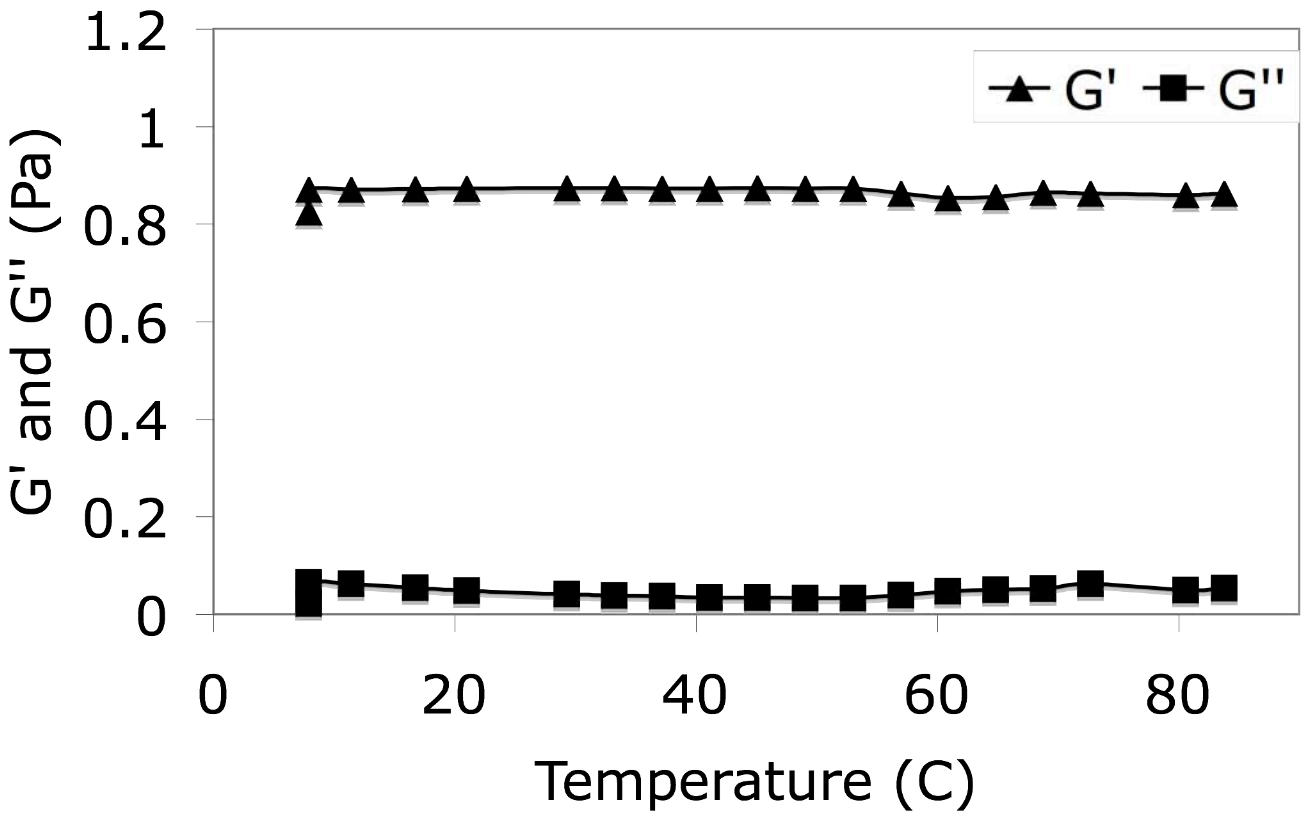
B-67. Dynamic testing of 1.000% HPMC with 0.100% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



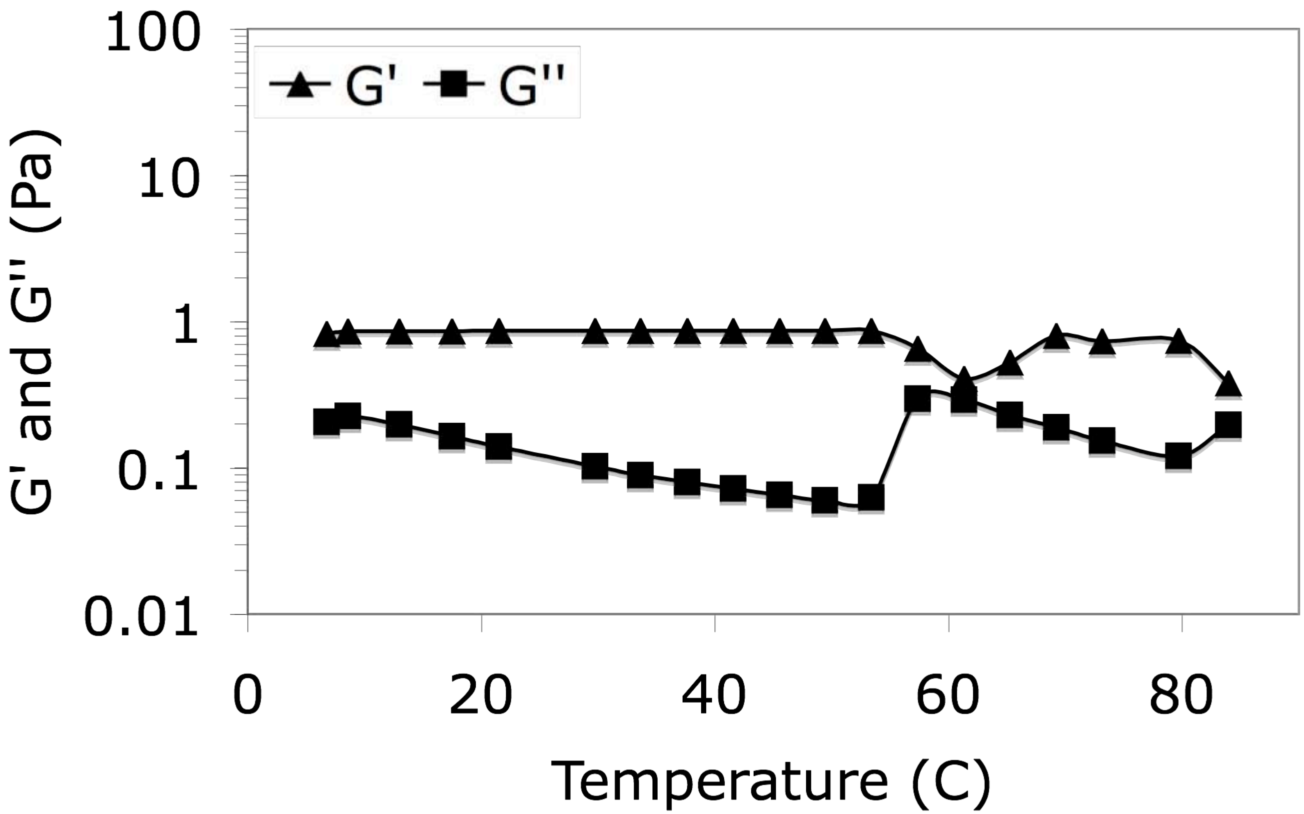
B-68. Dynamic testing of 1.000% HPMC with 0.200% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



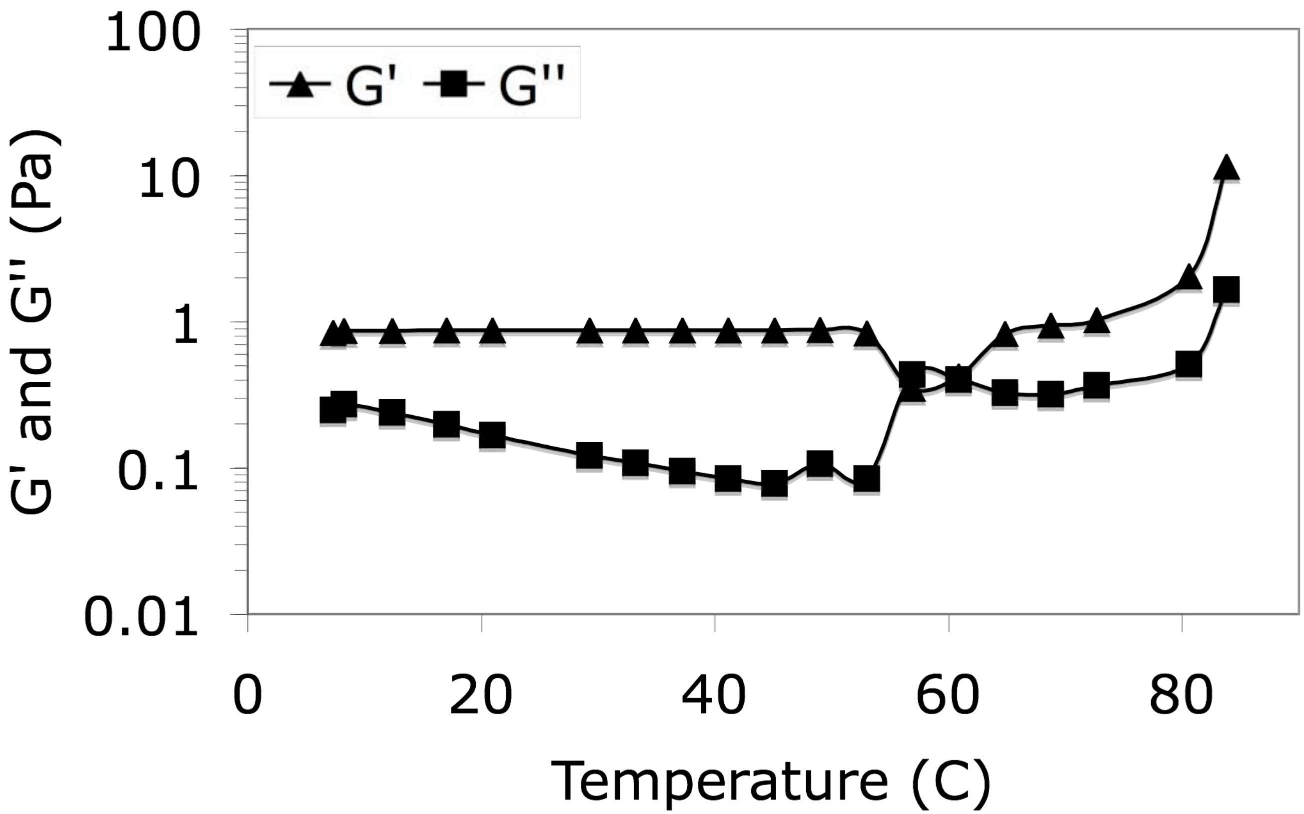
B-69. Dynamic testing of 1.000% HPMC with 0.300% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



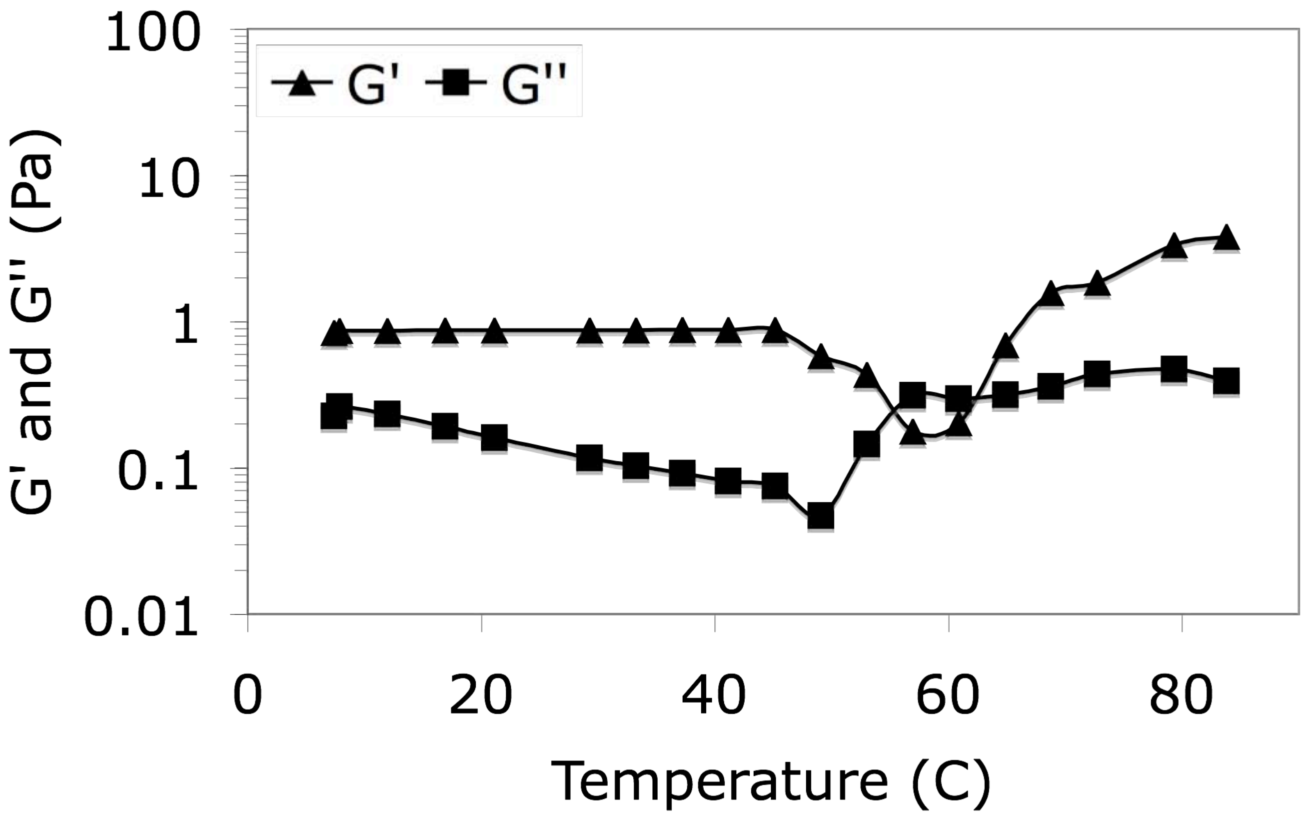
B-70. Dynamic testing of 1.000% HPMC with 0.400% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



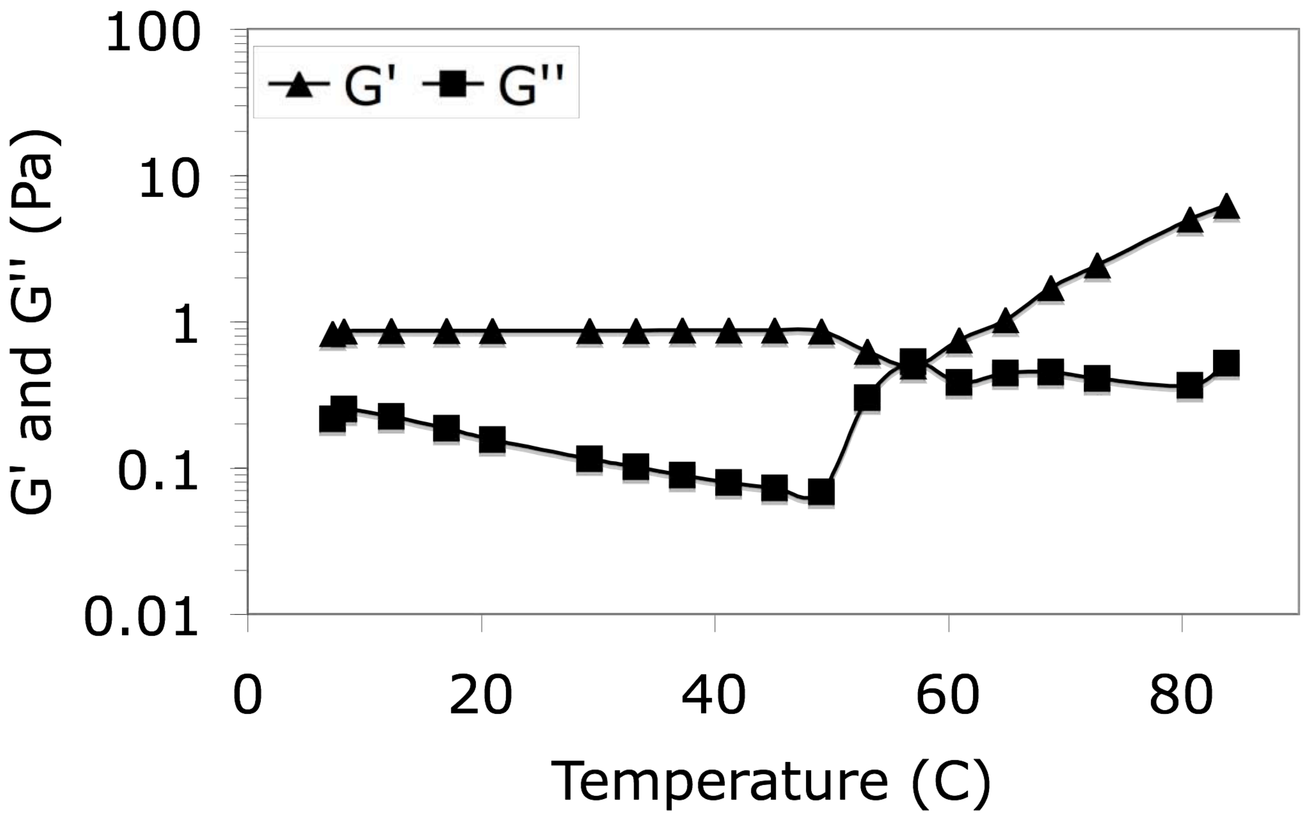
B-71. Dynamic testing of 1.000% SGMC with 0.000% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



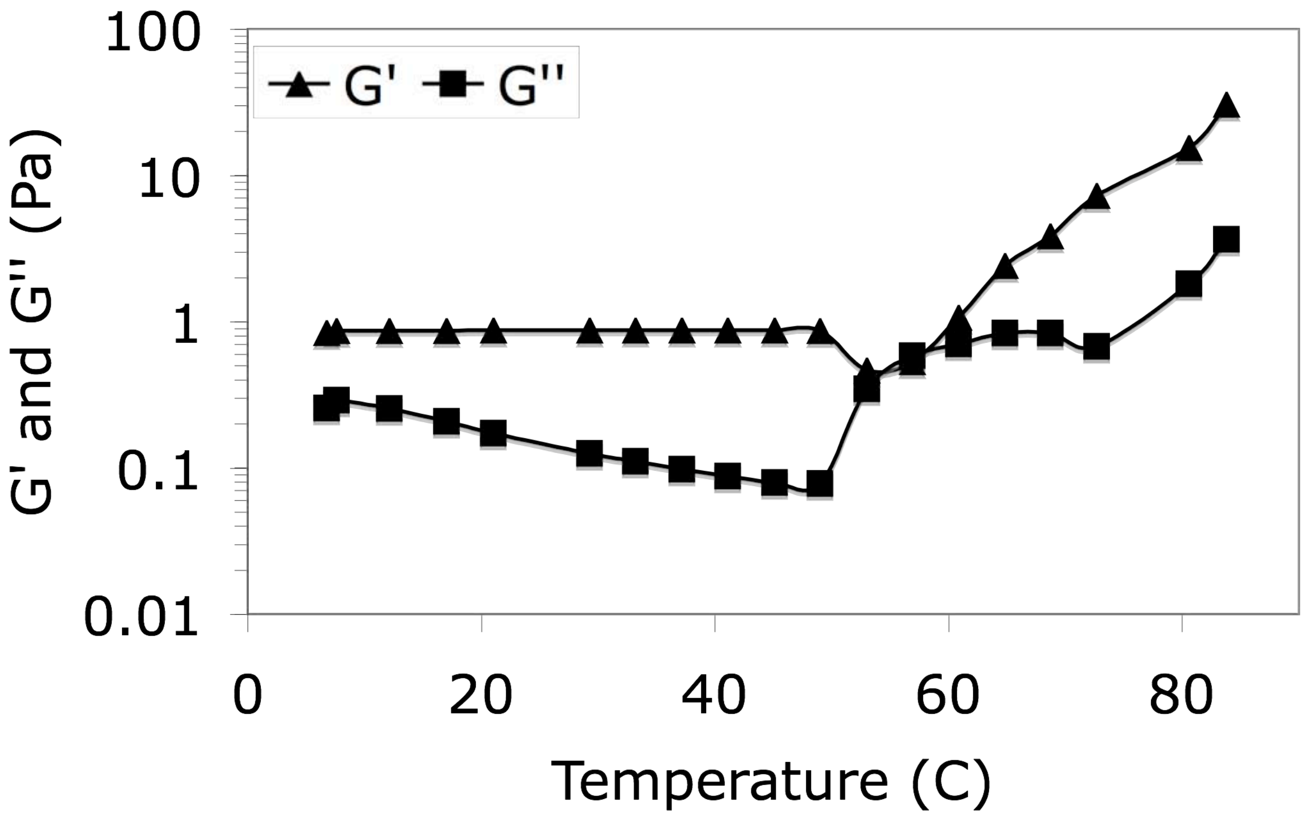
B-72. Dynamic testing of 1.000% SGMC with 0.100% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



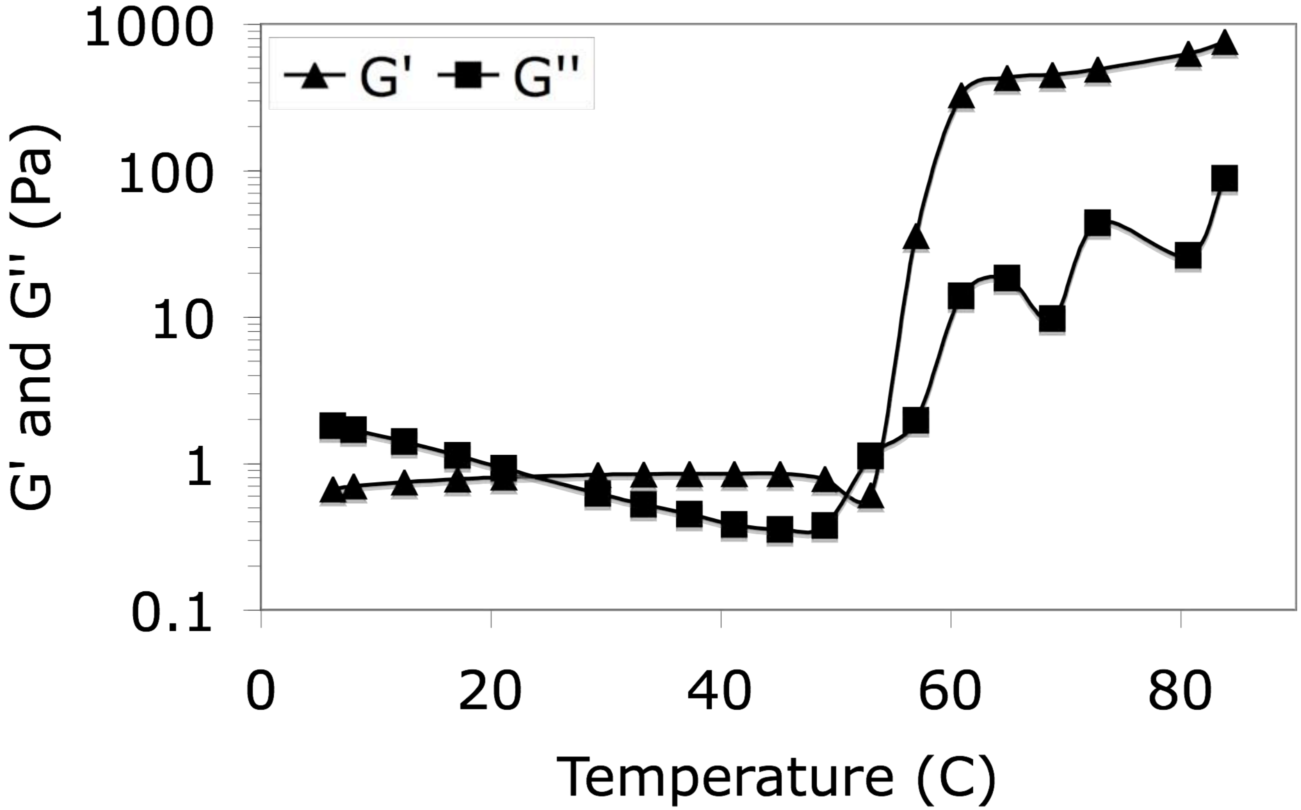
B-73. Dynamic testing of 1.000% SGMC with 0.200% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



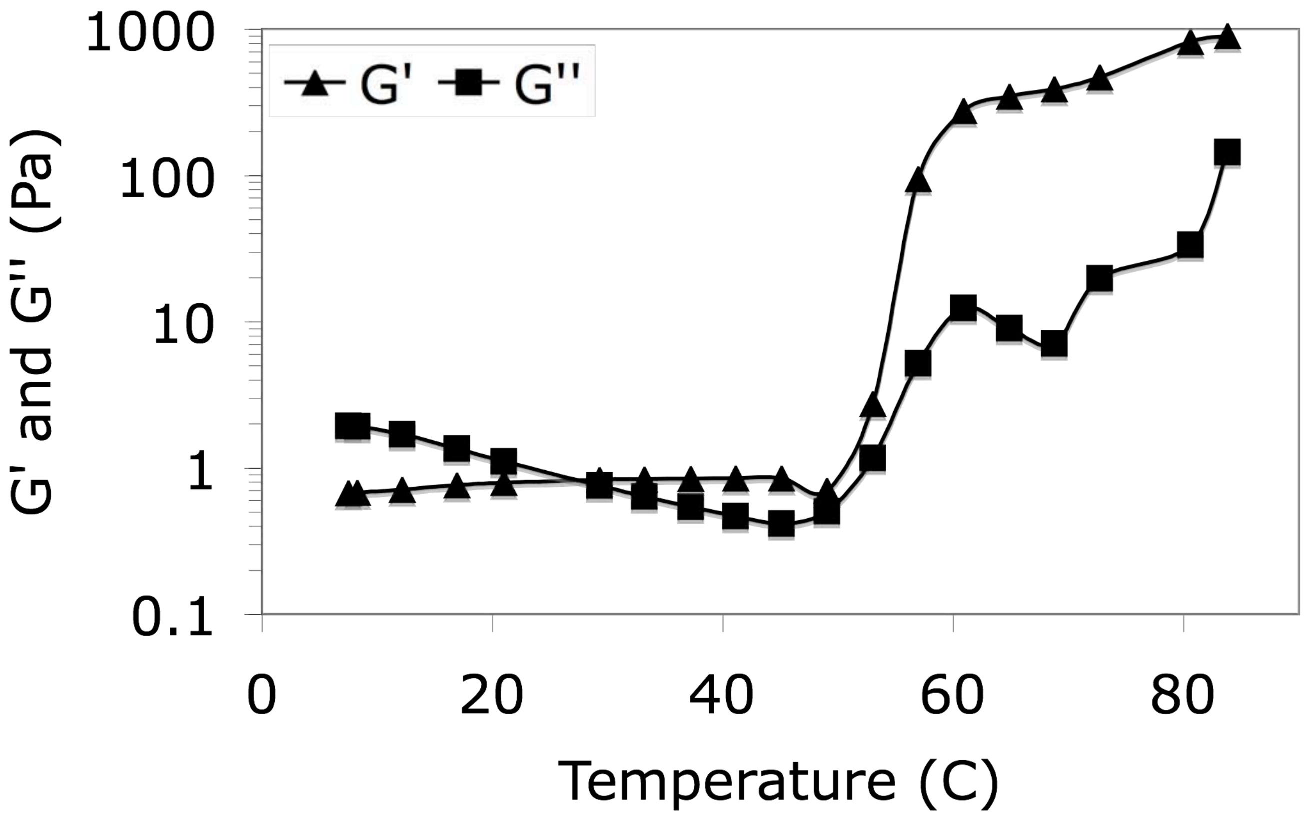
B-74. Dynamic testing of 1.000% SGMC with 0.300% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



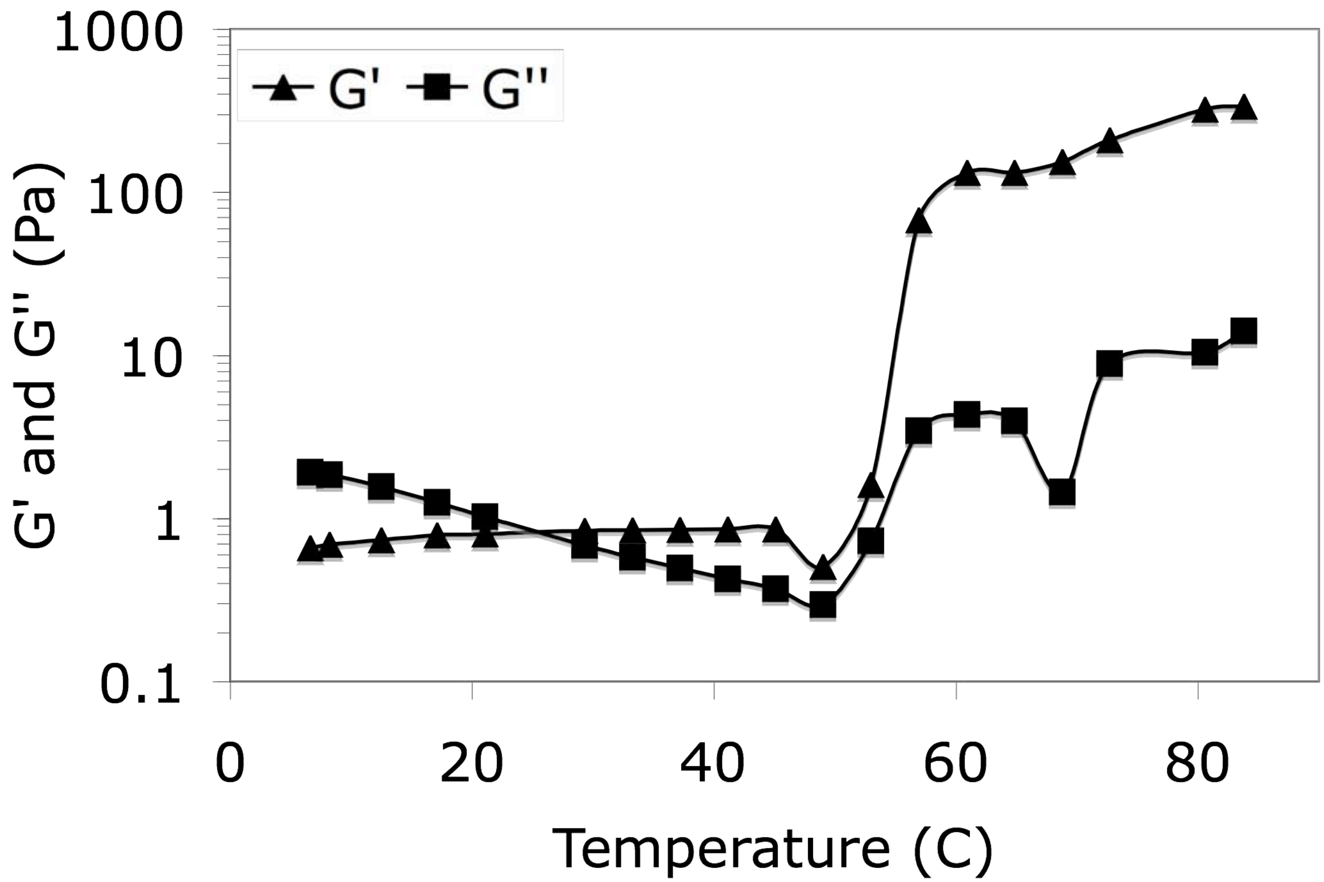
B-75. Dynamic testing of 1.000% SGMC with 0.400% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



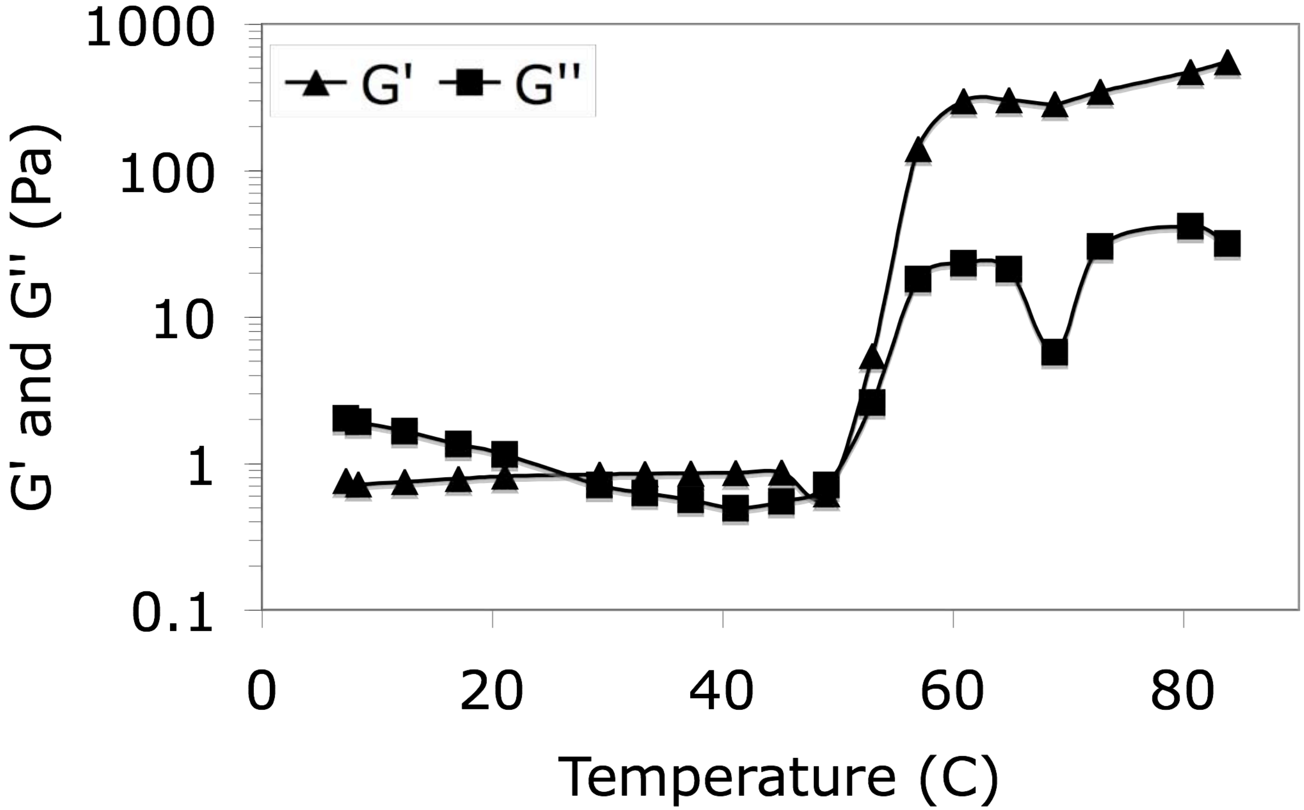
B-76. Dynamic testing of 2.000% SGMC with 0.000% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



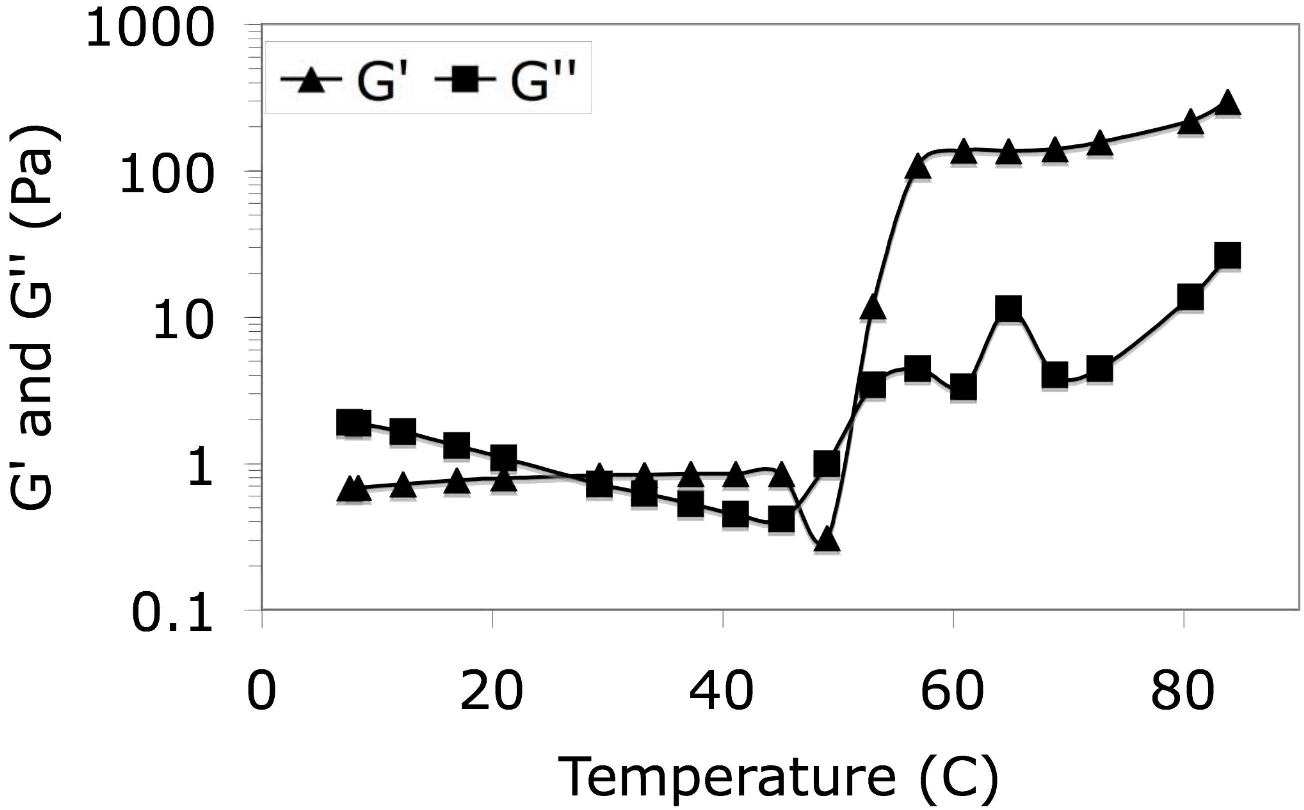
B-77. Dynamic testing of 2.000% SGMC with 0.100% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



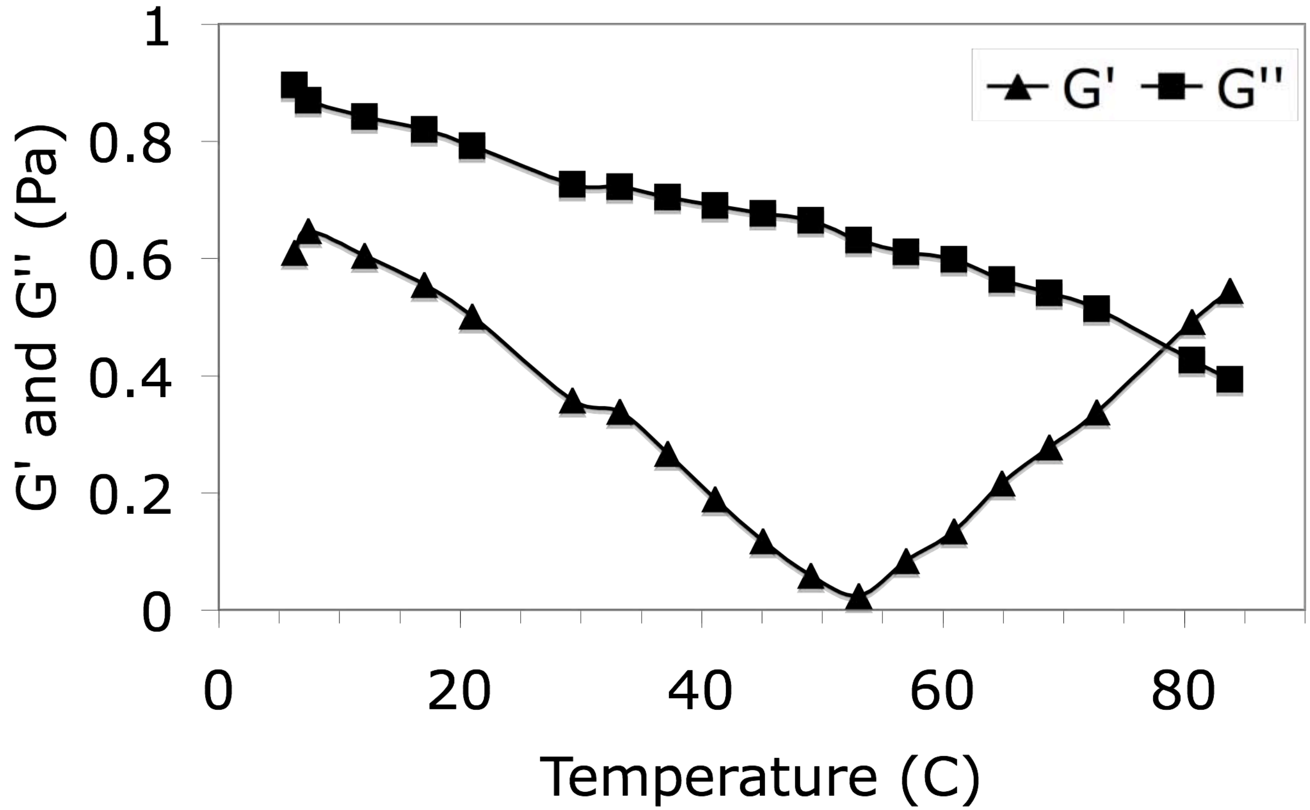
B-78. Dynamic testing of 2.000% SGMC with 0.200% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



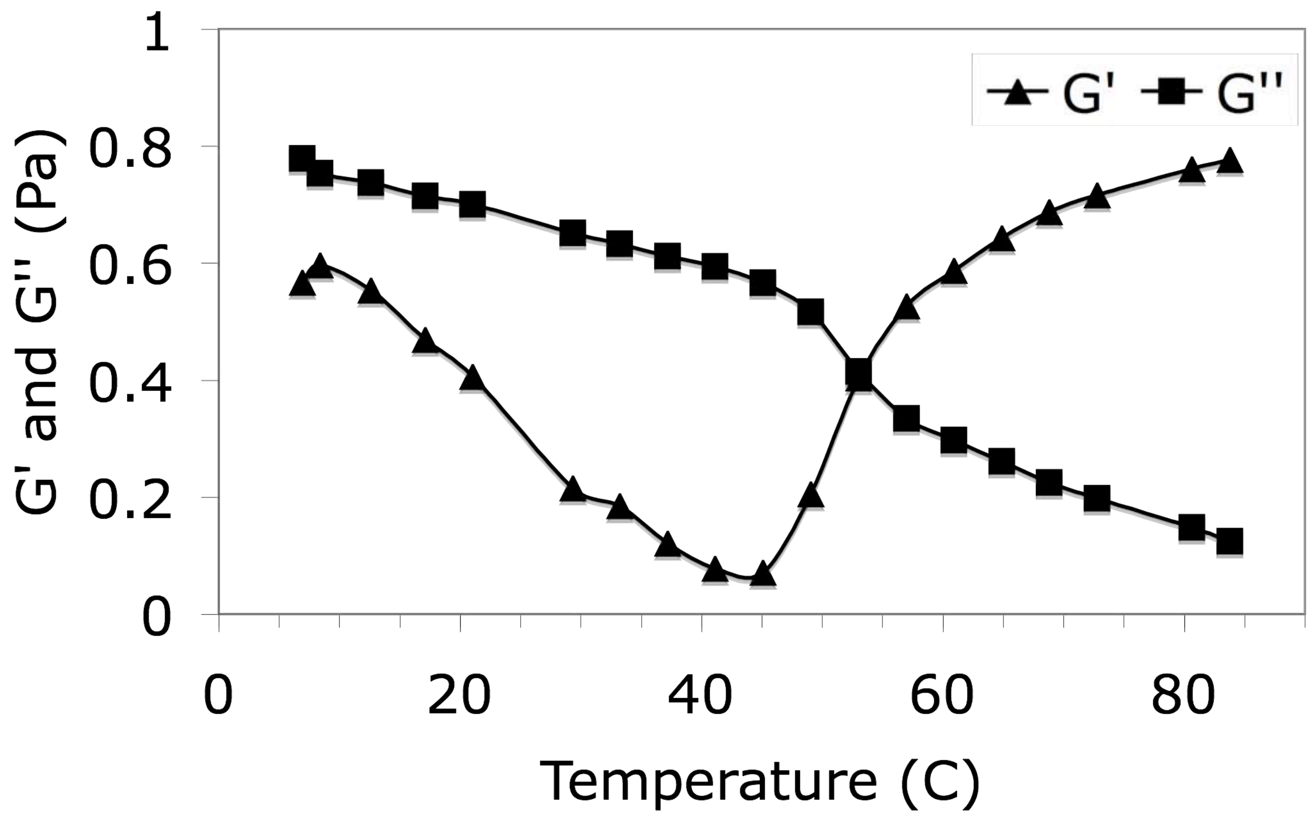
B-79. Dynamic testing of 2.000% SGMC with 0.300% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



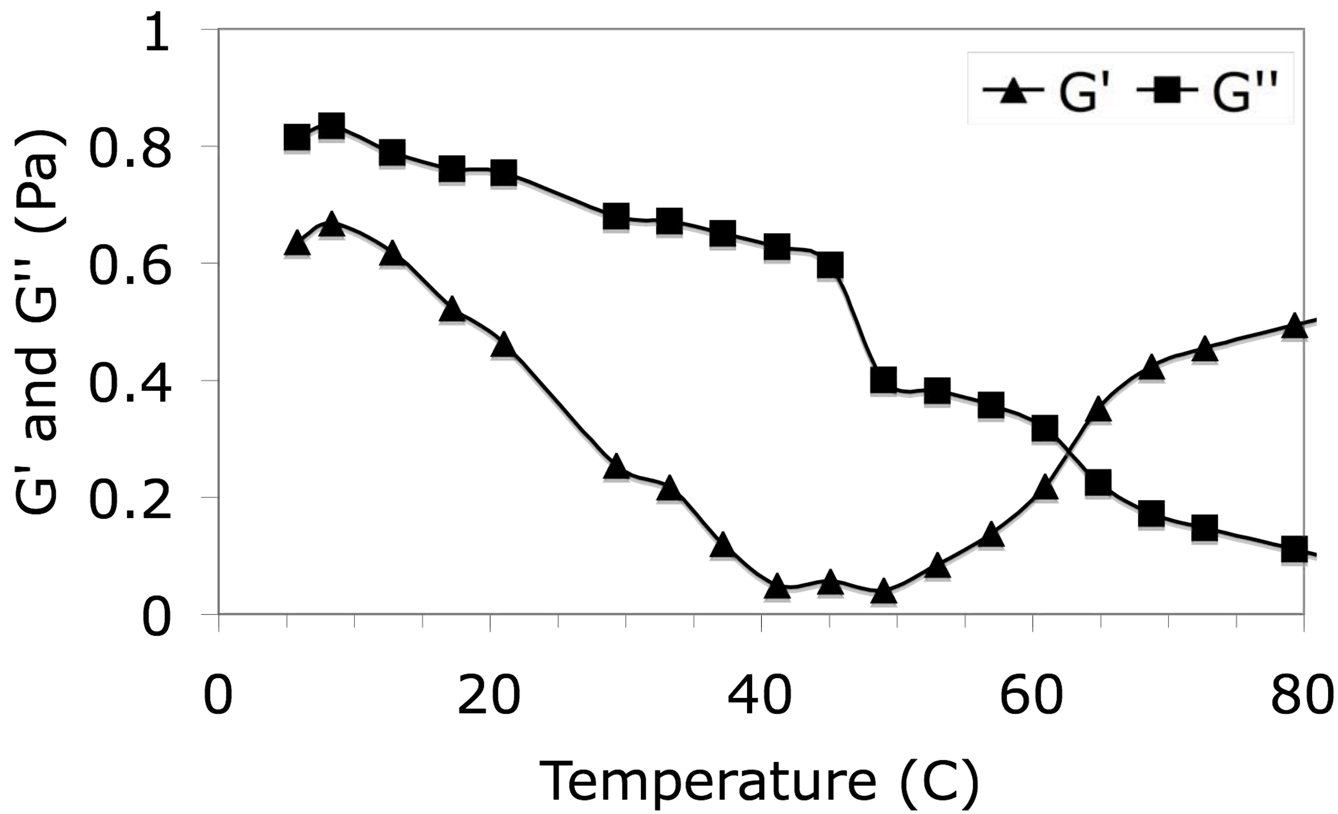
B-80. Dynamic testing of 2.000% SGMC with 0.400% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



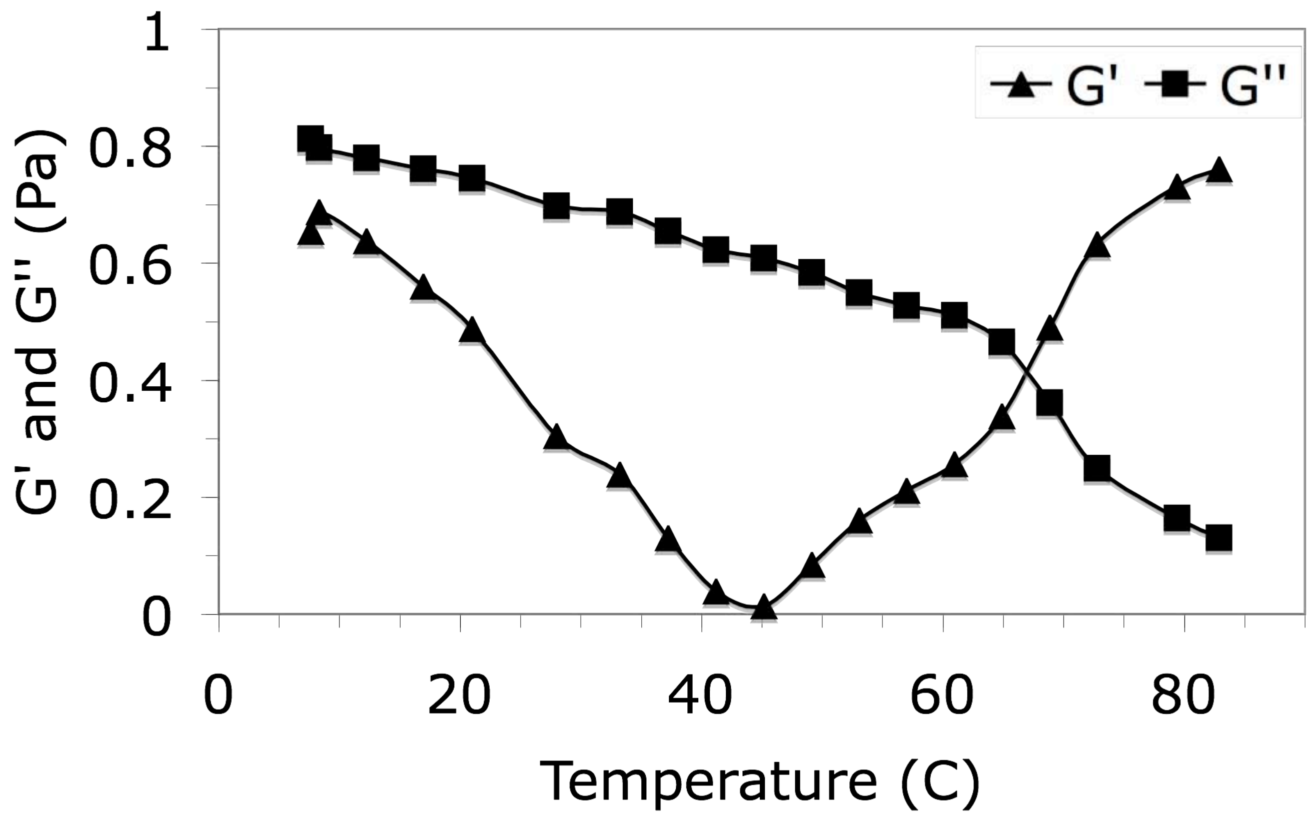
B-81. Dynamic testing of 0.250% XG with 0.000% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



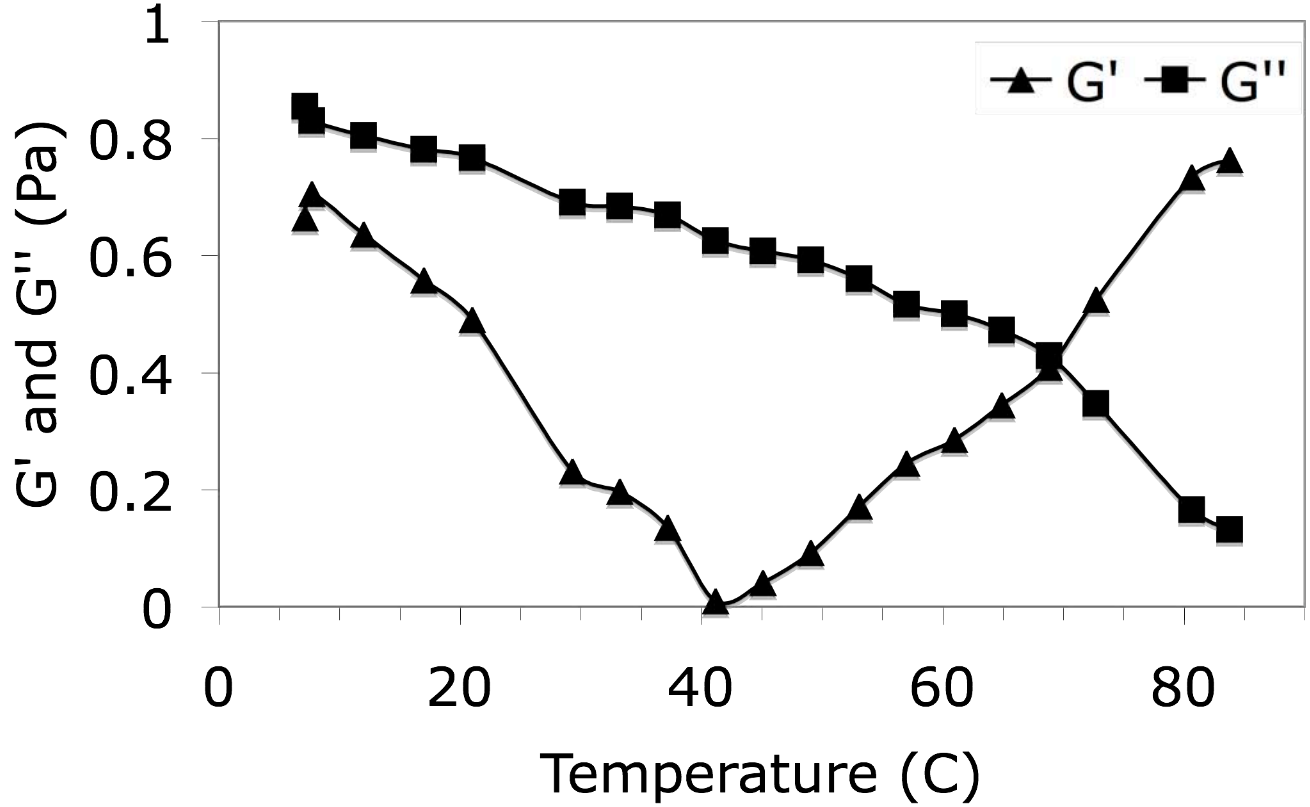
B-82. Dynamic testing of 0.250% XG with 0.100% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



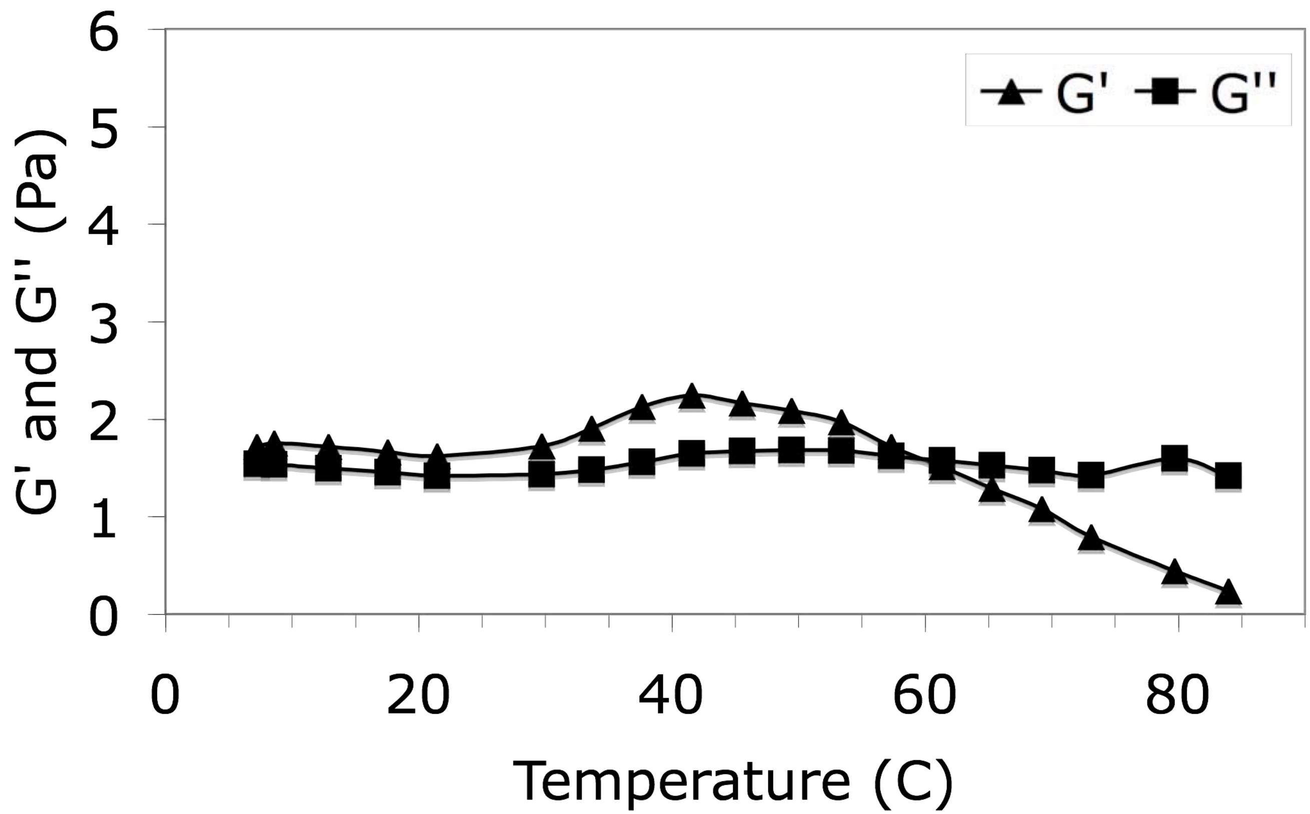
B-83. Dynamic testing of 0.250% XG with 0.200% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



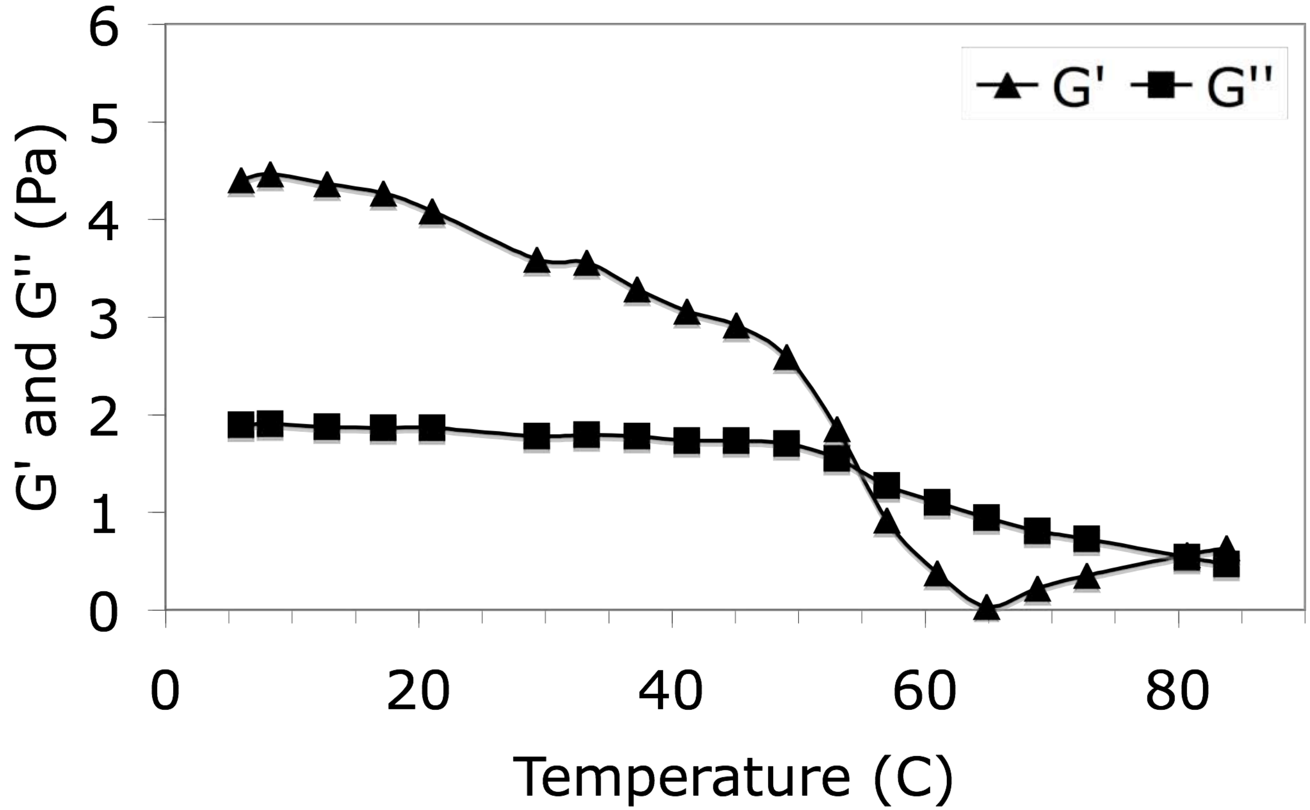
B-84. Dynamic testing of 0.250% XG with 0.300% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



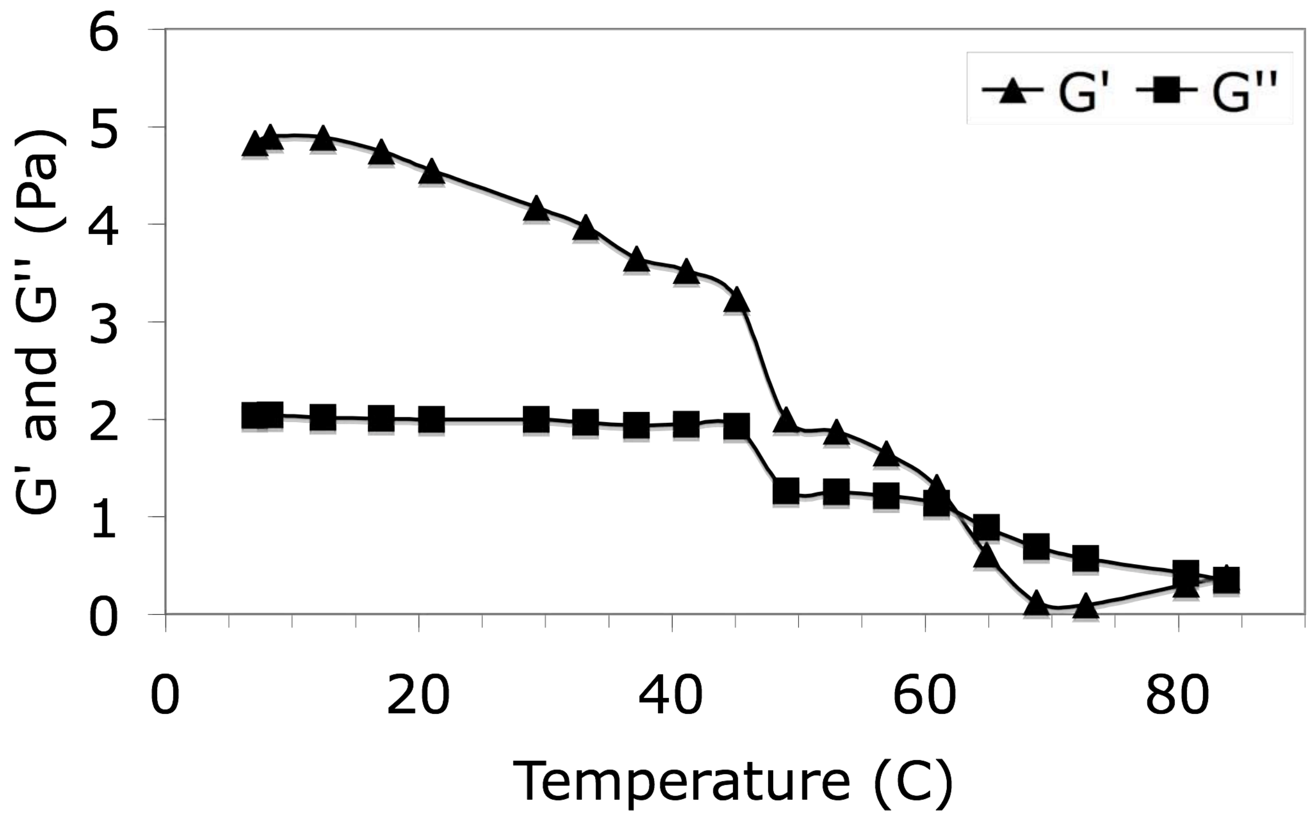
B-85. Dynamic testing of 0.250% XG with 0.400% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



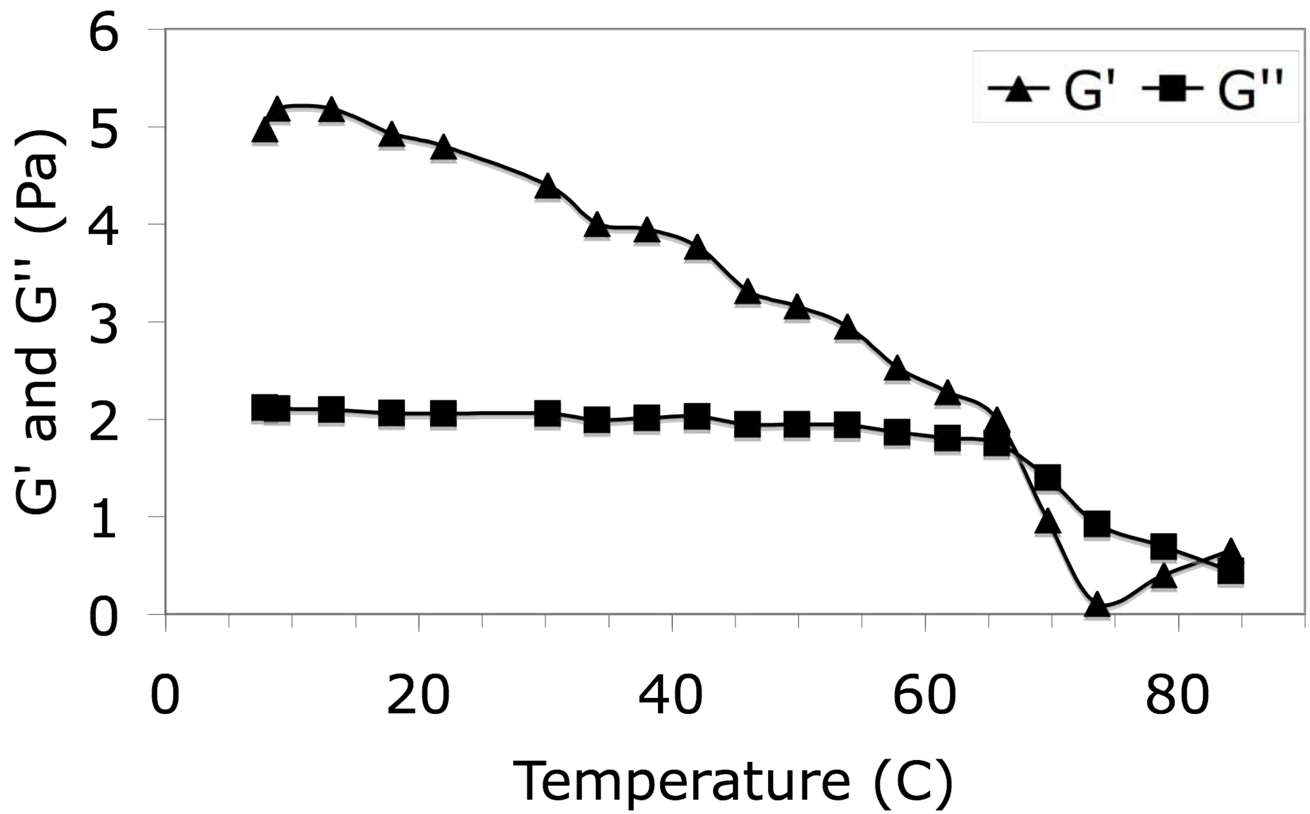
B-86. Dynamic testing of 0.500% XG with 0.000% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



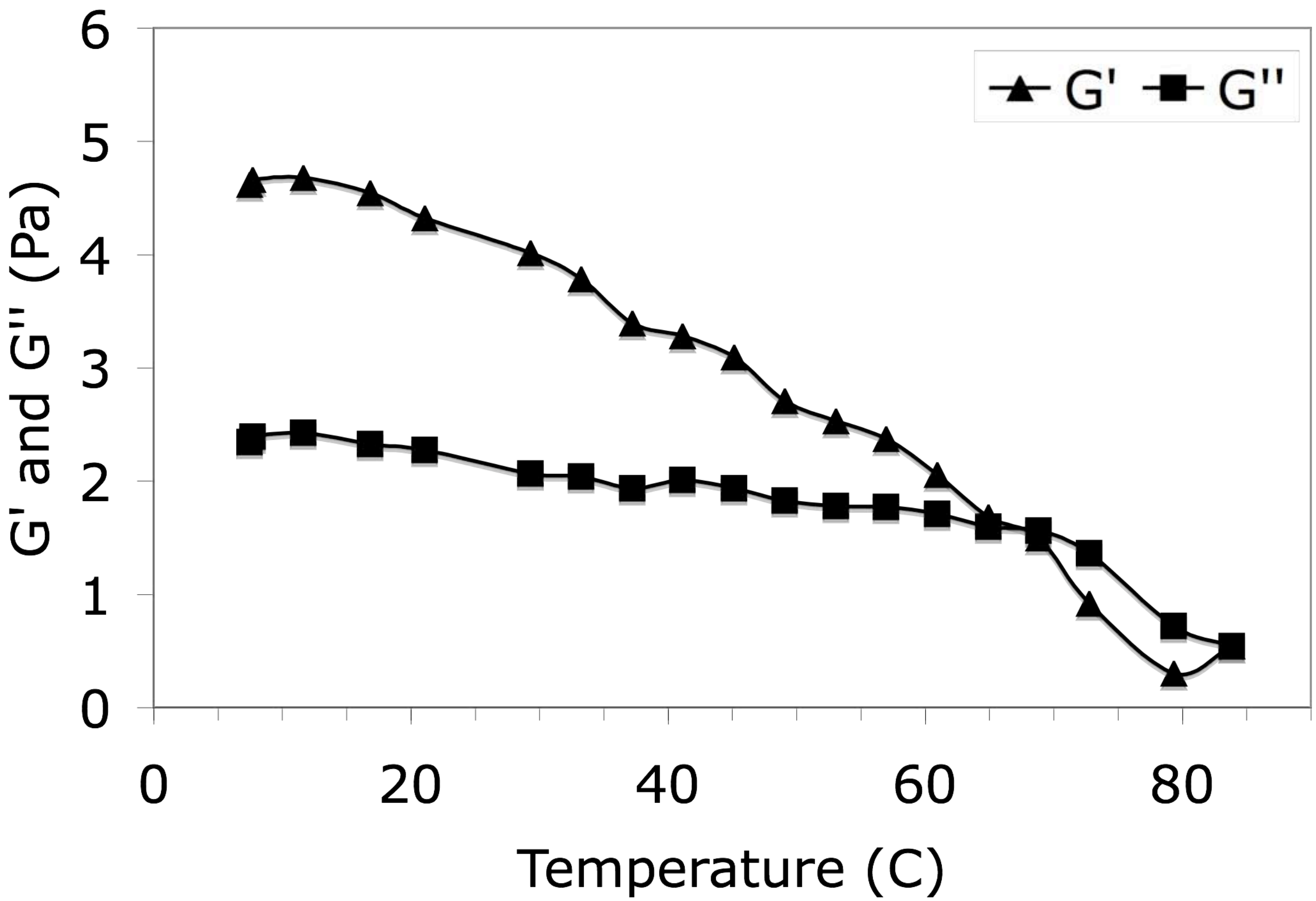
B-87. Dynamic testing of 0.500% XG with 0.100% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



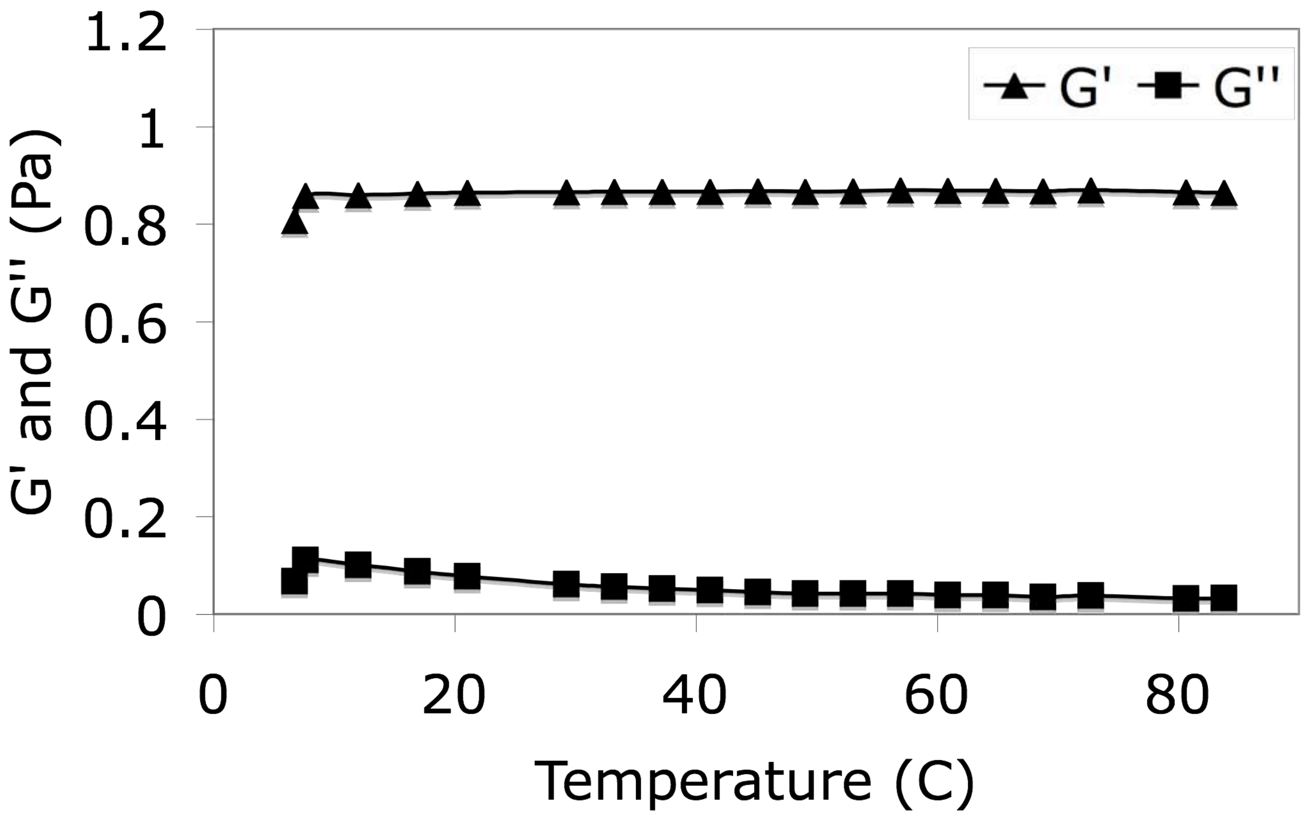
B-88. Dynamic testing of 0.500% XG with 0.200% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



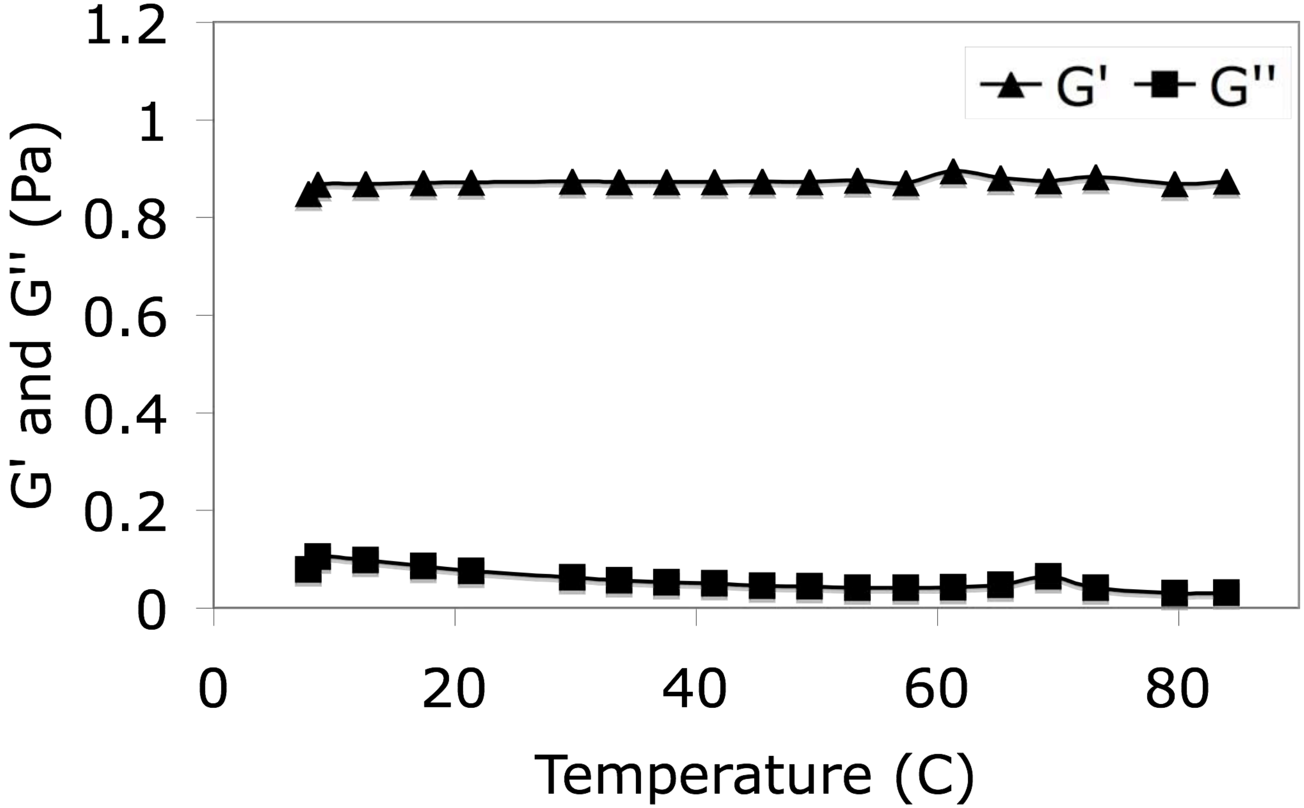
B-89. Dynamic testing of 0.500% XG with 0.300% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



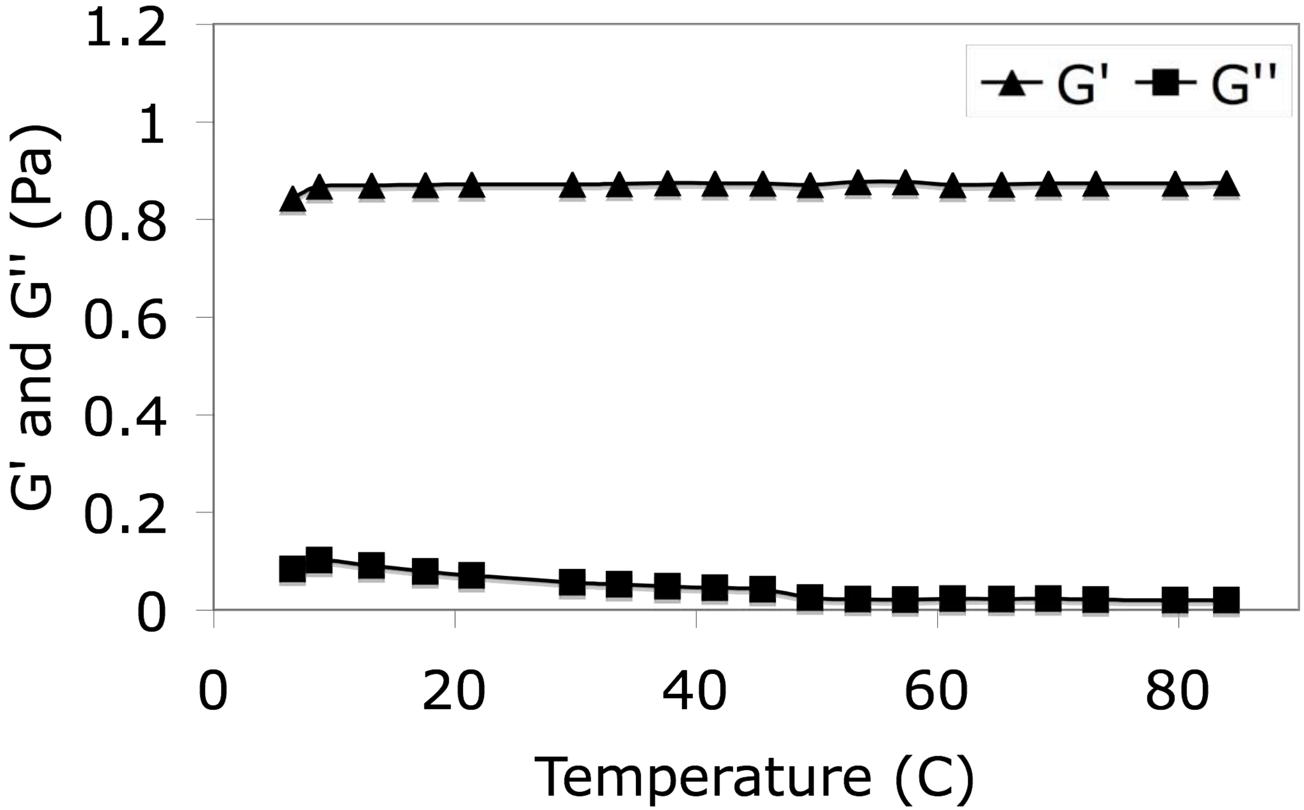
B-90. Dynamic testing of 0.500% XG with 0.400% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



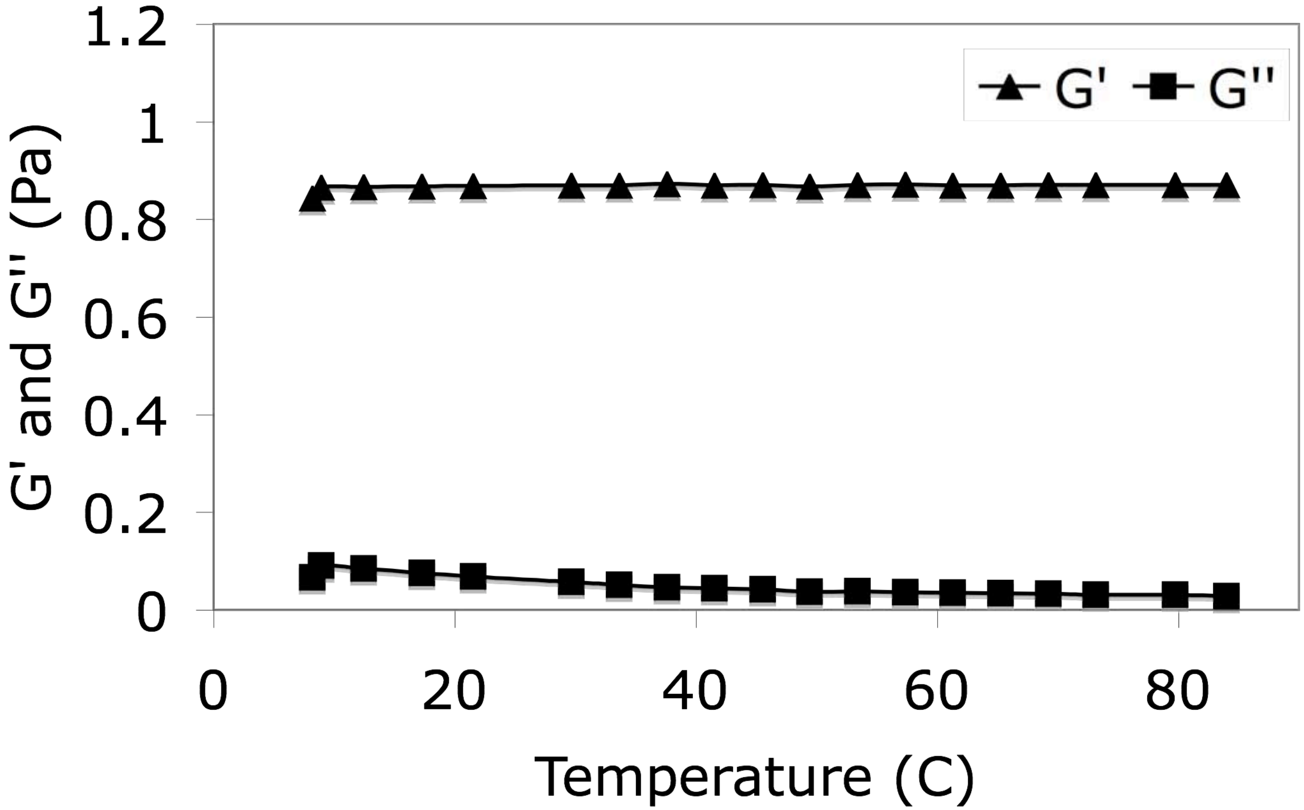
B-91. Dynamic testing of 0.125% KF with 0.000% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



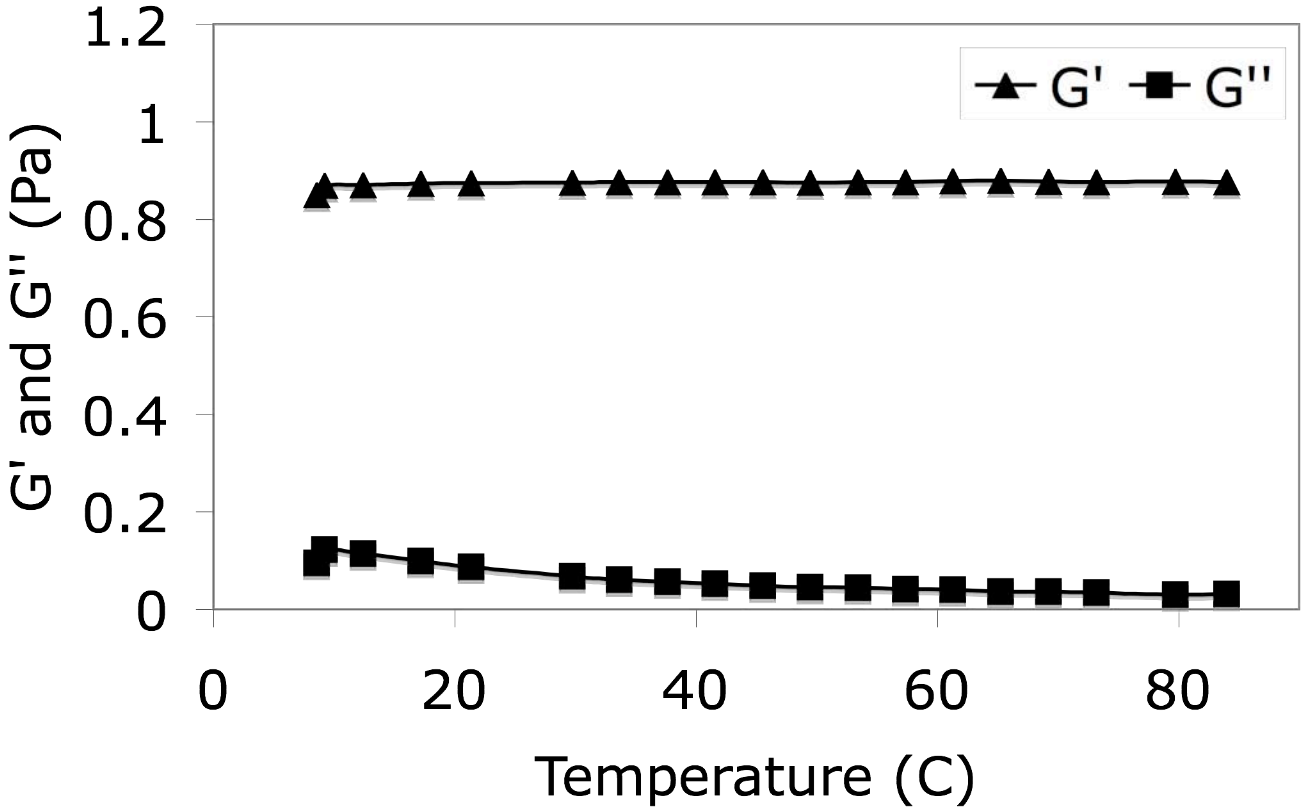
B-92. Dynamic testing of 0.125% KF with 0.100% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



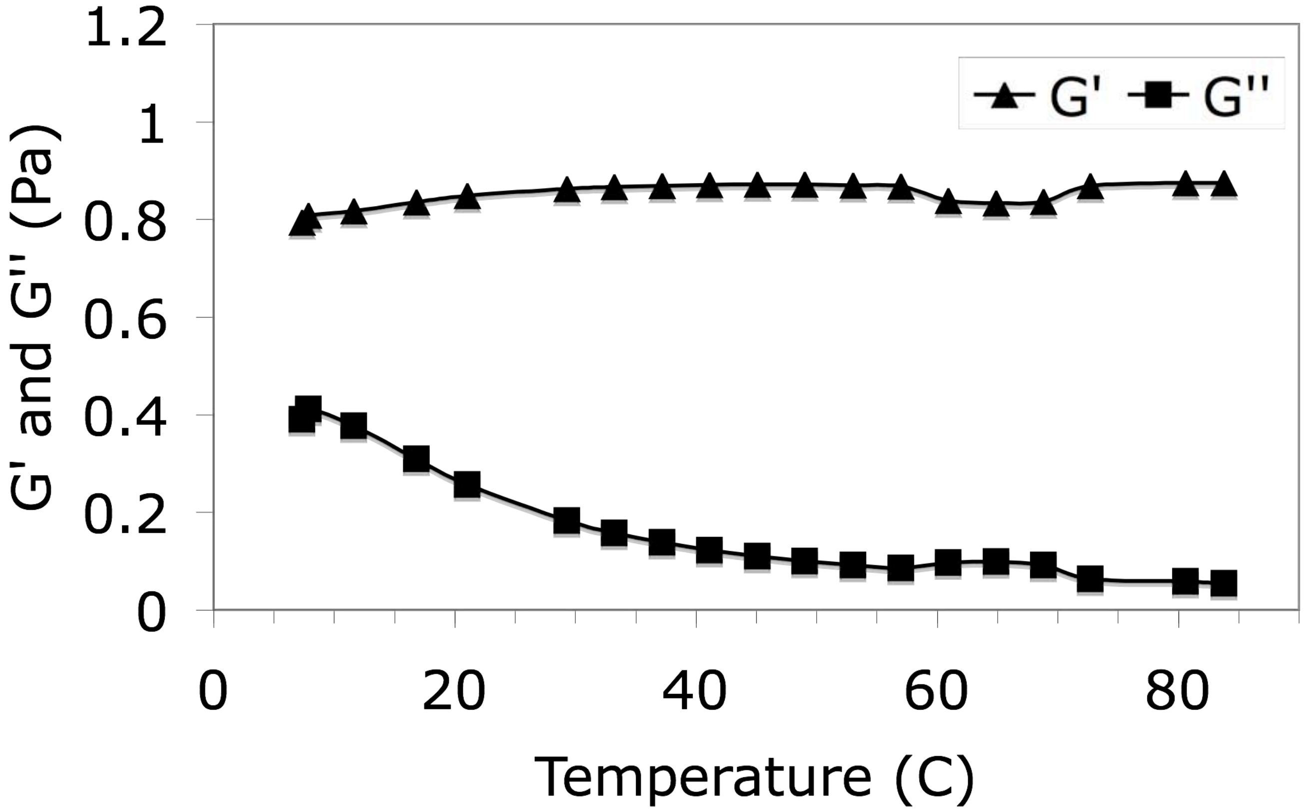
B-93. Dynamic testing of 0.125% KF with 0.200% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



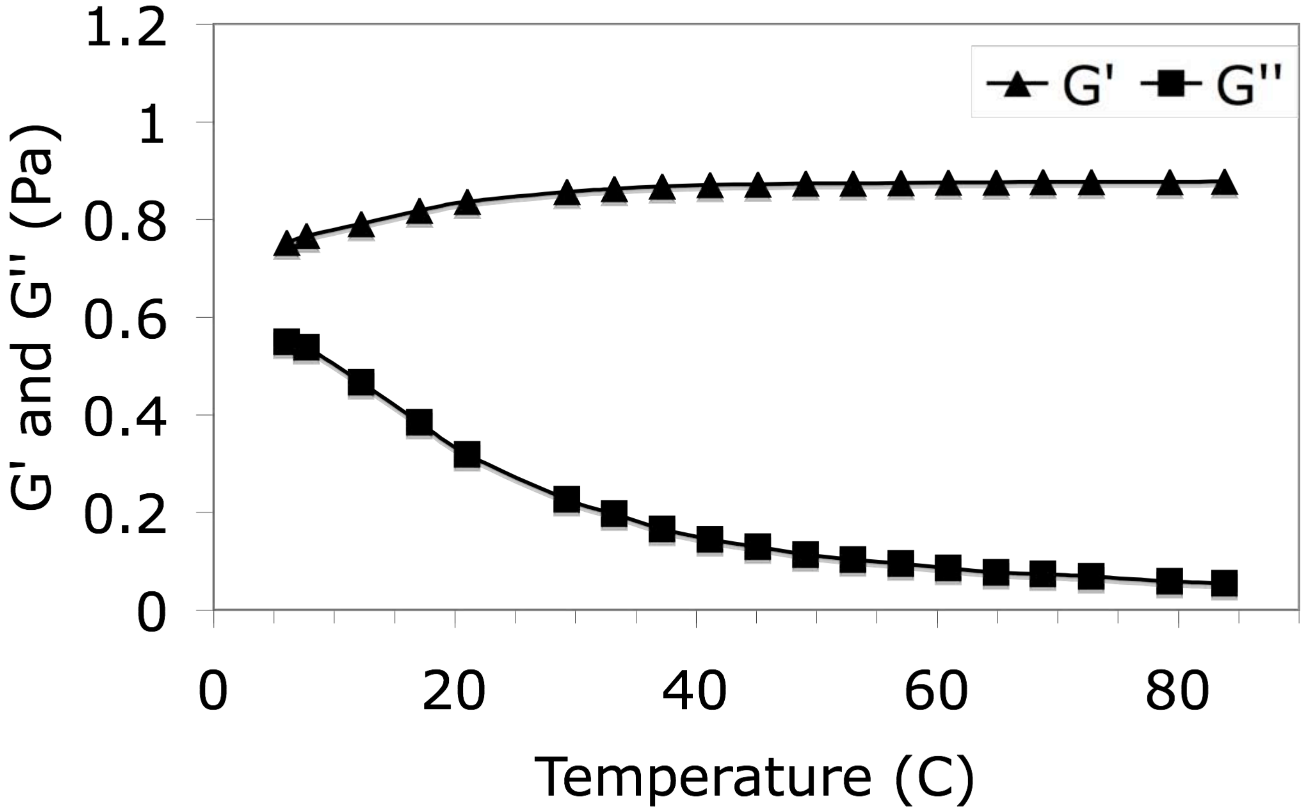
B-94. Dynamic testing of 0.125% KF with 0.300% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



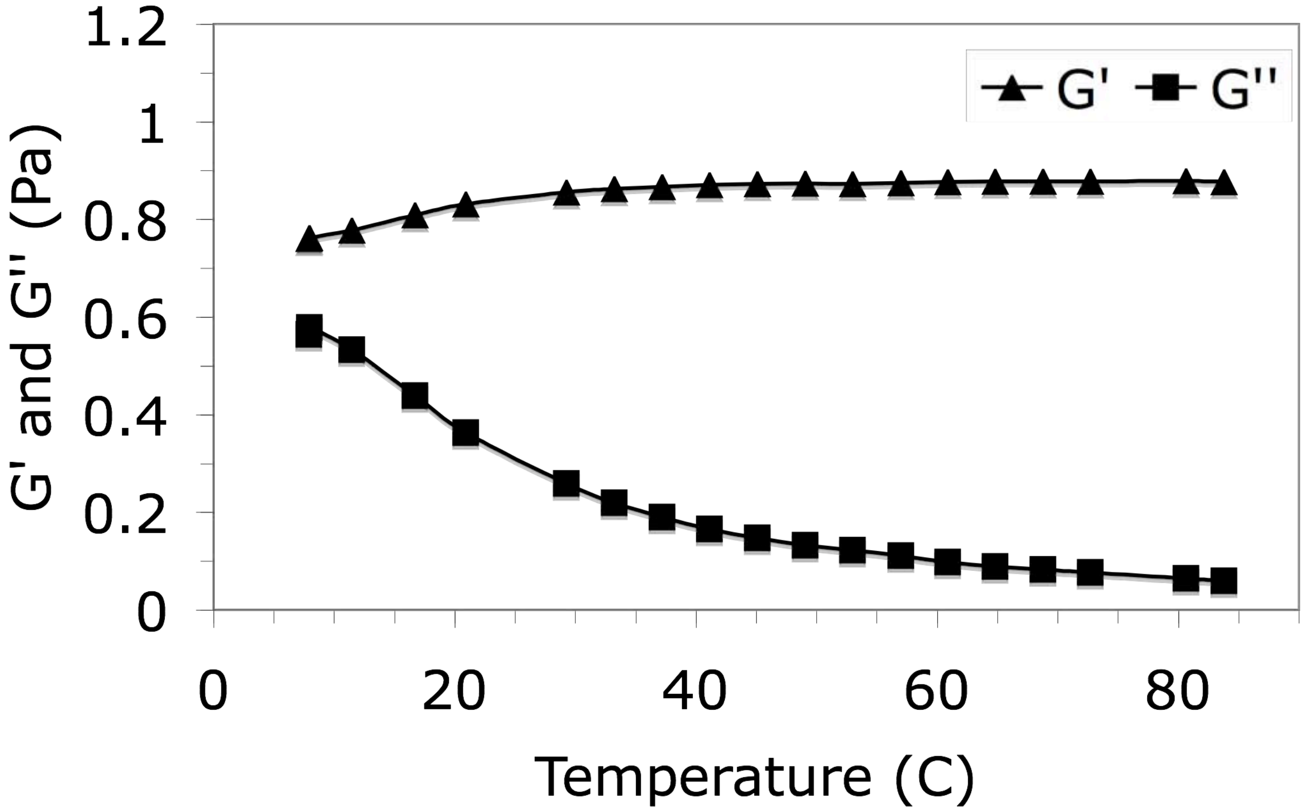
B-95. Dynamic testing of 0.125% KF with 0.400% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



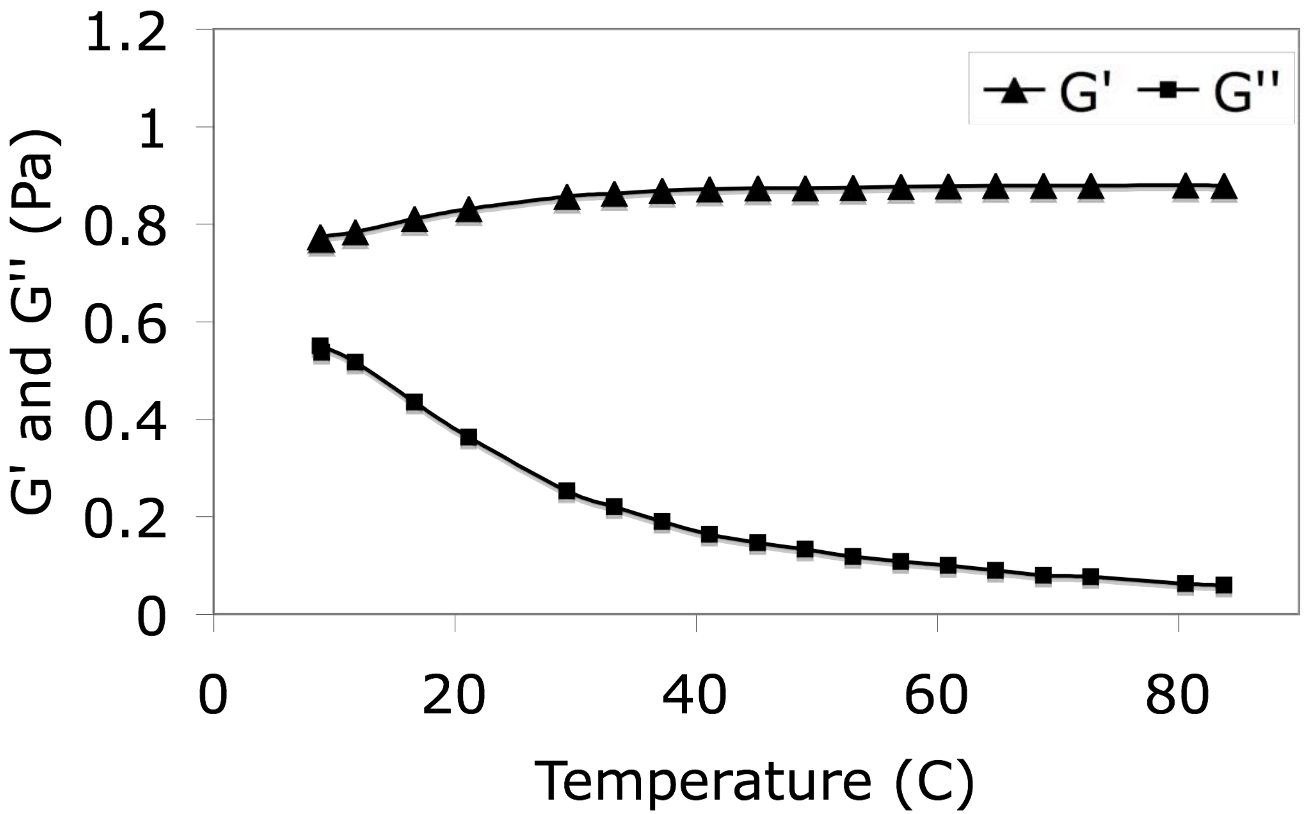
B-96. Dynamic testing of 0.250% KF with 0.000% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



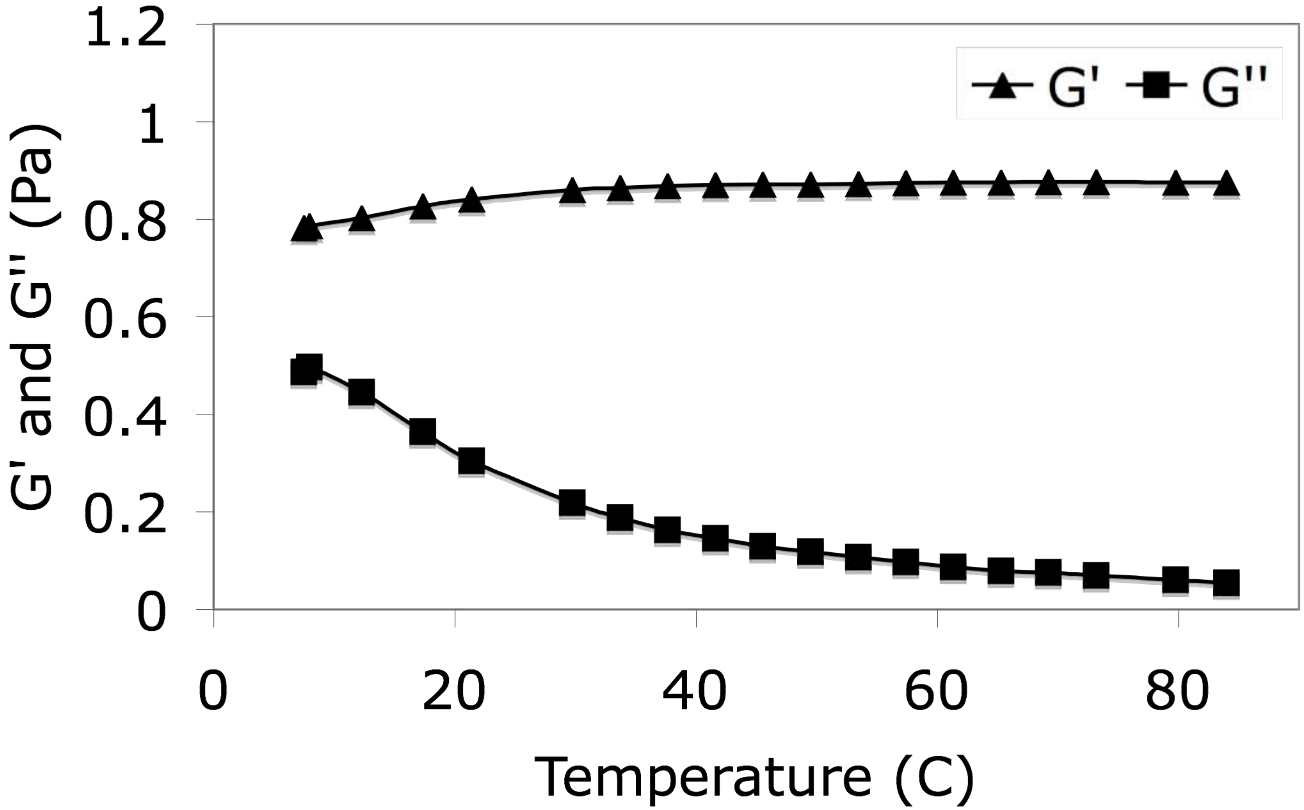
B-97. Dynamic testing of 0.250% KF with 0.100% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



B-98. Dynamic testing of 0.250% KF with 0.200% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.

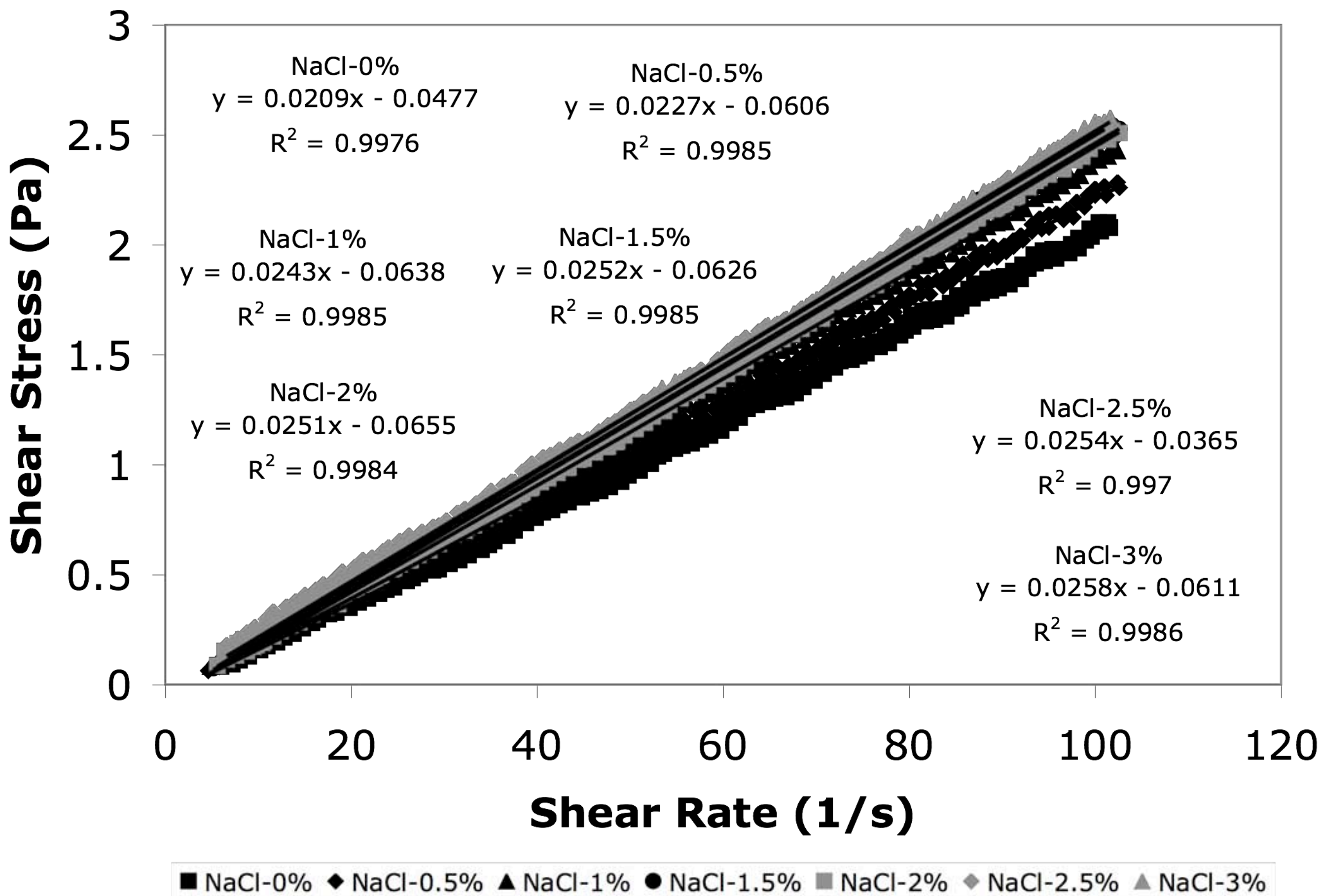


B-99. Dynamic testing of 0.250% KF with 0.300% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.

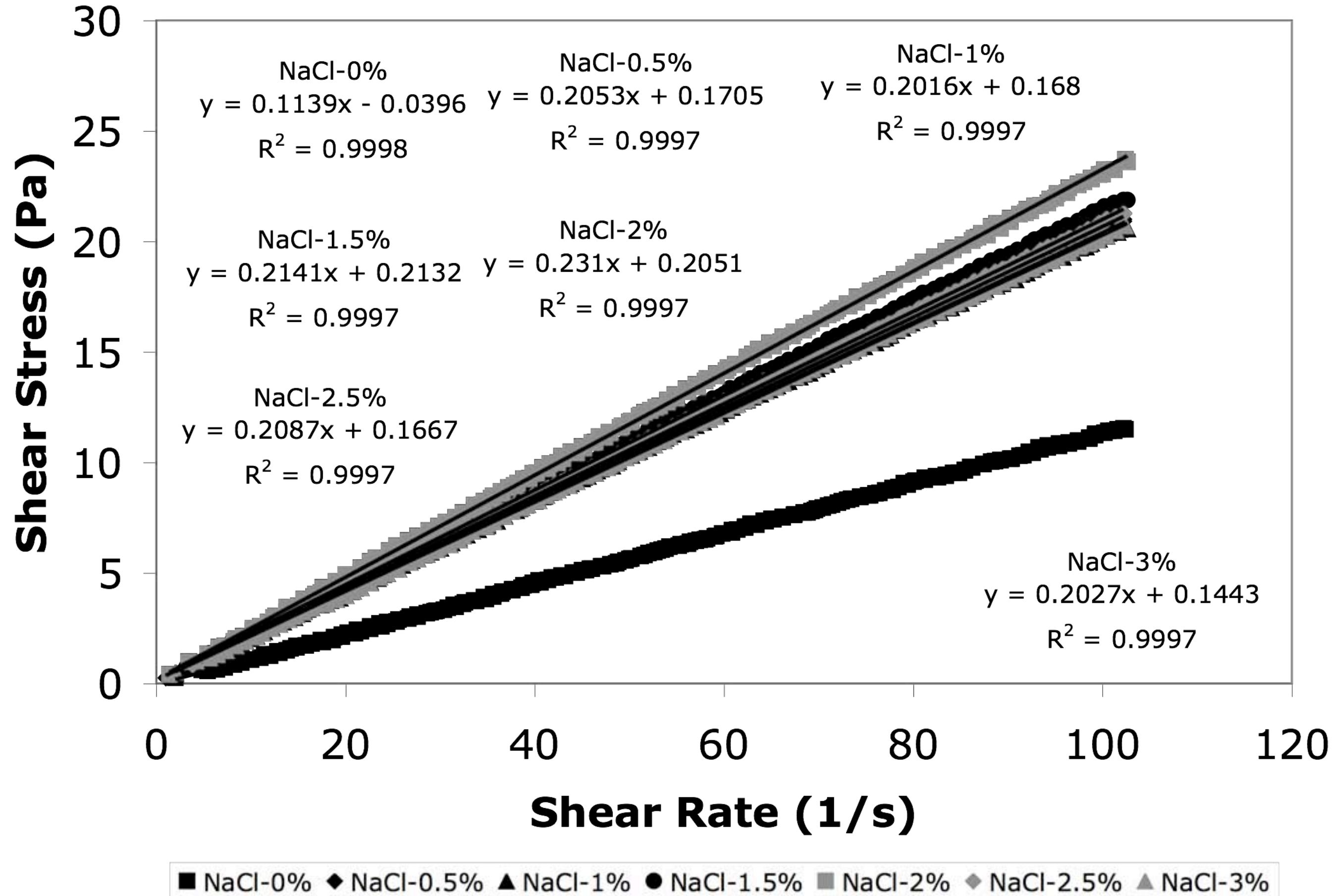


B-100. Dynamic testing of 0.250% KF with 0.400% sodium phosphate for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.

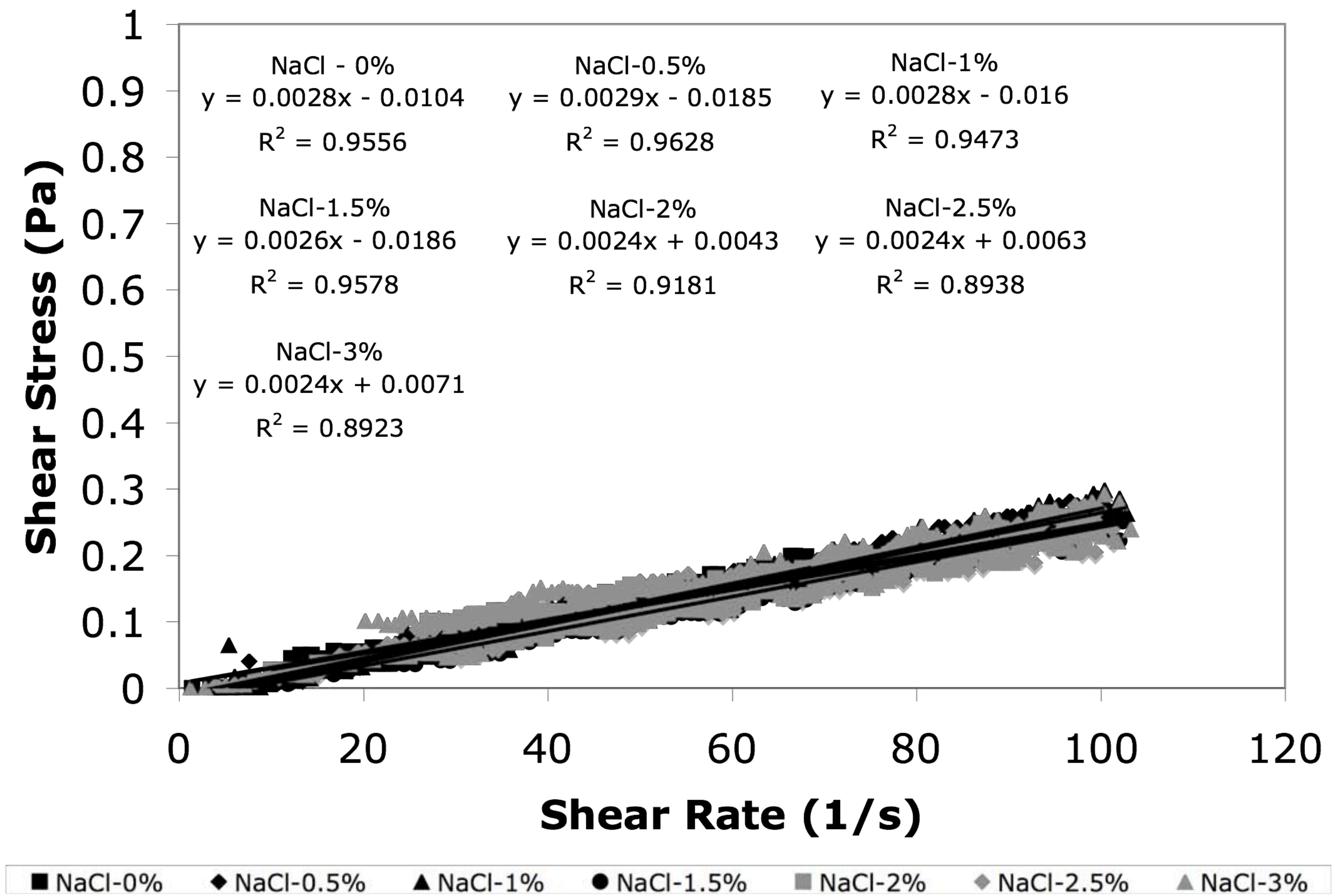
APPENDIX C



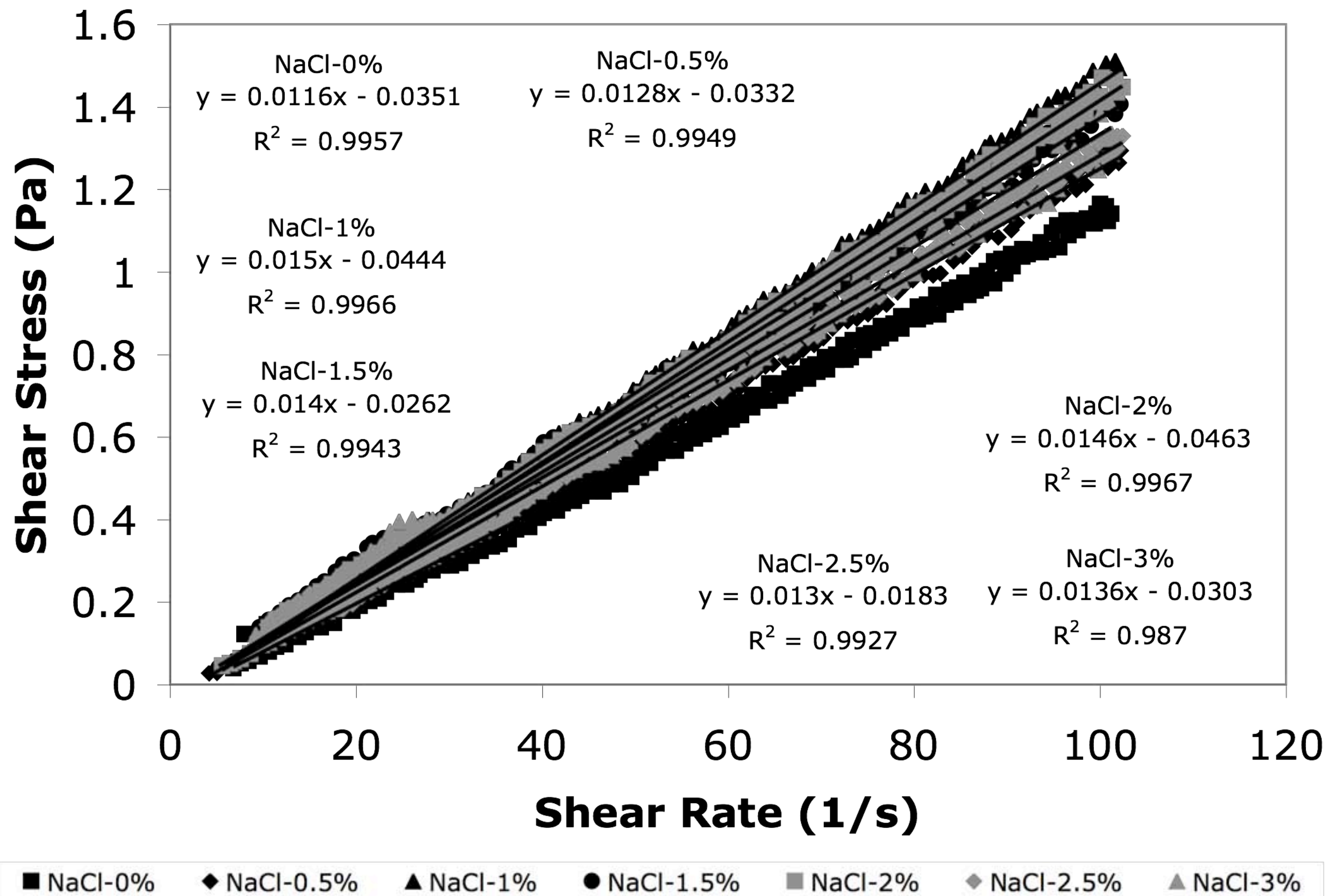
C-1. Fluid behavior for 1.000% MC with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 ^{o}C.



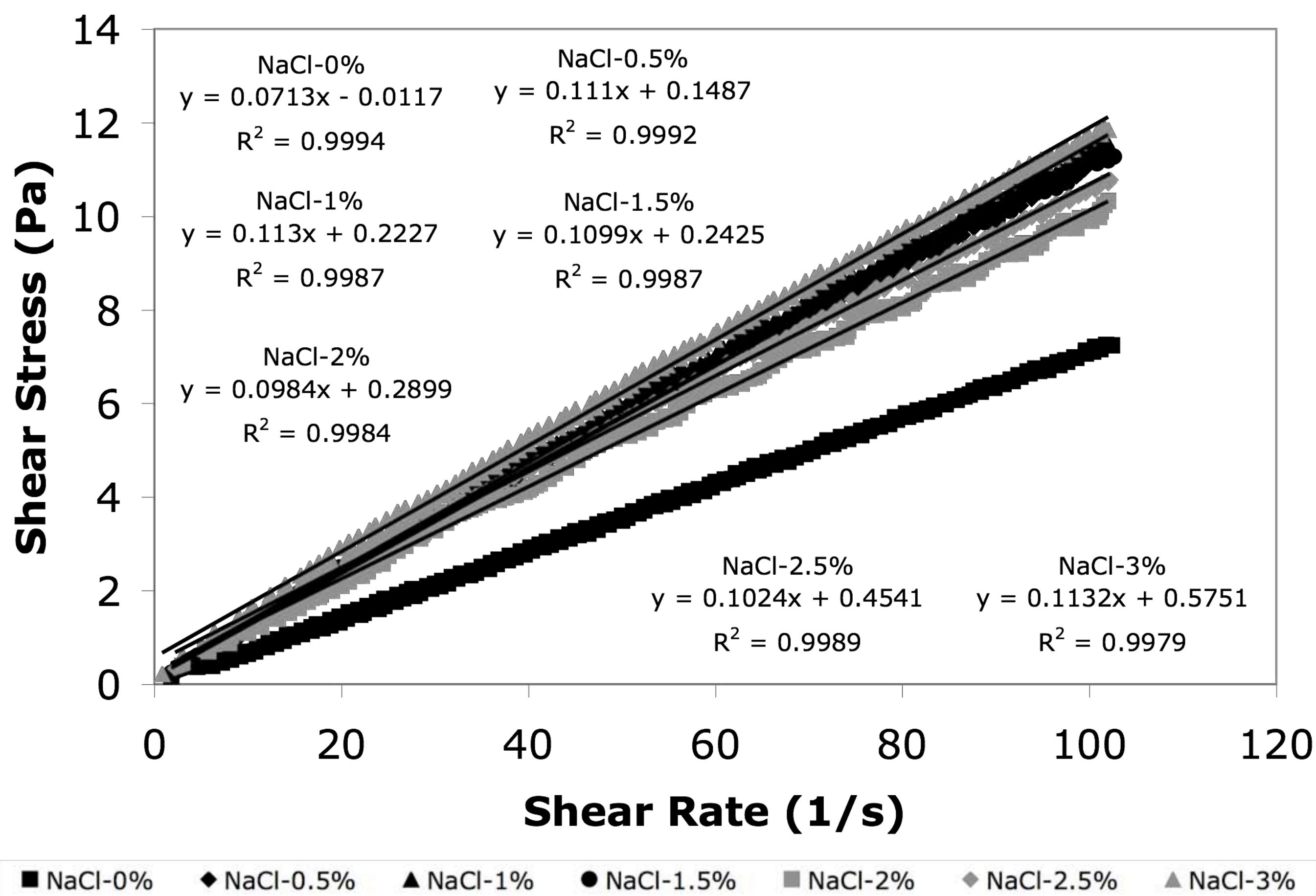
C-2. Fluid behavior for 2.000% MC with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 ^{o}C.



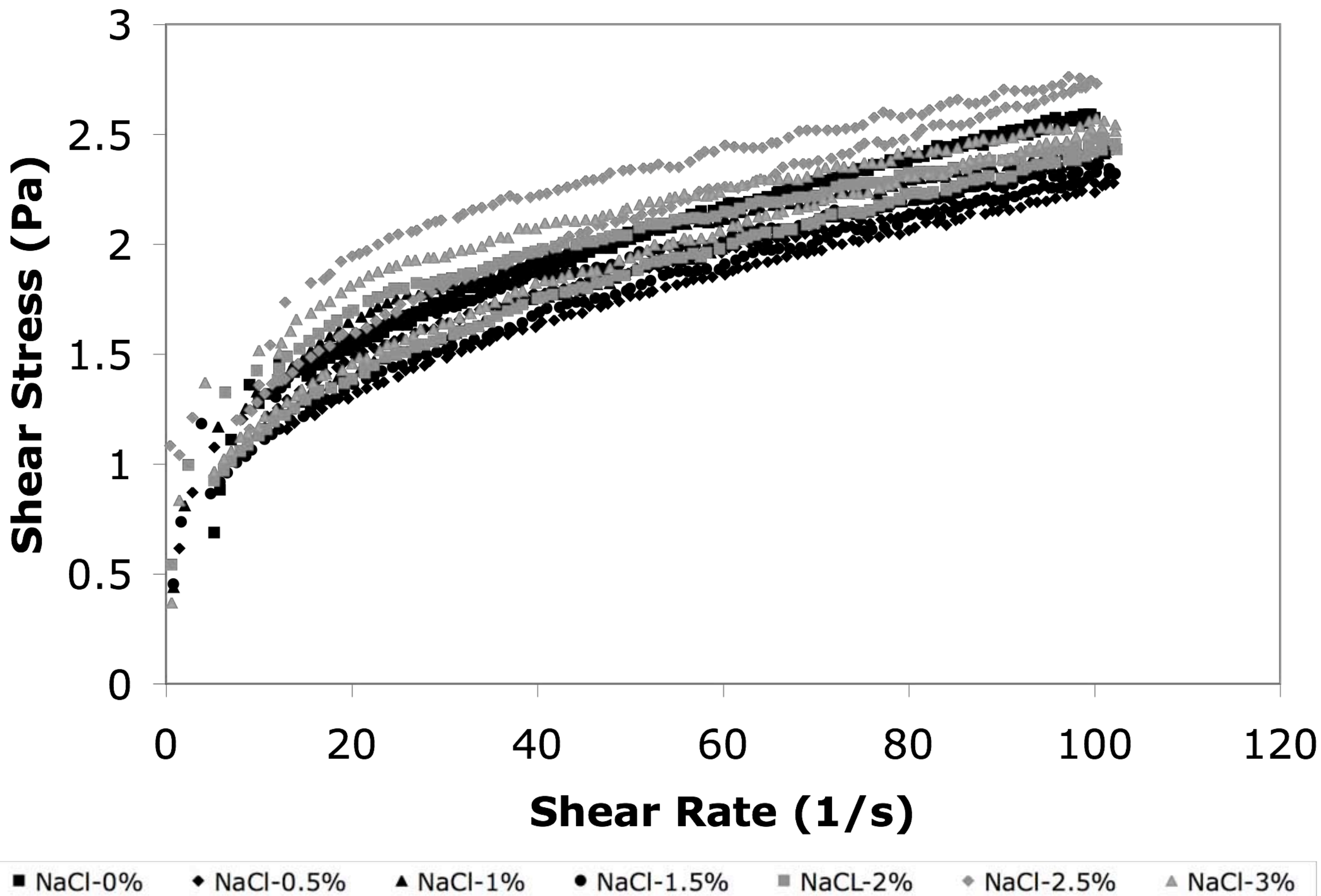
C-3. Fluid behavior for 1.000% HPMC with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 °C.



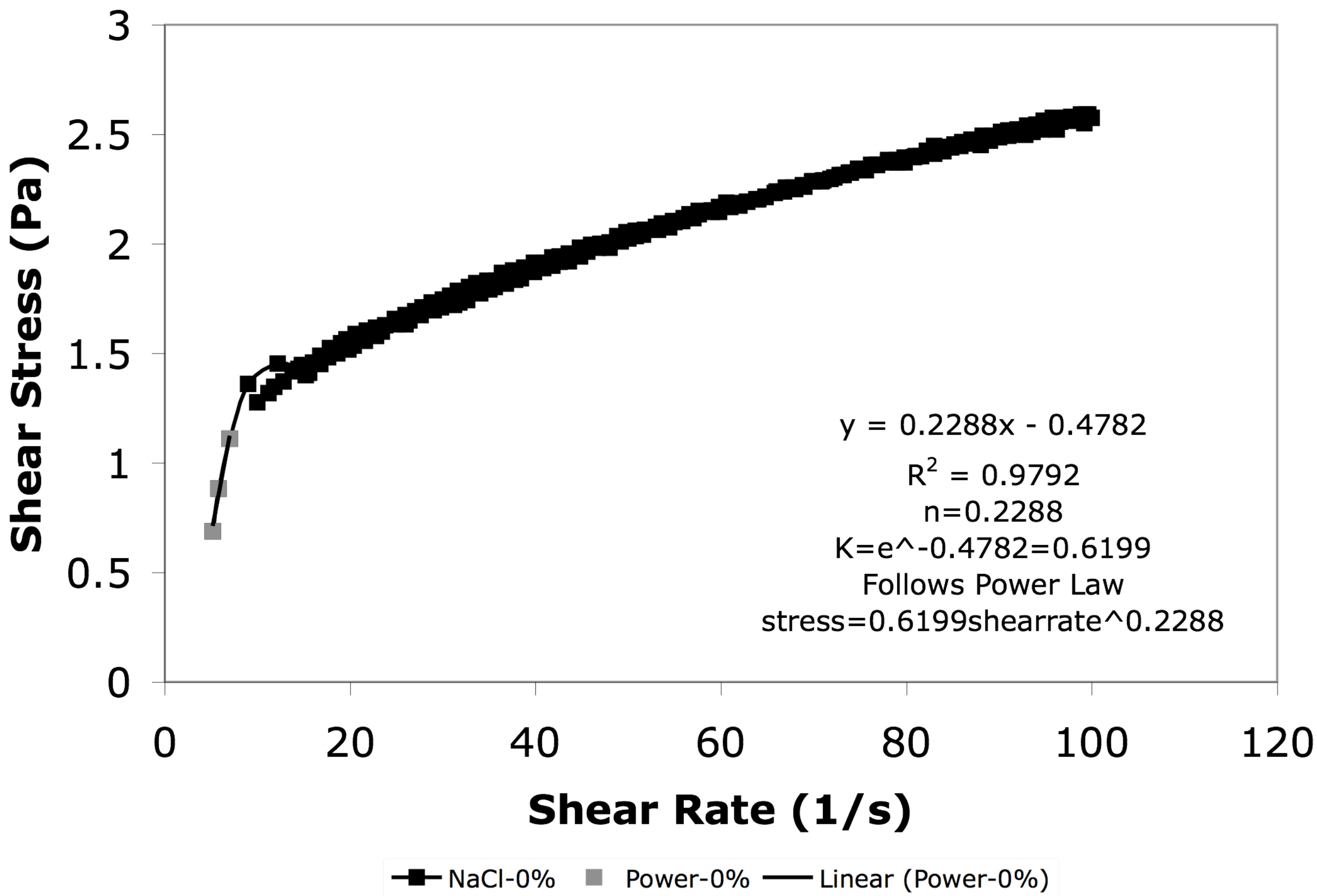
C-4. Fluid behavior for 1.000% SGMC with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 °C.



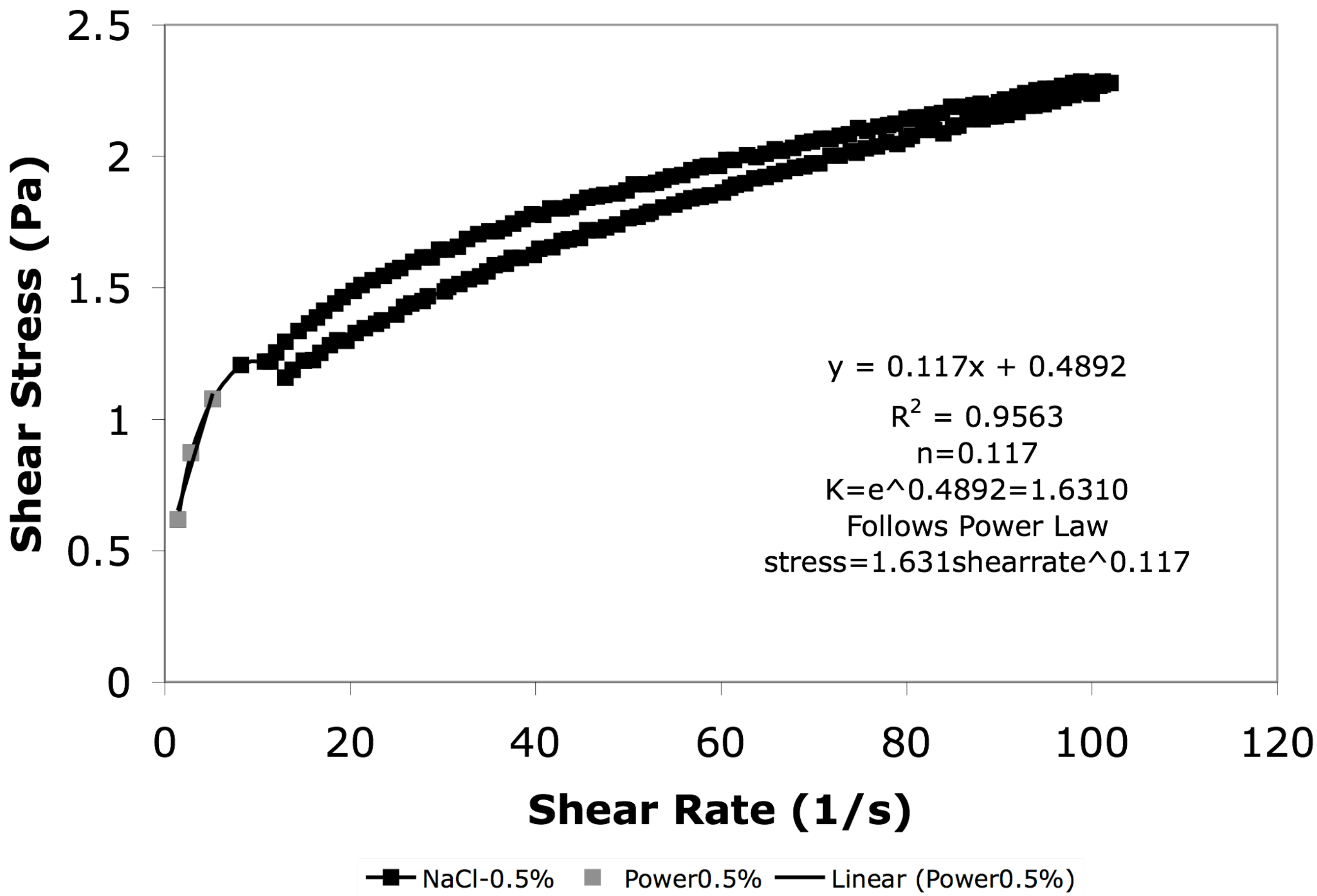
C-5. Fluid behavior for 2.000% SGMC with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 °C.



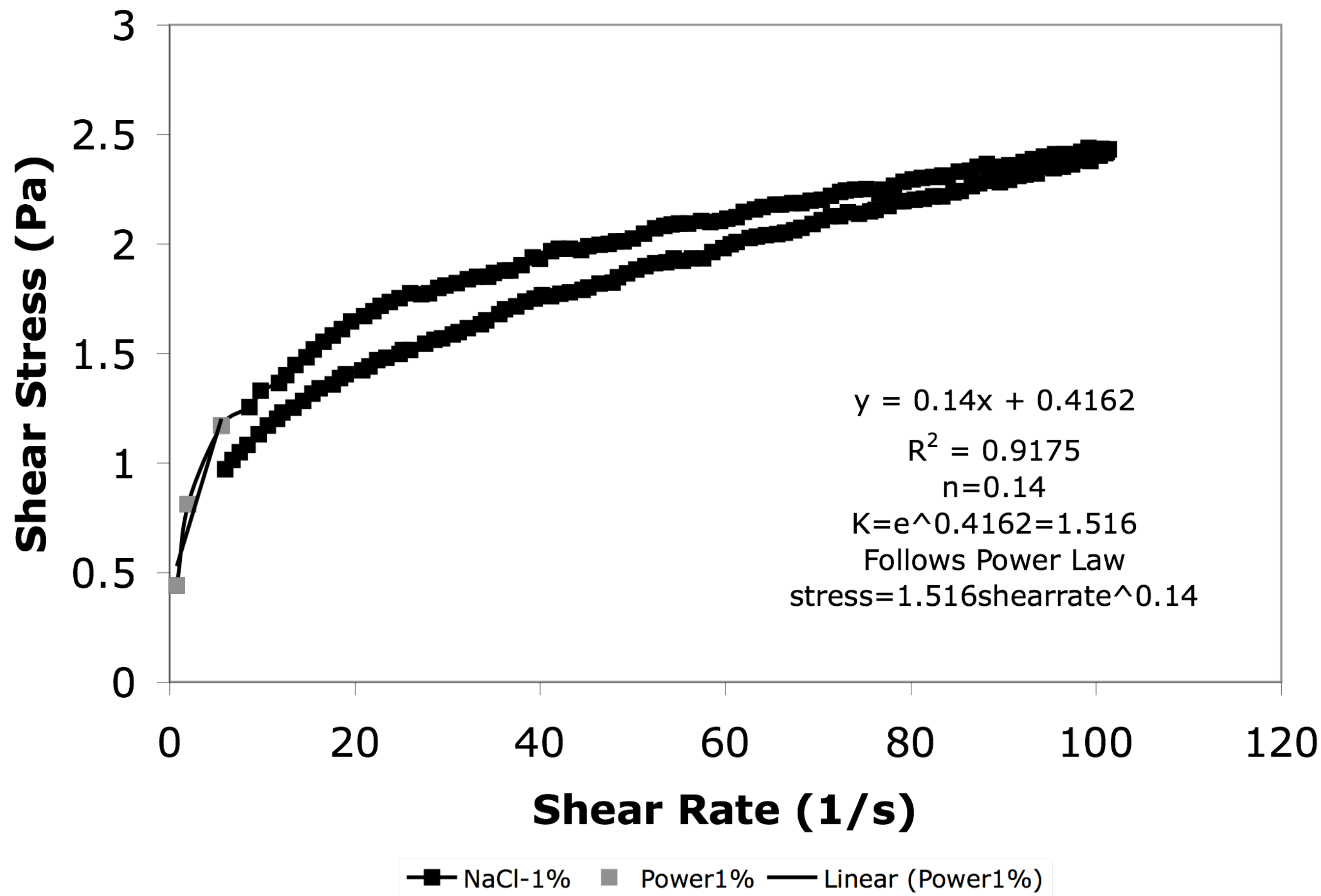
C-6. Fluid behavior for 0.250% XG with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 ^{o}C.



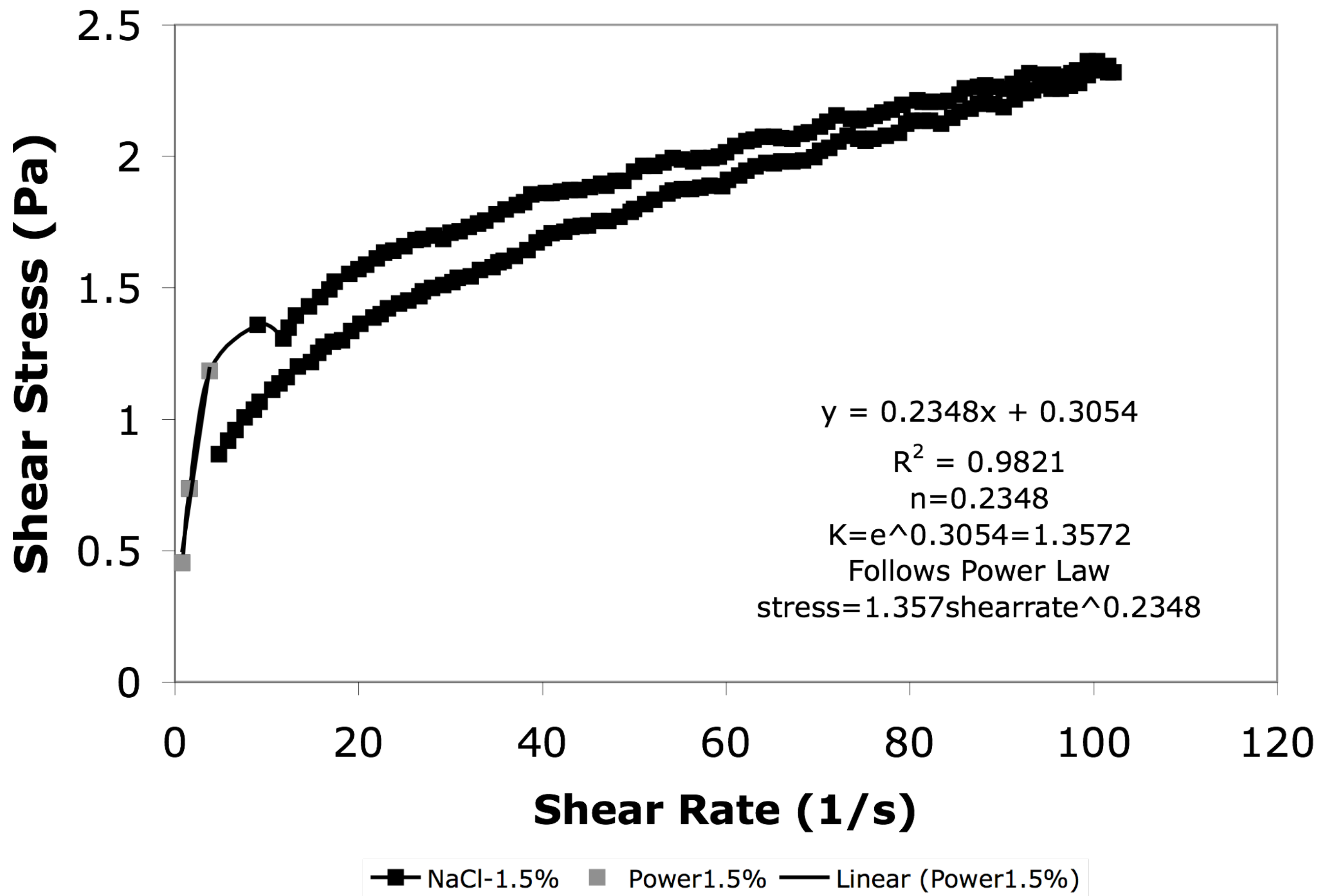
C-7. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 0.000% salt at 25 ^{o}C.



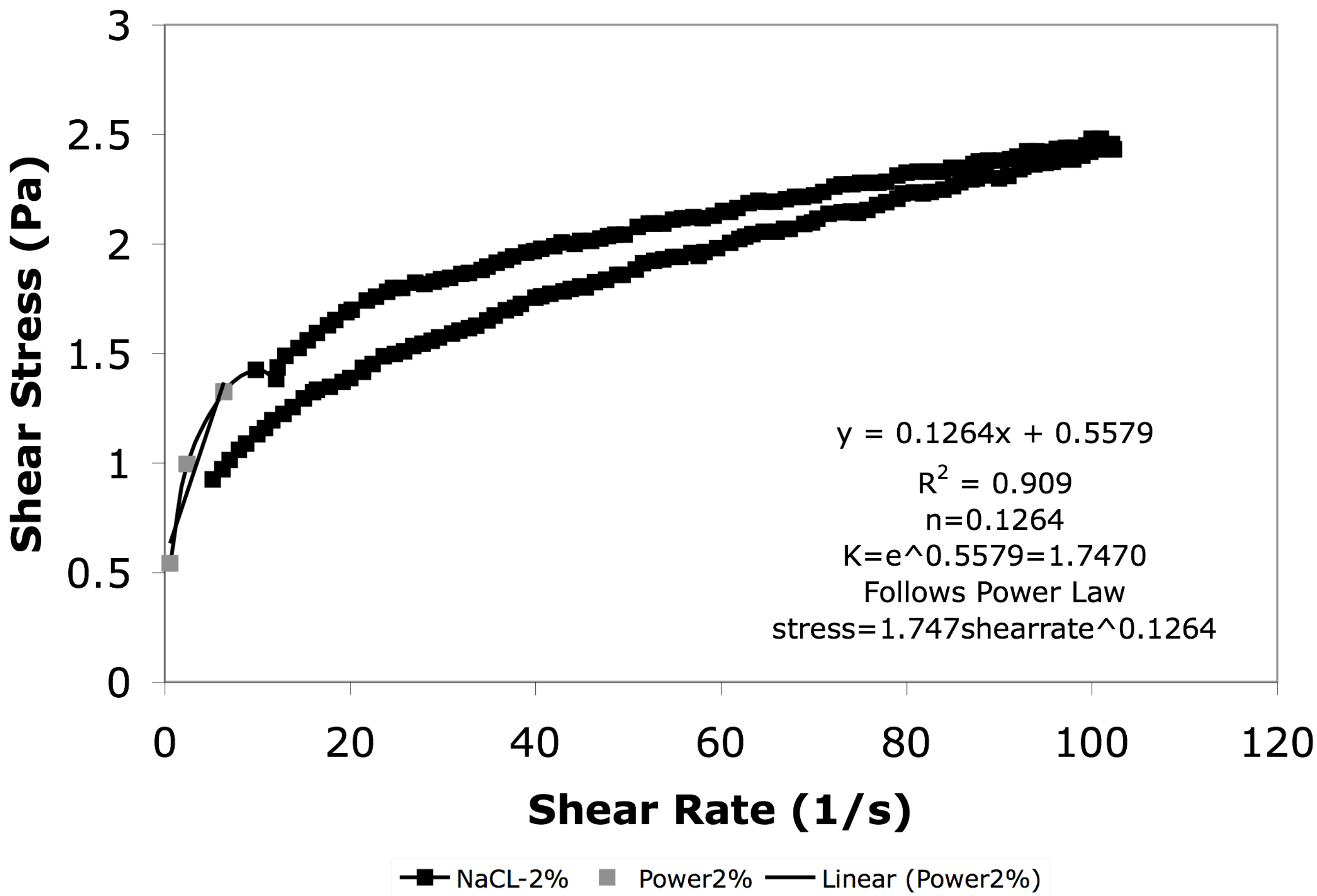
C-8. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 0.500% salt at 25 °C.



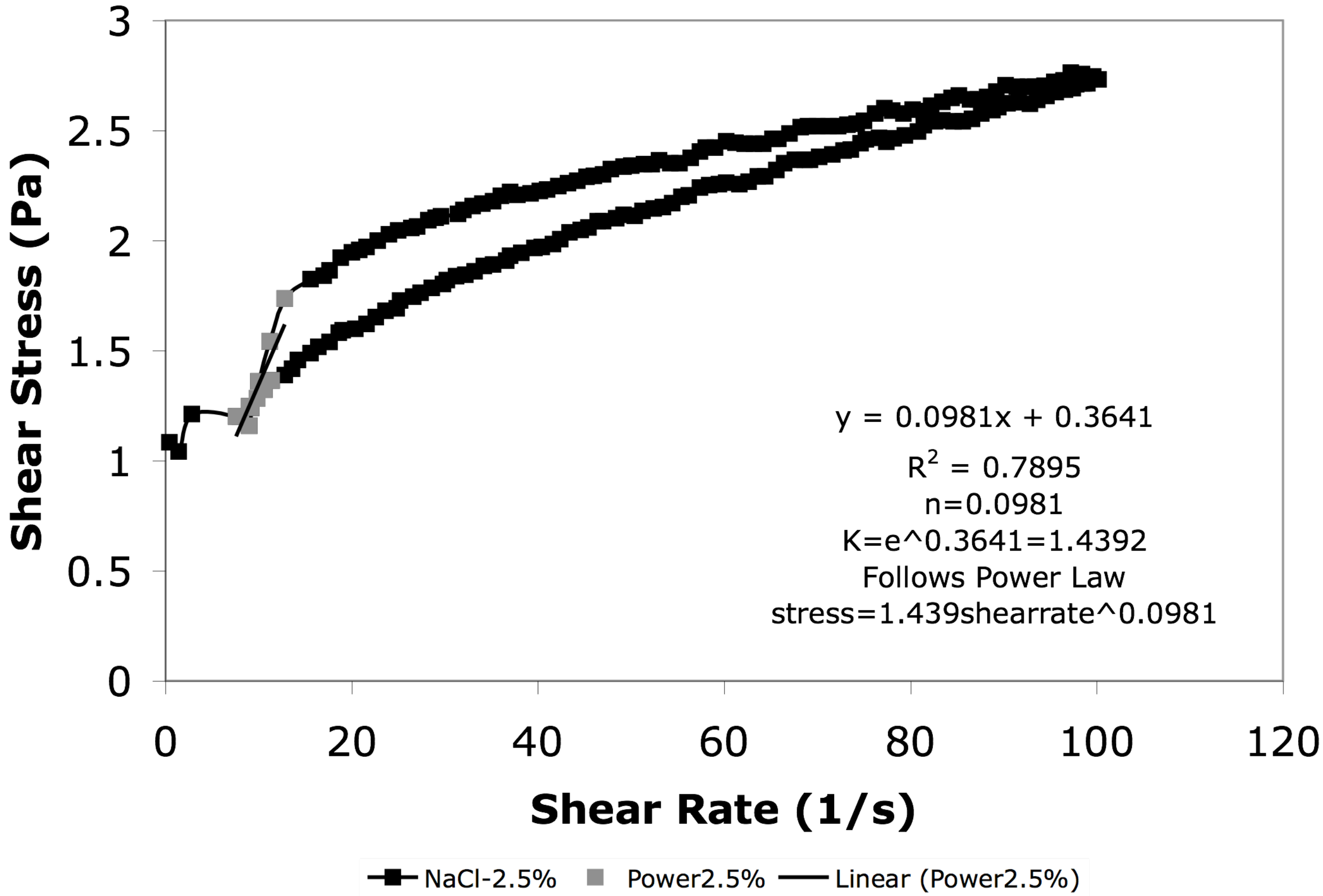
C-9. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 1.000% salt at 25 °C.



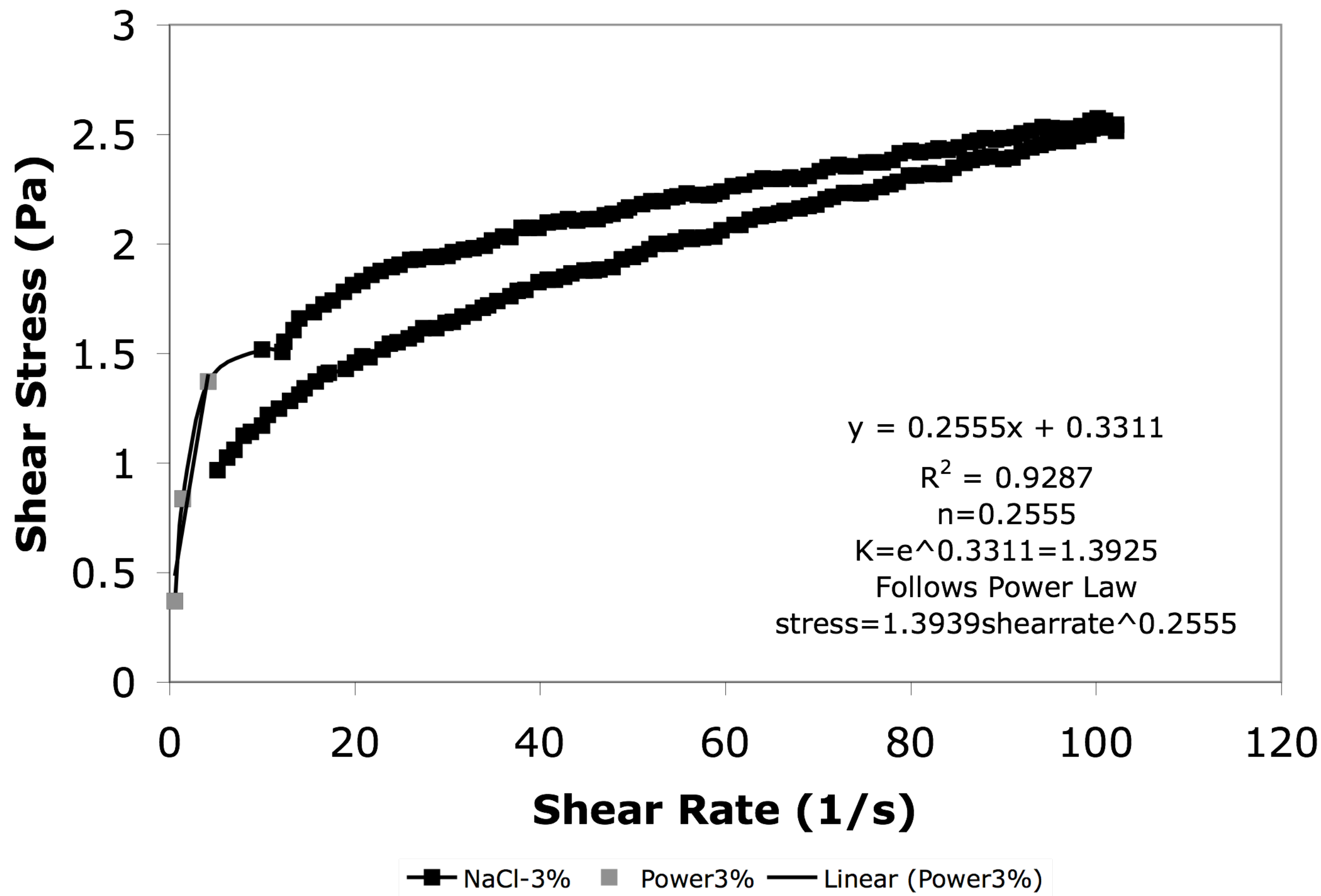
C-10. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 1.500% salt at 25 ^{o}C.



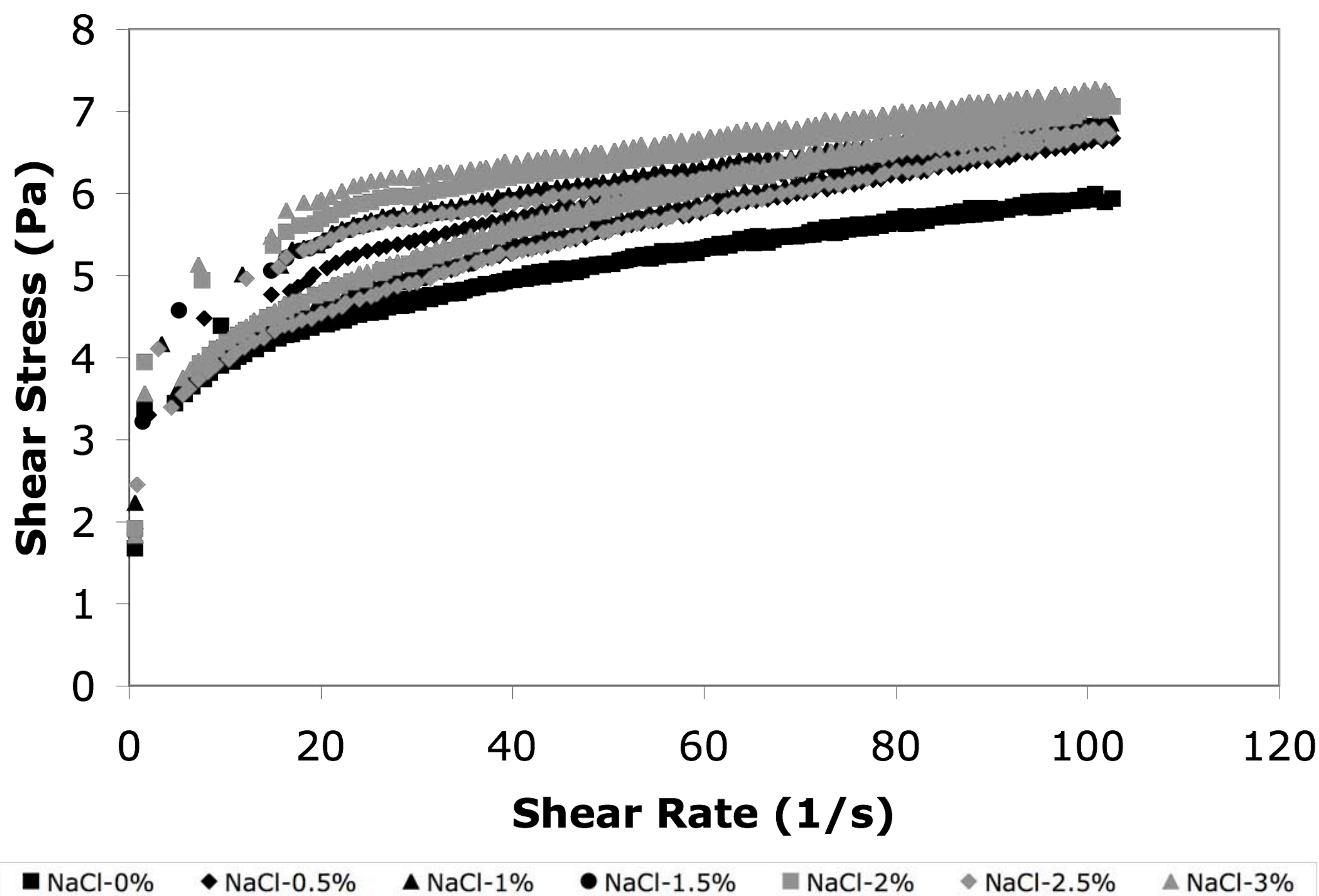
C-11. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 2.000% salt at 25 ^{o}C.



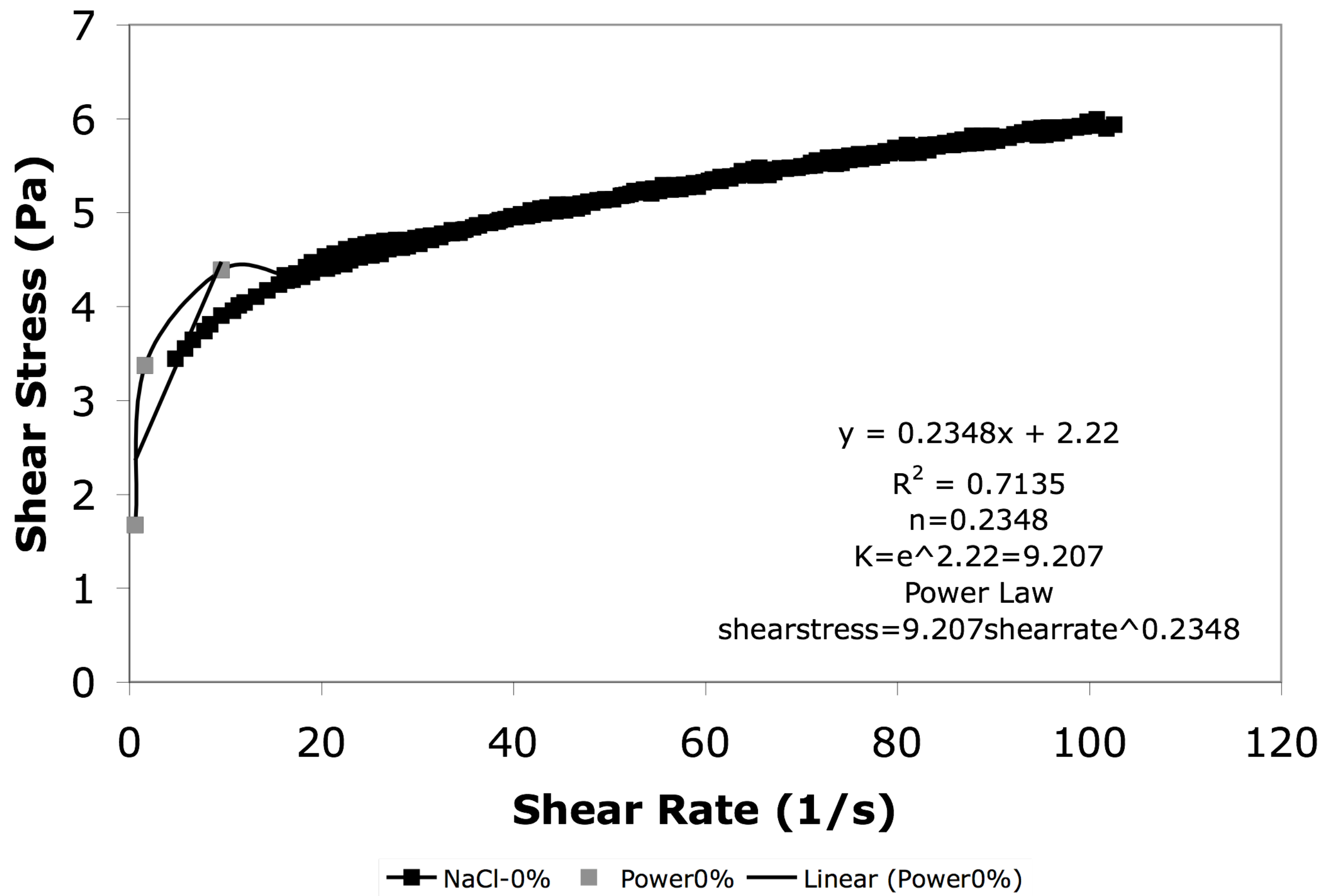
C-12. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 2.500% salt at 25 ^{o}C.



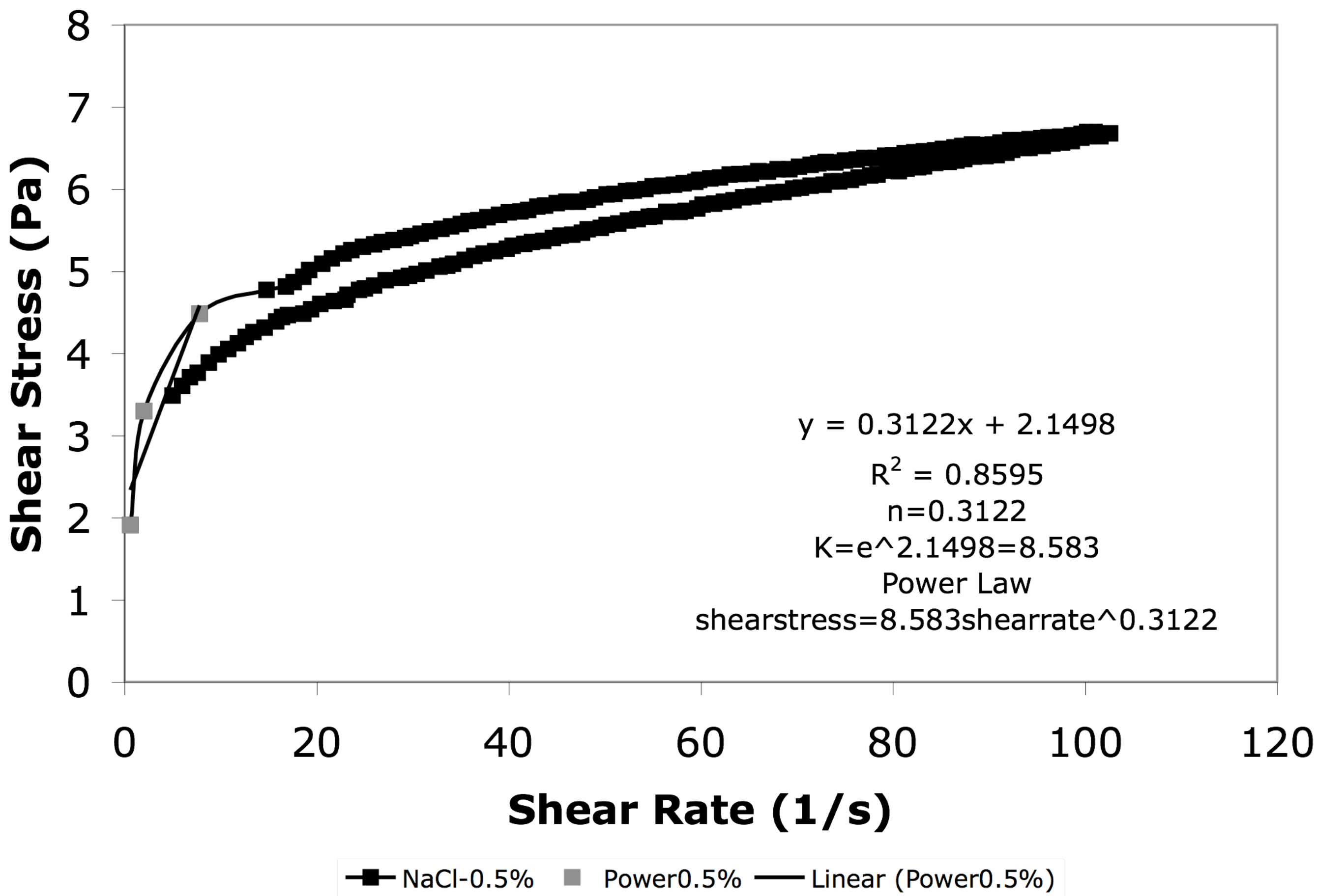
C-13. Mean linear shear-thinning determination of fluid behavior for 0.250% XG with 3.000% salt at 25 °C.



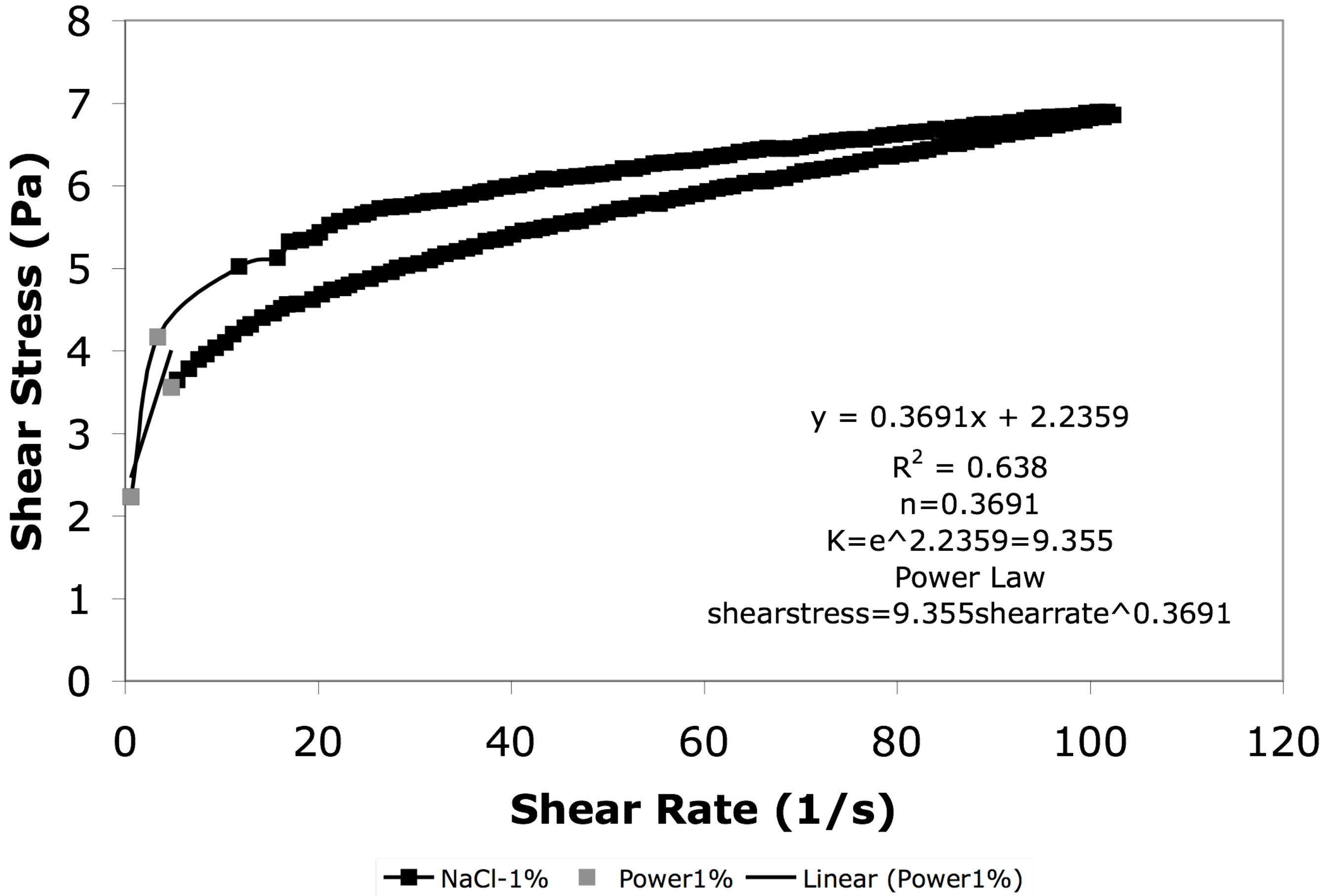
C-14. Fluid behavior for 0.500% XG with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 ^{o}C.



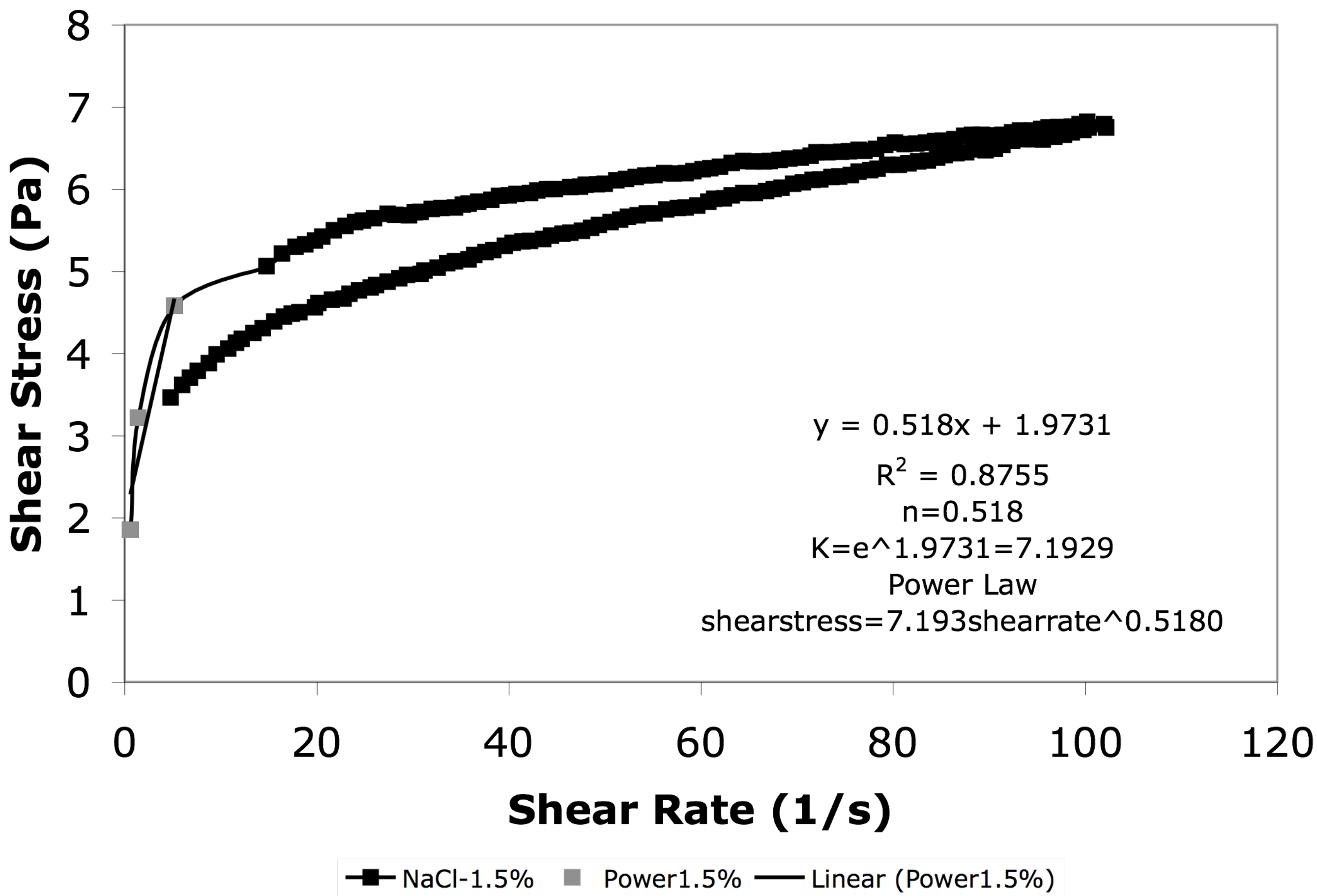
C-15. Mean linear shear-thinning determination of fluid behavior for 0.500%XG with 0.000% salt at 25 °C.



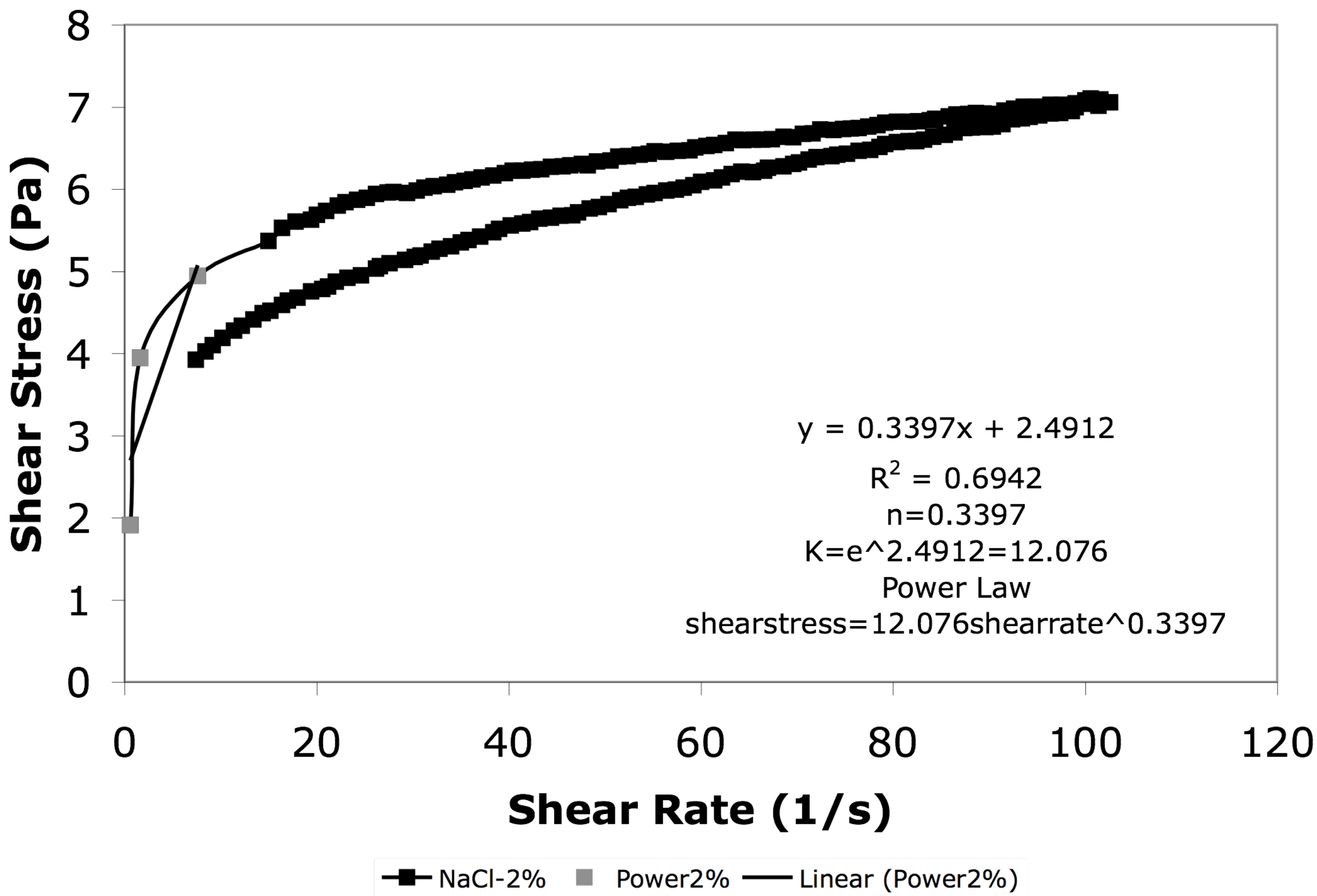
C-16. Mean linear shear-thinning determination of fluid behavior for 0.500%XG with 0.500% salt at 25 ^{o}C.



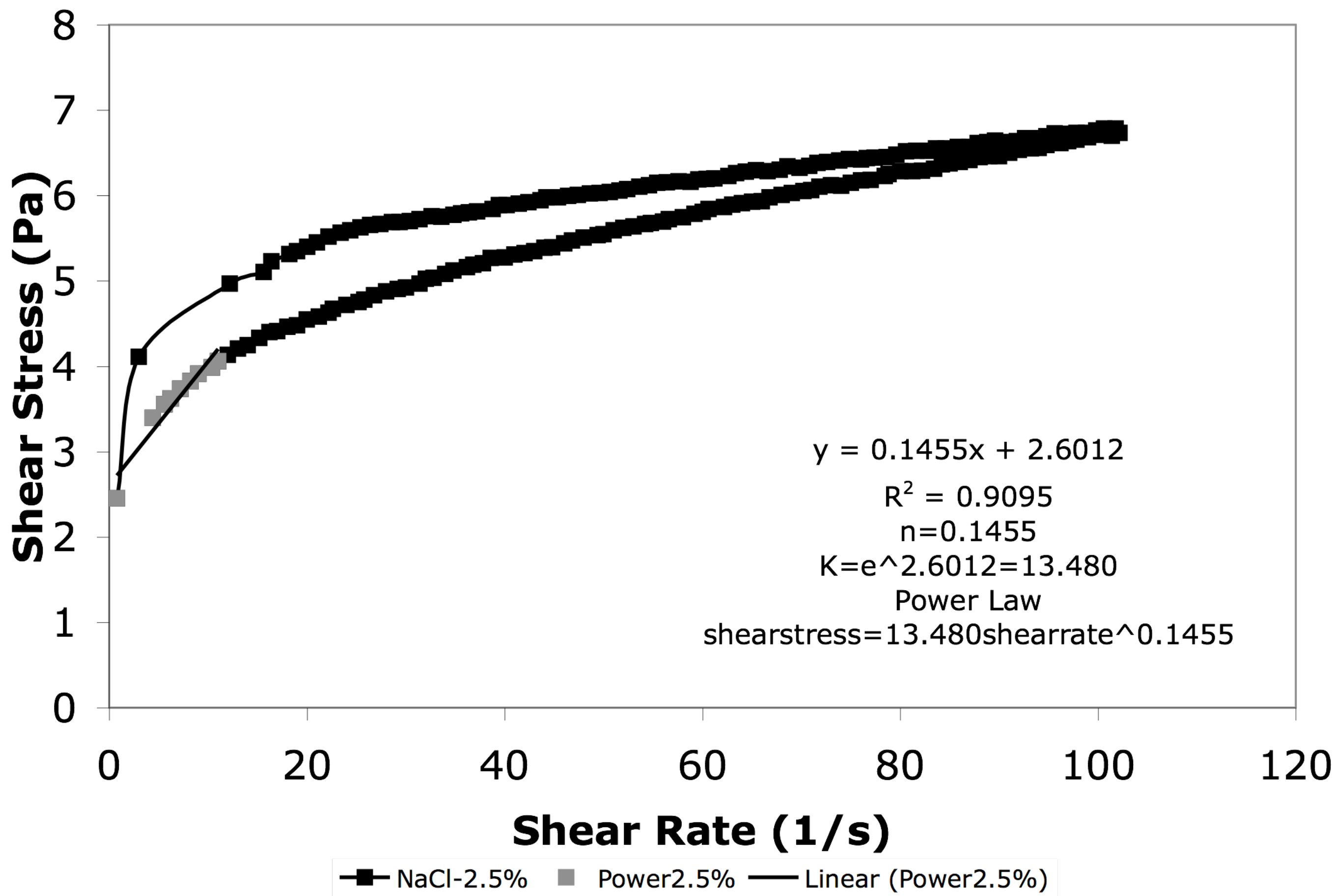
C-17. Mean linear shear-thinning determination of fluid behavior for 0.500%XG with 1.000% salt at 25 ^{o}C.



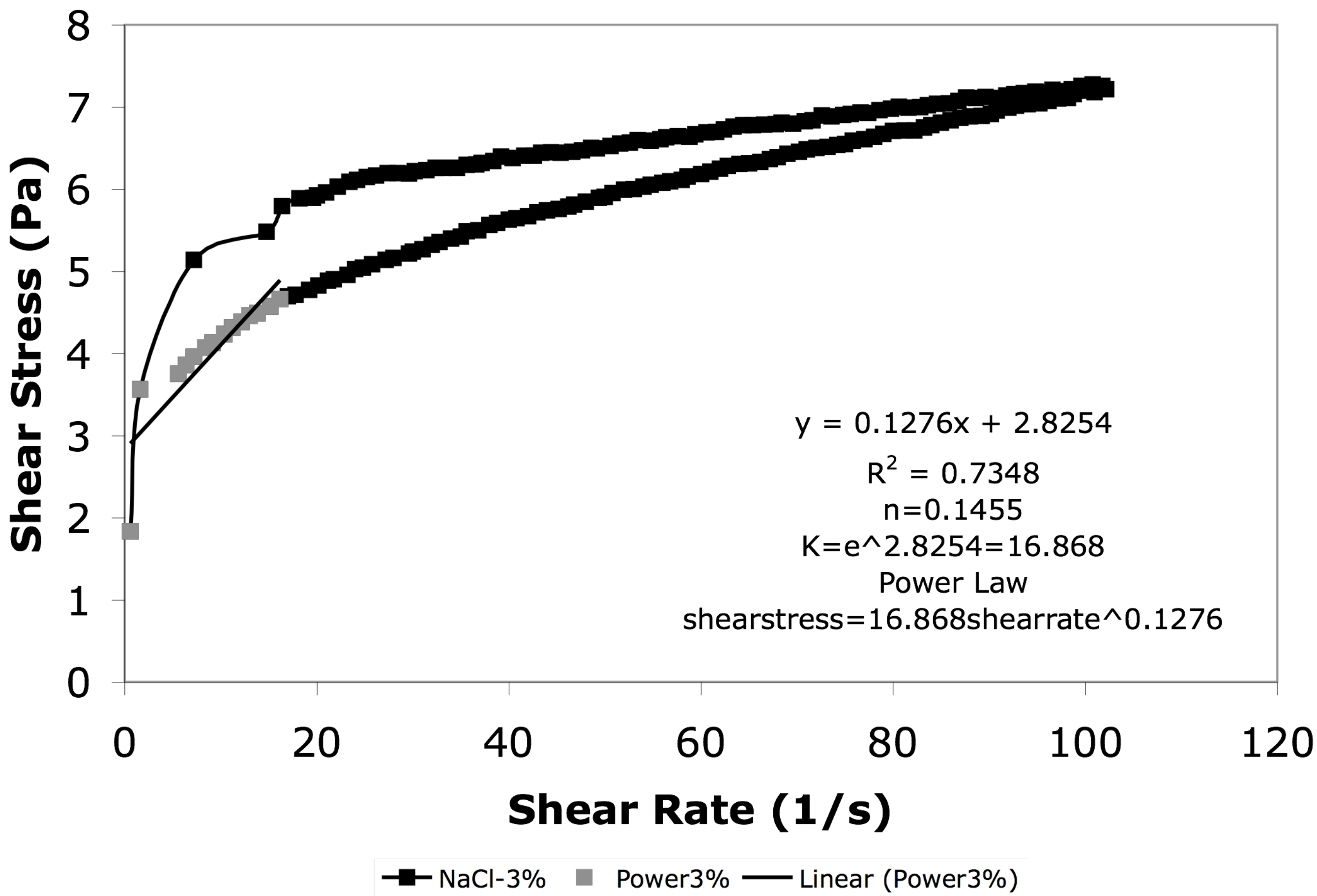
C-18. Mean linear shear-thinning determination of fluid behavior for 0.500%XG with 1.500% salt at 25 ^{o}C.



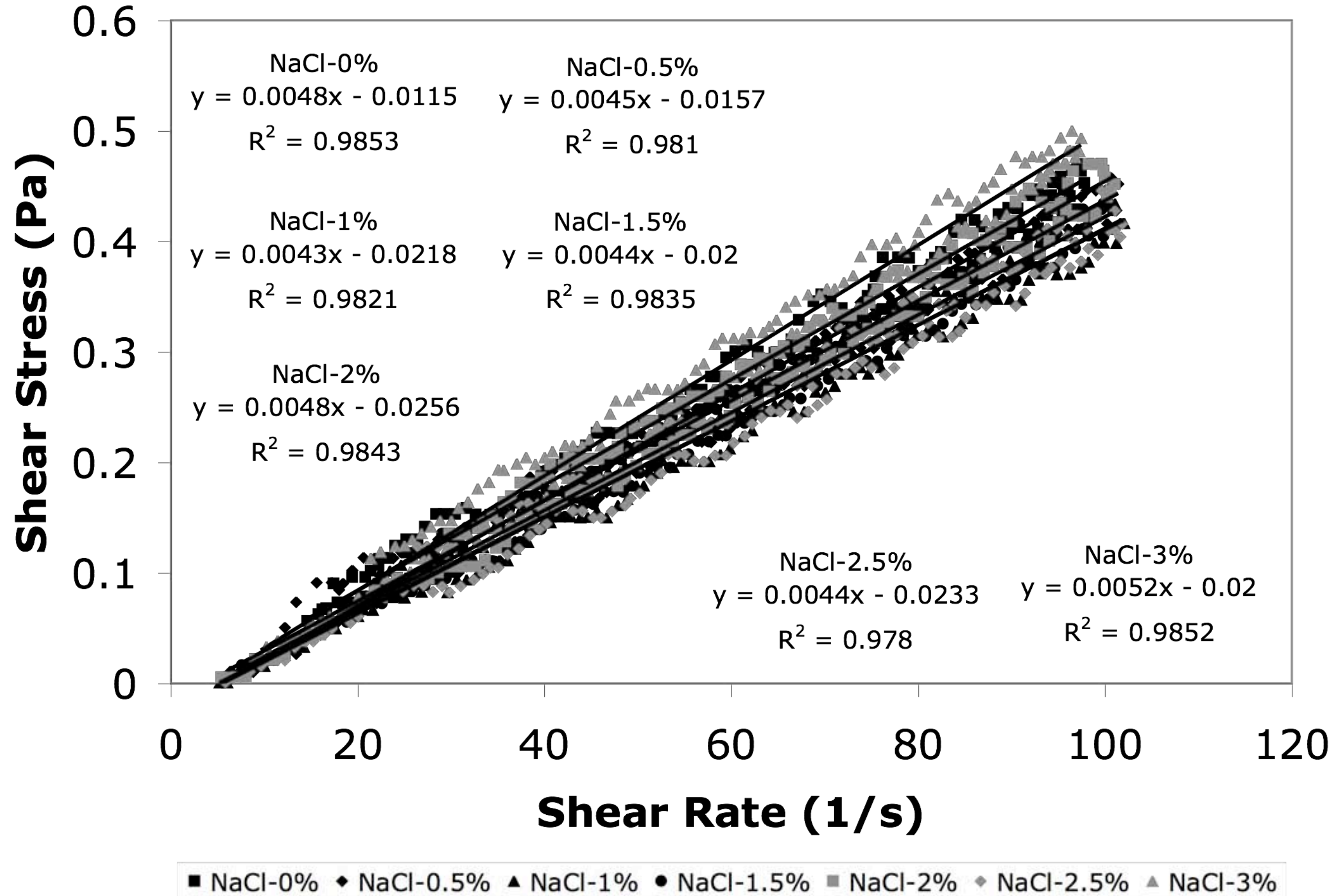
C-19. Mean linear shear-thinning determination of fluid behavior for 0.500%XG with 2.000% salt at 25 °C.



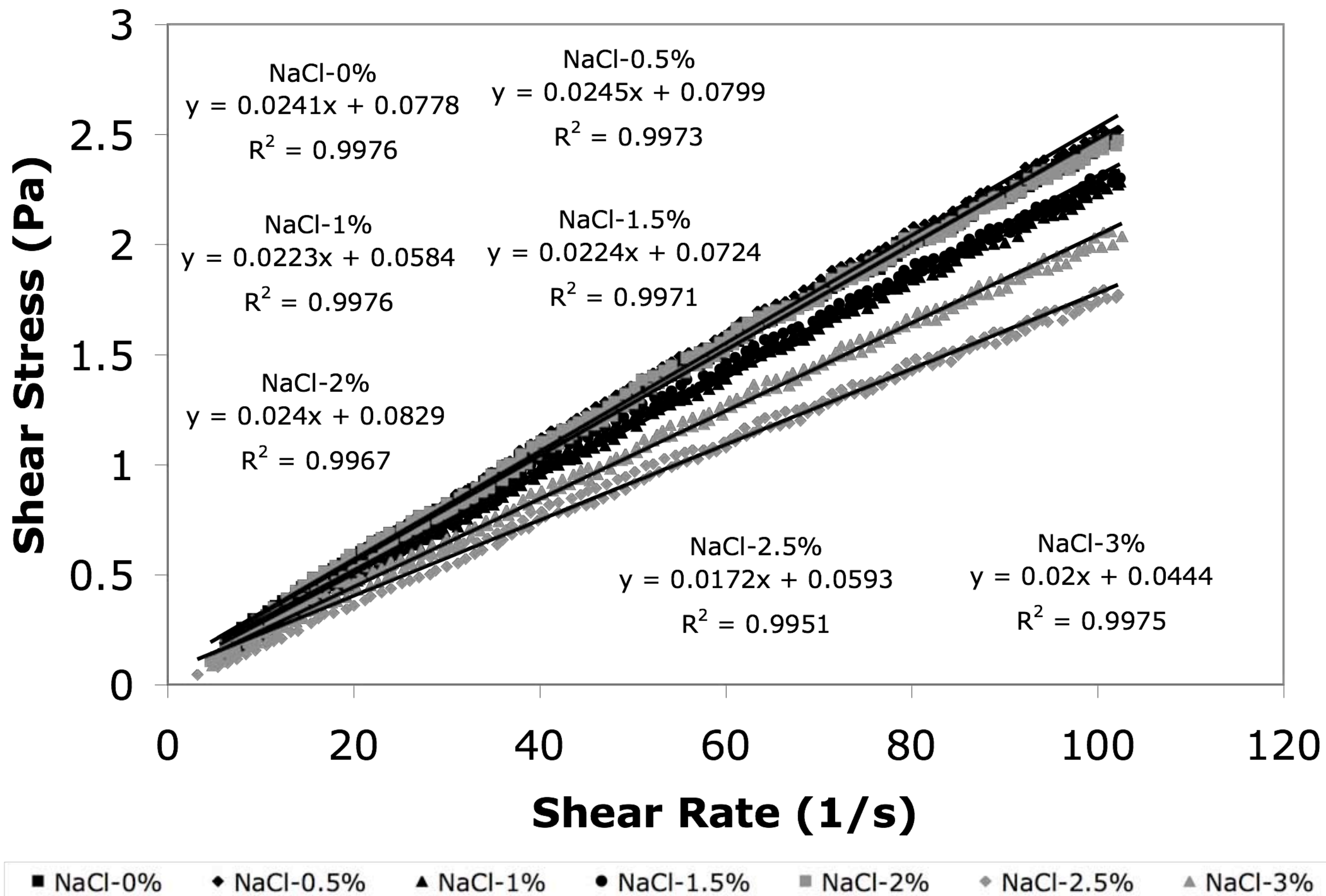
C-20. Mean linear shear-thinning determination of fluid behavior for 0.500%XG with 2.500% salt at 25 ^{o}C.



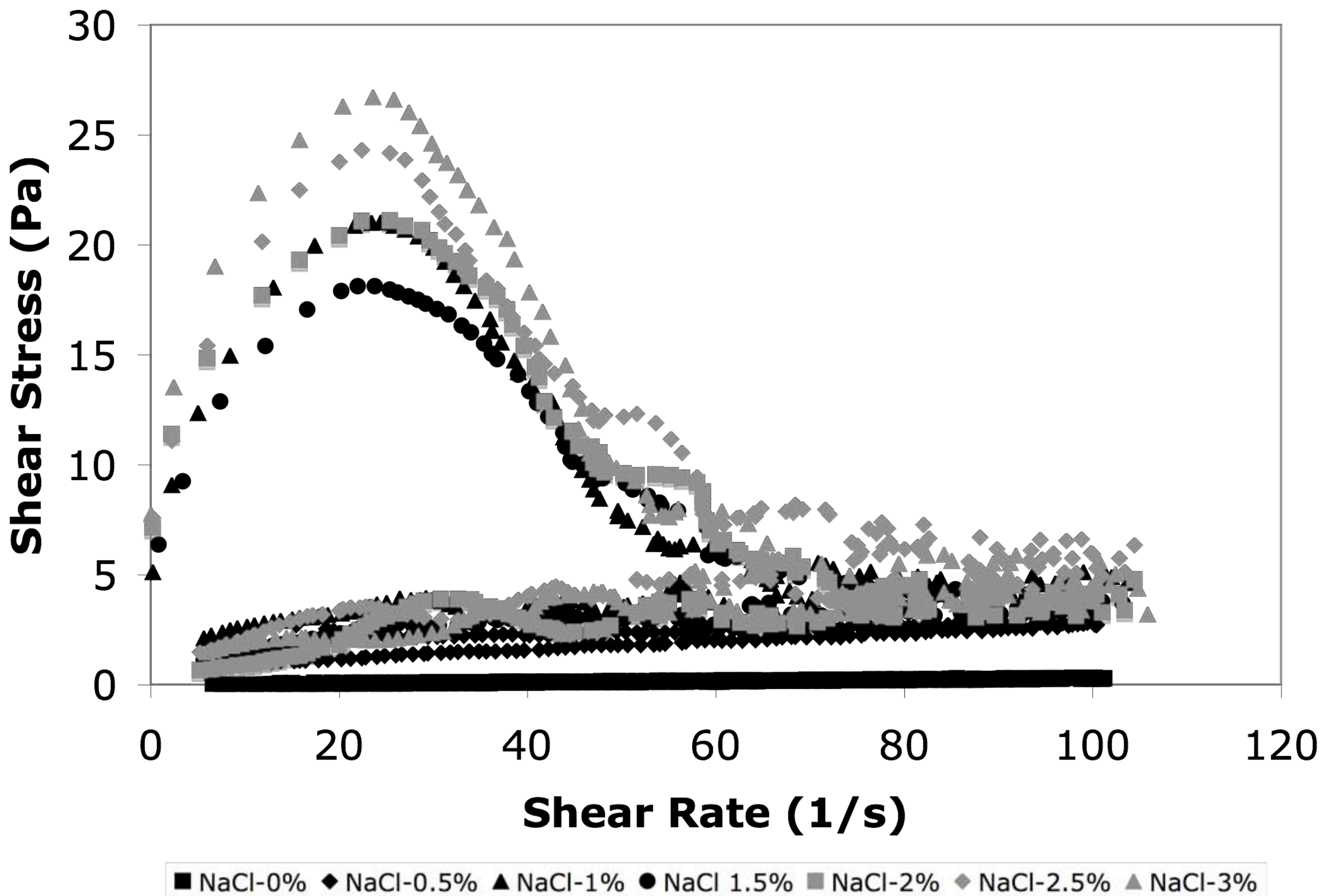
C-21. Mean linear shear-thinning determination of fluid behavior for 0.500%XG with 3.000% salt at 25 ^{o}C.



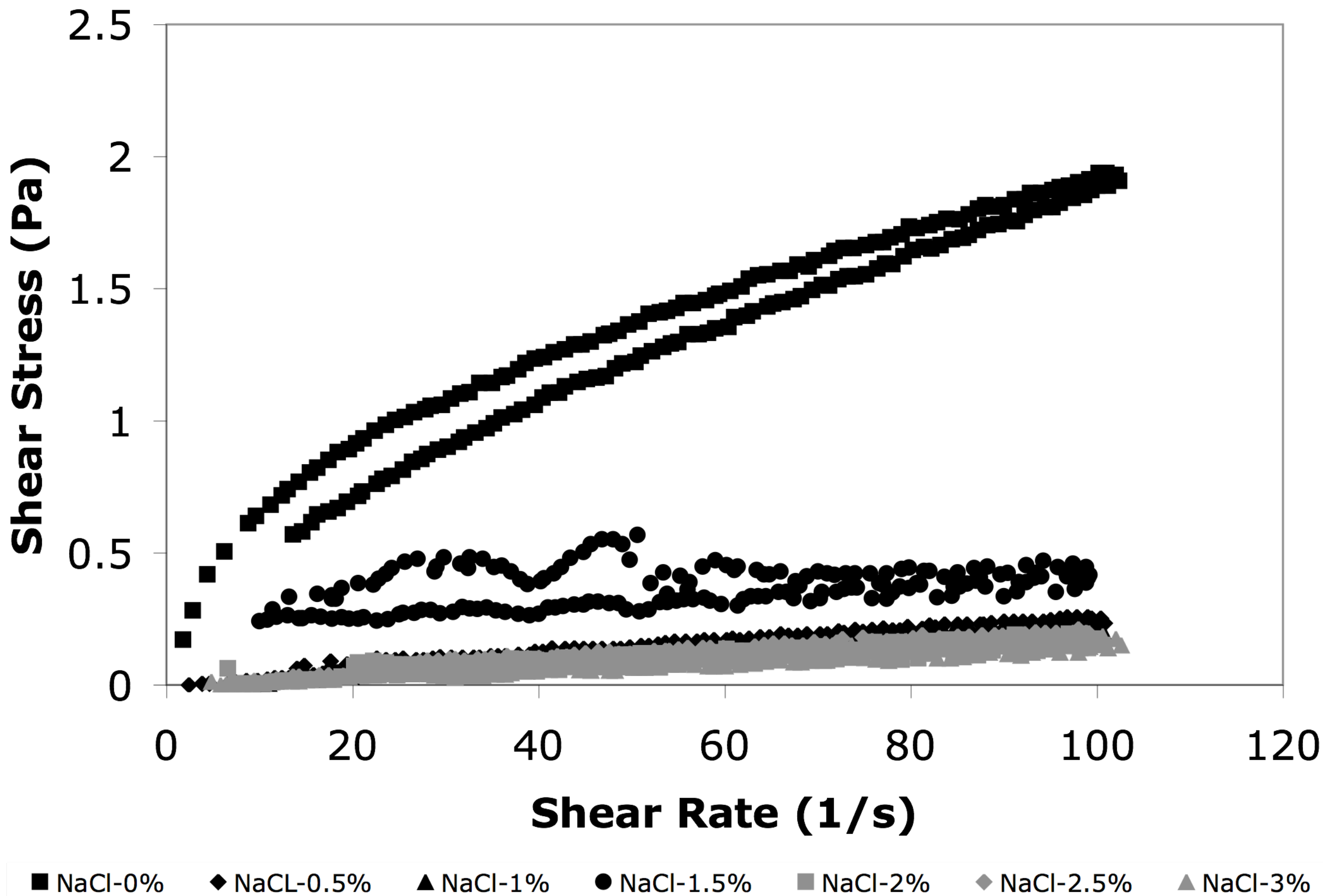
C-22. Fluid behavior for 0.125% KF with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 °C.



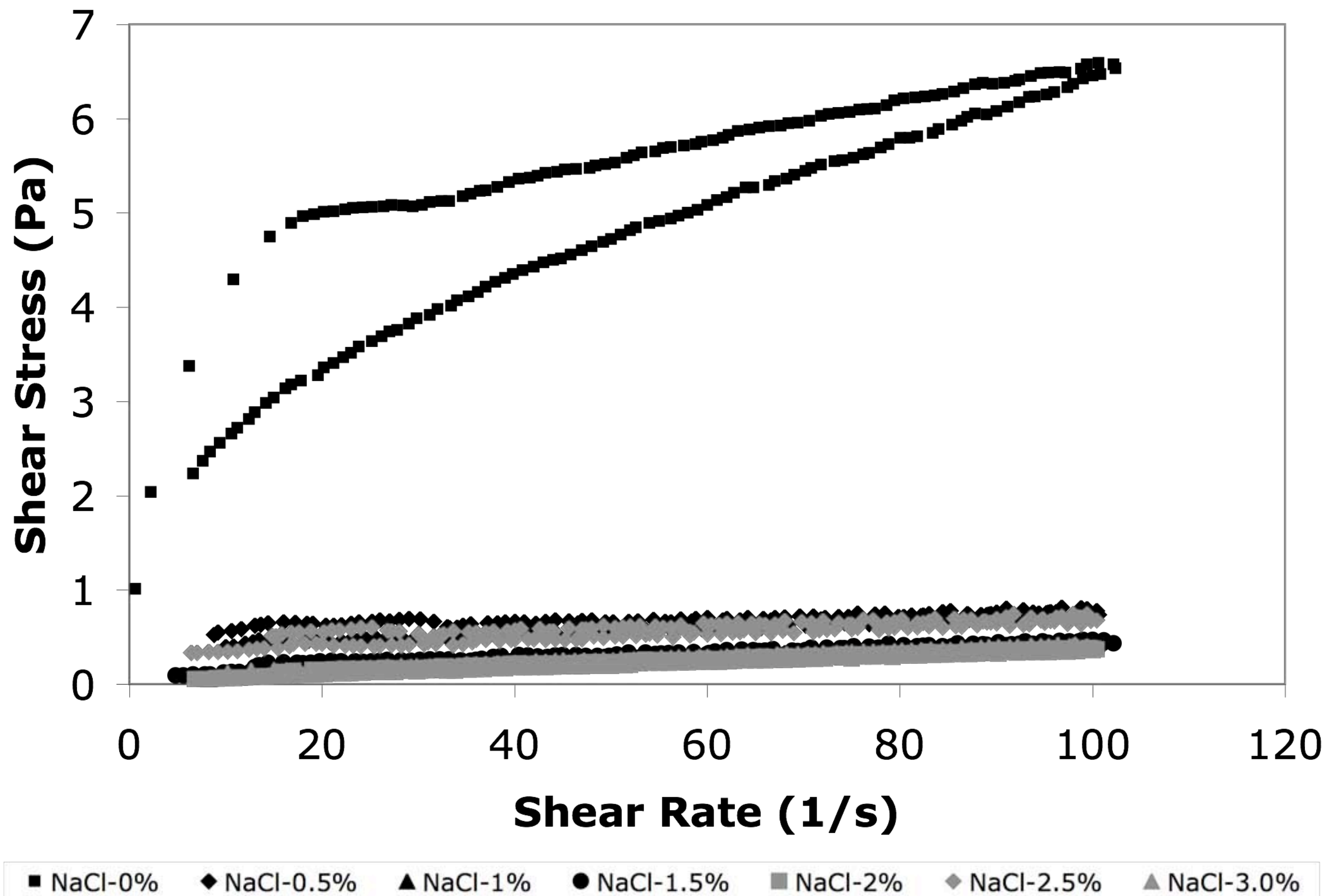
C-23. Fluid behavior for 0.250% KF with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 °C.



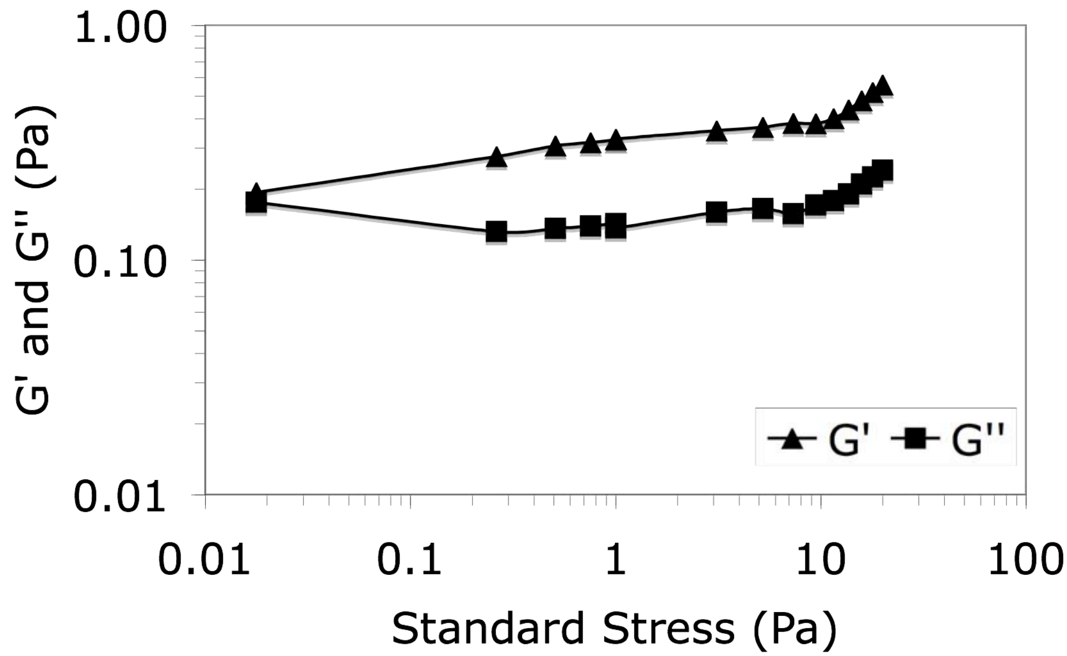
C-24. Fluid behavior for 0.250% GG with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 ^{o}C.



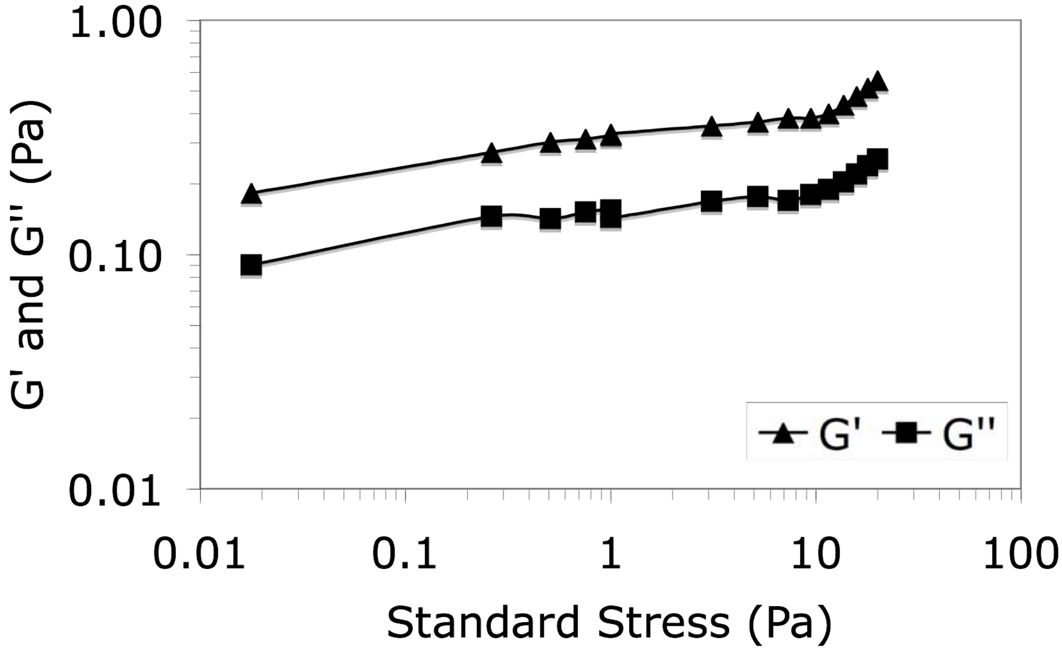
C-25. Fluid behavior for 0.0625% GGLT with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 °C.



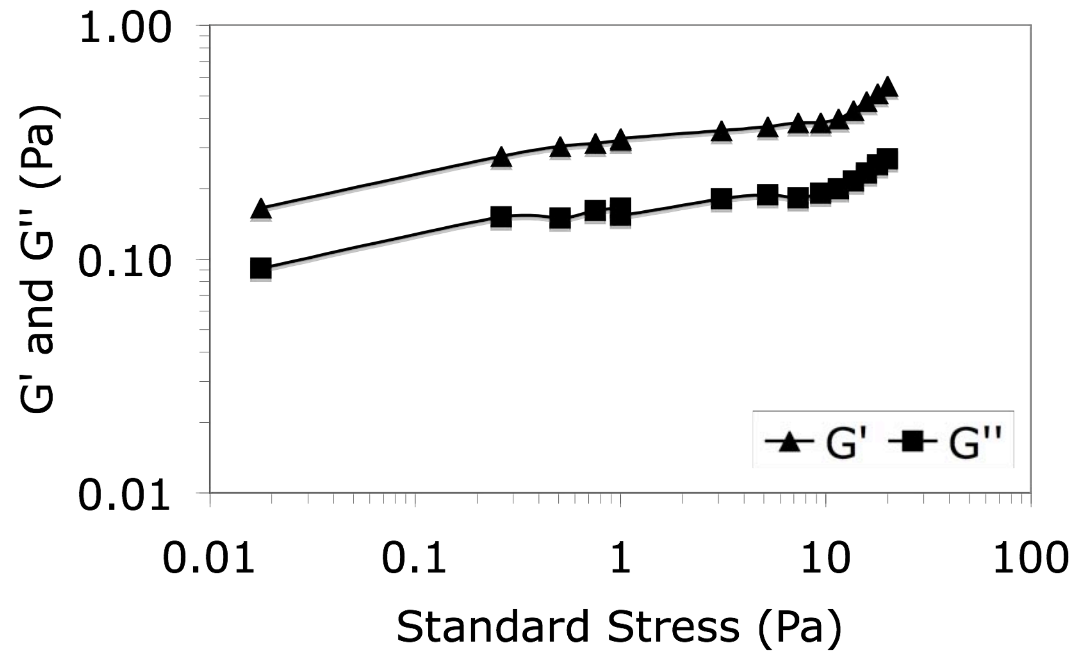
C-26. Fluid behavior for 0.125% GGLT with 0.000%, 0.500%, 1.000%, 1.500%, 2.000%, 2.500%, and 3.000% salt at 25 ^{o}C.



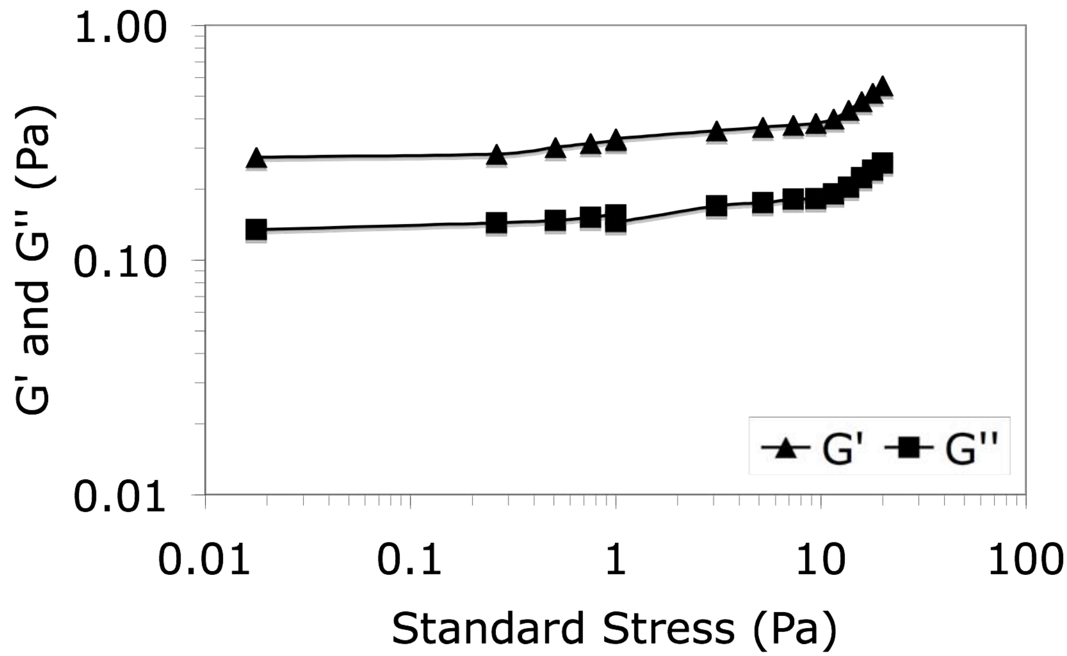
C-1. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 0.5% NaCl at 1 Hz and 25 ^{o}C.



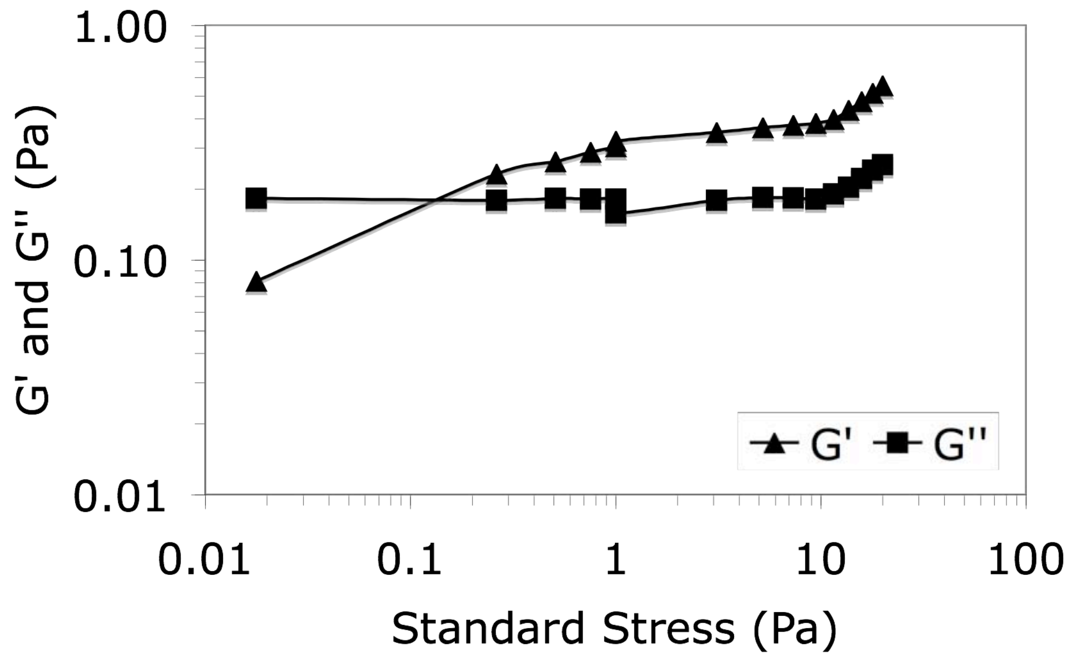
C-2. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 1.0% NaCl at 1 Hz and 25 ^{o}C.



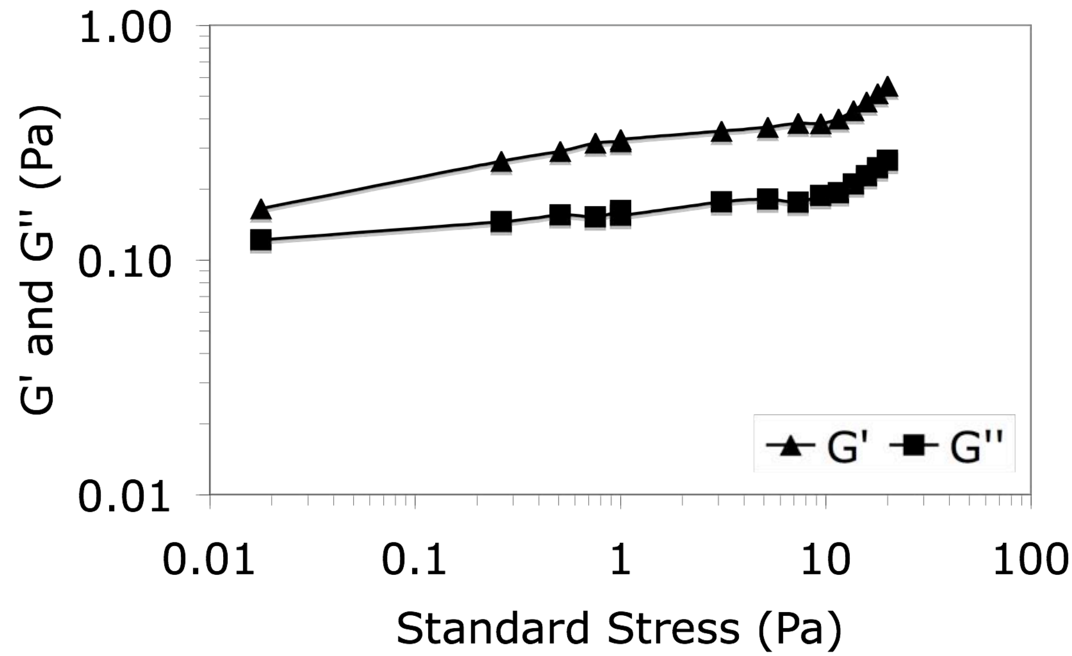
C-3. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 1.5% NaCl at 1 Hz and 25 ^{o}C.



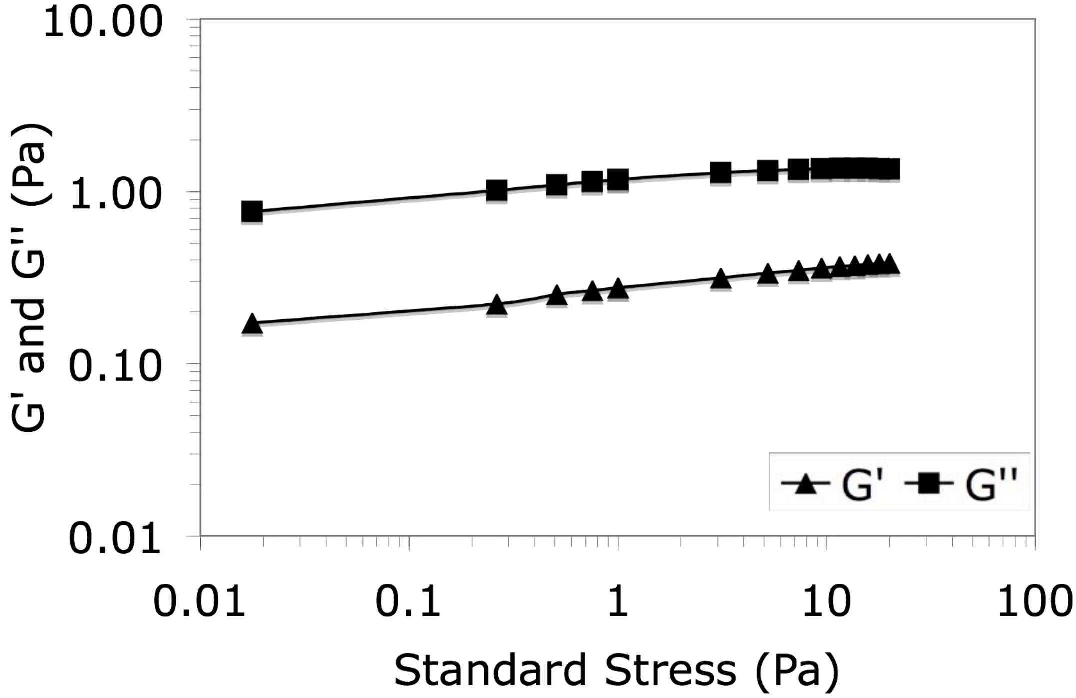
C-4. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 2.0% NaCl at 1 Hz and 25 ^{o}C.



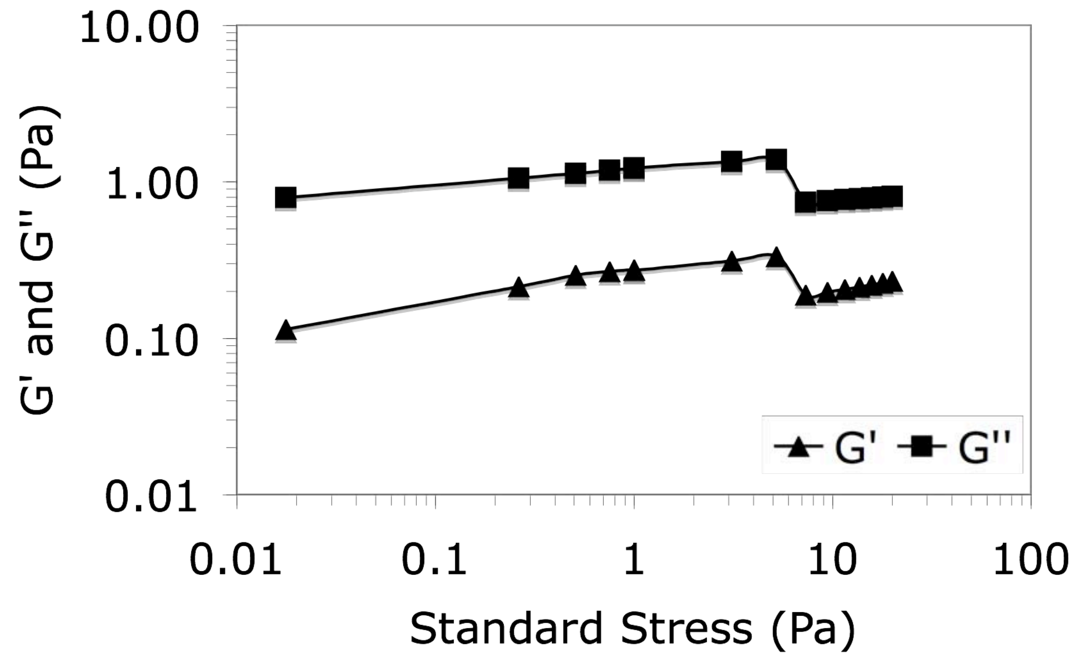
C-5. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 2.5% NaCl at 1 Hz and 25 °C.



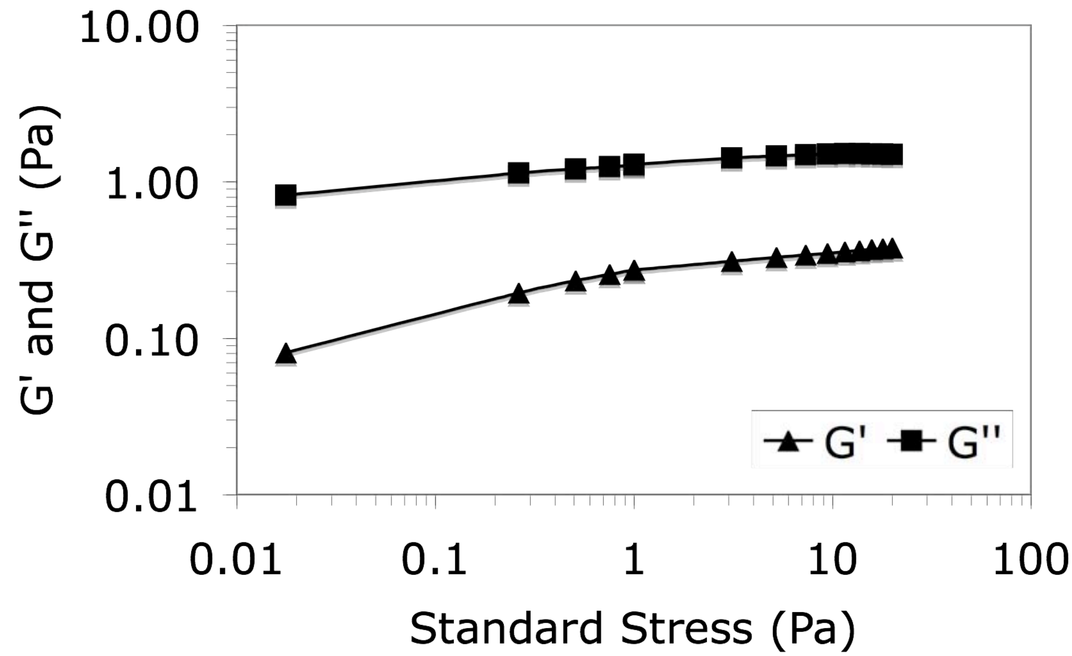
C-6. Stress sweep for determination of linear viscoelastic region of 1.000% MC with 3.0% NaCl at 1 Hz and 25 ^{o}C.



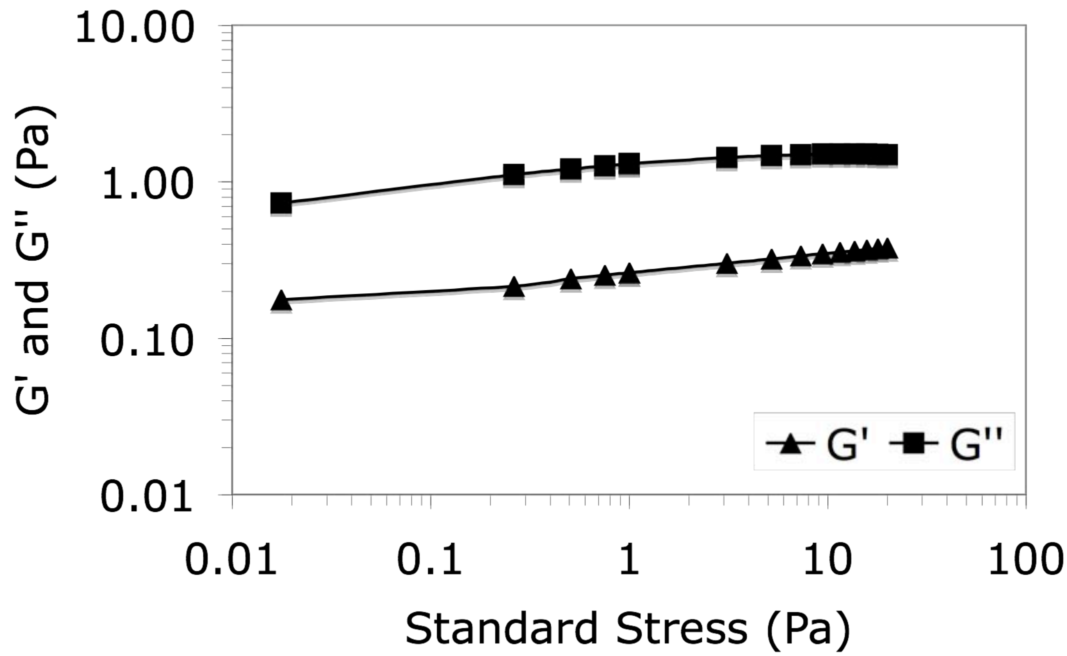
C-7. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 0.5% NaCl at 1 Hz and 25 ^{o}C.



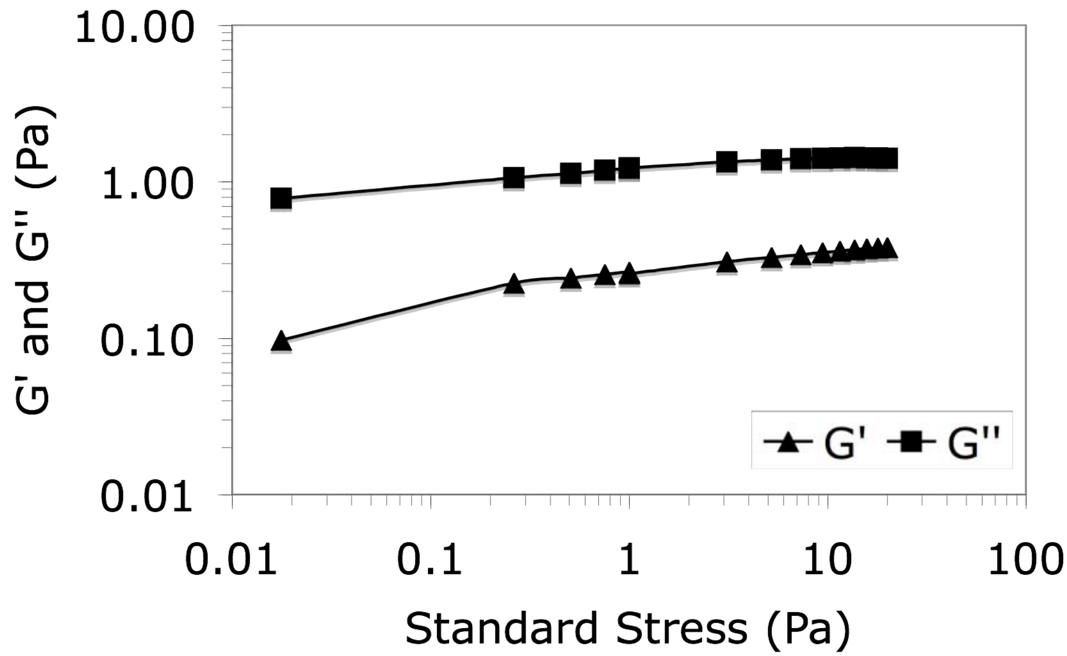
C-8. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 1.0% NaCl at 1 Hz and 25 ^{o}C.



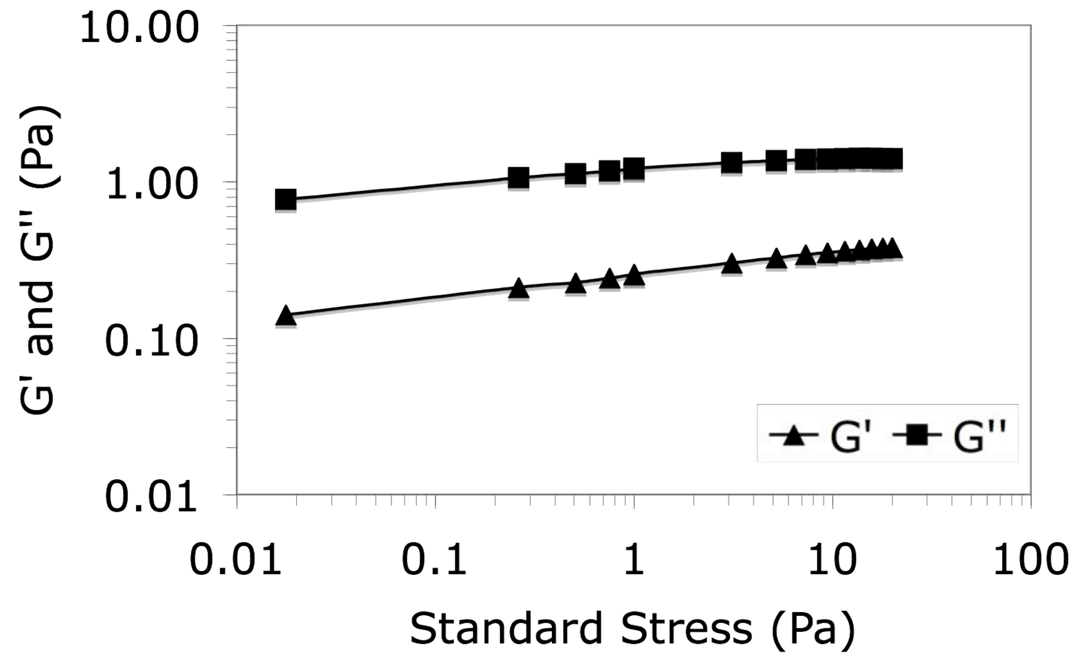
C-9. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 1.5% NaCl at 1 Hz and 25 ^{o}C.



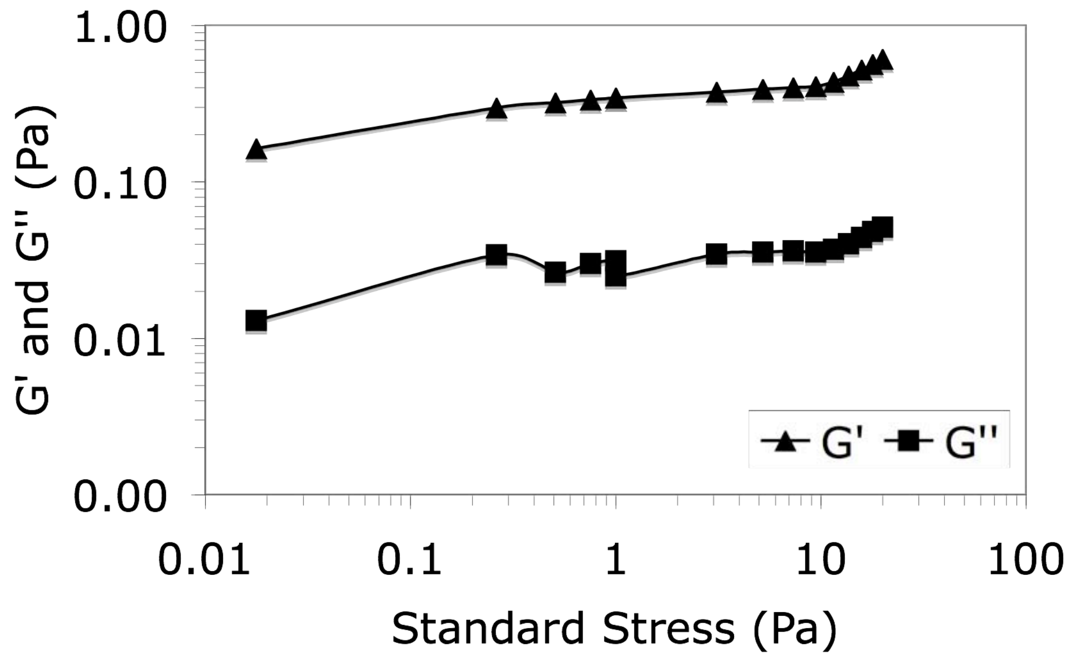
C-10. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 2.0% NaCl at 1 Hz and 25 ^{o}C.



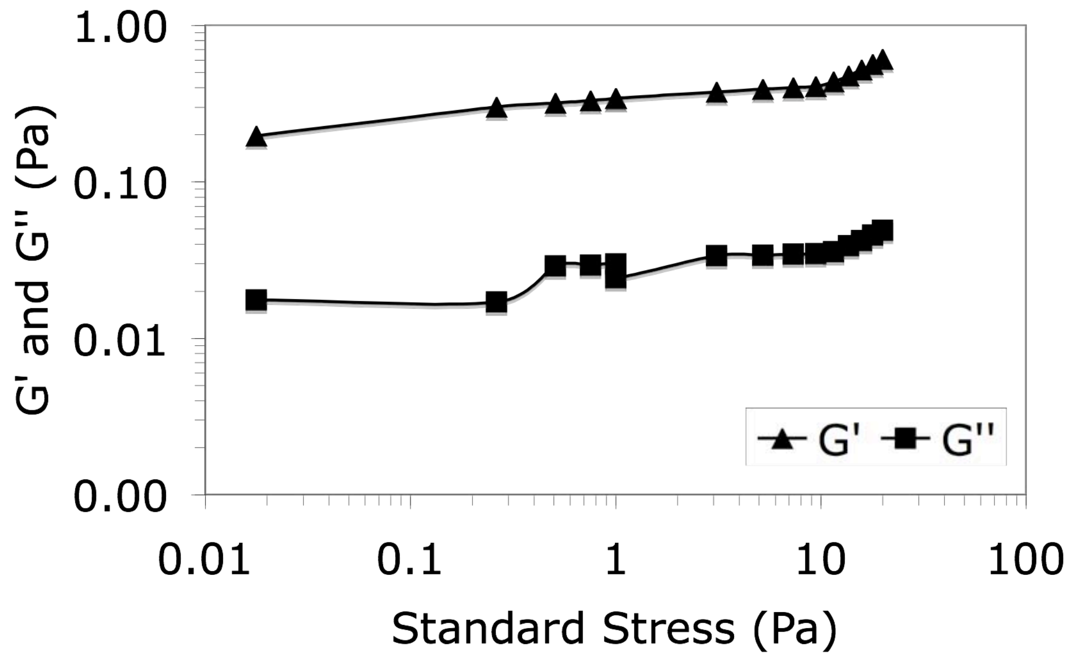
C-11. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 2.5% NaCl at 1 Hz and 25 ^{o}C.



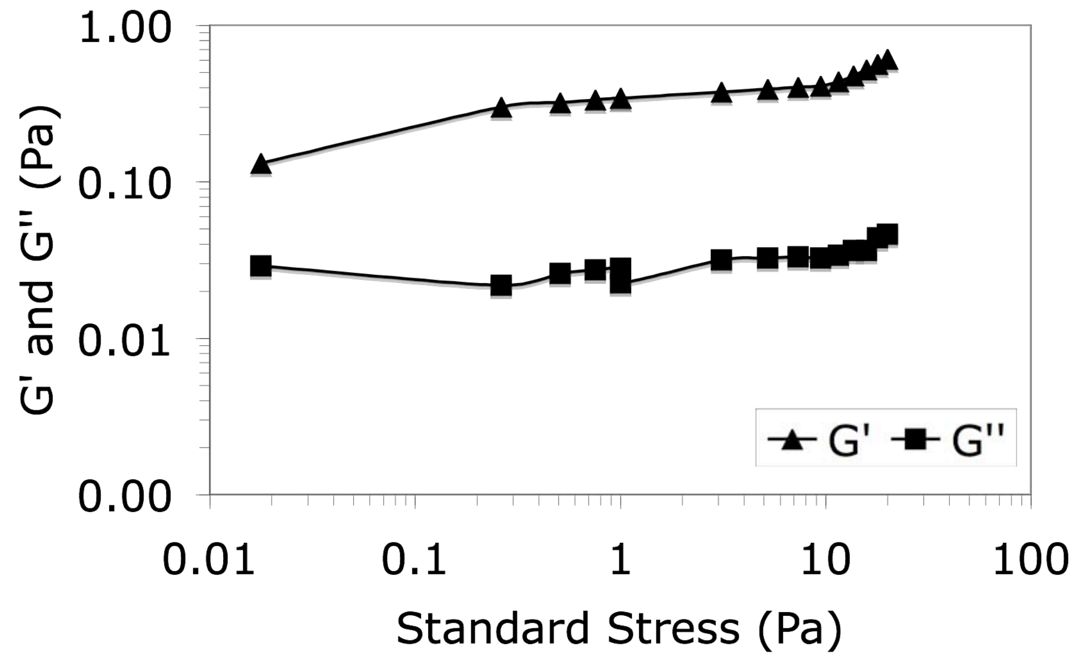
C-12. Stress sweep for determination of linear viscoelastic region of 2.000% MC with 3.0% NaCl at 1 Hz and 25 ^{o}C.



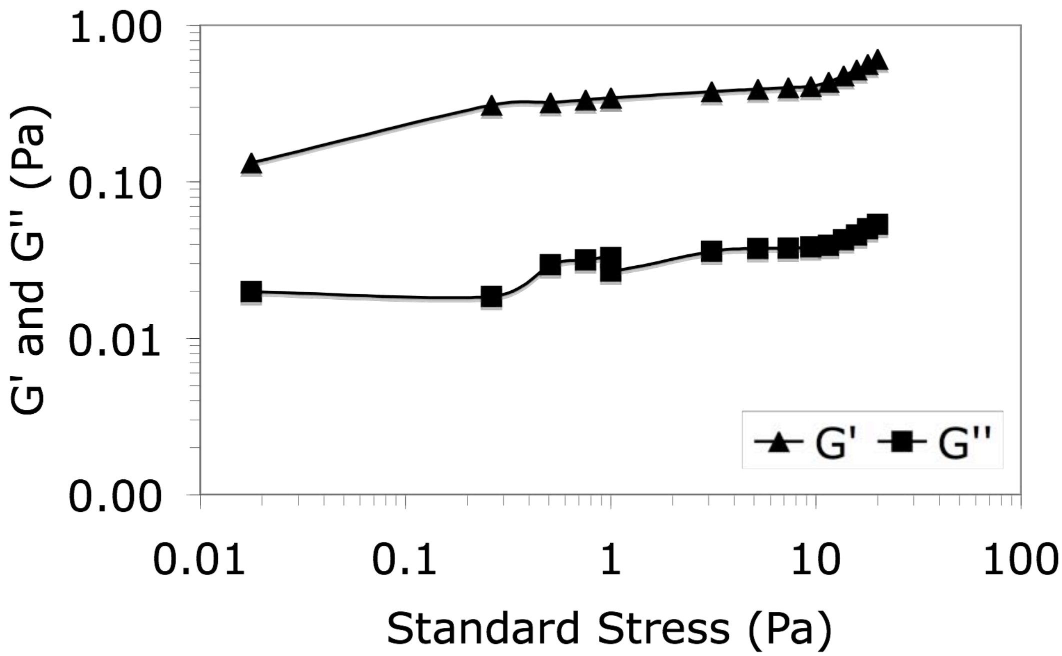
C-13. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 0.5% NaCl at 1 Hz and 25 ^{o}C.



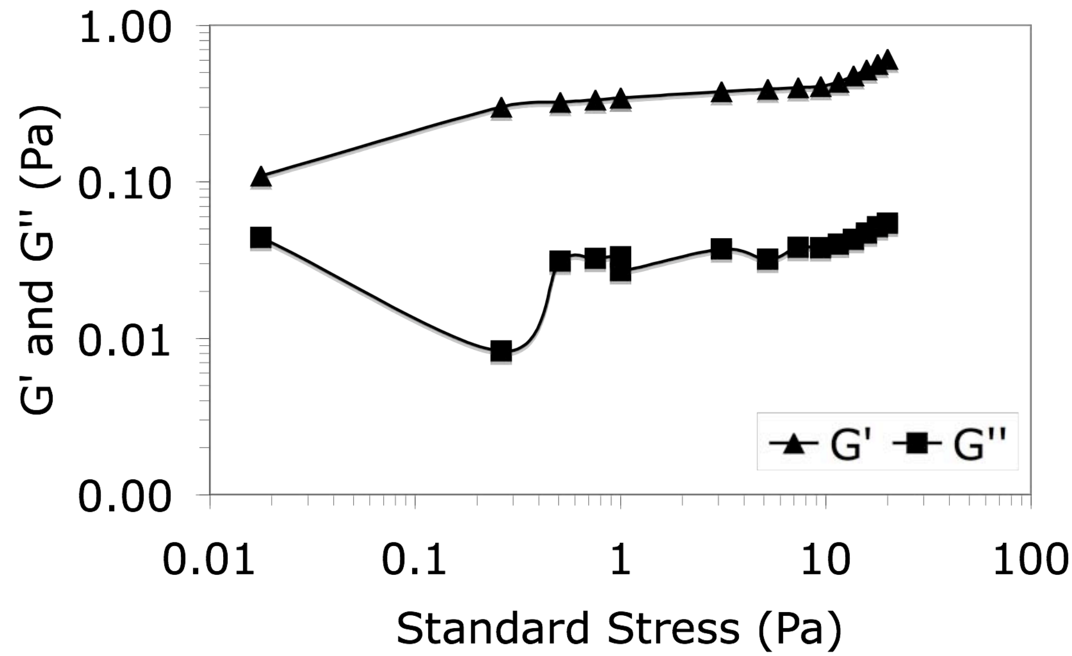
C-14. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 1.0% NaCl L at 1 Hz and 25 ^{o}C.



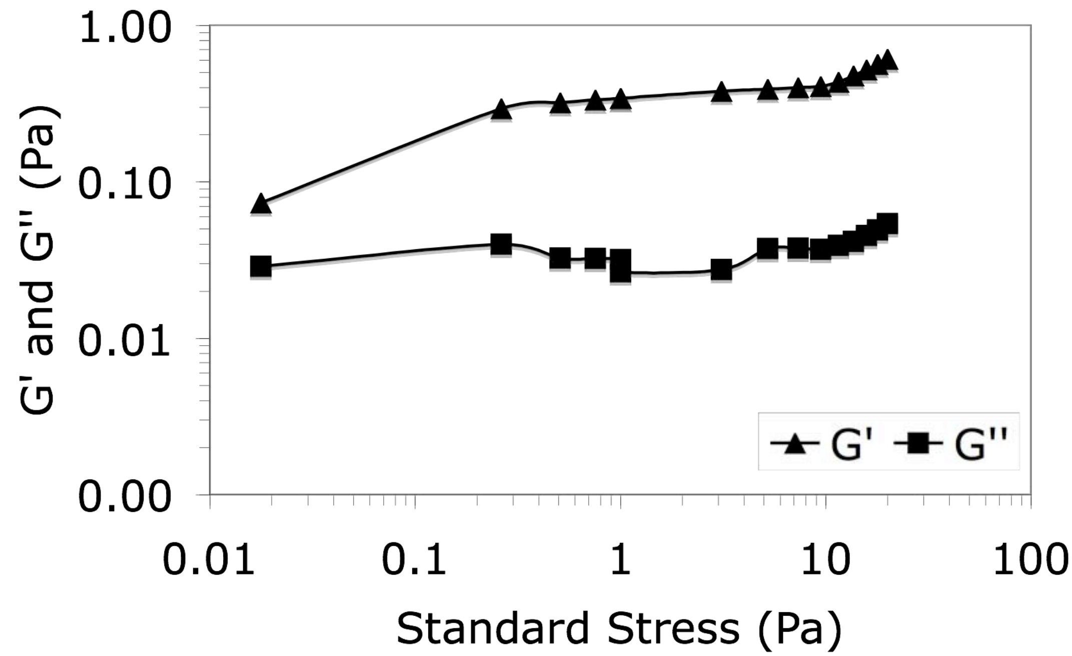
C-15. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 1.5% NaCl at 1 Hz and 25 ^{o}C.



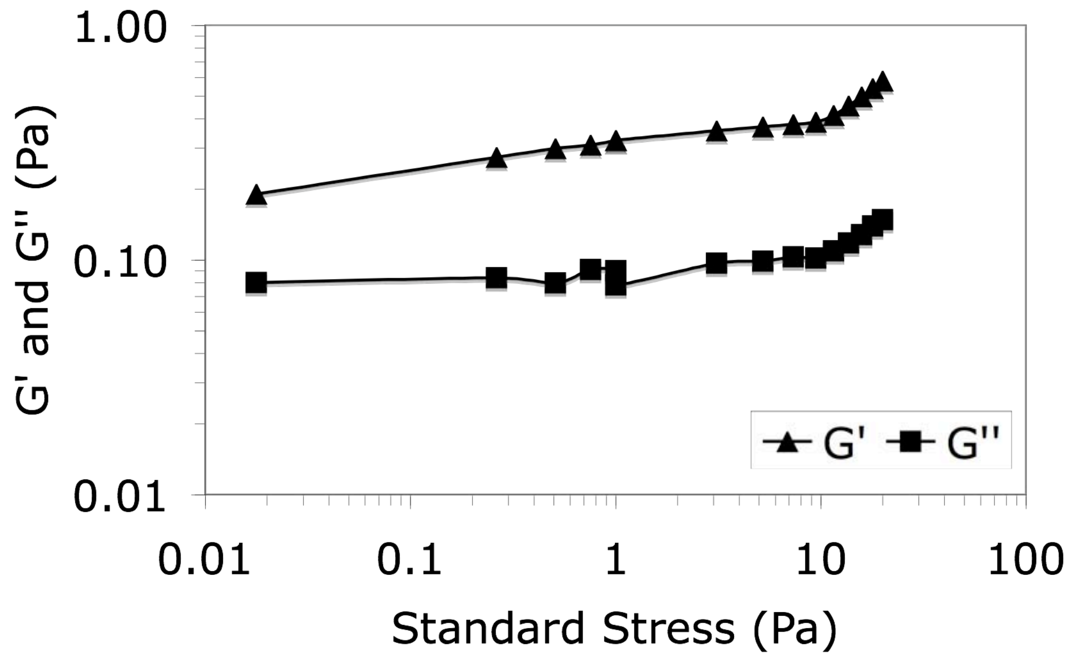
C-16. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 2.0% NaCl at 1 Hz and 25 ^{o}C.



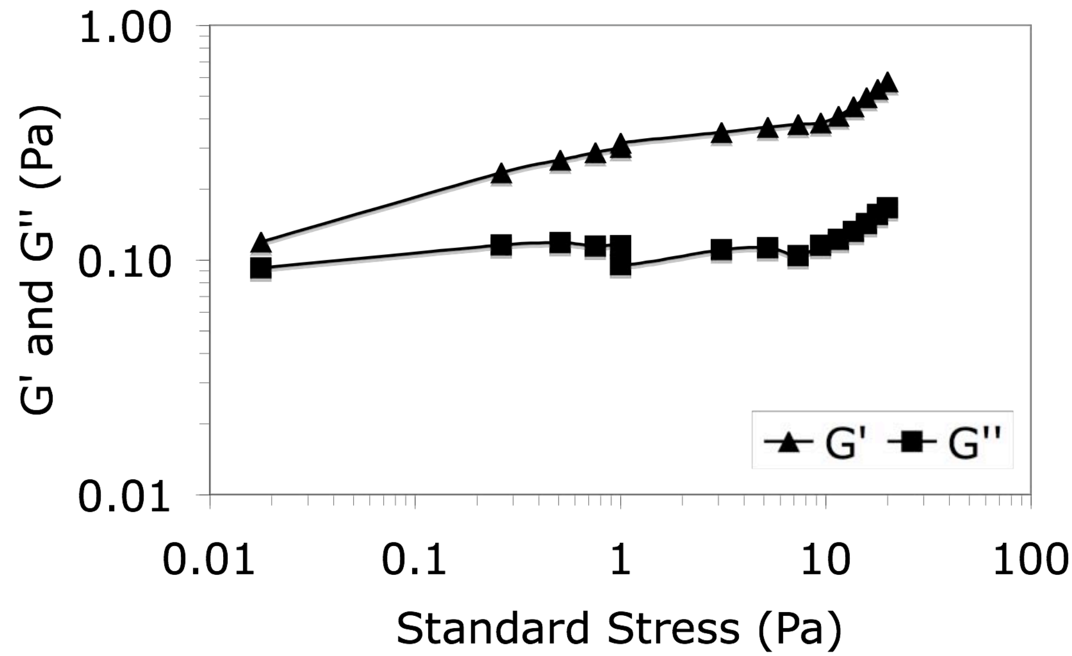
C-17. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 2.5% NaCl at 1 Hz and 25 °C.



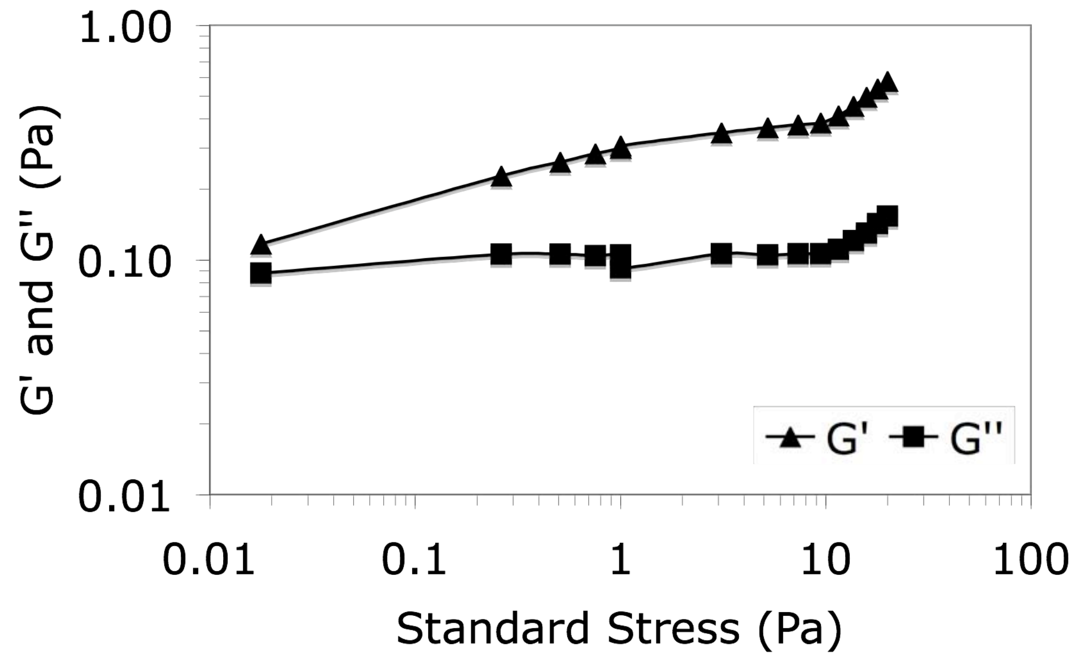
C-18. Stress sweep for determination of linear viscoelastic region of 1.000% HPMC with 3.0% NaCl at 1 Hz and 25 ^{o}C.



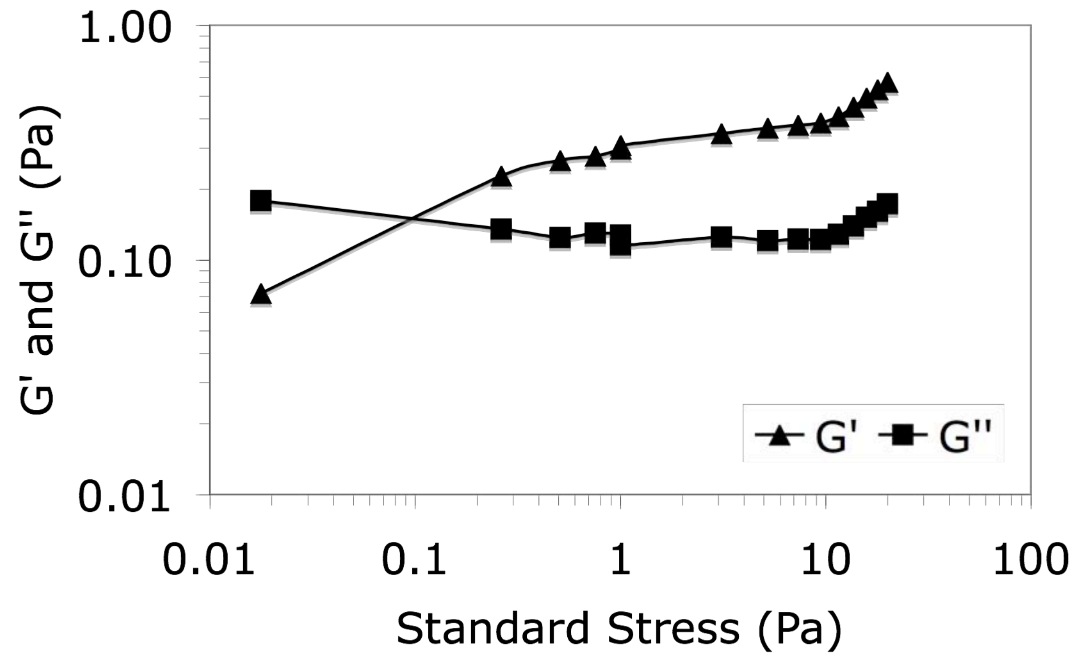
C-19. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 0.5% NaCl at 1 Hz and 25 ^{o}C.



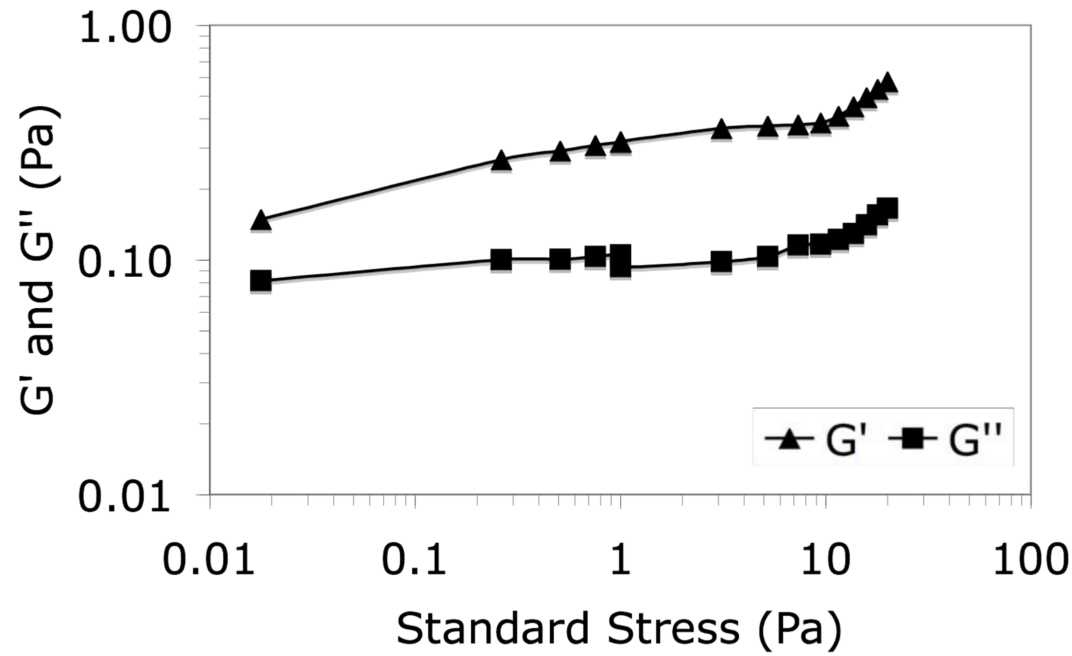
C-20. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 1.0% NaCl at 1 Hz and 25 ^{o}C.



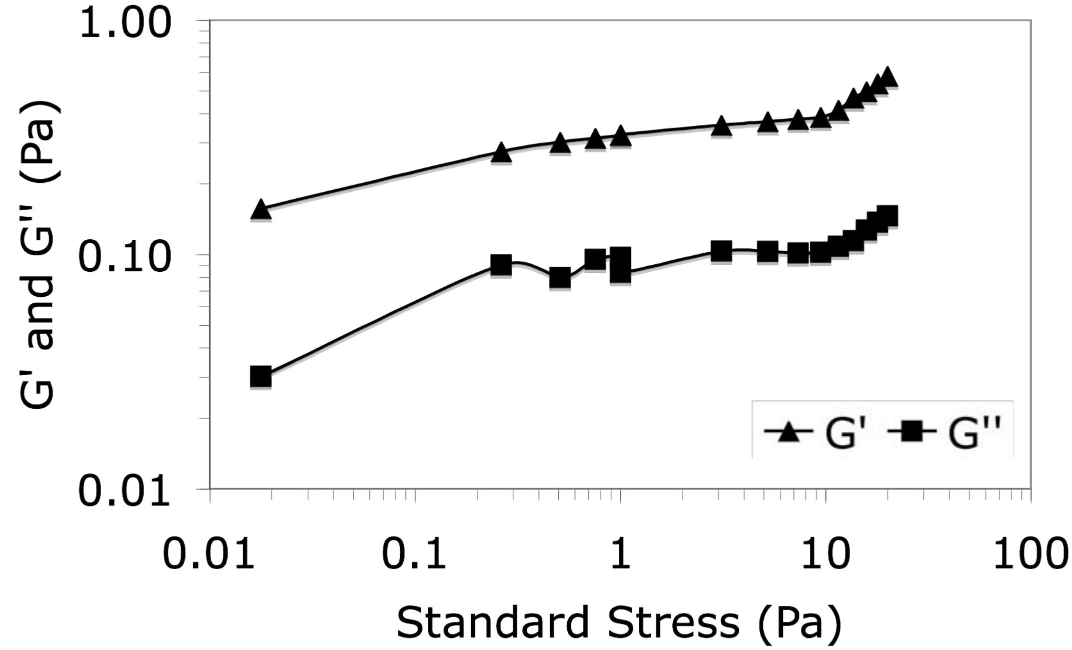
C-21. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 1.5% NaCl at 1 Hz and 25 ^{o}C.



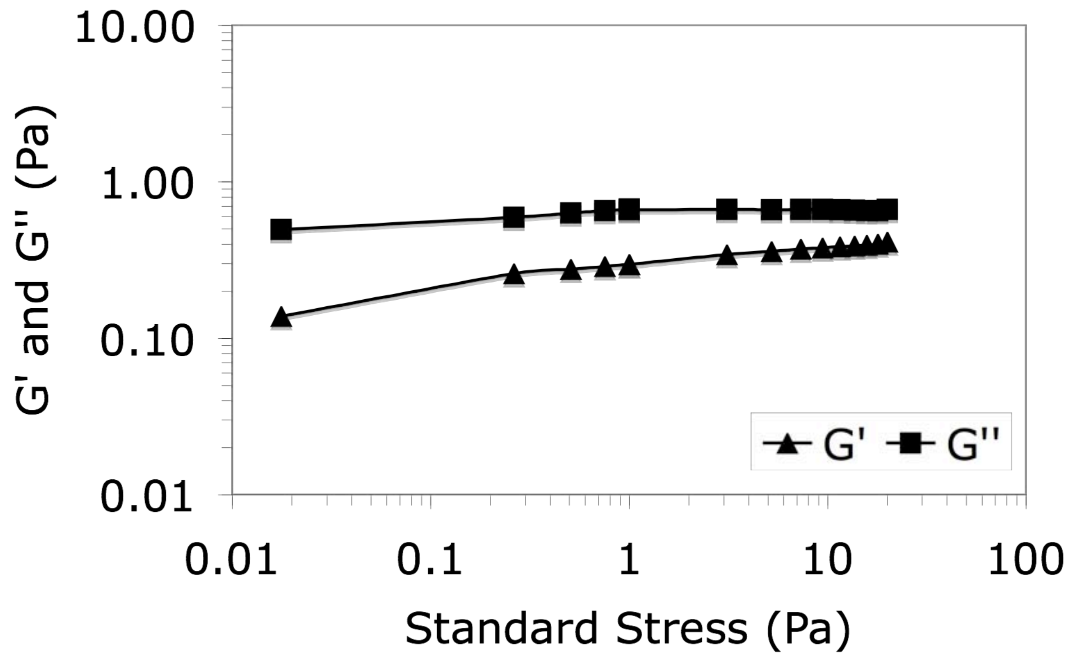
C-22. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 2.0% NaCl at 1 Hz and 25 ^{o}C.



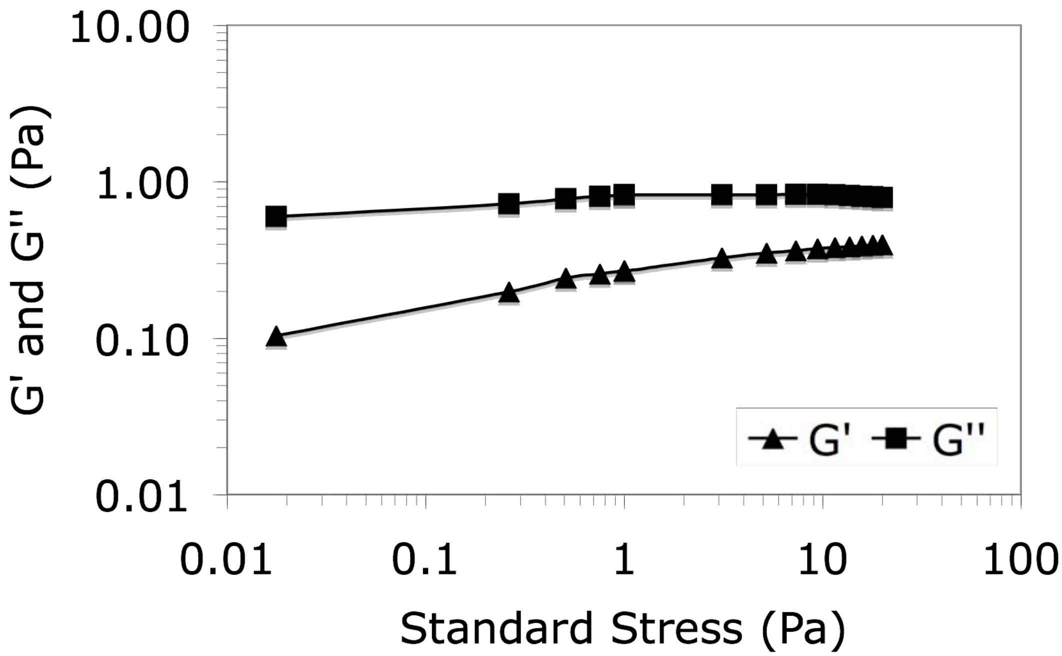
C-23. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 2.5% NaCl at 1 Hz and 25 °C.



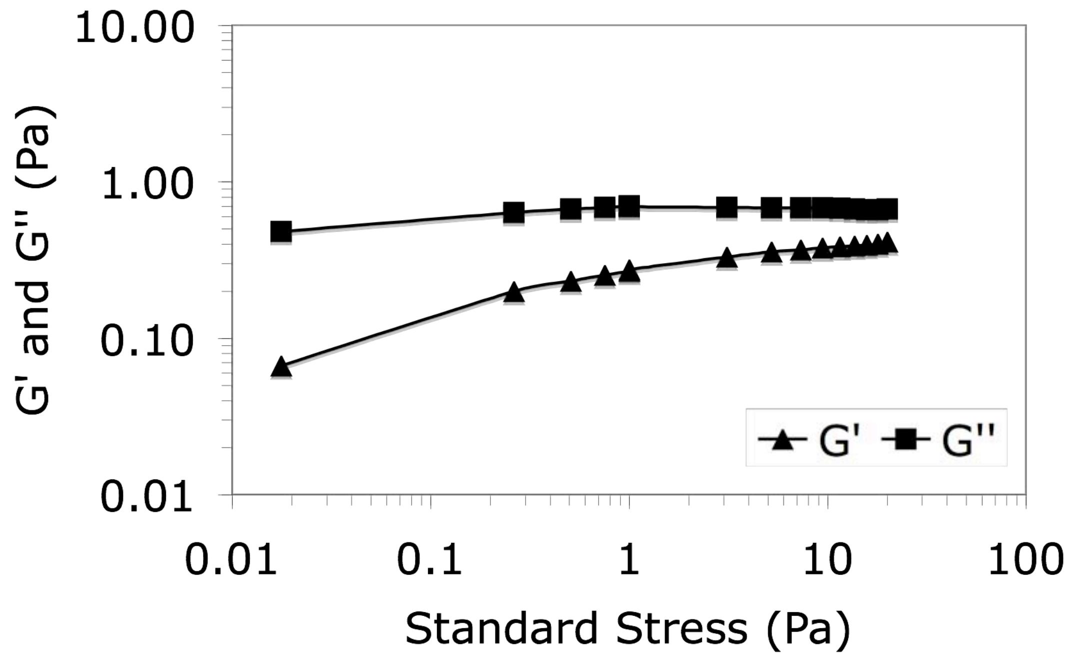
C-24. Stress sweep for determination of linear viscoelastic region of 1.000% SGMC with 3.0% NaCl at 1 Hz and 25 ^{o}C.



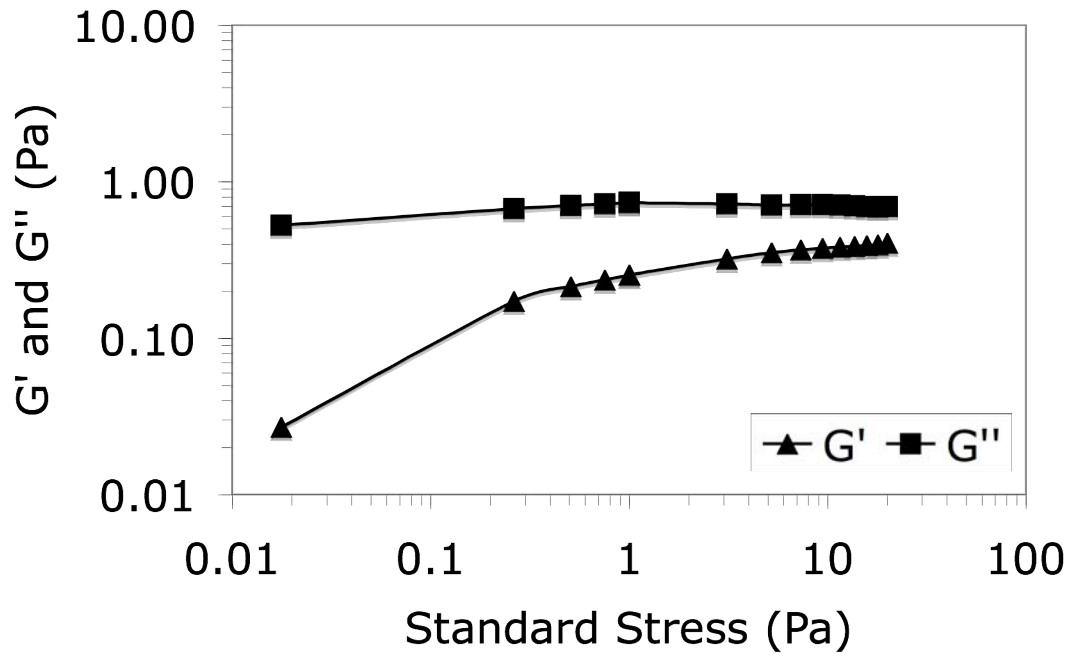
C-25. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 0.5% NaCl at 1 Hz and 25 ^{o}C.



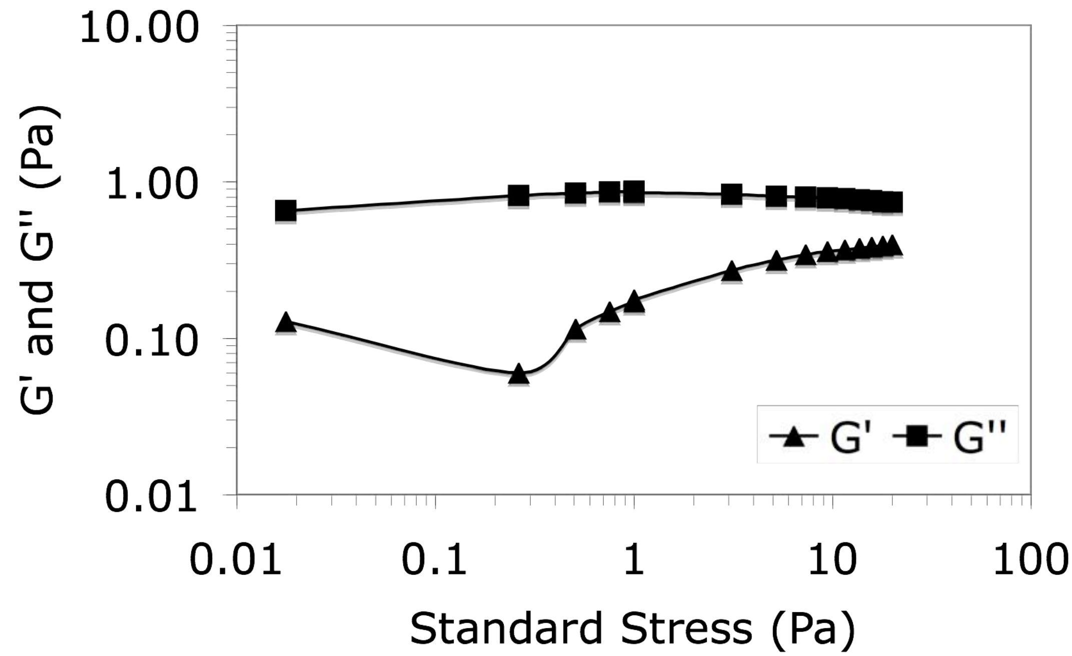
C-26. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 1.0% NaCl at 1 Hz and 25 ^{o}C.



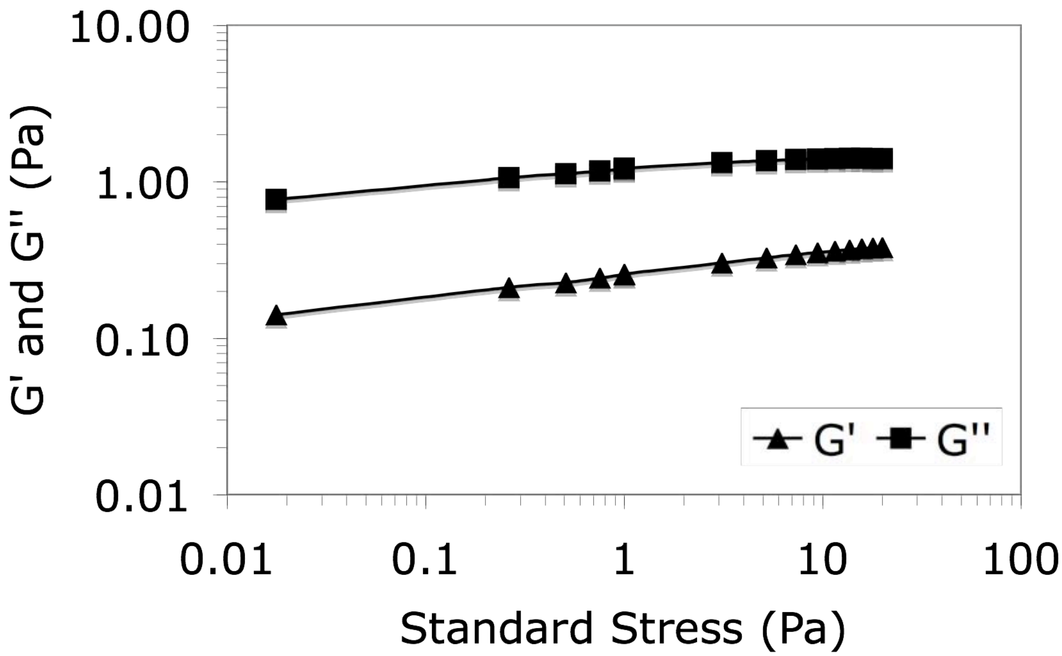
C-27. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 1.5% NaCl at 1 Hz and 25 ^{o}C.



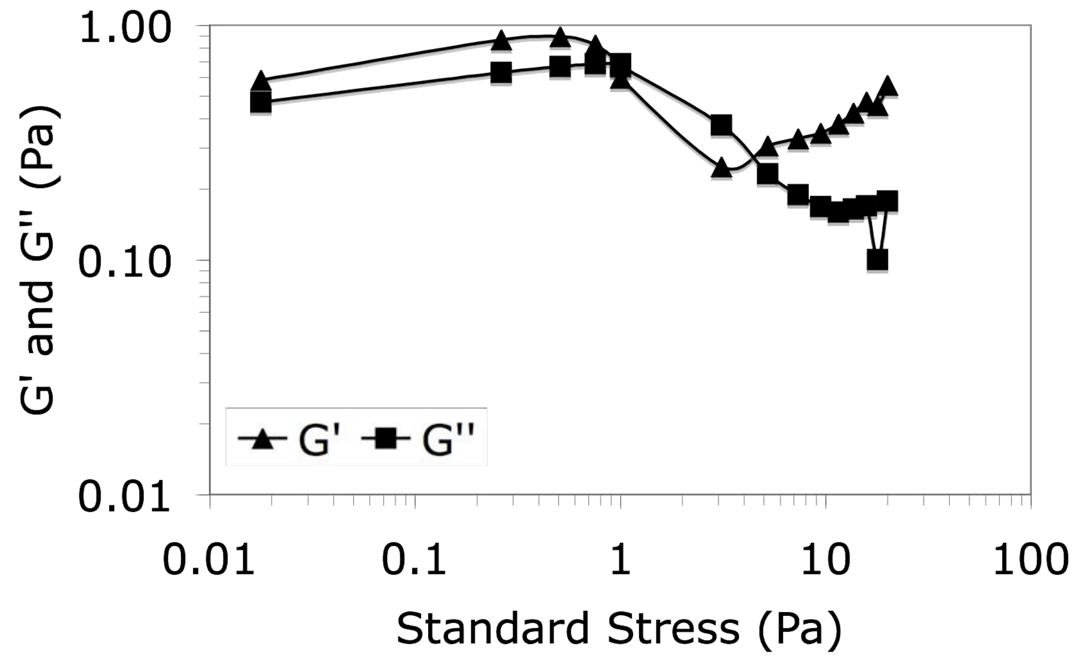
C-28. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 2.0% NaCl at 1 Hz and 25 ^{o}C.



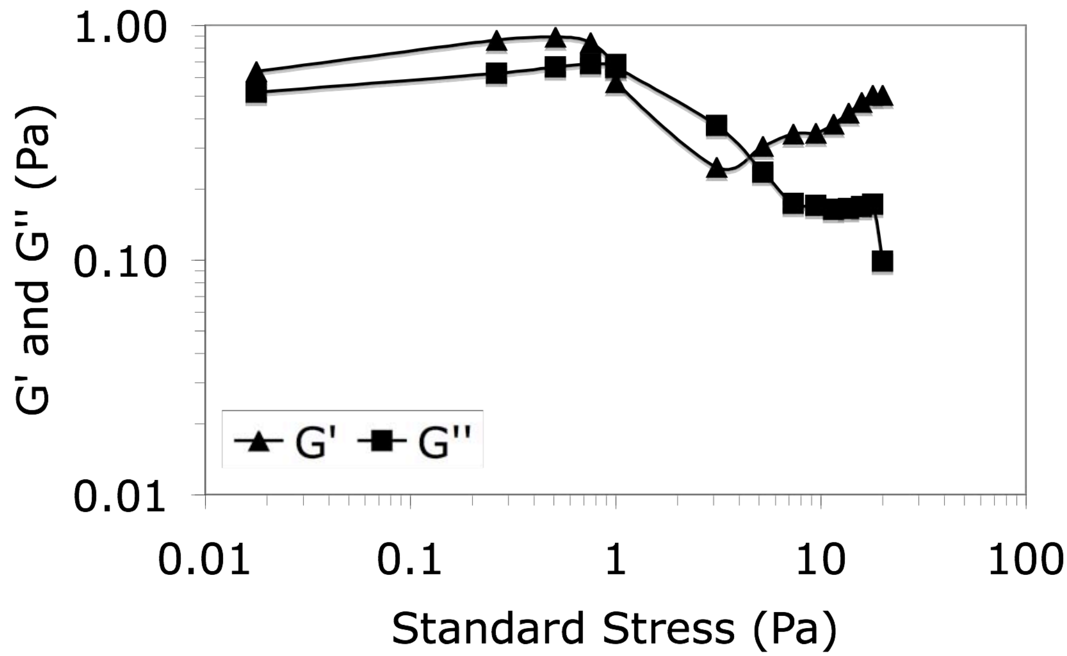
C-29. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 2.5% NaCl at 1 Hz and 25 ^{o}C.



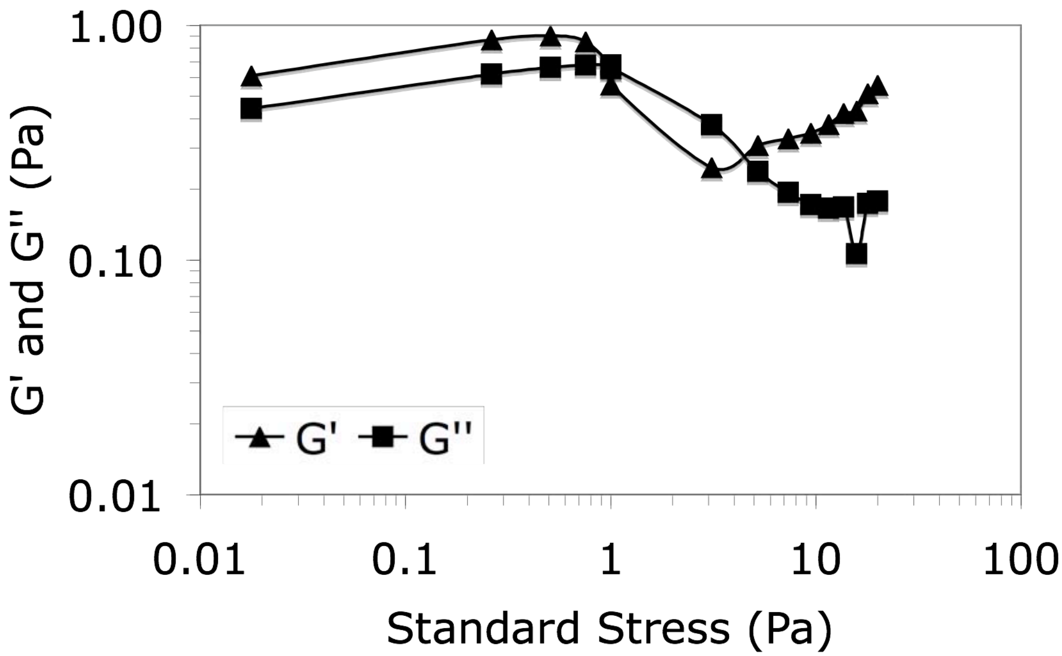
C-30. Stress sweep for determination of linear viscoelastic region of 2.000% SGMC with 3.0% NaCl at 1 Hz and 25 ^{o}C.



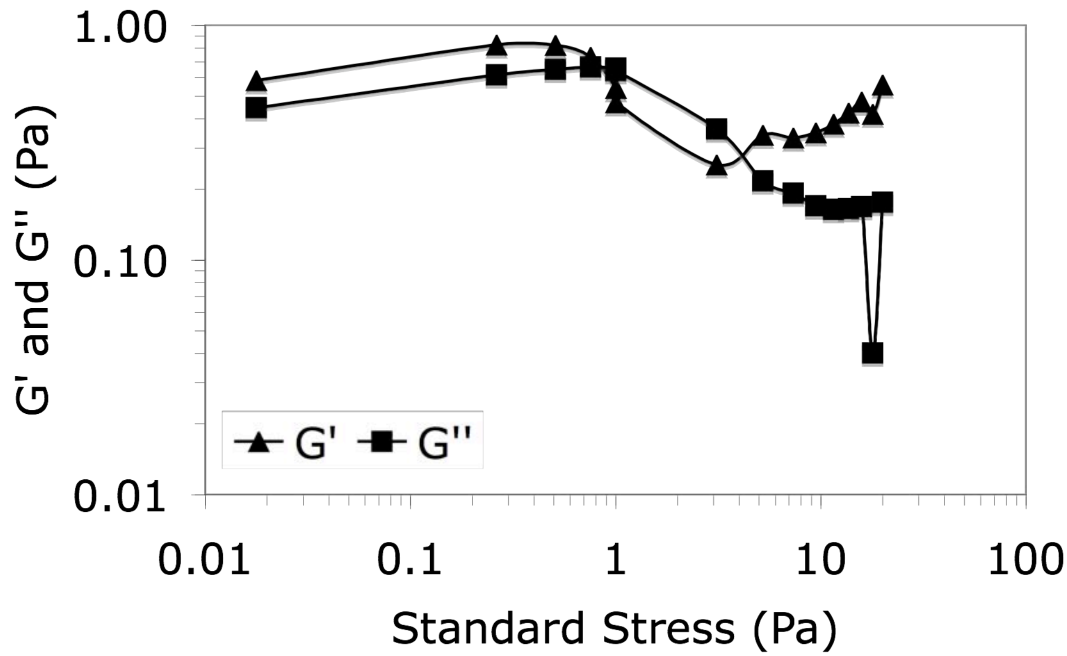
C-31. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 0.5% NaCl at 1 Hz and 25 ^{o}C.



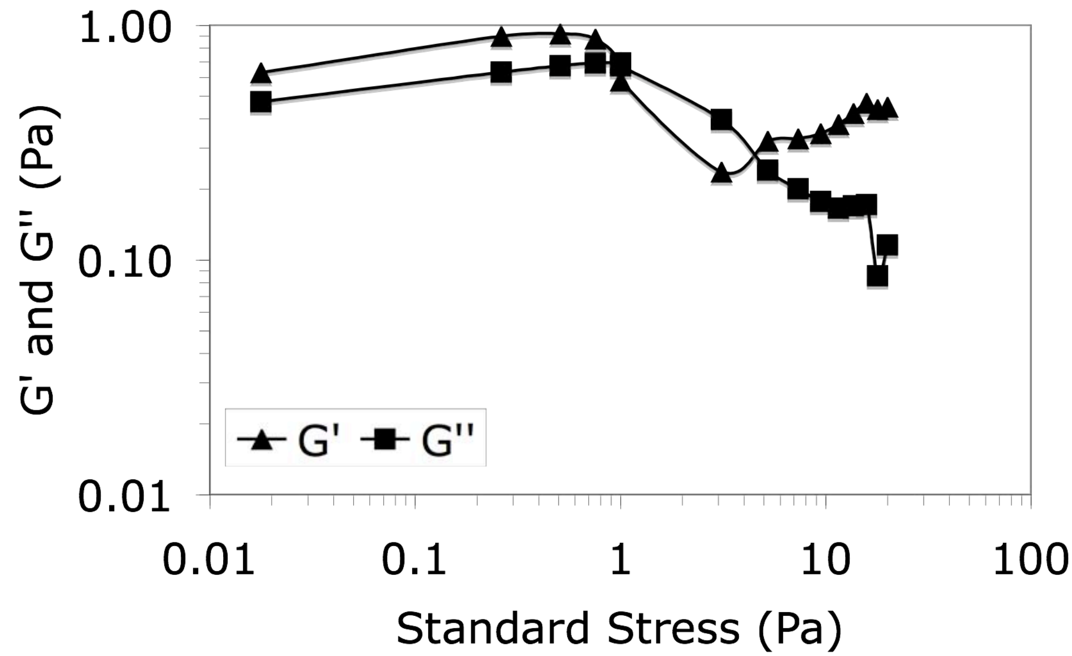
C-32. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 1.0% NaCl at 1 Hz and 25 ^{o}C.



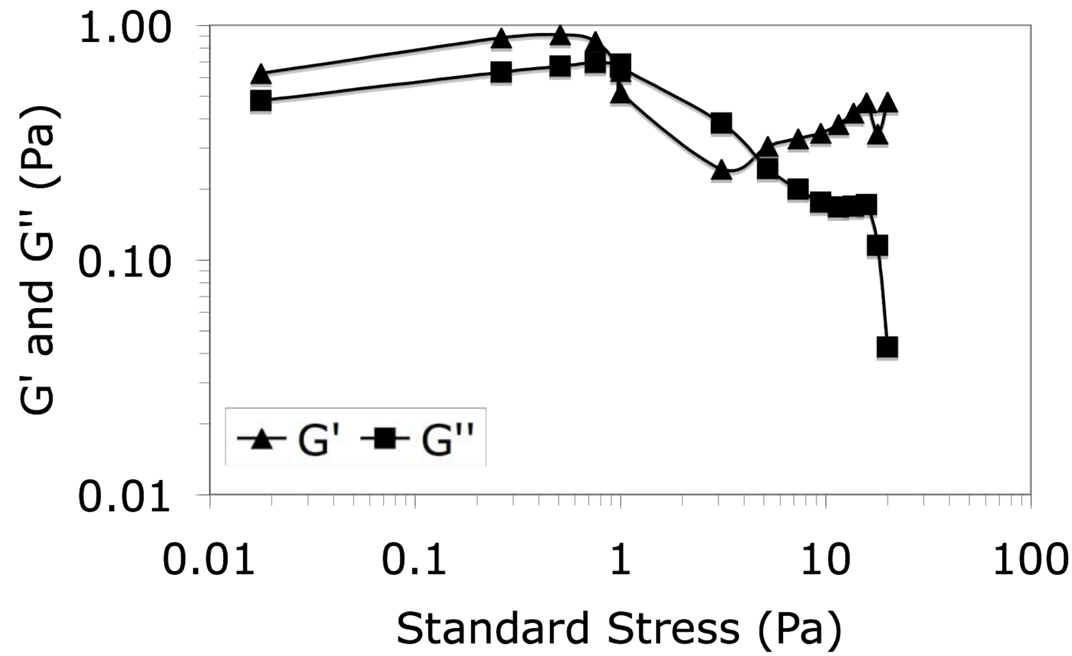
C-33. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 1.5% NaCl at 1 Hz and 25 ^oC.



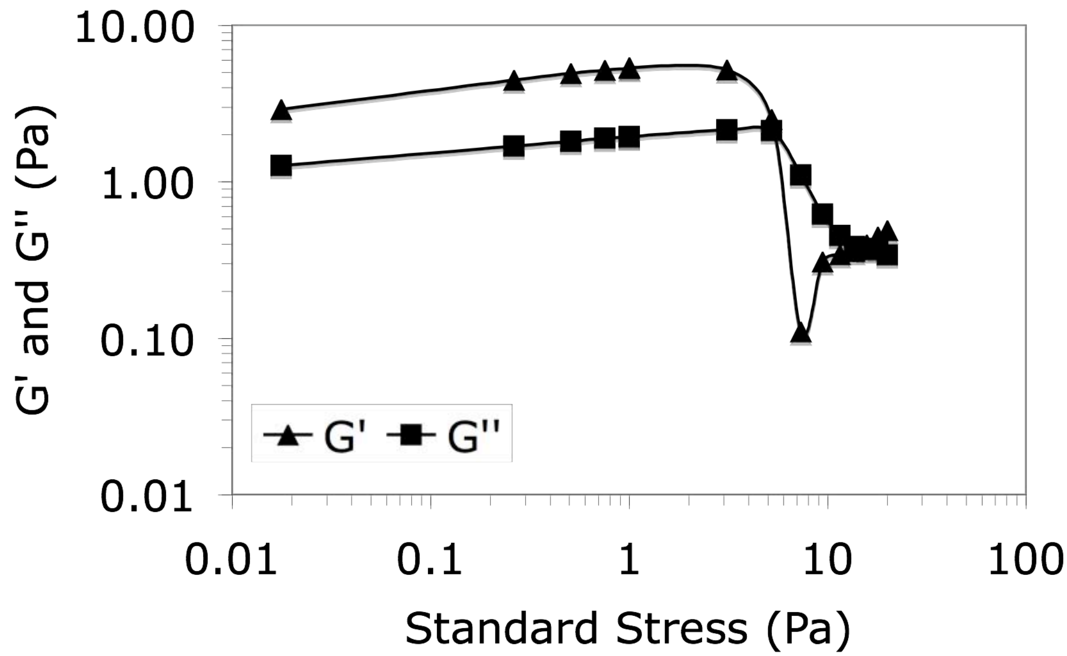
C-34. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 2.0% NaCl at 1 Hz and 25 ^{o}C.



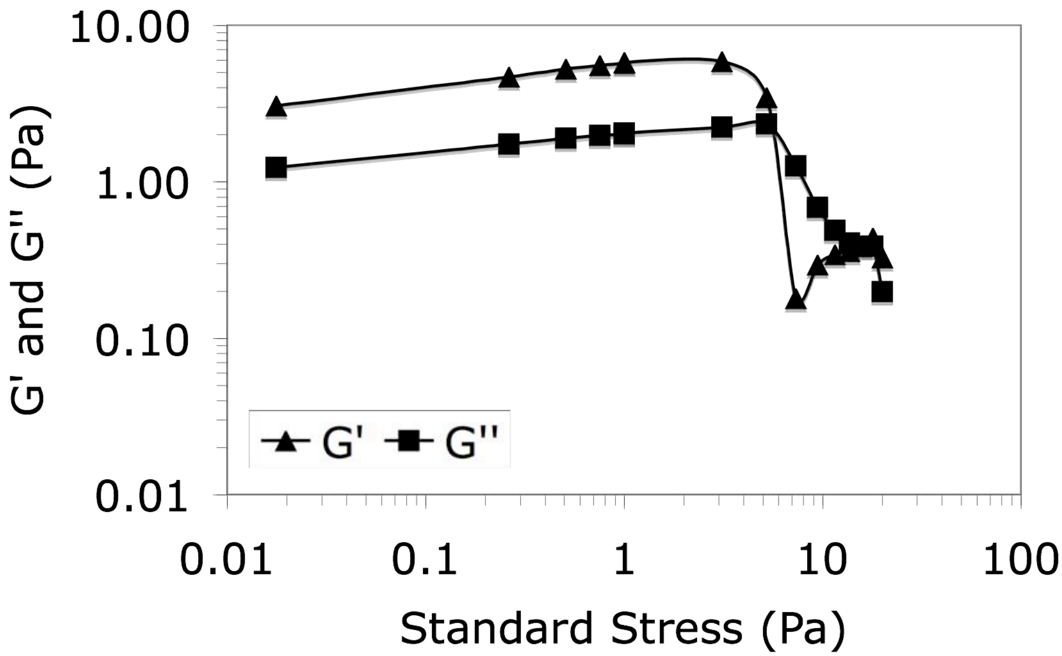
C-35. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 2.5% NaCl at 1 Hz and 25 ^{o}C.



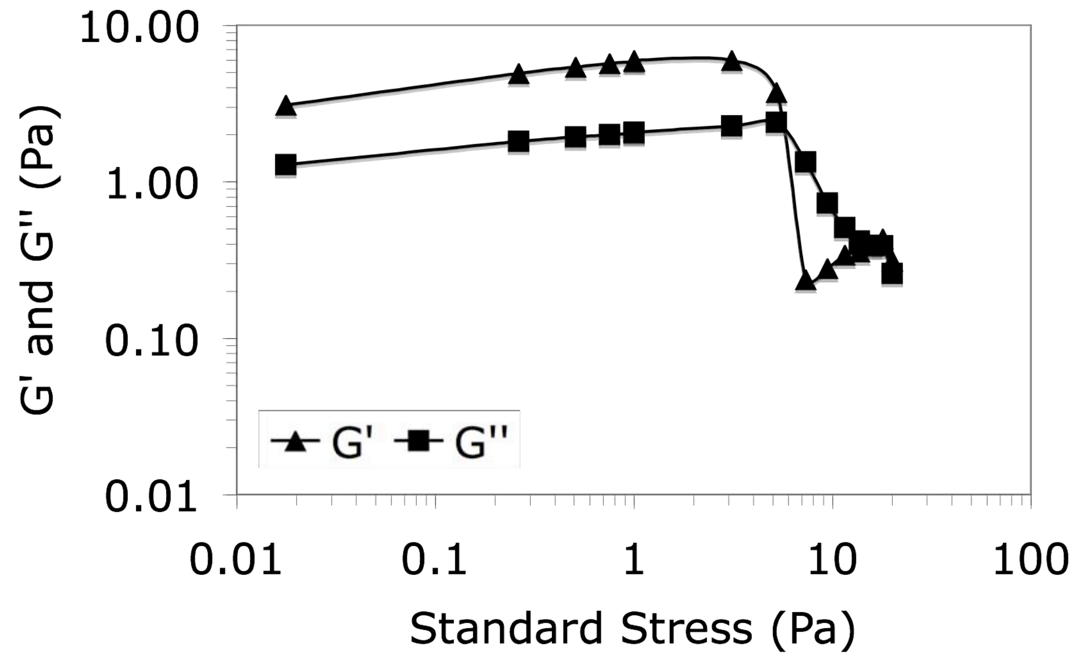
C-36. Stress sweep for determination of linear viscoelastic region of 0.250% XG with 3.0% NaCl at 1 Hz and 25 ^{o}C.



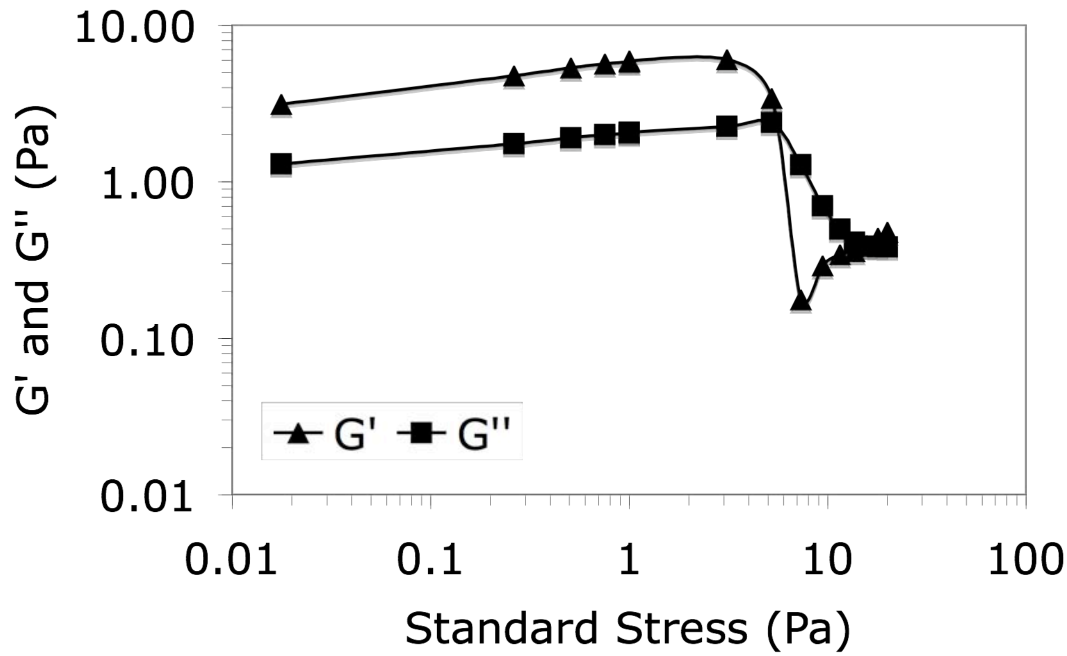
C-37. Stress sweep for determination of linear viscoelastic region of 0.500% XG with 0.5% NaCl at 1 Hz and 25 ^{o}C.



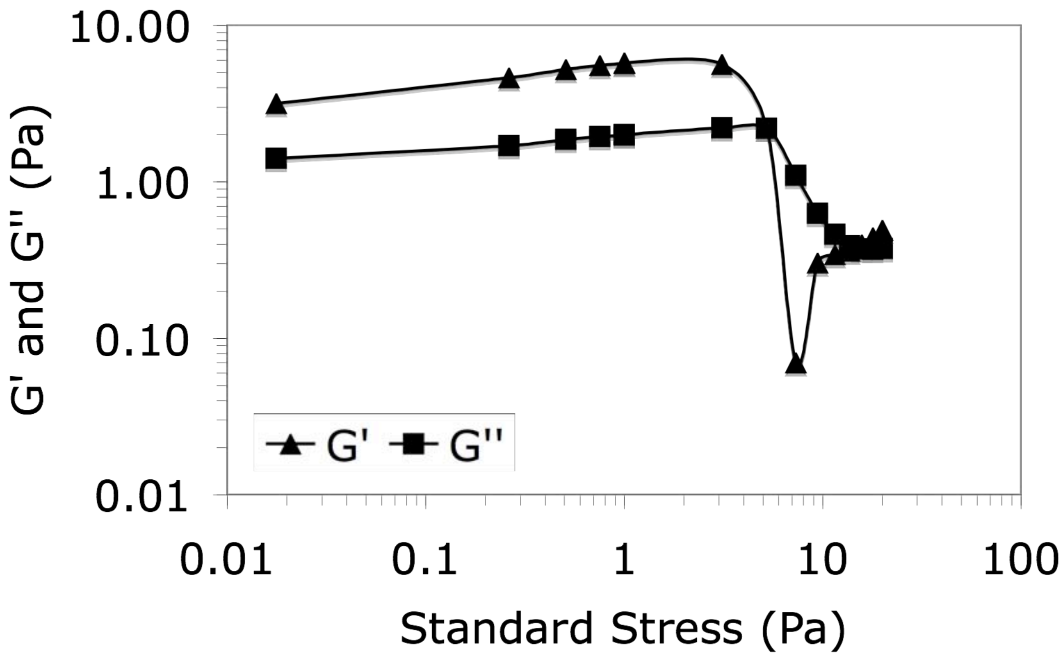
C-38 Stress sweep for determination of linear viscoelastic region of 0.500% XG with 1.0% NaCl at 1 Hz and 25 ^{o}C.



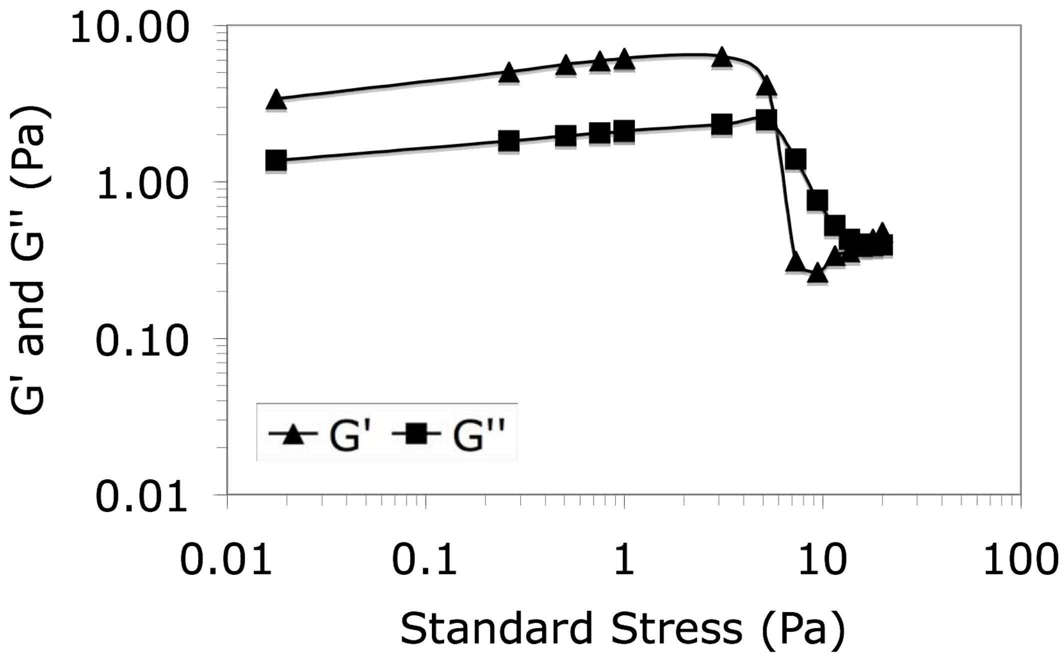
C-39. Stress sweep for determination of linear viscoelastic region of 0.500% XG with 1.5% NaCl at 1 Hz and 25 ^{o}C.



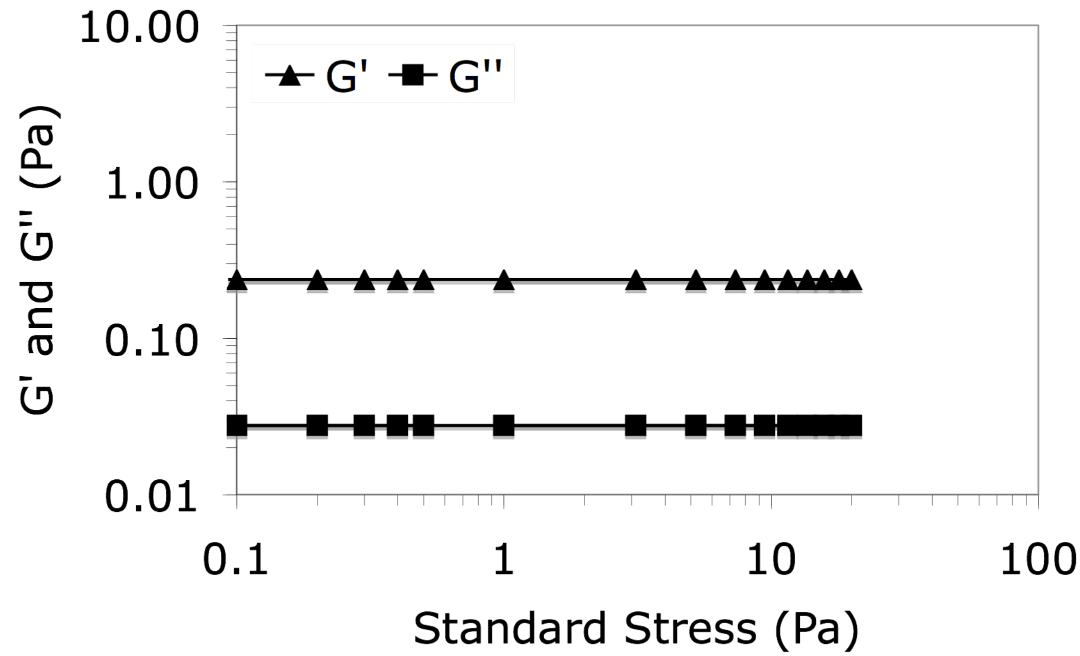
C-40. Stress sweep for determination of linear viscoelastic region of 0.500% XG with 2.0% NaCl at 1 Hz and 25 ^{o}C.



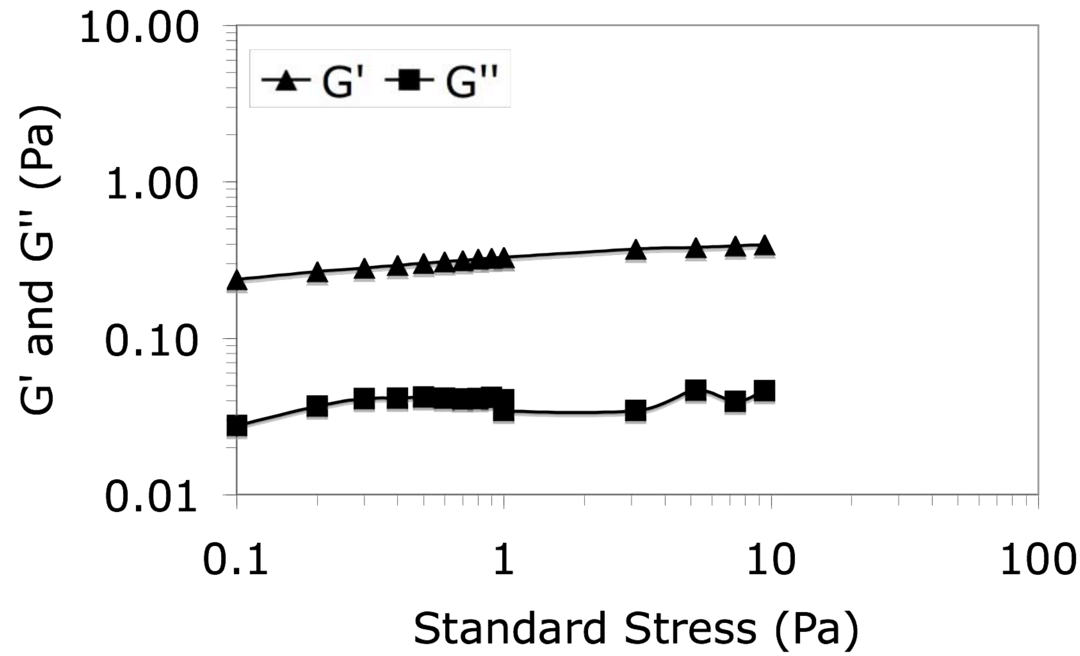
C-41 Stress sweep for determination of linear viscoelastic region of 0.500% XG with 2.5% NaCl at 1 Hz and 25 ^oC.



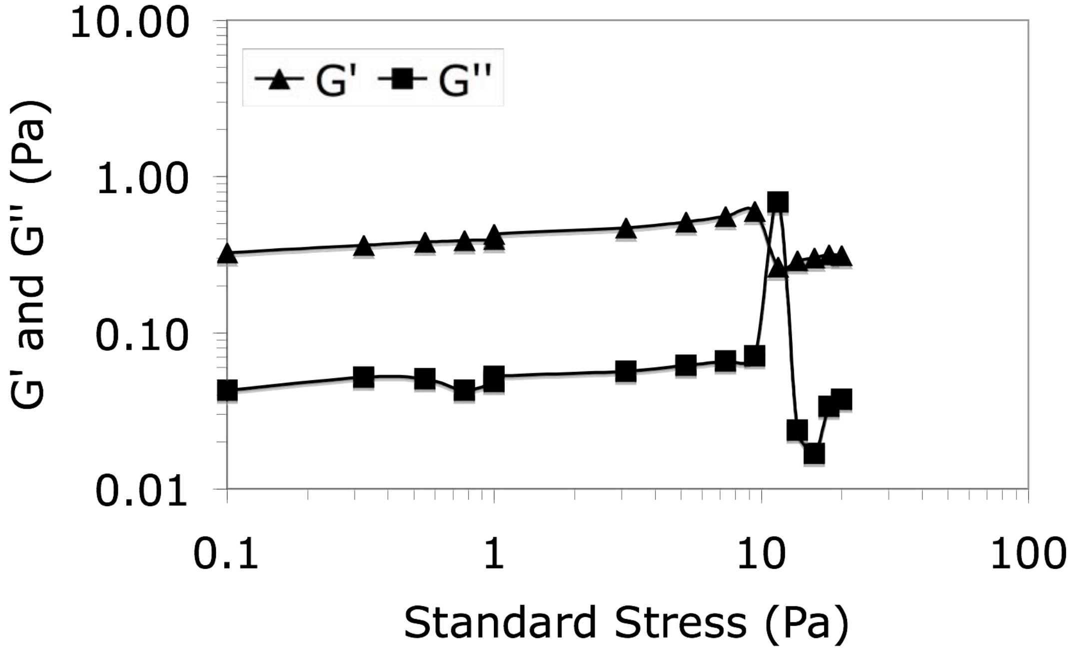
C-42. Stress sweep for determination of linear viscoelastic region of 0.500% XG with 3.0% NaCl at 1 Hz and 25 ^{o}C.



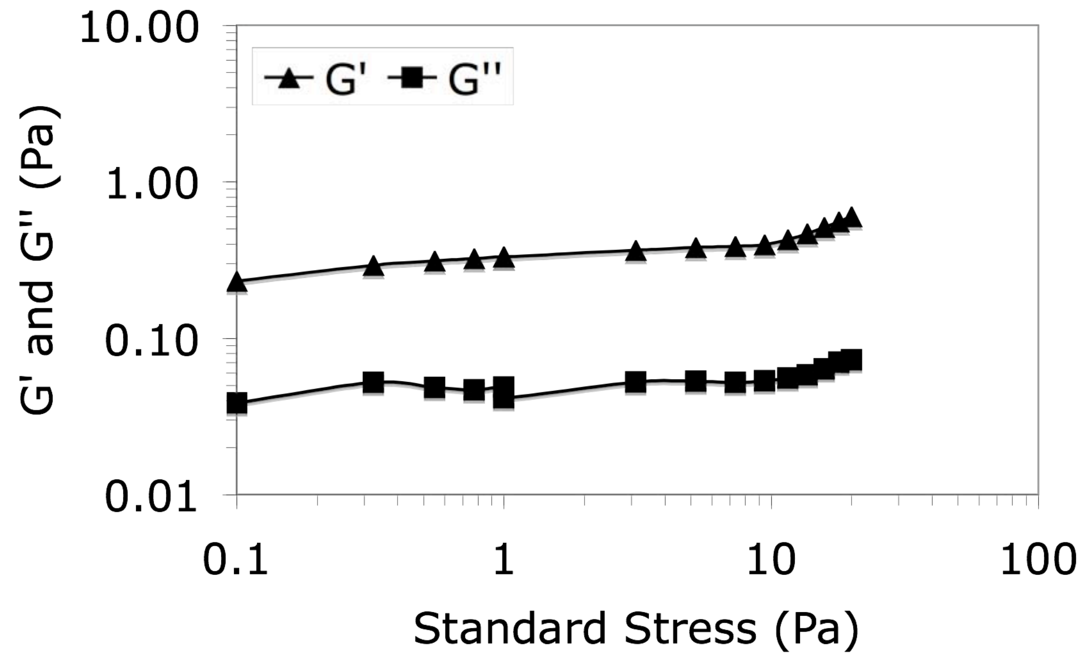
C-43. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 0.5% NaCl at 1 Hz and 25 ^{o}C.



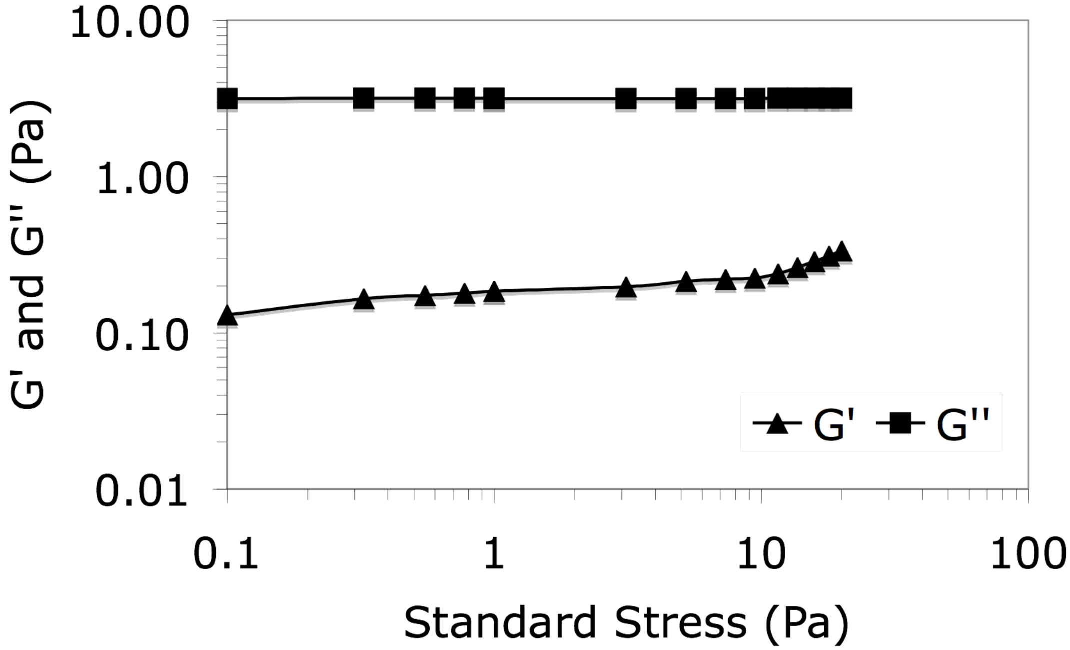
C-44. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 1.0% NaCl at 1 Hz and 25 ^{o}C.



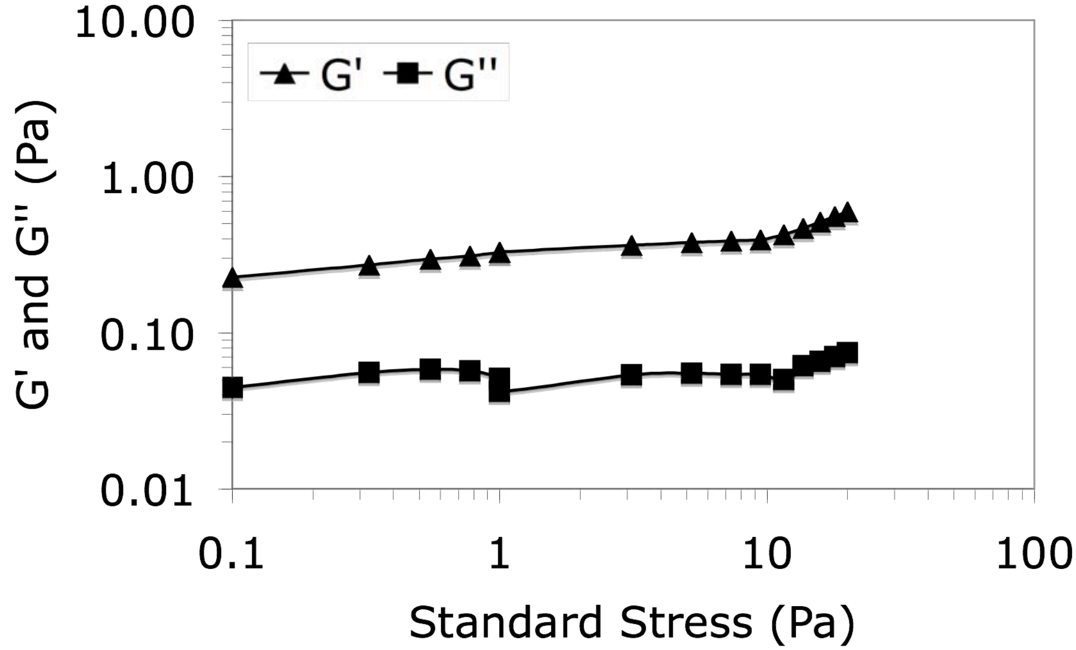
C-45. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 1.5% NaCl at 1 Hz and 25 ^{o}C.



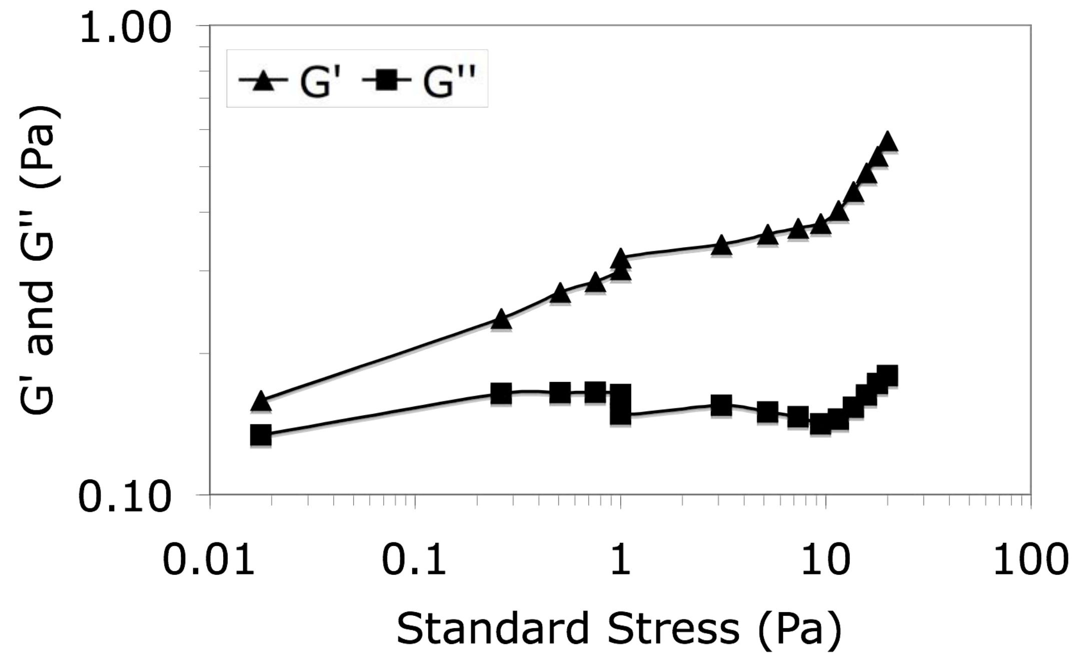
C-46. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 2.0% NaCl at 1 Hz and 25 ^oC.



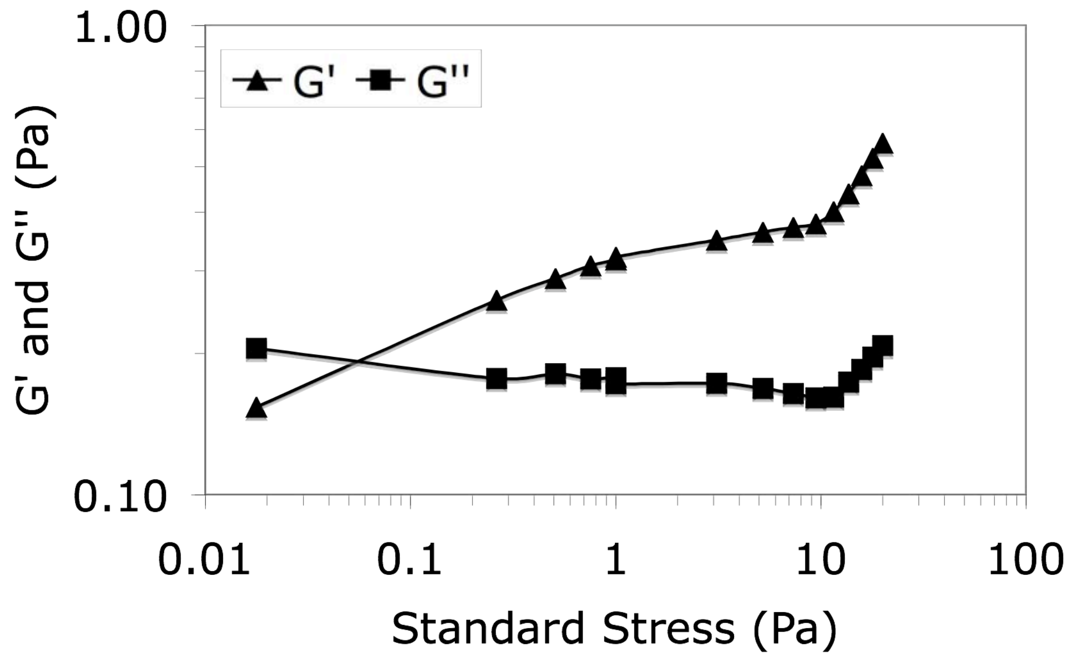
C-47. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 2.5% NaCl at 1 Hz and 25 ^{o}C.



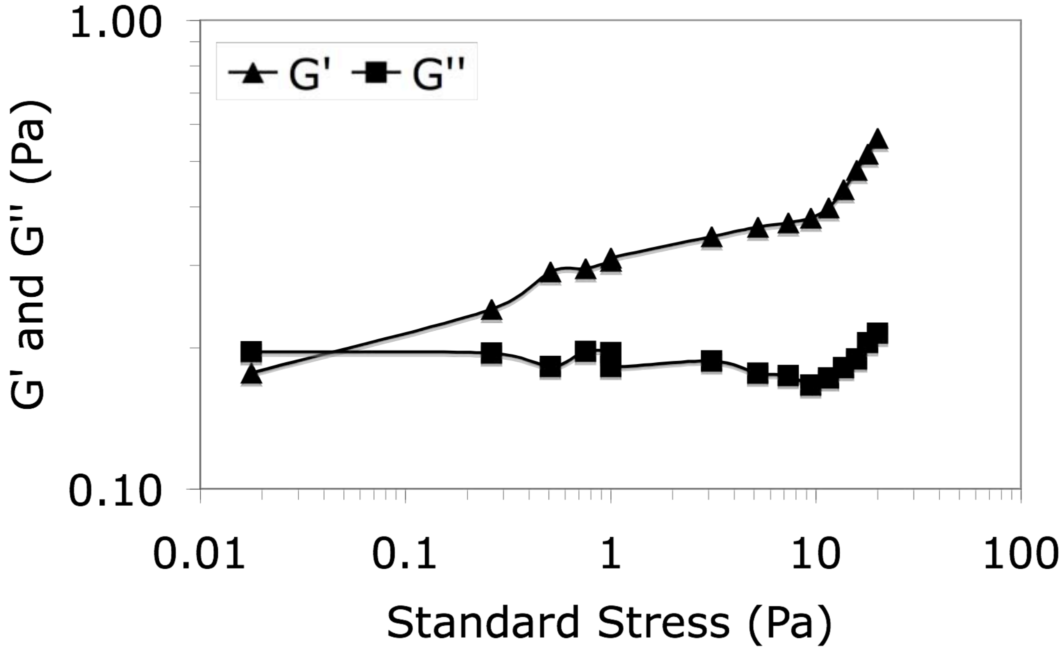
C-48. Stress sweep for determination of linear viscoelastic region of 0.125% KF with 3.0% NaCl at 1 Hz and 25 ^{o}C.



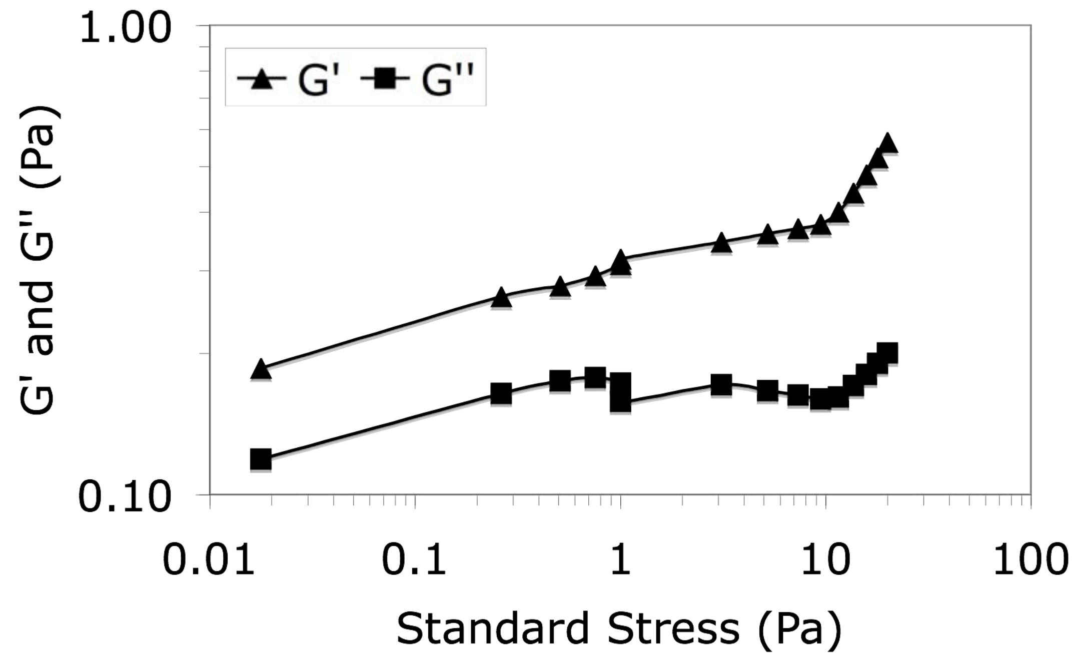
C-49. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 0.5% NaCl at 1 Hz and 25 ^{o}C.



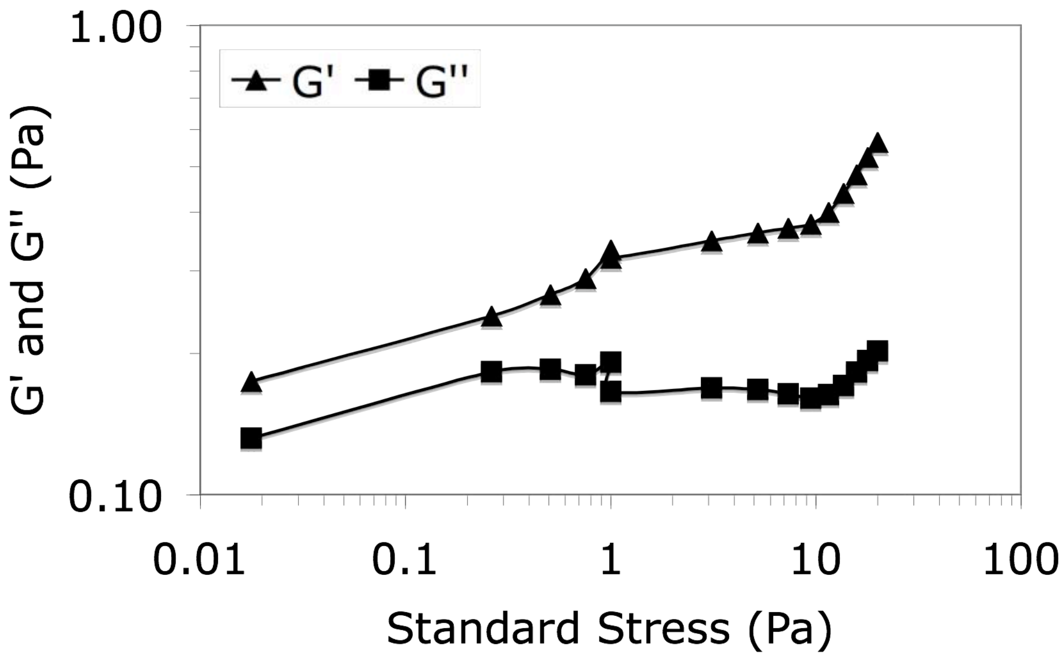
C-50. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 1.0% NaCl at 1 Hz and 25 ^{o}C.



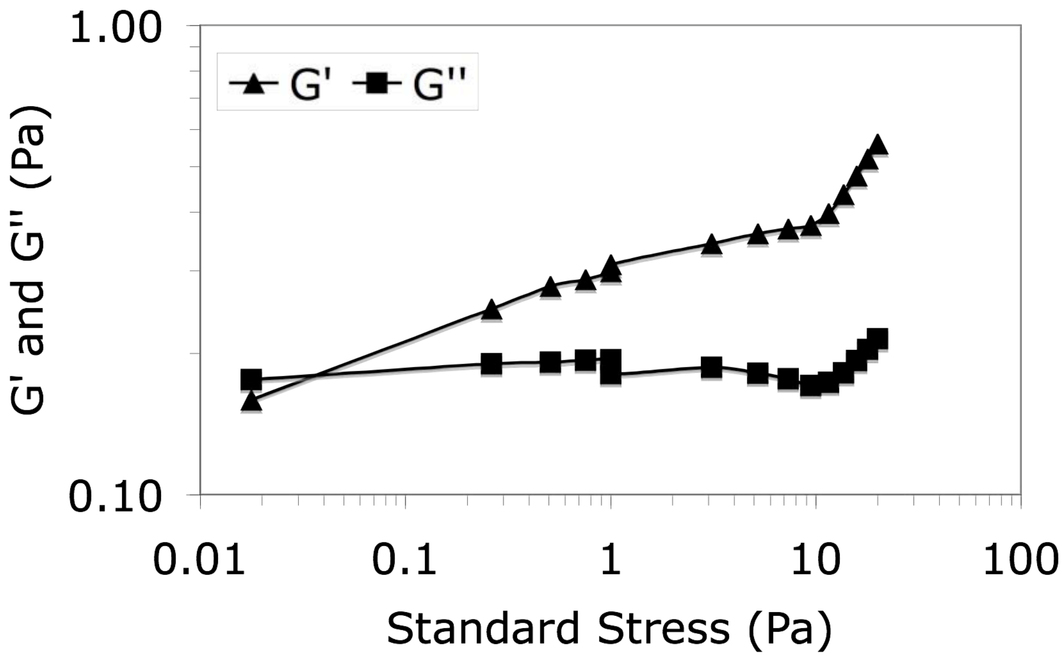
C-51. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 1.5% NaCl at 1 Hz and 25 ^{o}C.



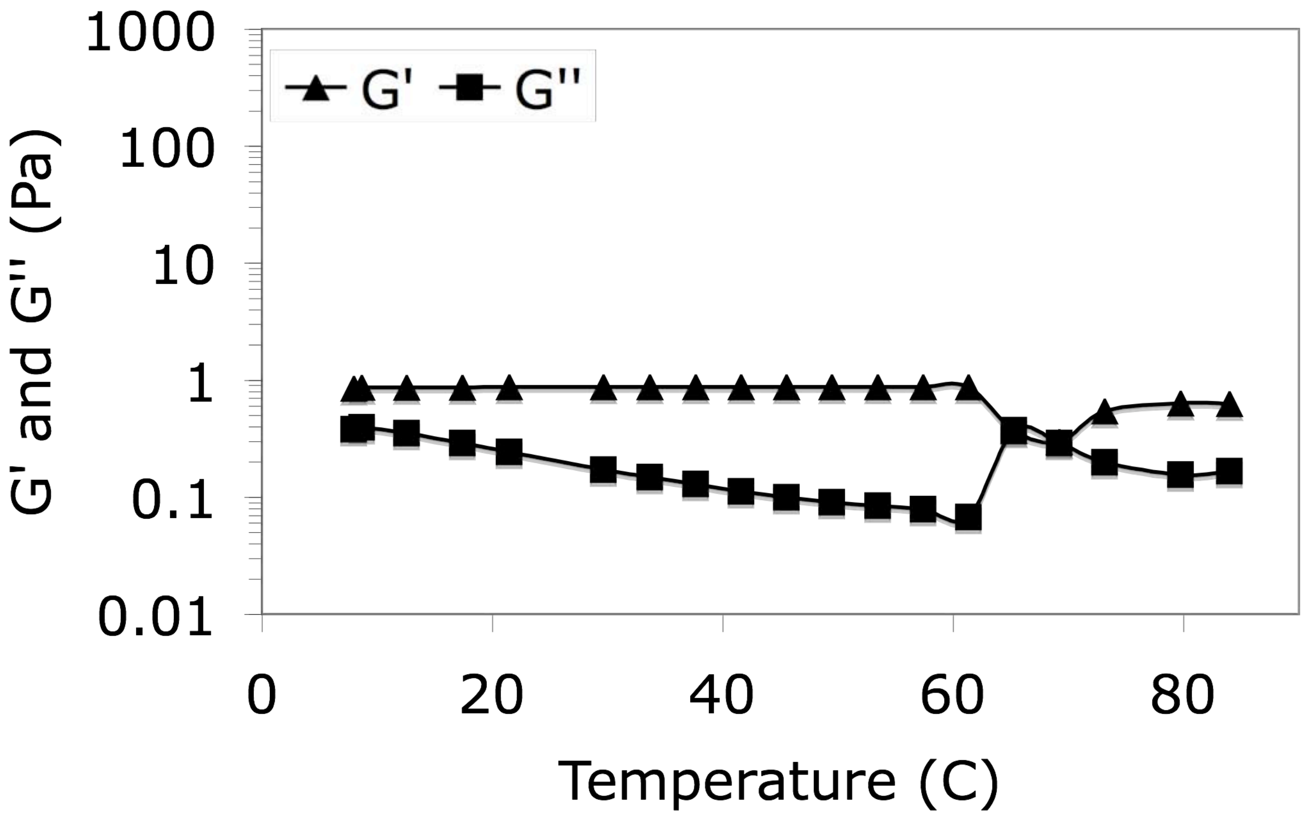
C-52. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 2.0% NaCl at 1 Hz and 25 ^{o}C.



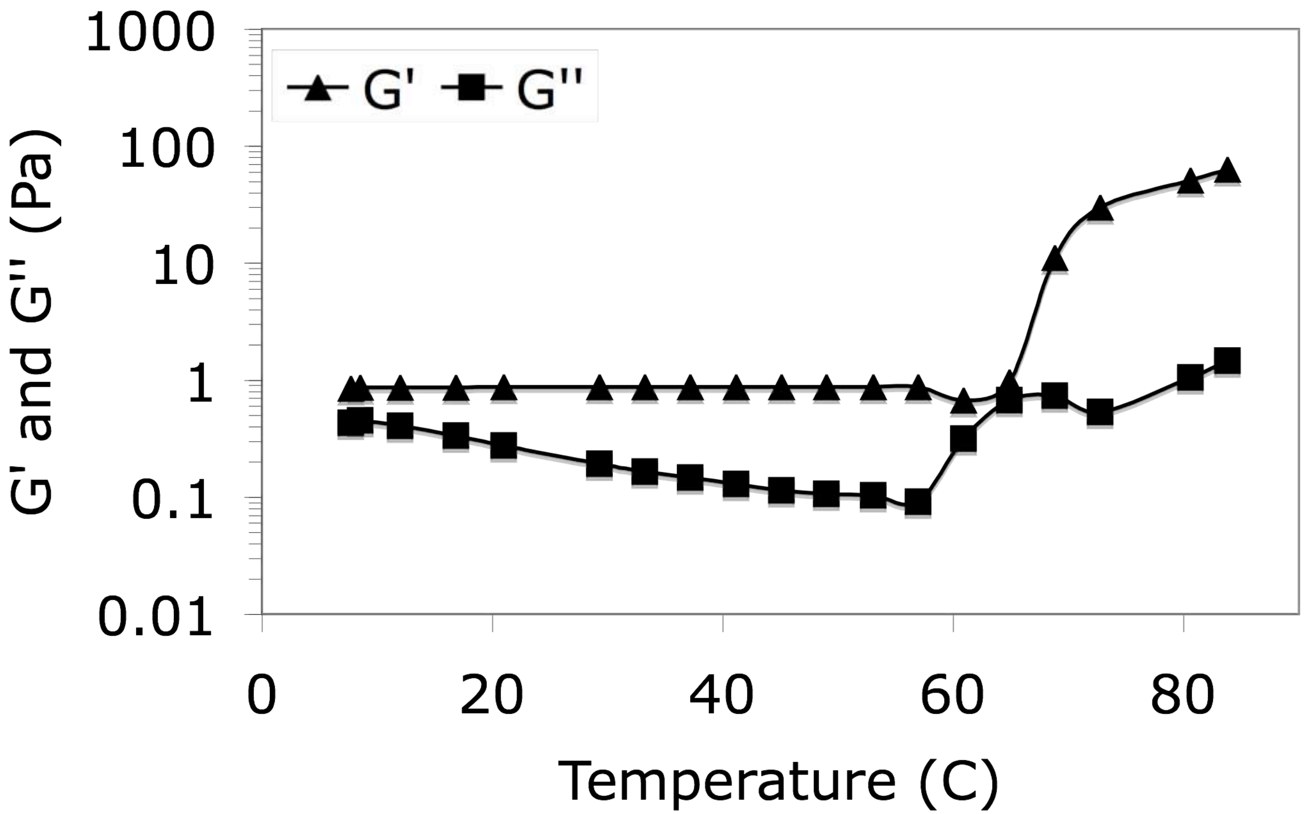
C-53. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 2.5% NaCl at 1 Hz and 25 ^{o}C.



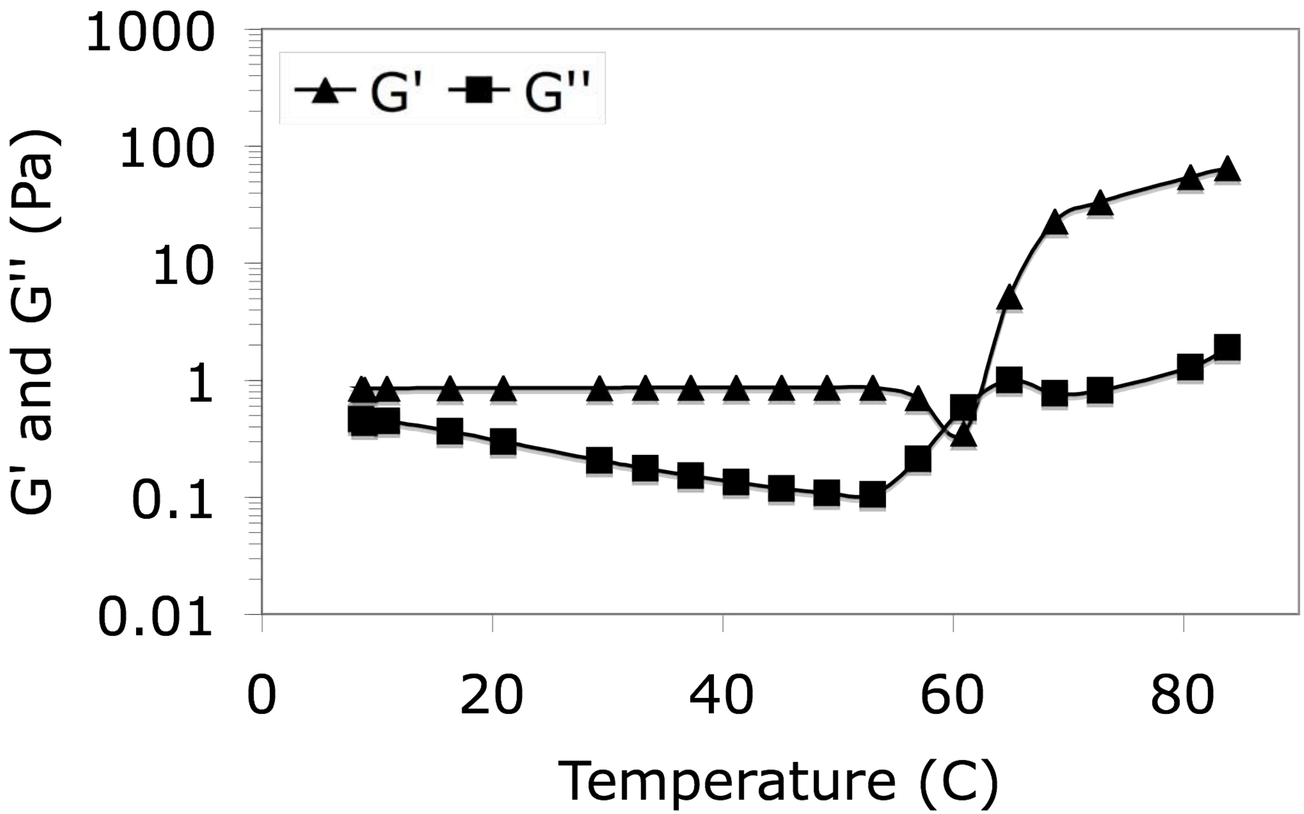
C-54. Stress sweep for determination of linear viscoelastic region of 0.250% KF with 3.0% NaCl at 1 Hz and 25 ^oC.



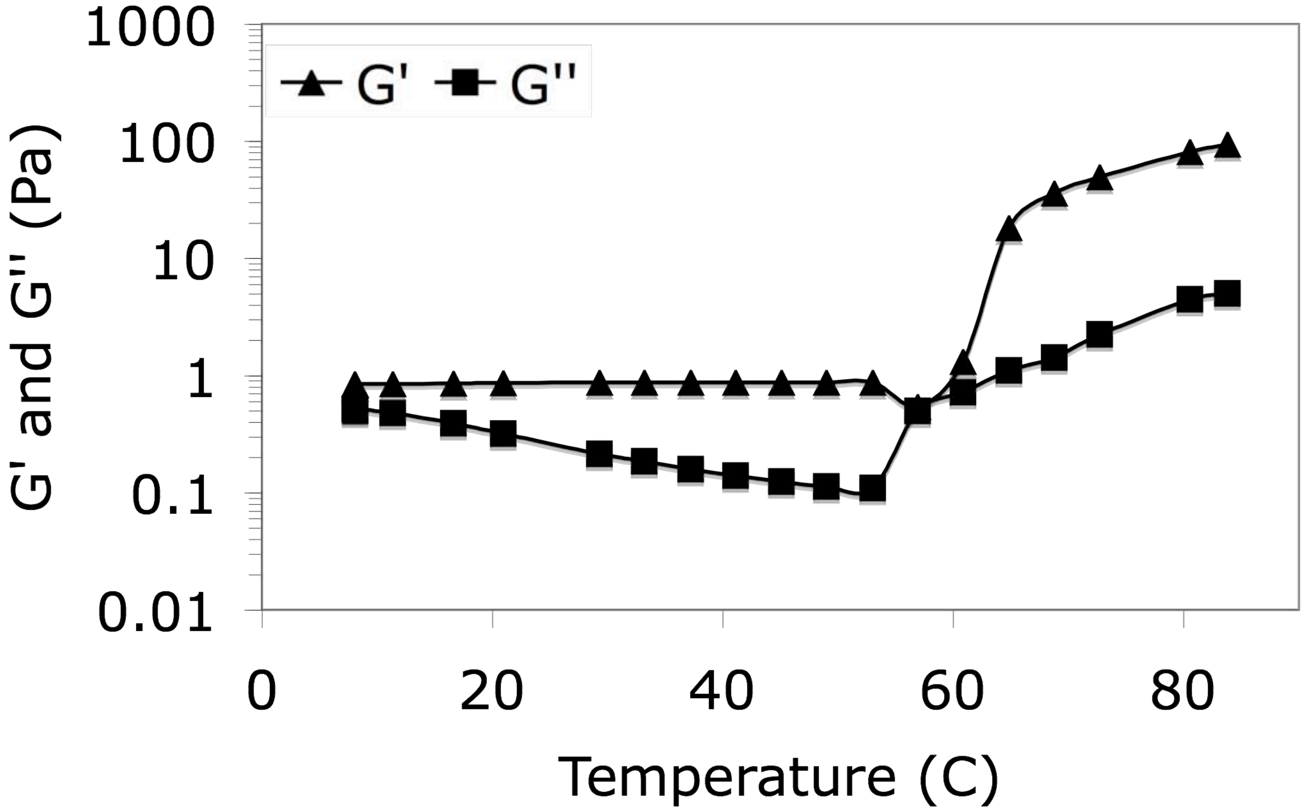
C-81. Dynamic testing of 1.000% MC with 0.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



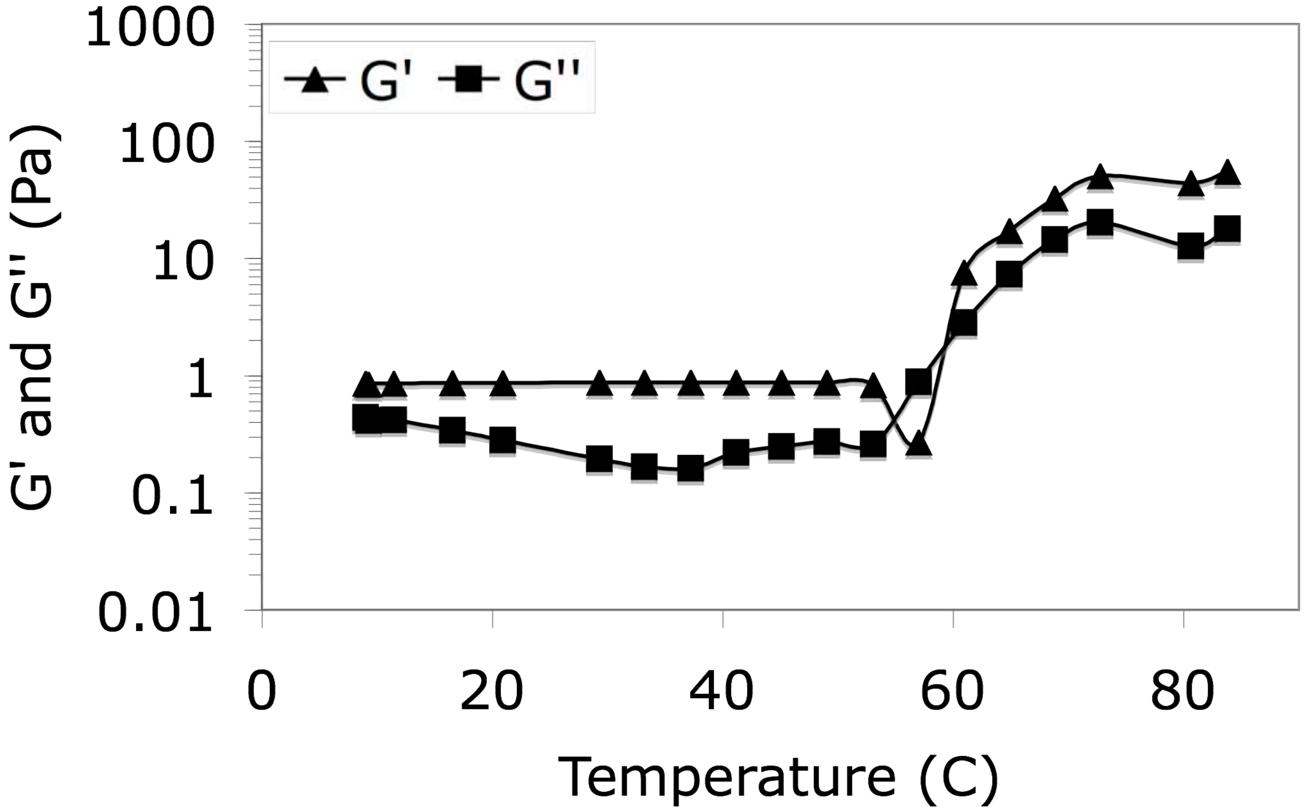
C-82. Dynamic testing of 1.000% MC with 0.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



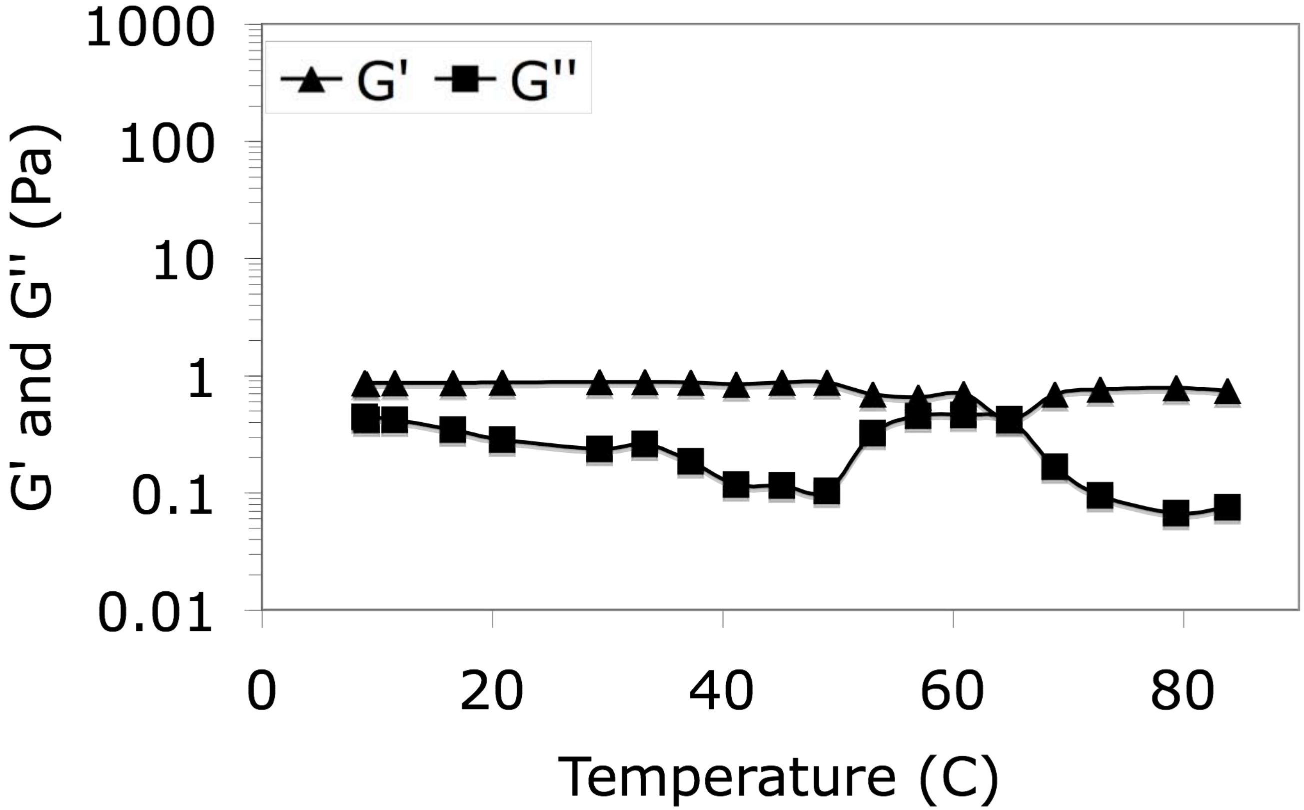
C-83. Dynamic testing of 1.000% MC with 1.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



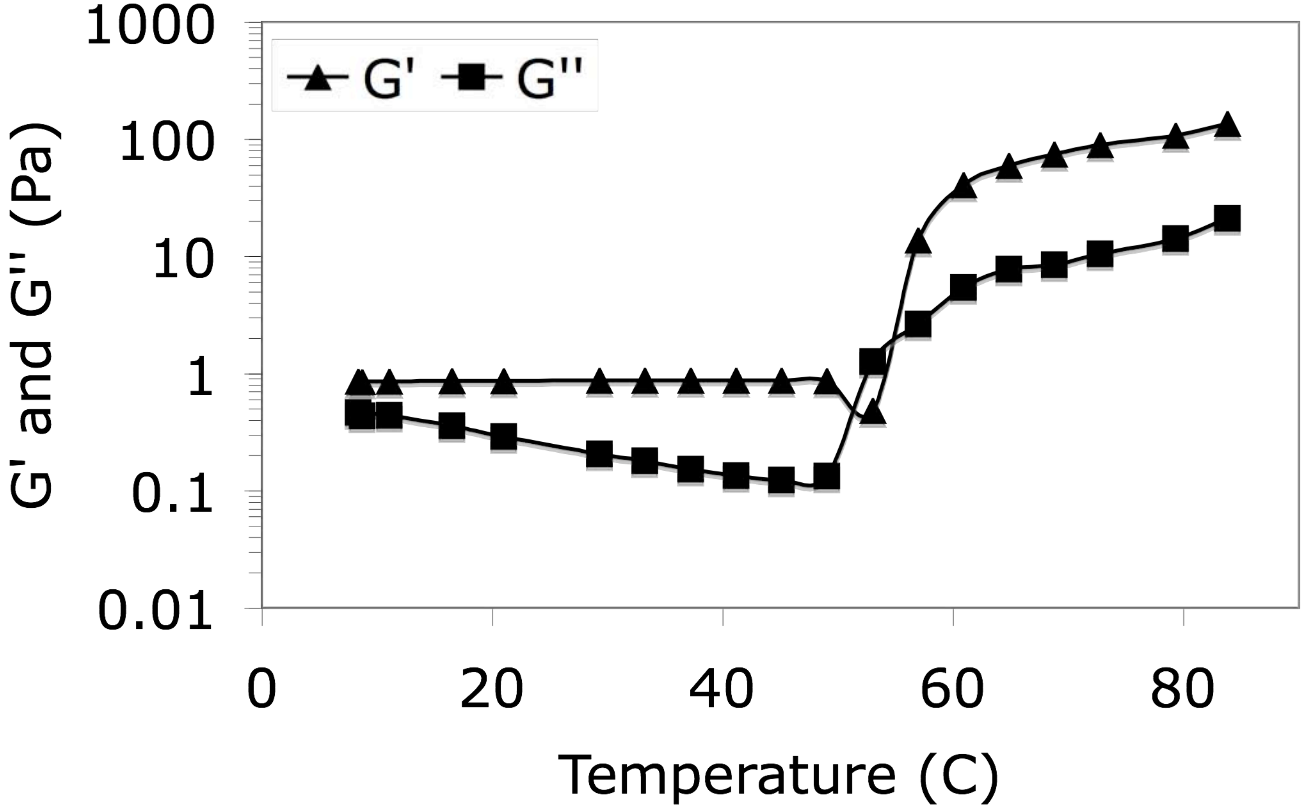
C-84. Dynamic testing of 1.000% MC with 1.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



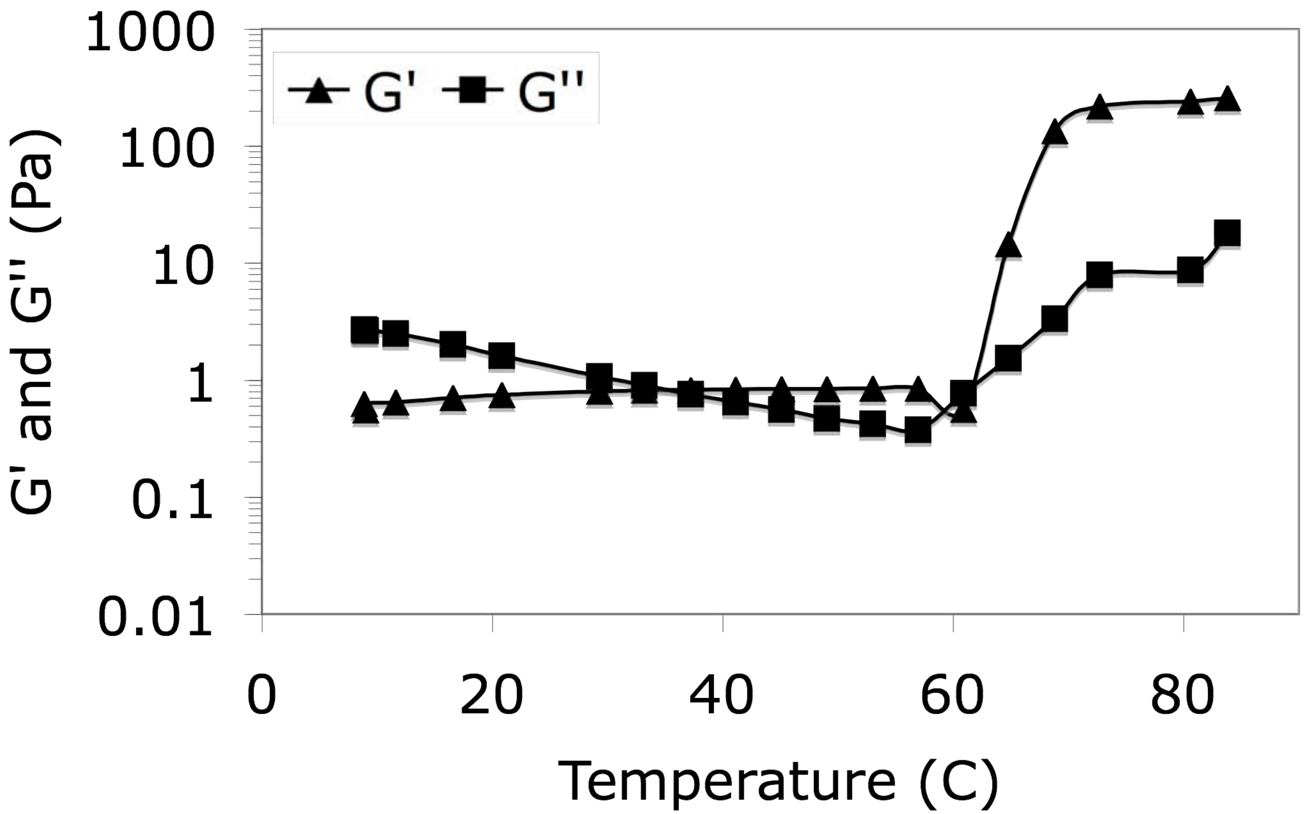
C-85. Dynamic testing of 1.000% MC with 2.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



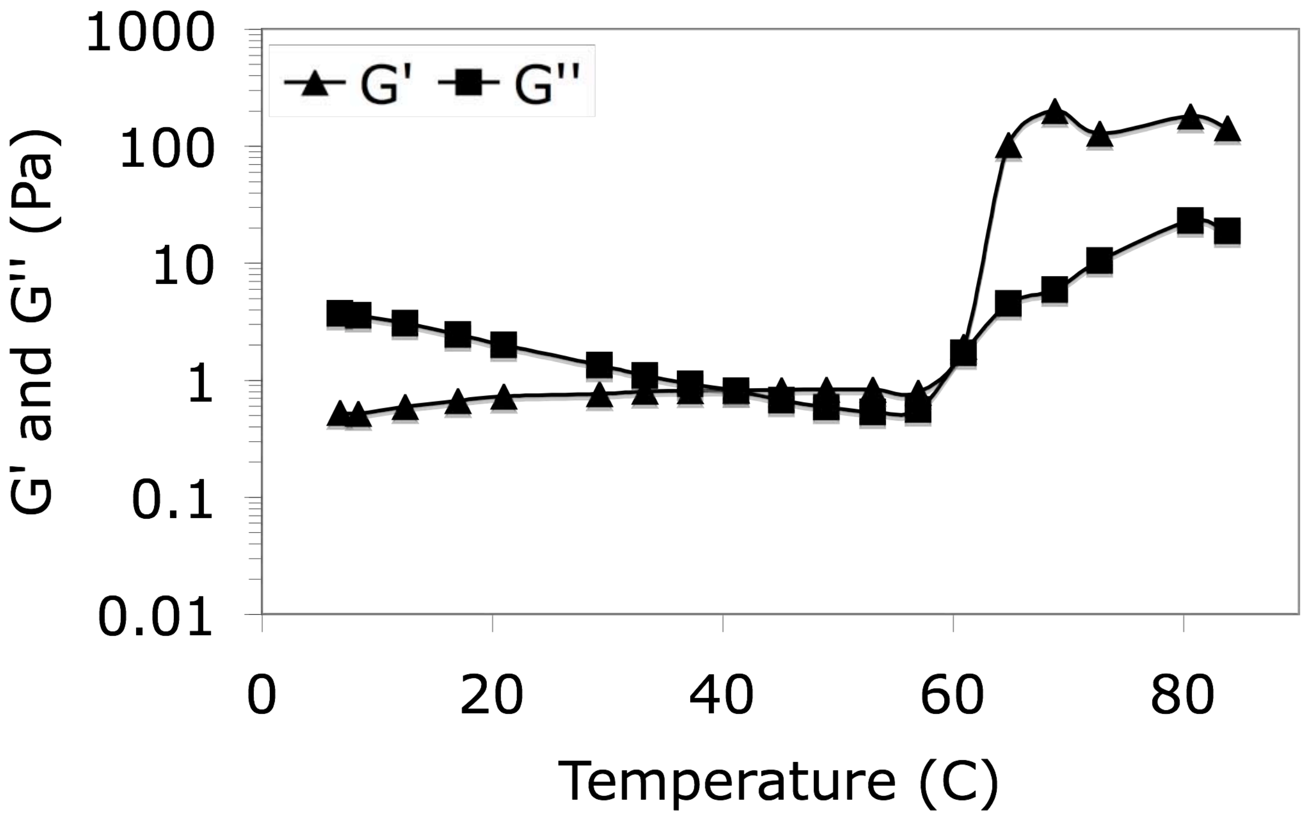
C-86. Dynamic testing of 1.000% MC with 2.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



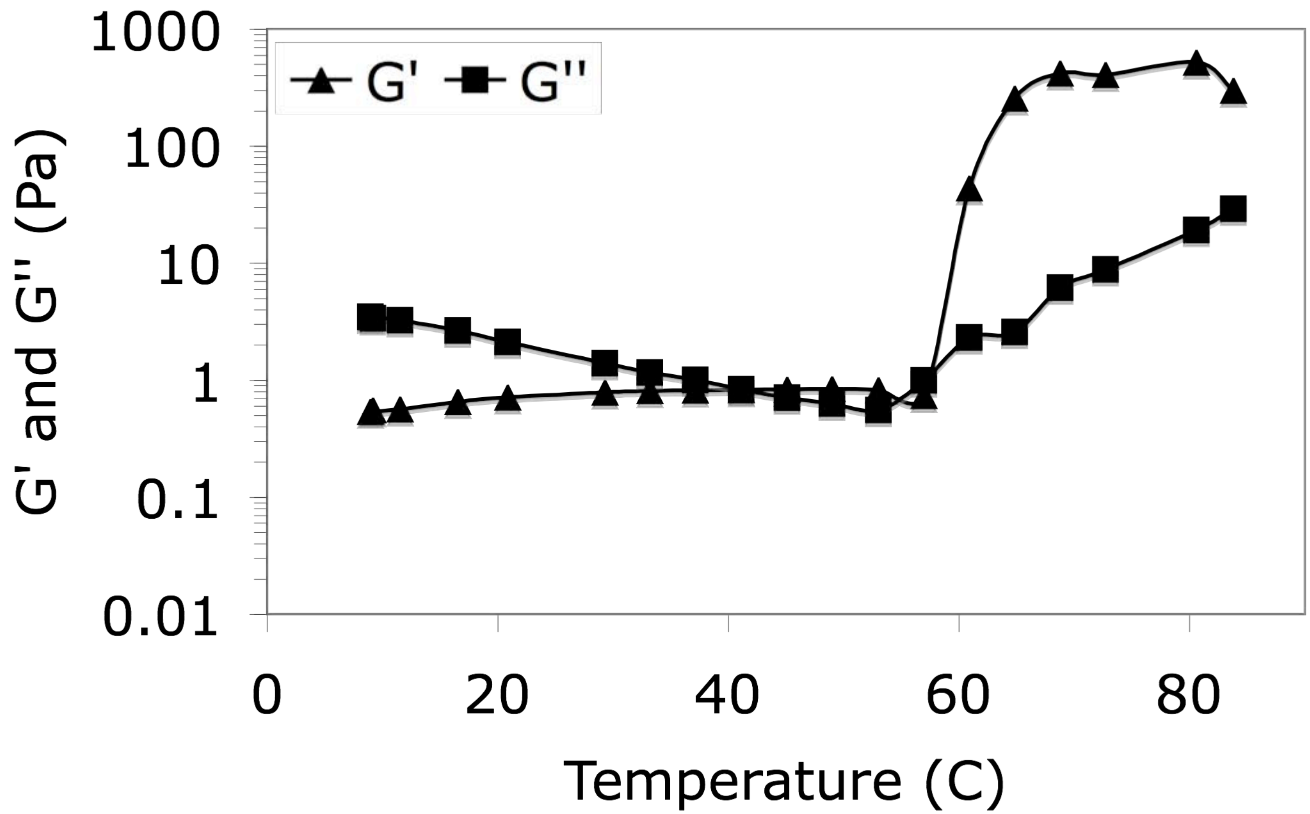
C-87. Dynamic testing of 1.000% MC with 3.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



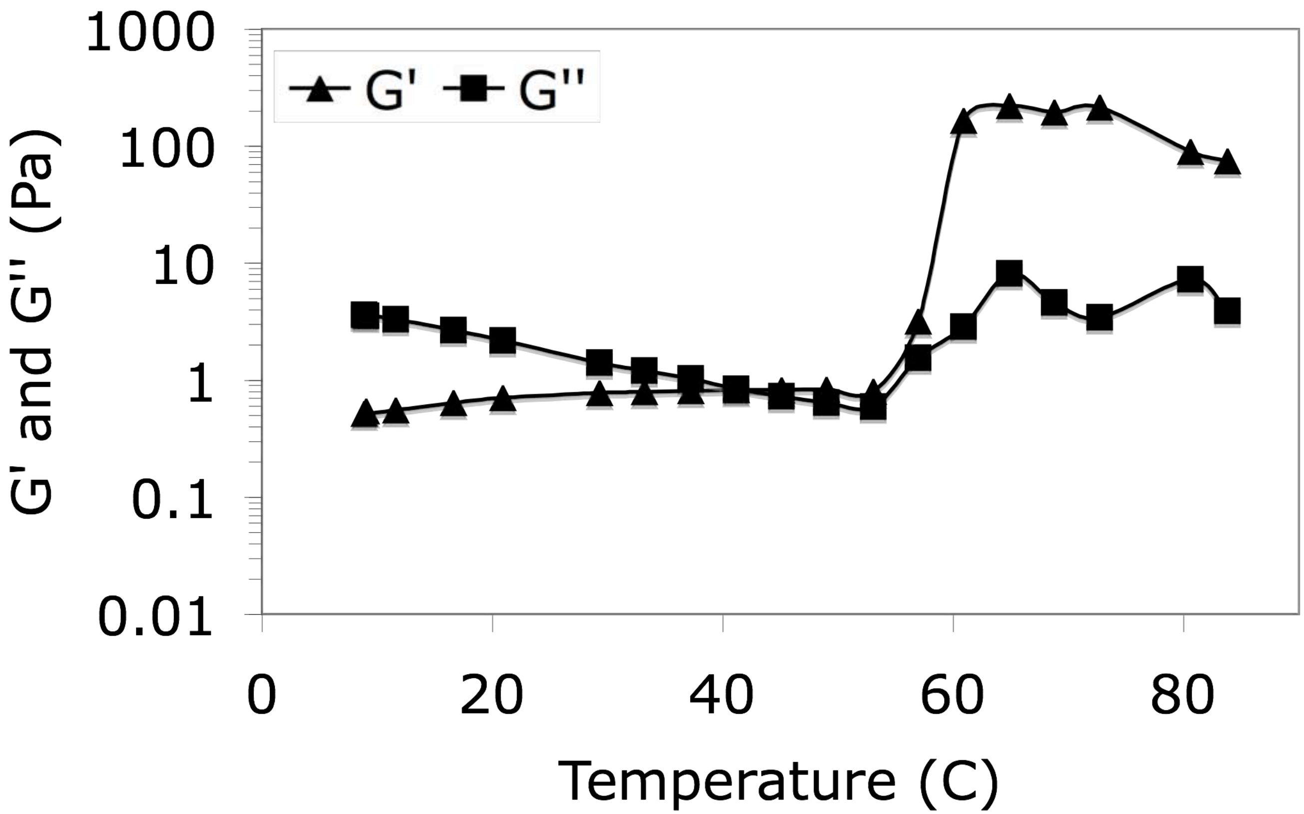
C-88. Dynamic testing of 2.000% MC with 0.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



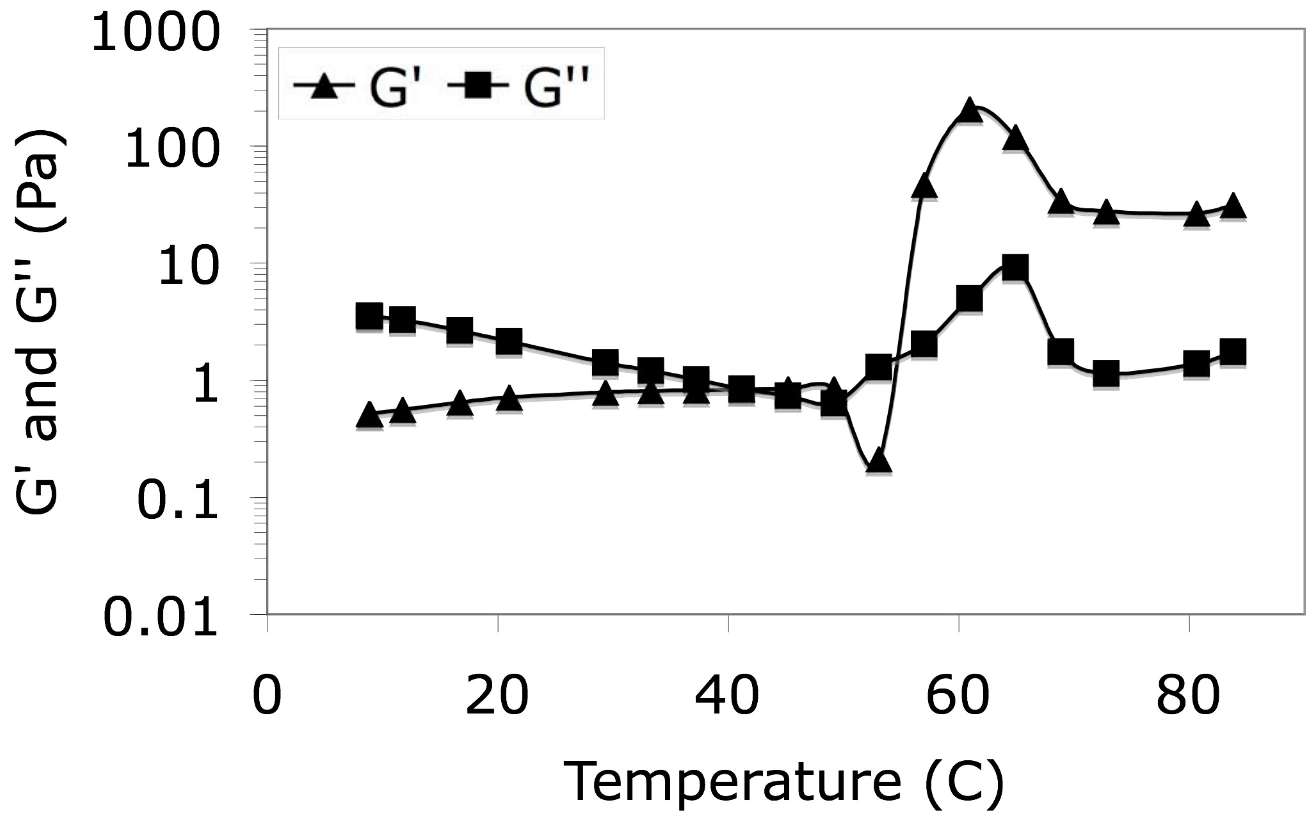
C-89. Dynamic testing of 2.000% MC with 0.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



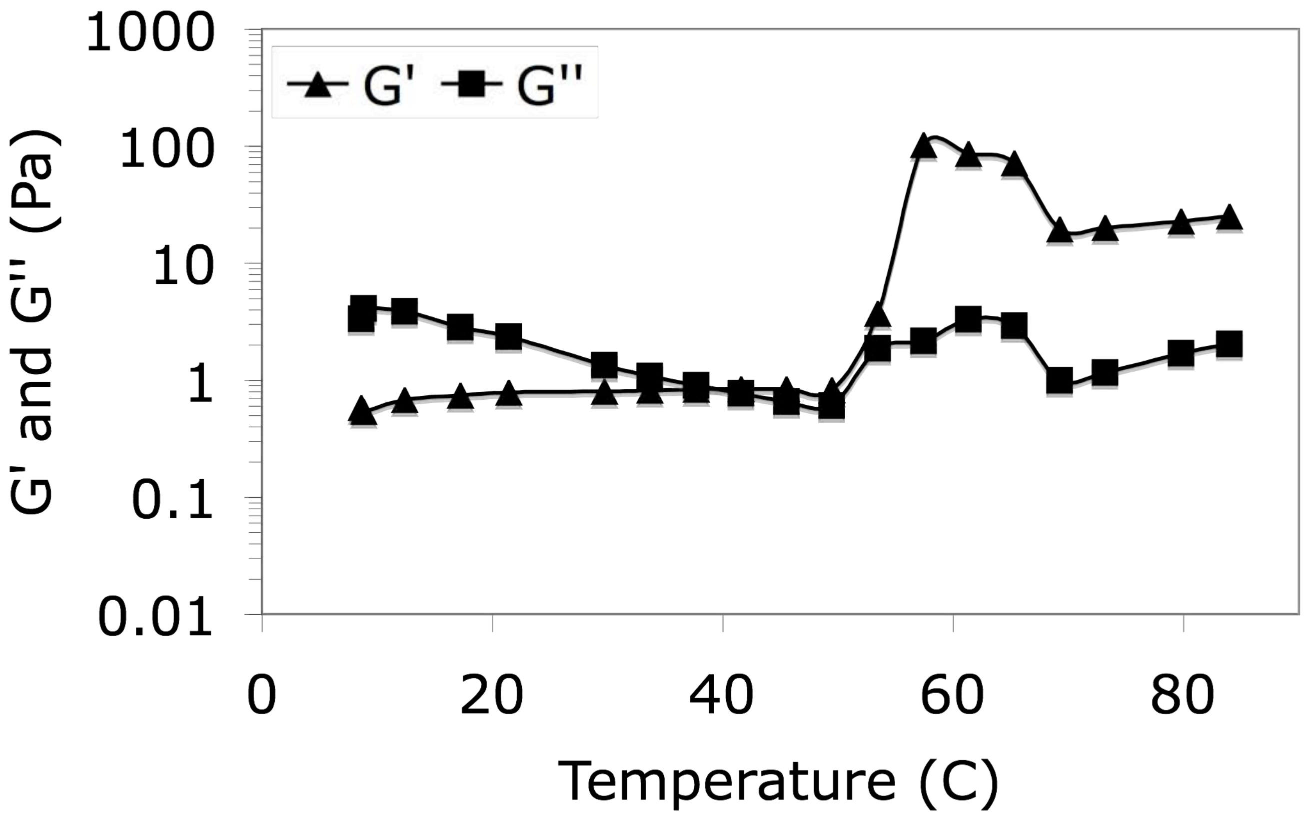
C-90. Dynamic testing of 2.000% MC with 1.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



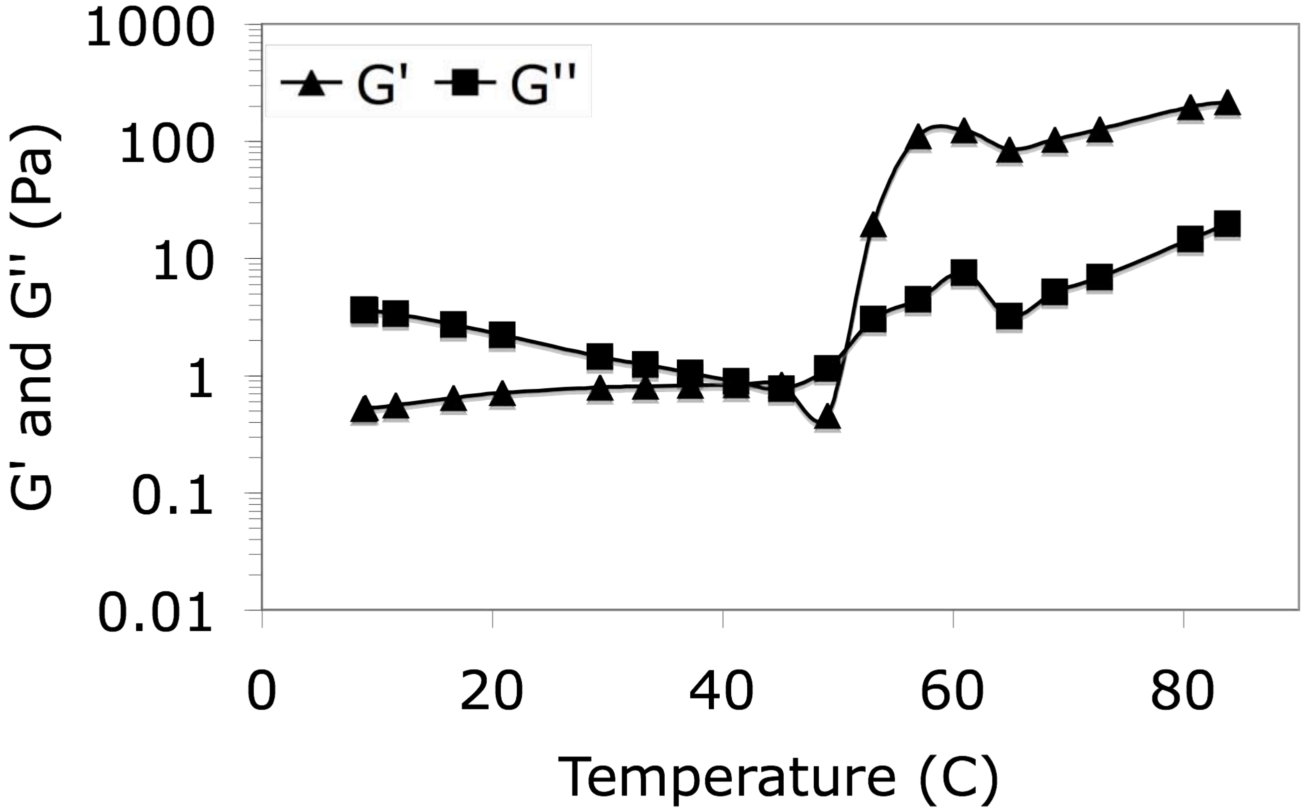
C-91. Dynamic testing of 2.000% MC with 1.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



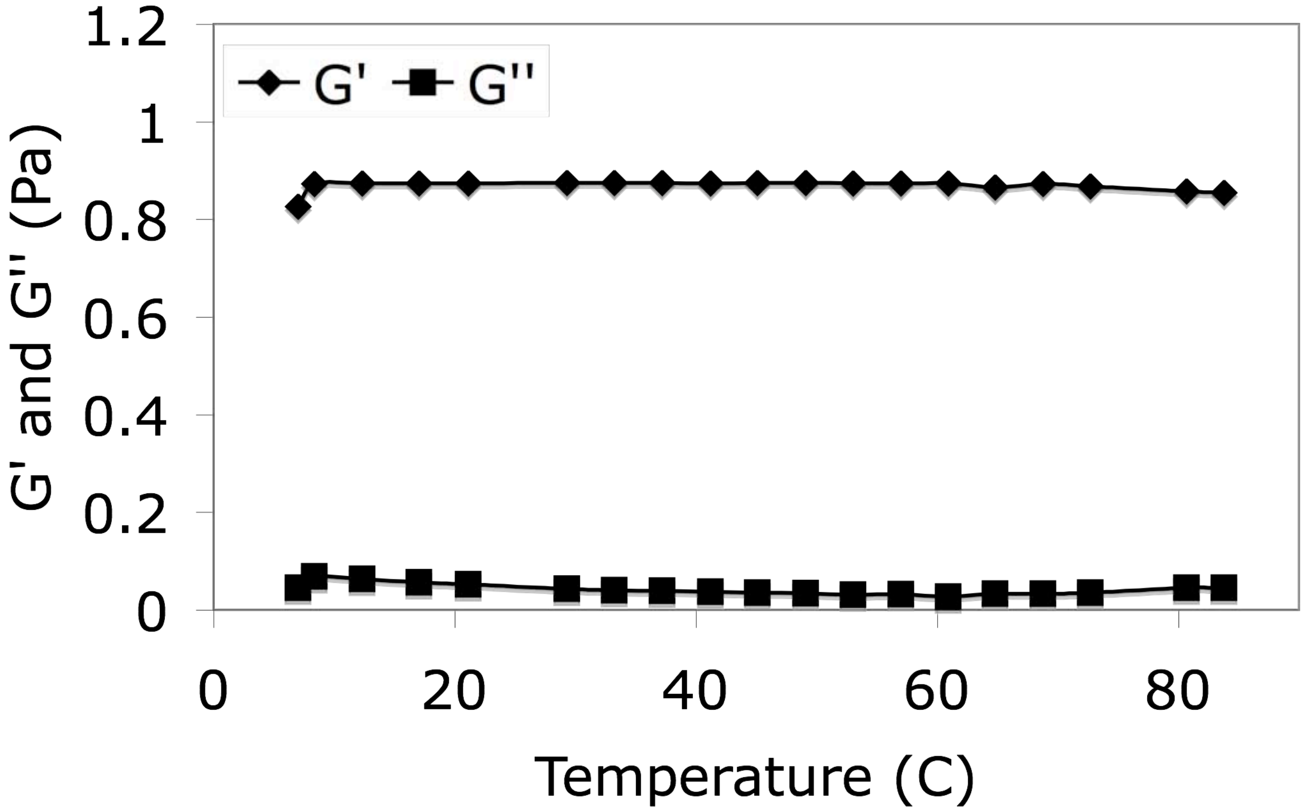
C-92. Dynamic testing of 2.000% MC with 2.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



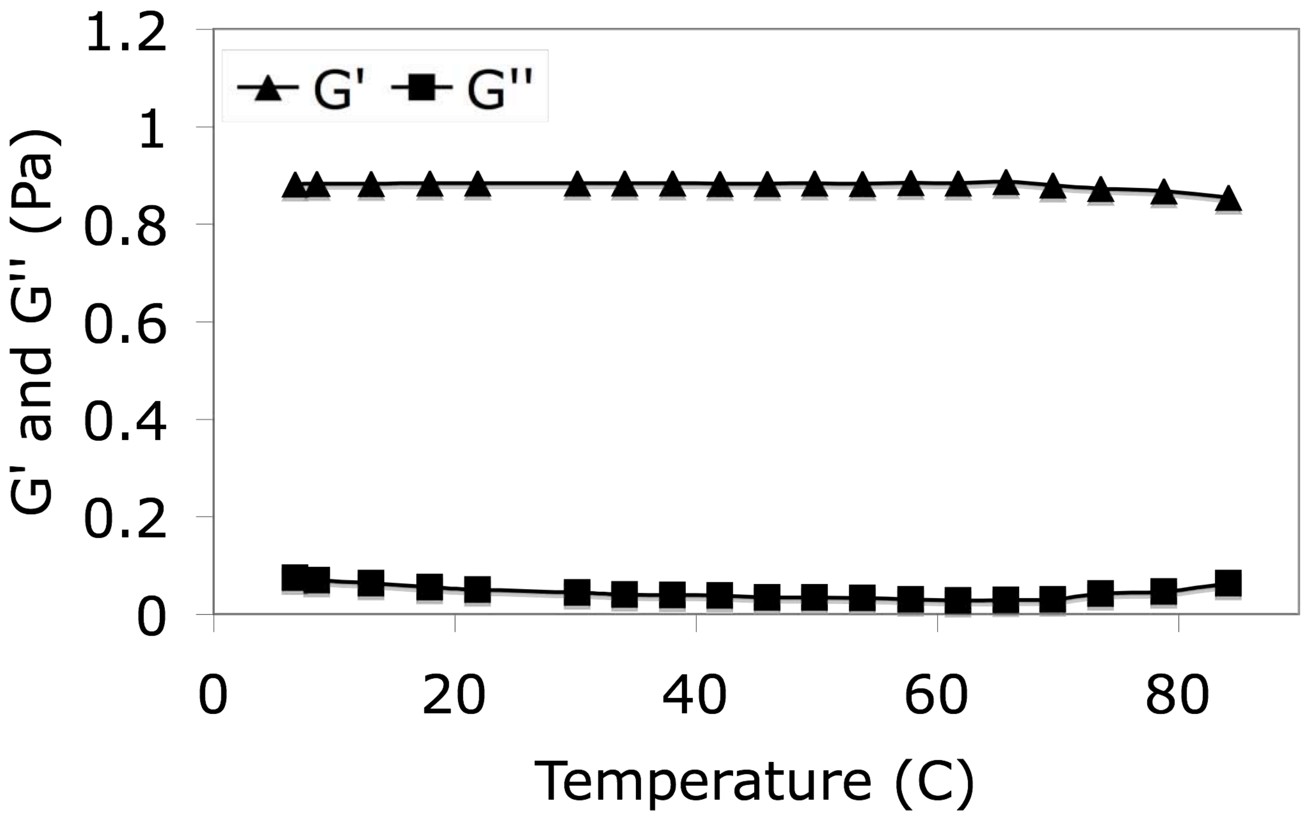
C-93. Dynamic testing of 2.000% MC with 2.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



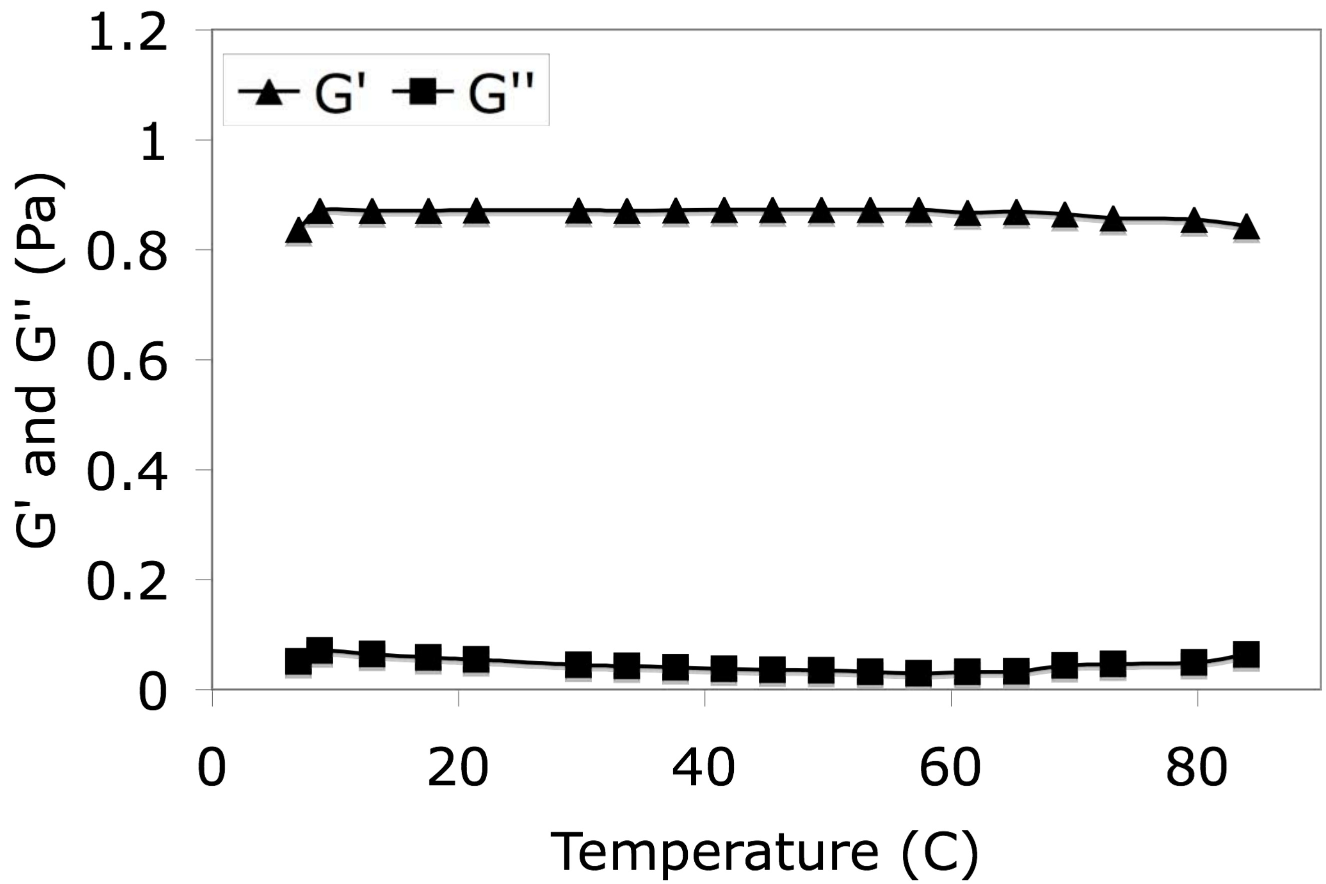
C-94. Dynamic testing of 2.000% MC with 3.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



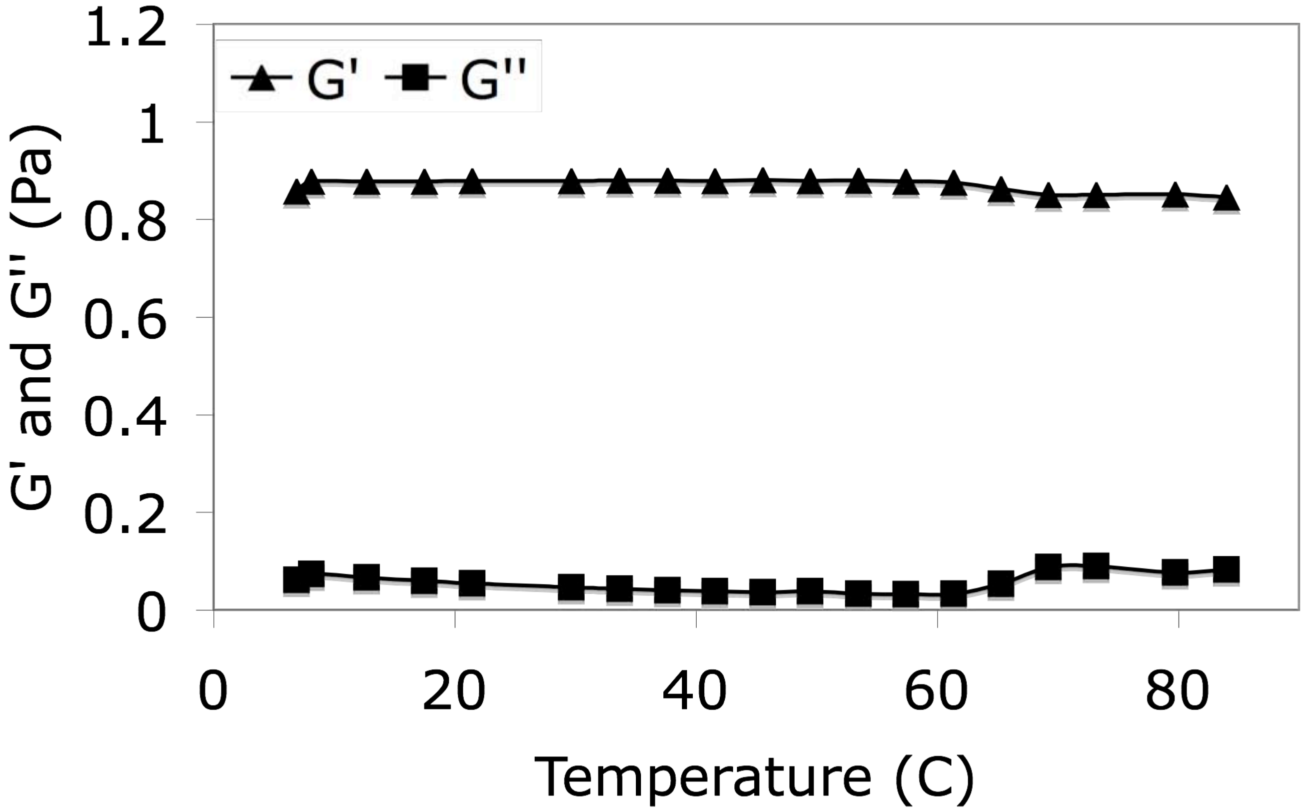
C-95. Dynamic testing of 1.000% HPMC with 0.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



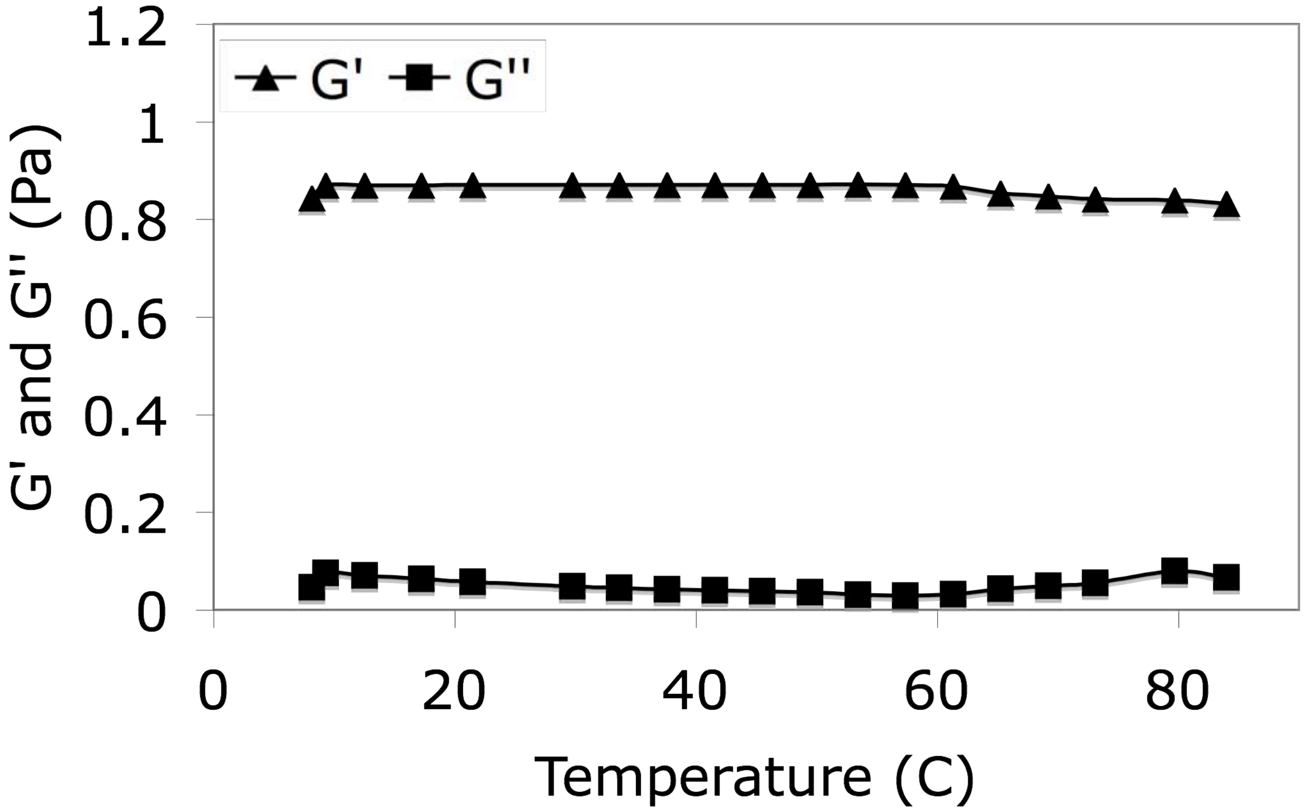
C-96. Dynamic testing of 1.000% HPMC with 0.500% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



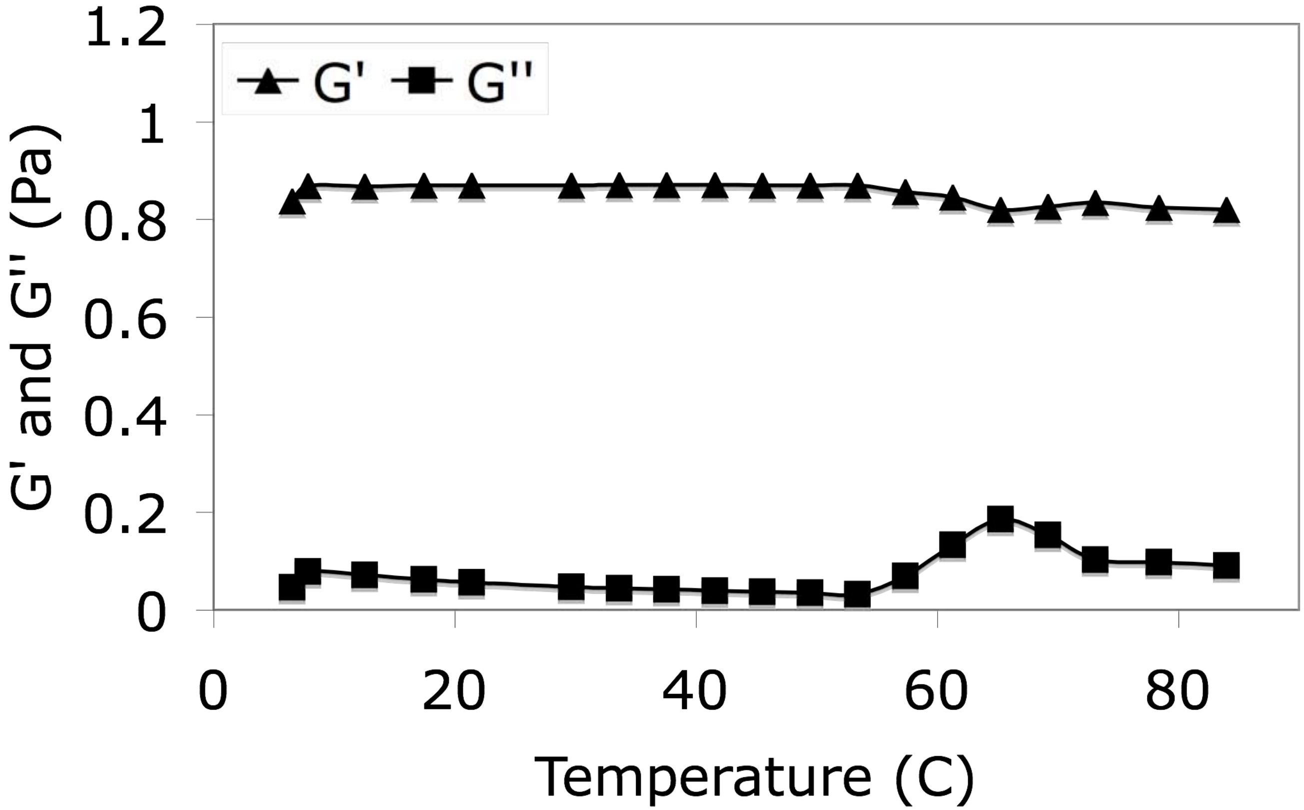
C-97. Dynamic testing of 1.000% HPMC with 1.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



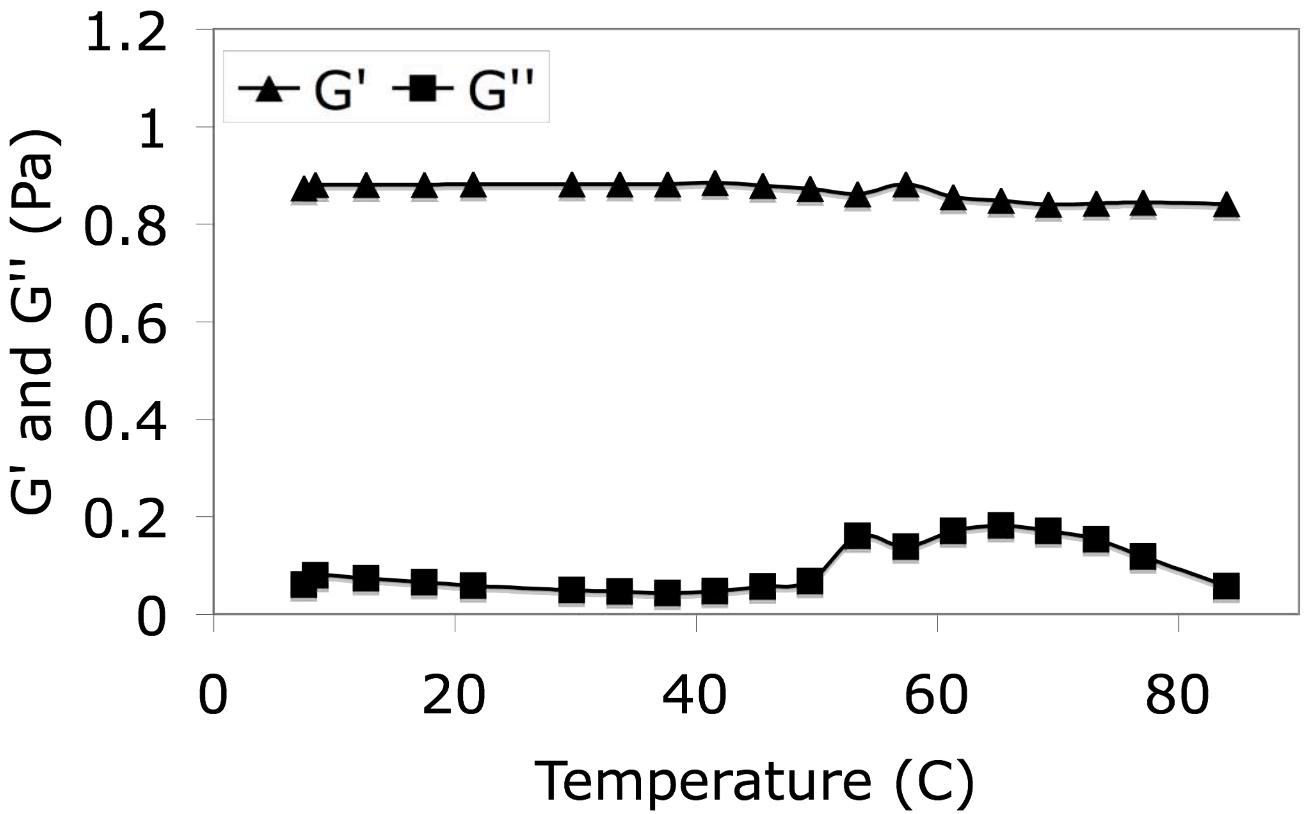
C-98. Dynamic testing of 1.000% HPMC with 1.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



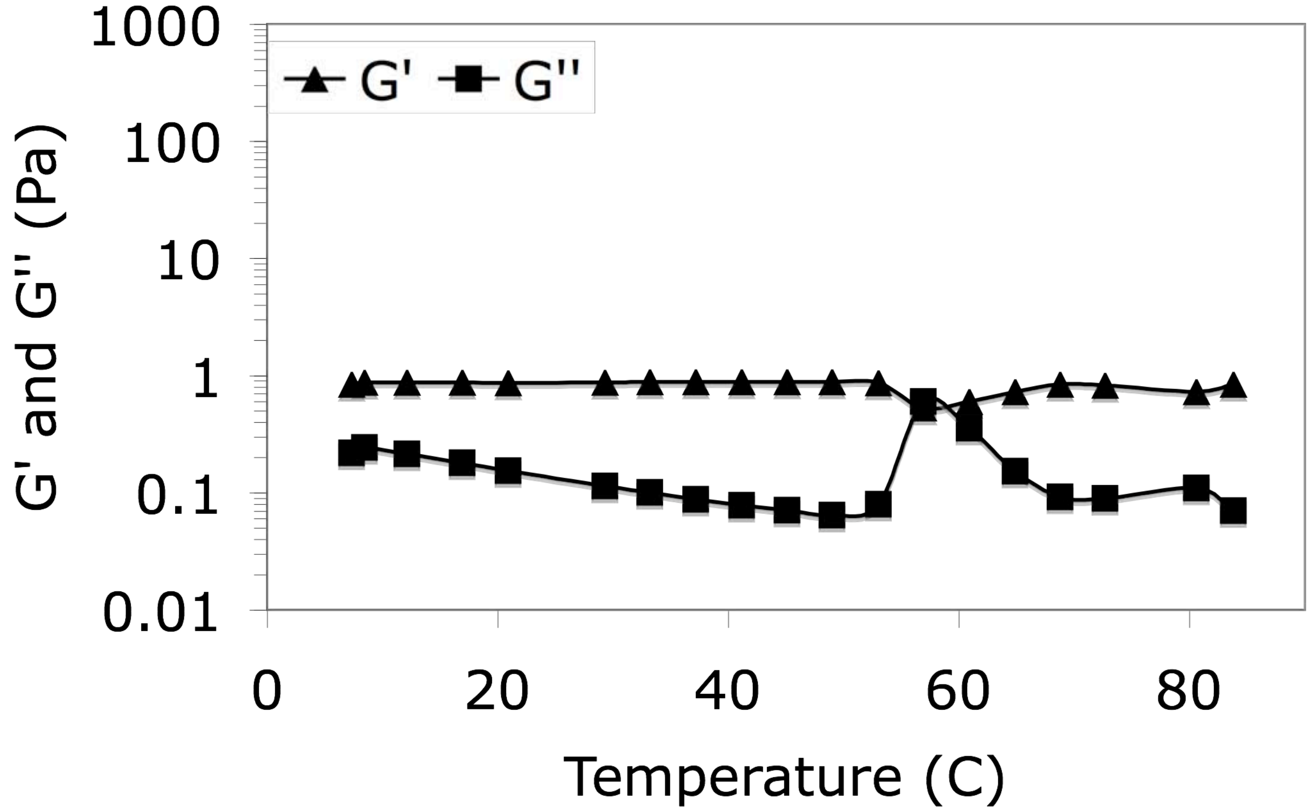
C-99. Dynamic testing of 1.000% HPMC with 2.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



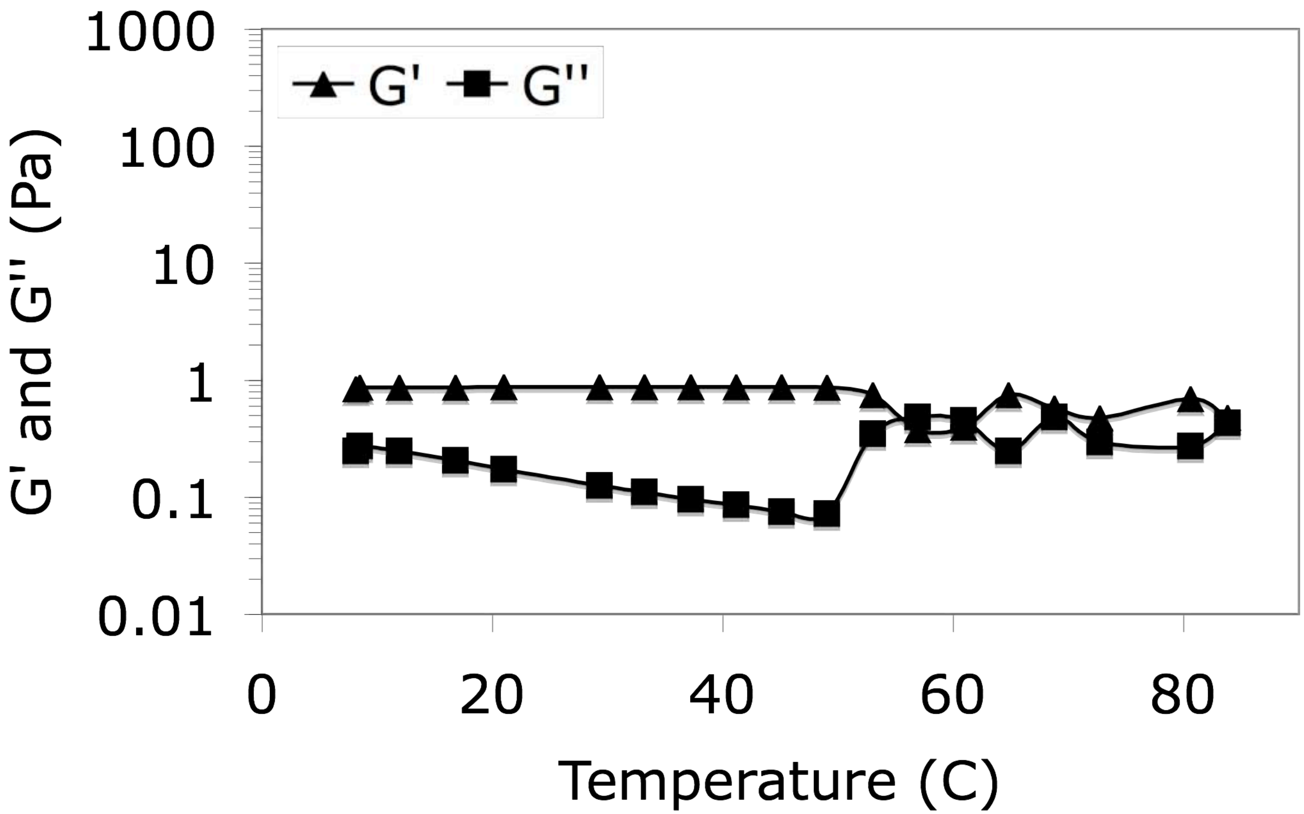
C-100. Dynamic testing of 1.000% HPMC with 2.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^oC to 85 ^oC.



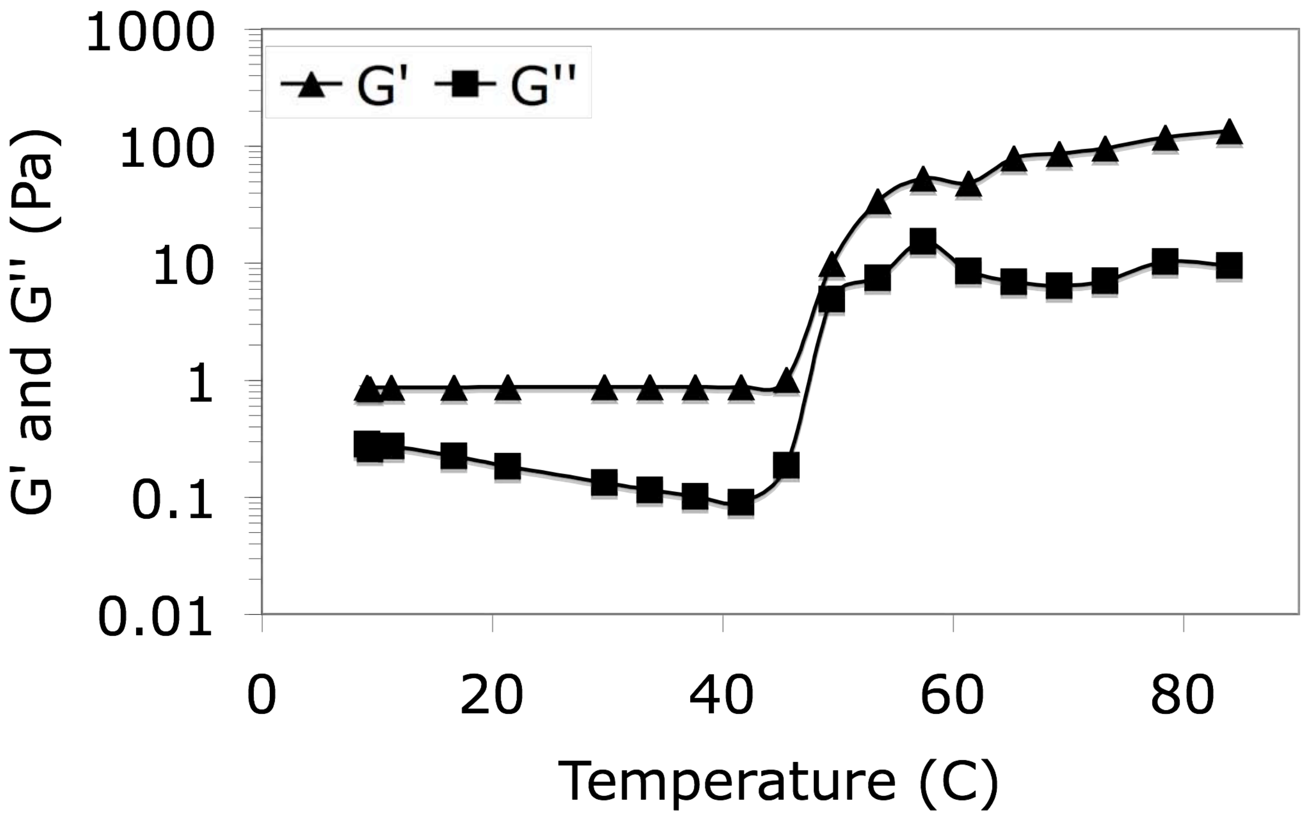
C-101. Dynamic testing of 1.000% HPMC with 3.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



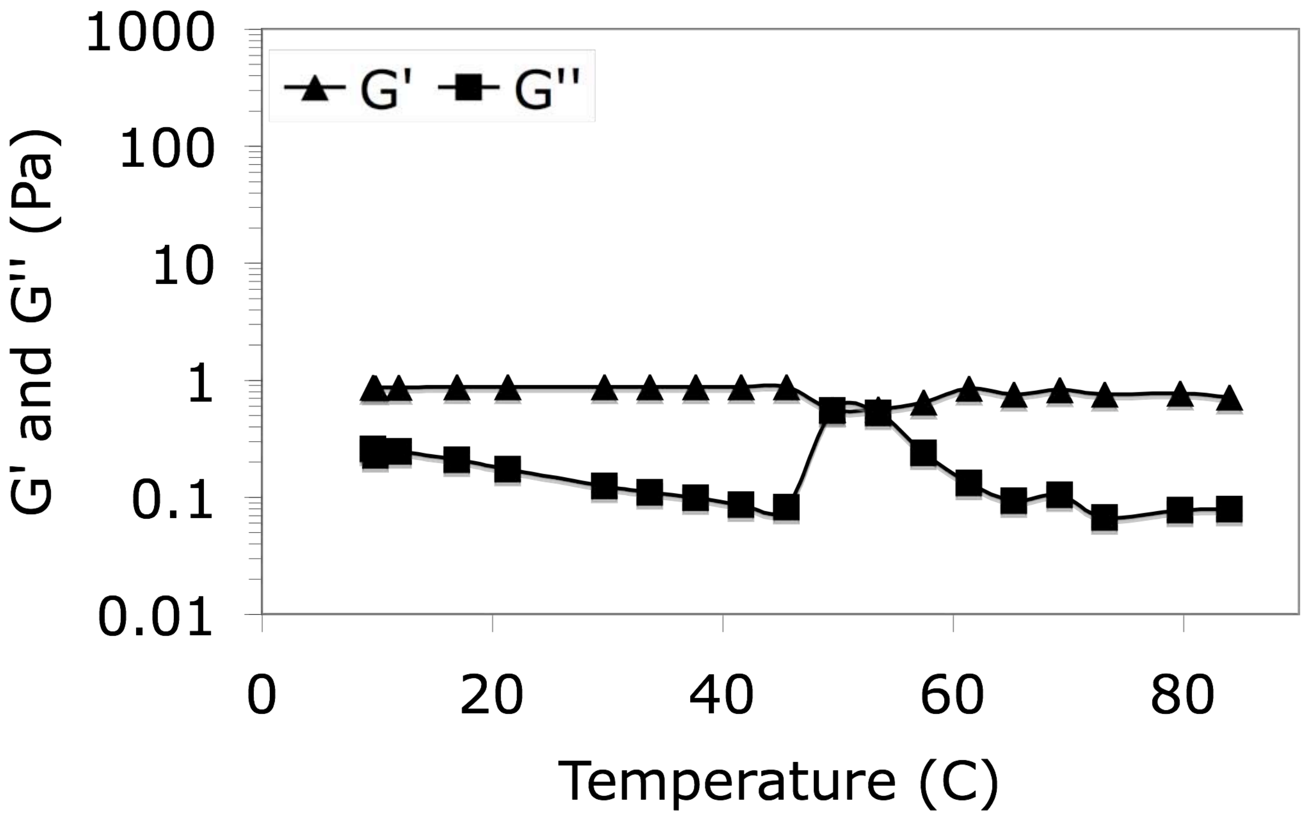
C-102. Dynamic testing of 1.000% SGMC with 0.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



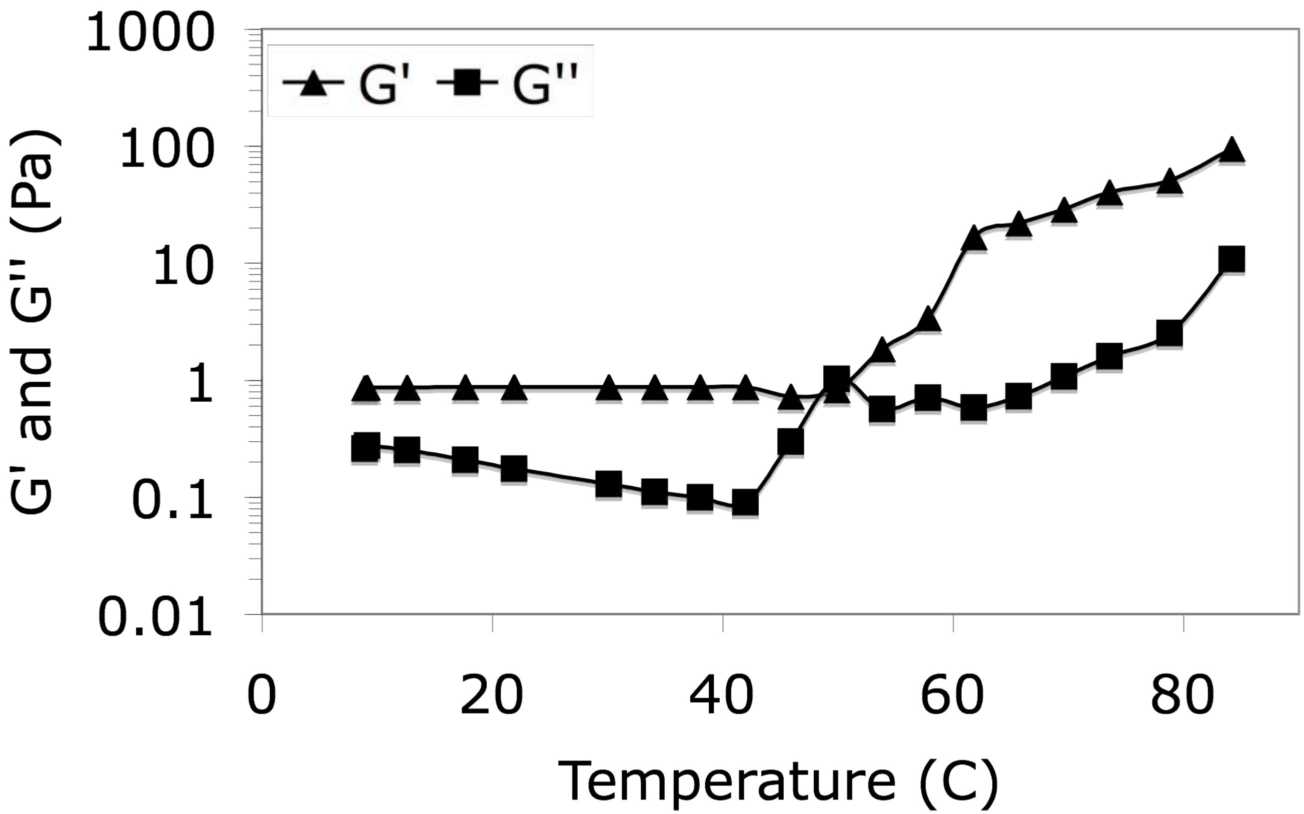
C-103. Dynamic testing of 1.000% SGMC with 0.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



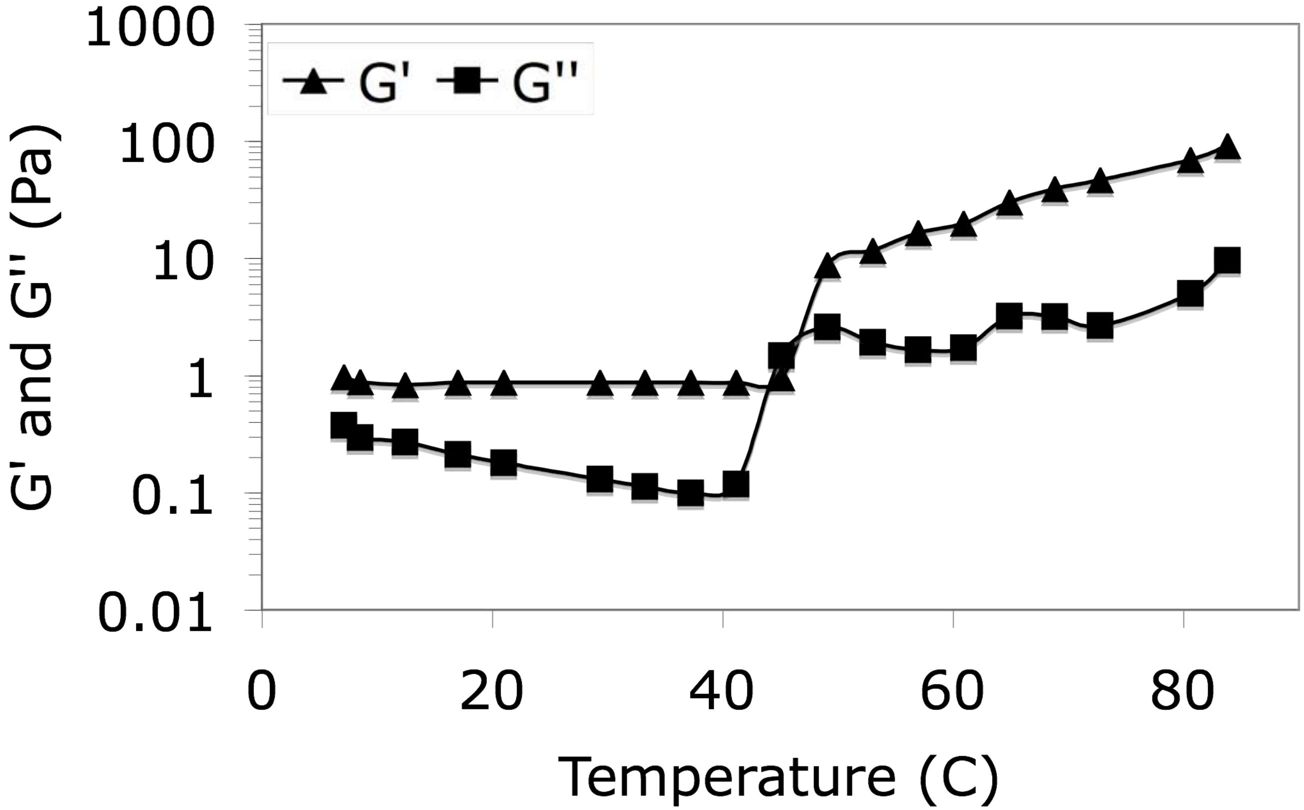
C-104. Dynamic testing of 1.000% SGMC with 1.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



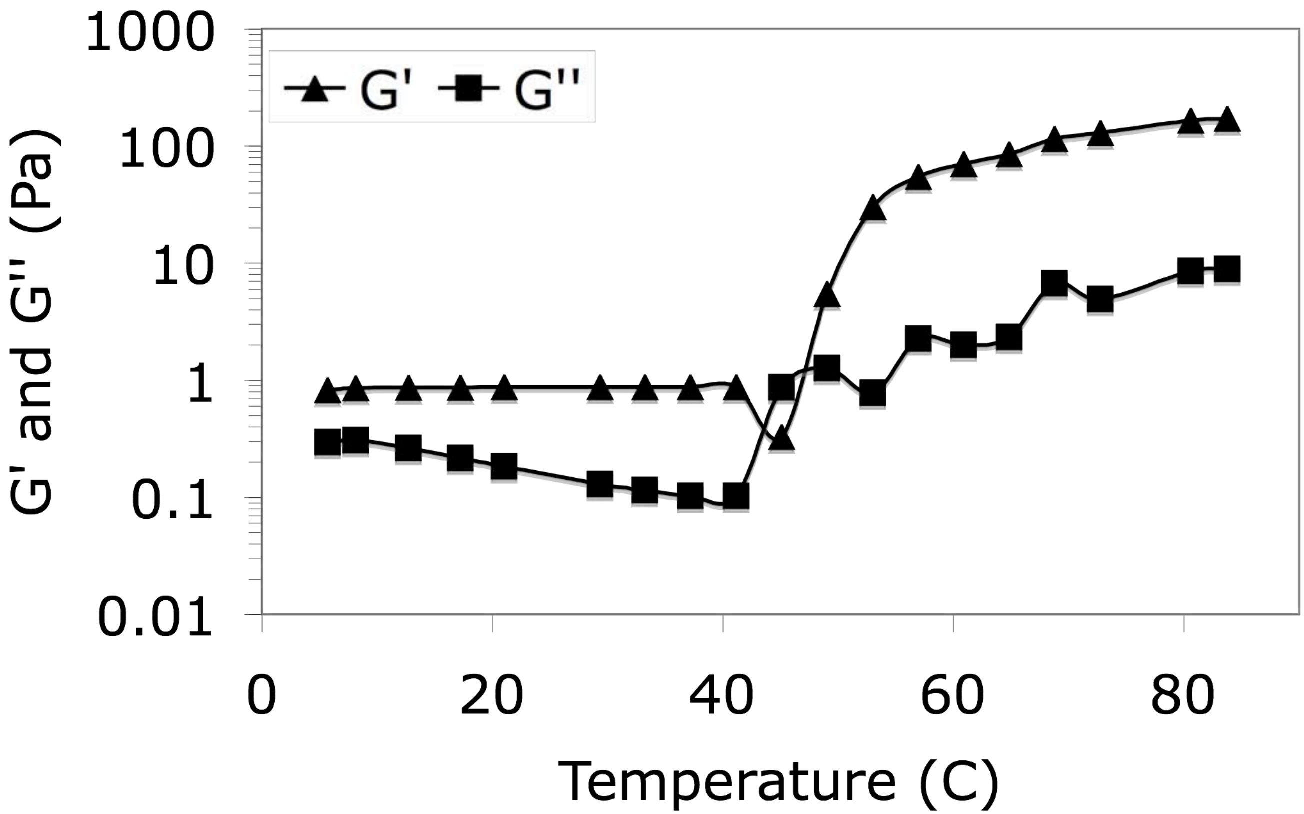
C-105. Dynamic testing of 1.000% SGMC with 1.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



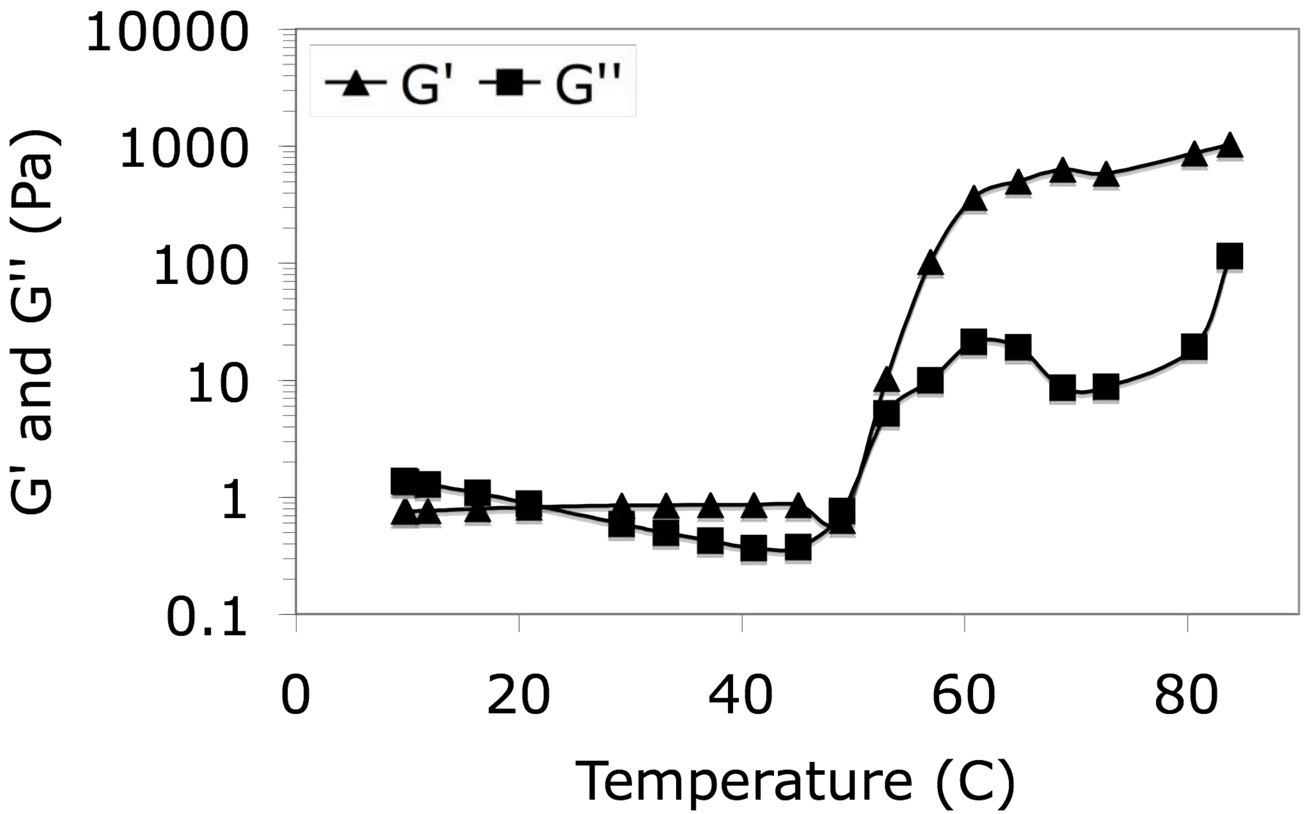
C-106. Dynamic testing of 1.000% SGMC with 2.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



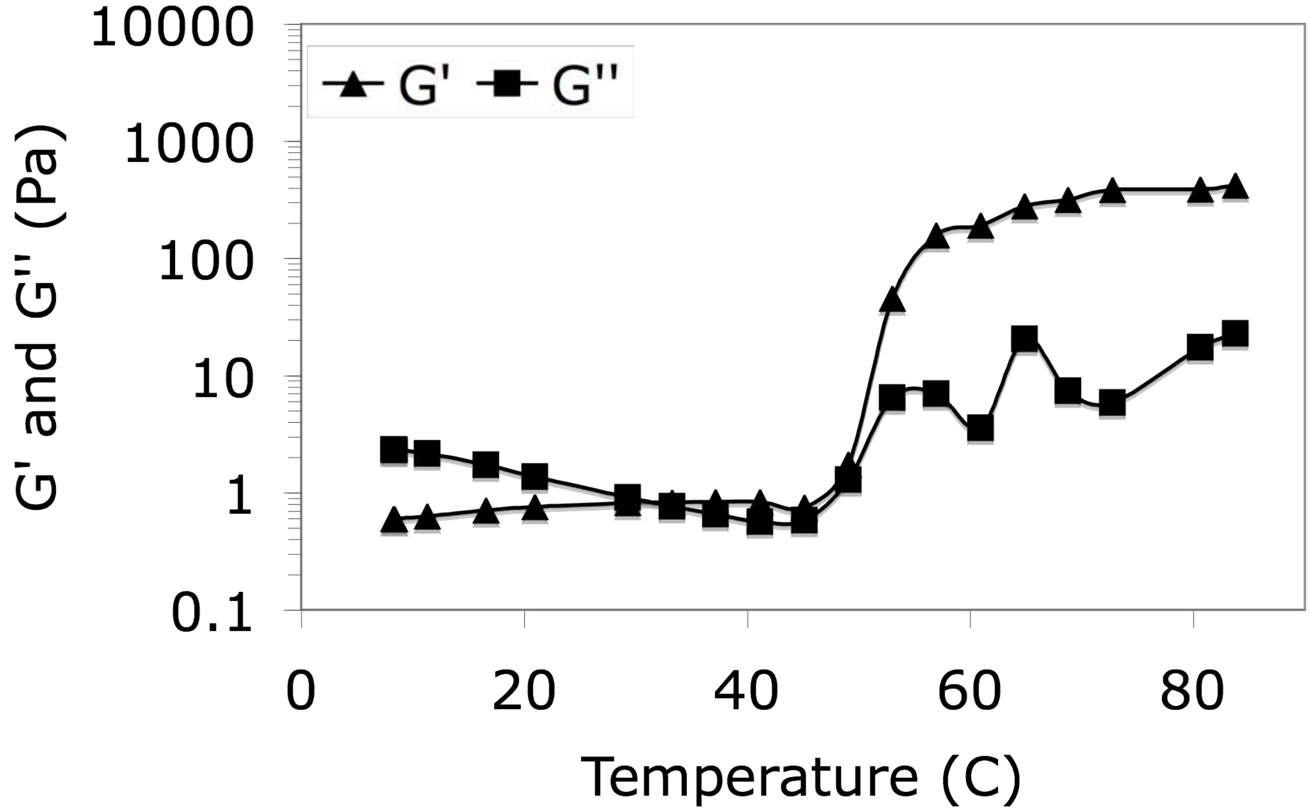
C-107. Dynamic testing of 1.000% SGMC with 2.500% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



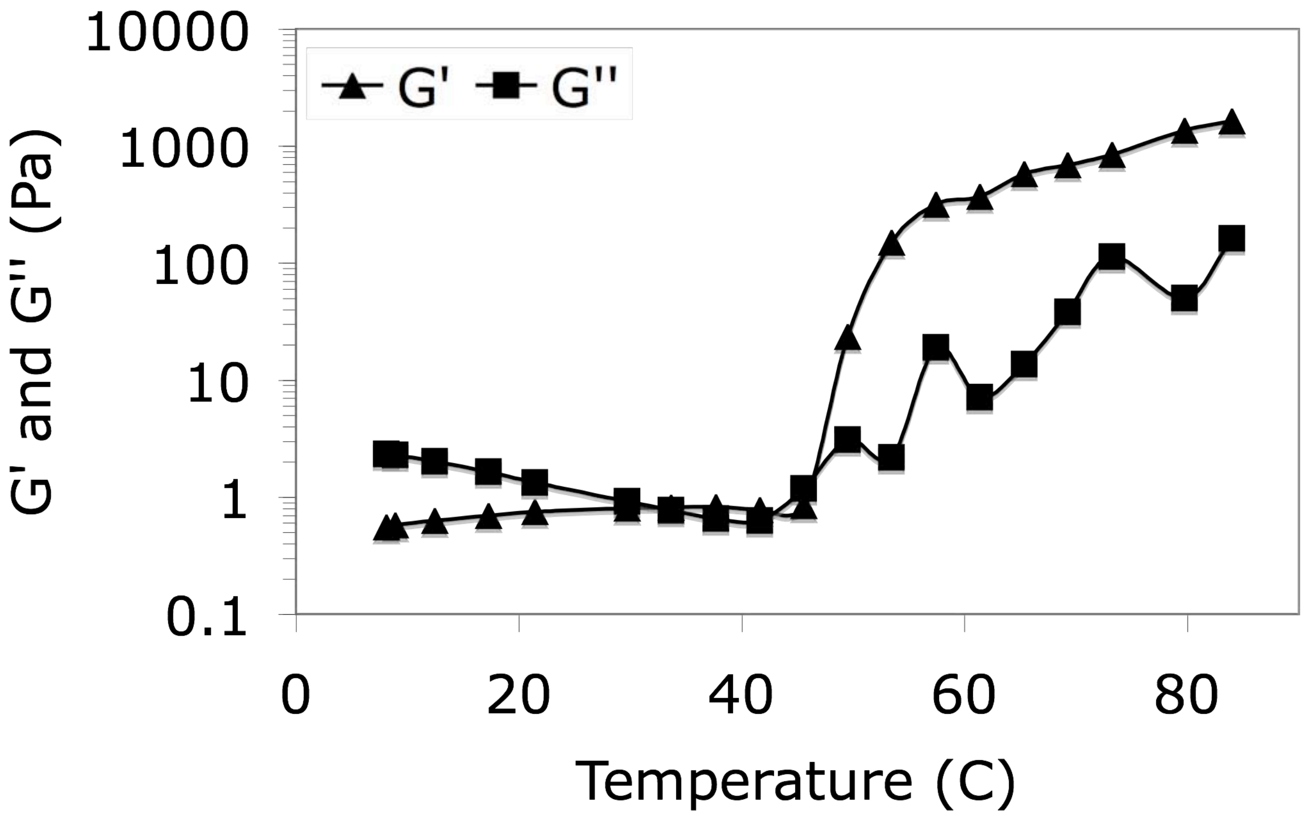
C-108. Dynamic testing of 1.000% SGMC with 3.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



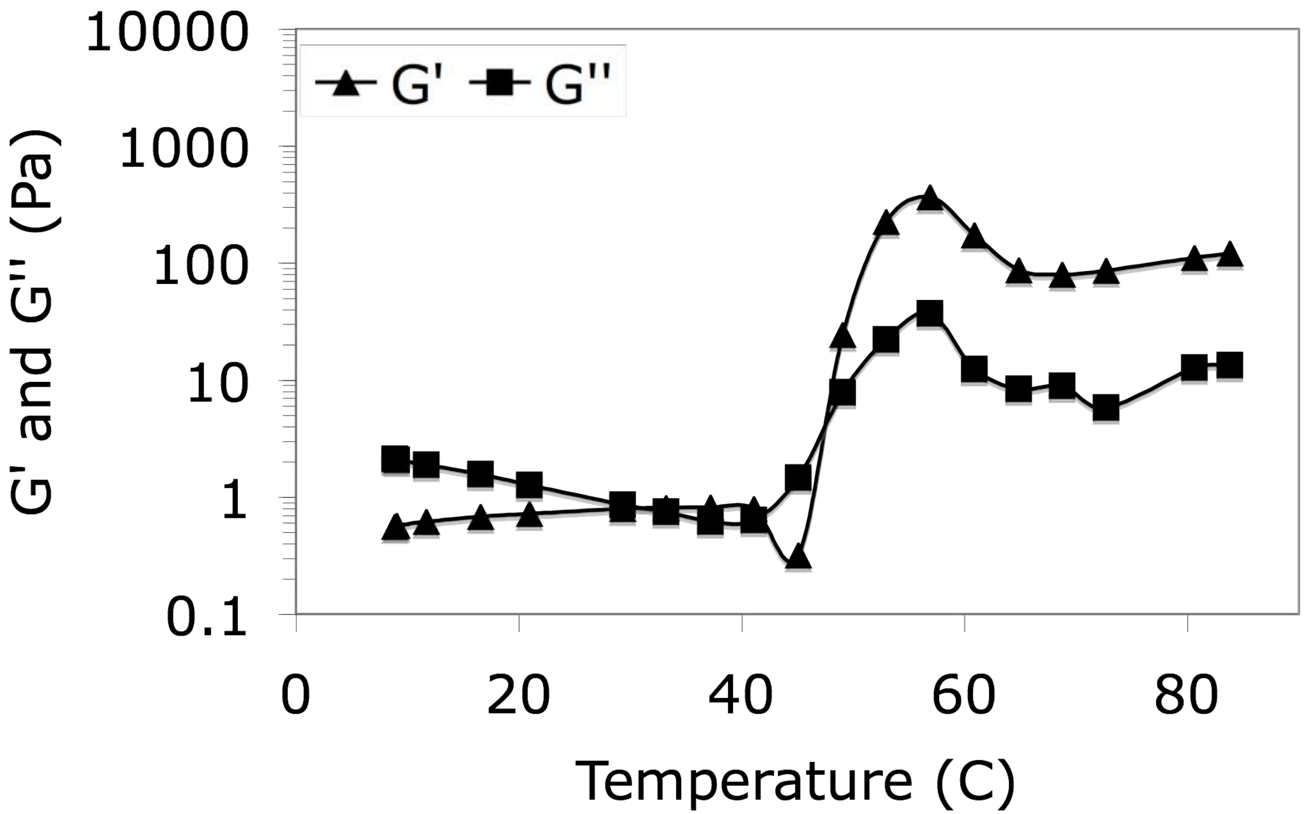
C-109. Dynamic testing of 2.000% SGMC with 0.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



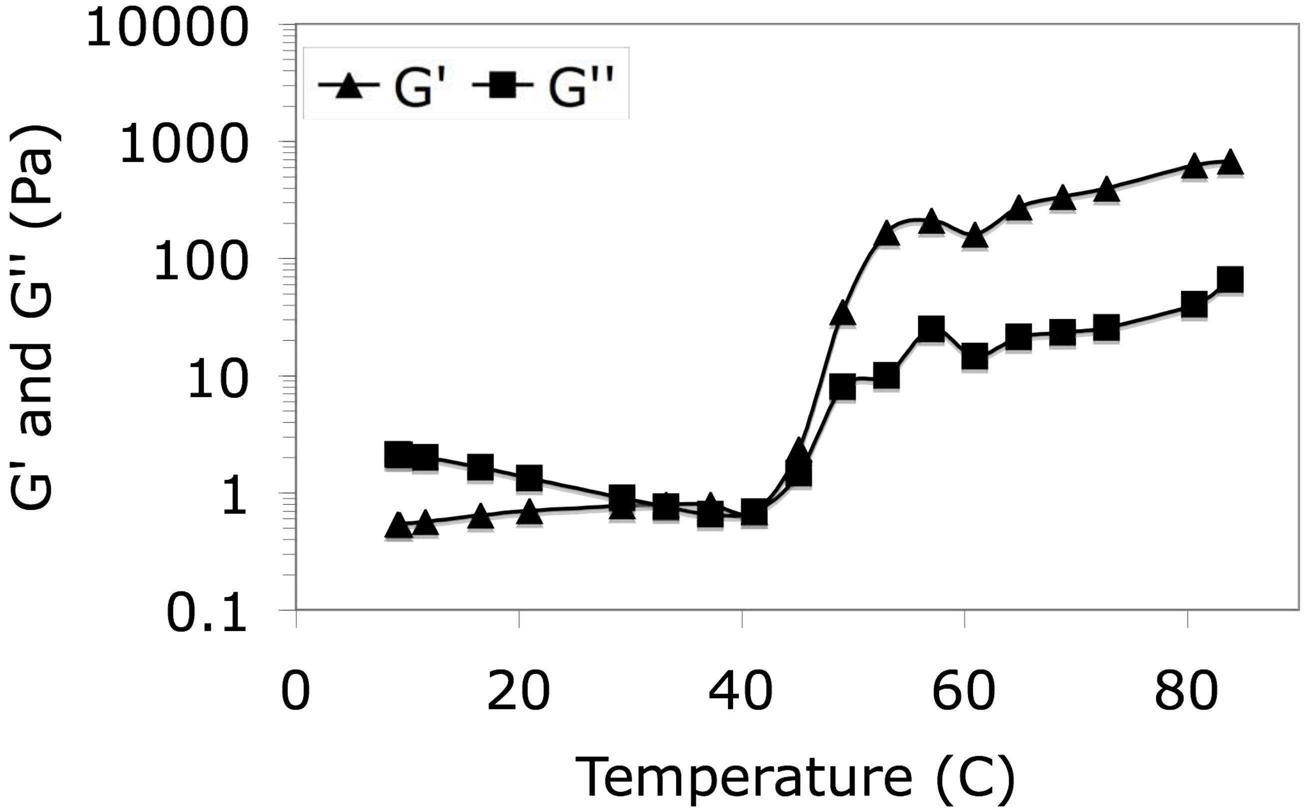
C-110. Dynamic testing of 2.000% SGMC with 0.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



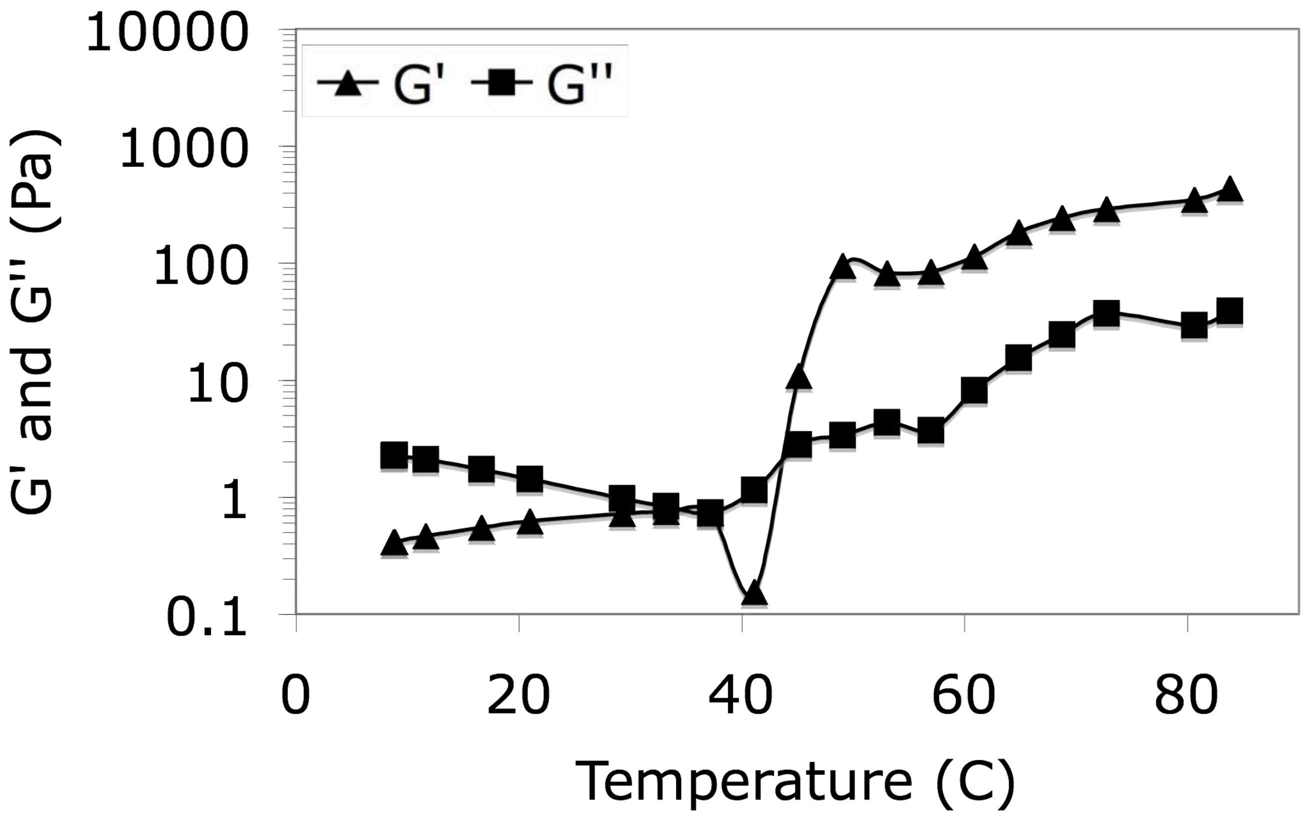
C-111. Dynamic testing of 2.000% SGMC with 1.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



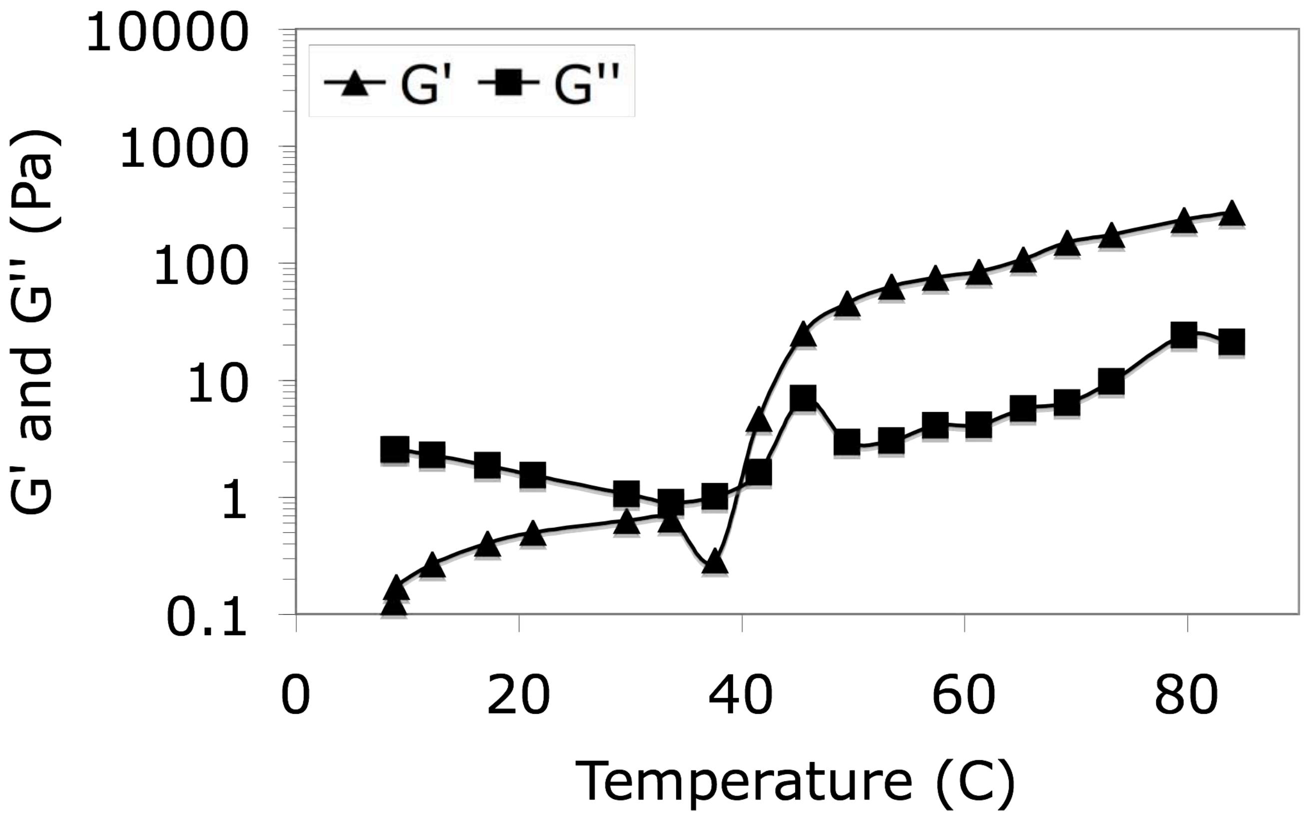
C-112. Dynamic testing of 2.000% SGMC with 1.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



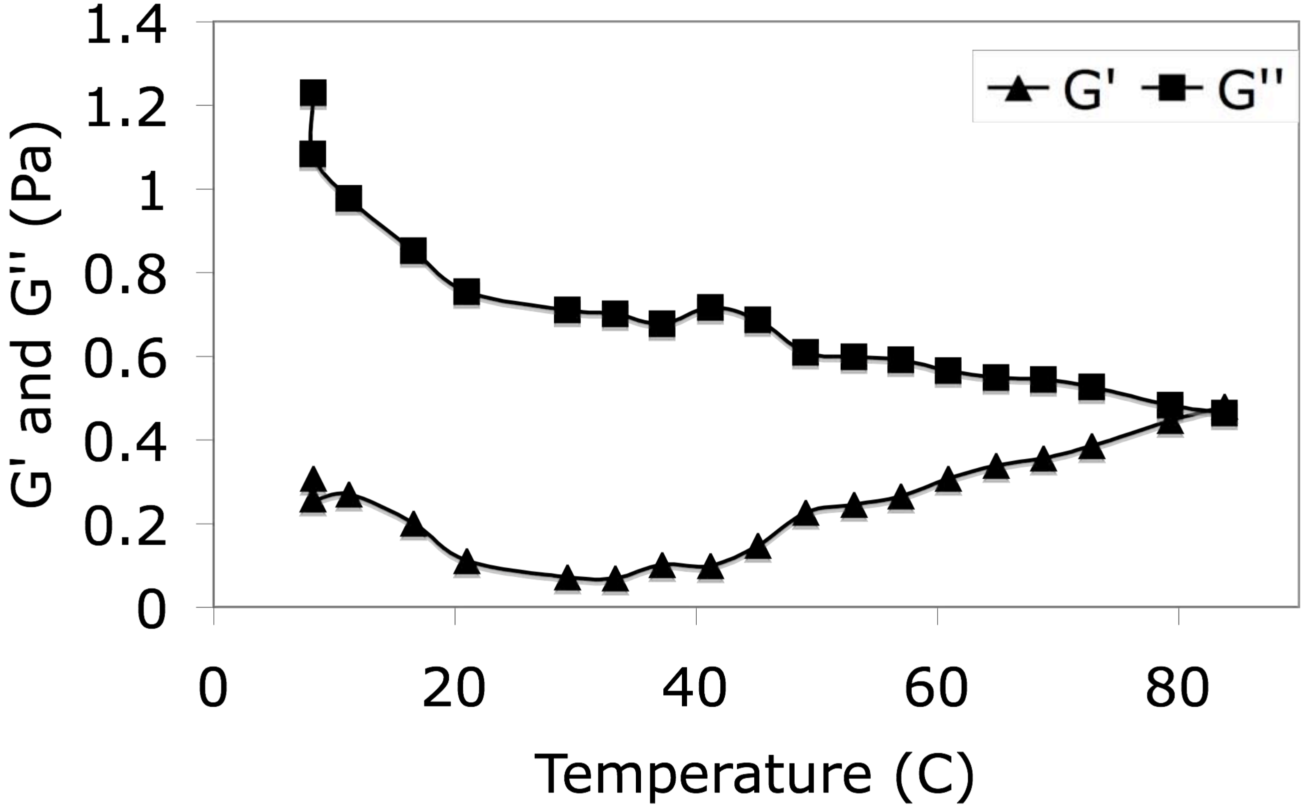
C-113. Dynamic testing of 2.000% SGMC with 2.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



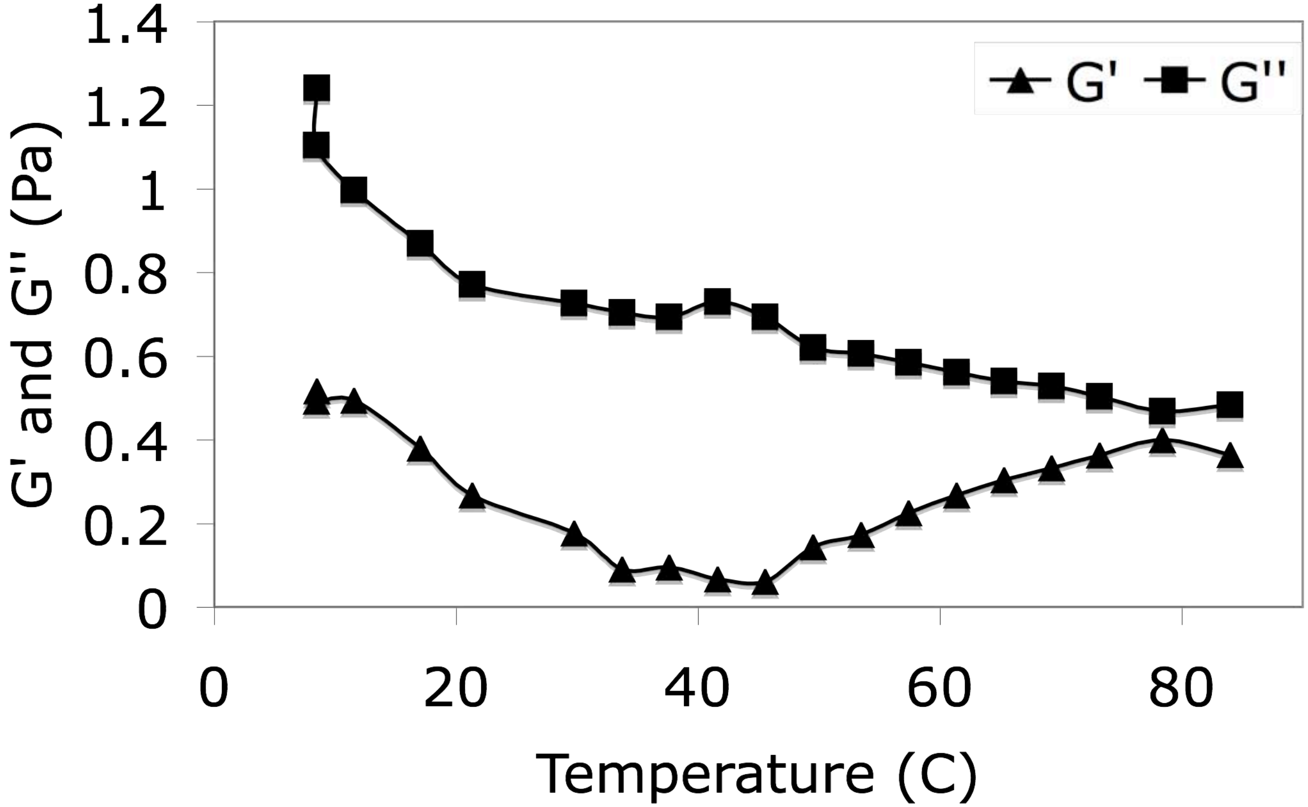
C-114. Dynamic testing of 2.000% SGMC with 2.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



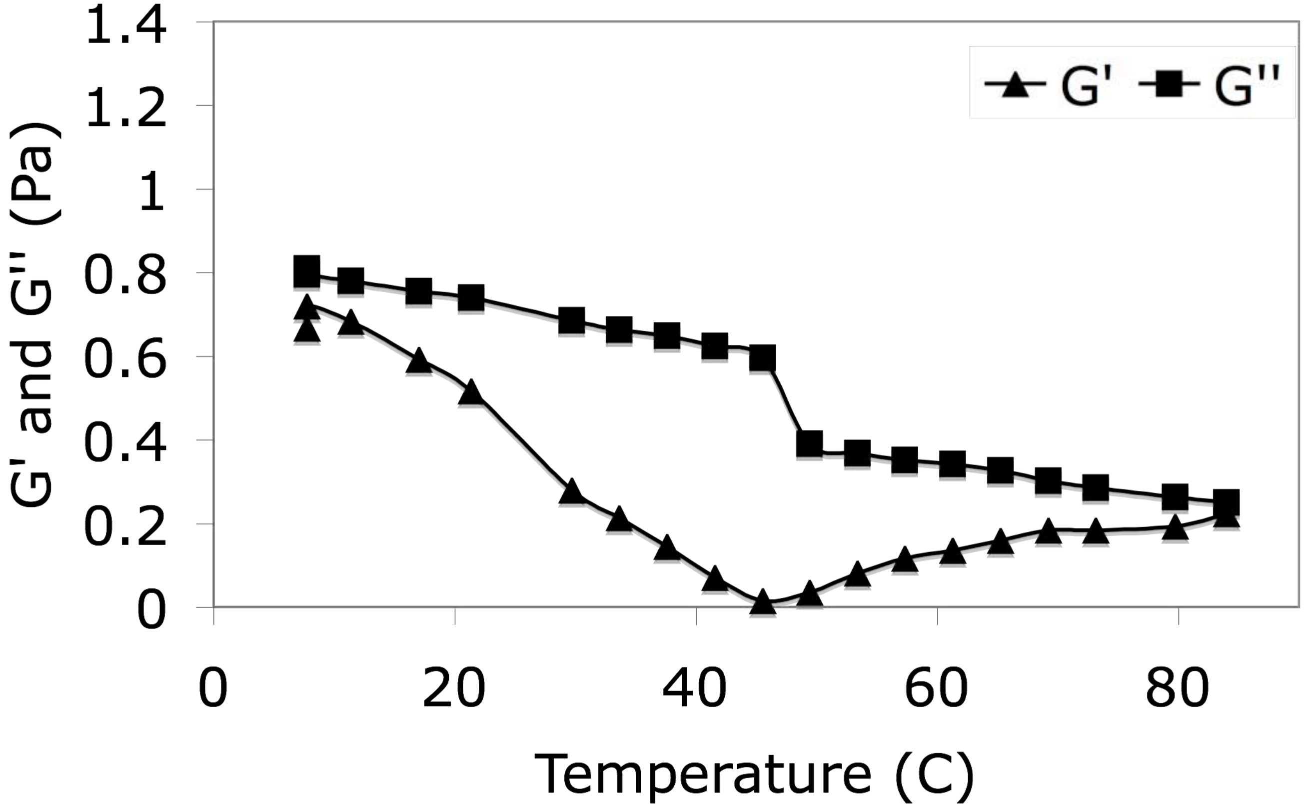
C-115. Dynamic testing of 2.000% SGMC with 3.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



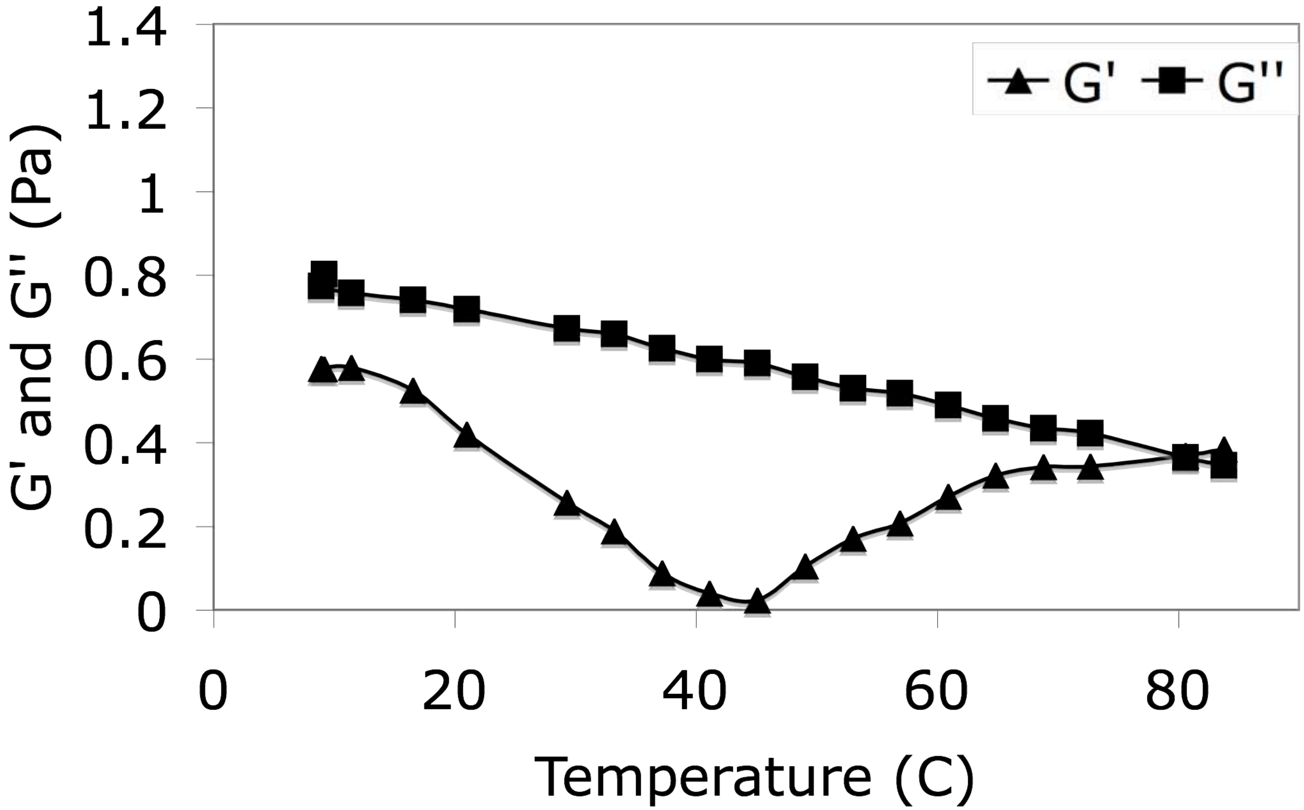
C-116. Dynamic testing of 0.250% XG with 0.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



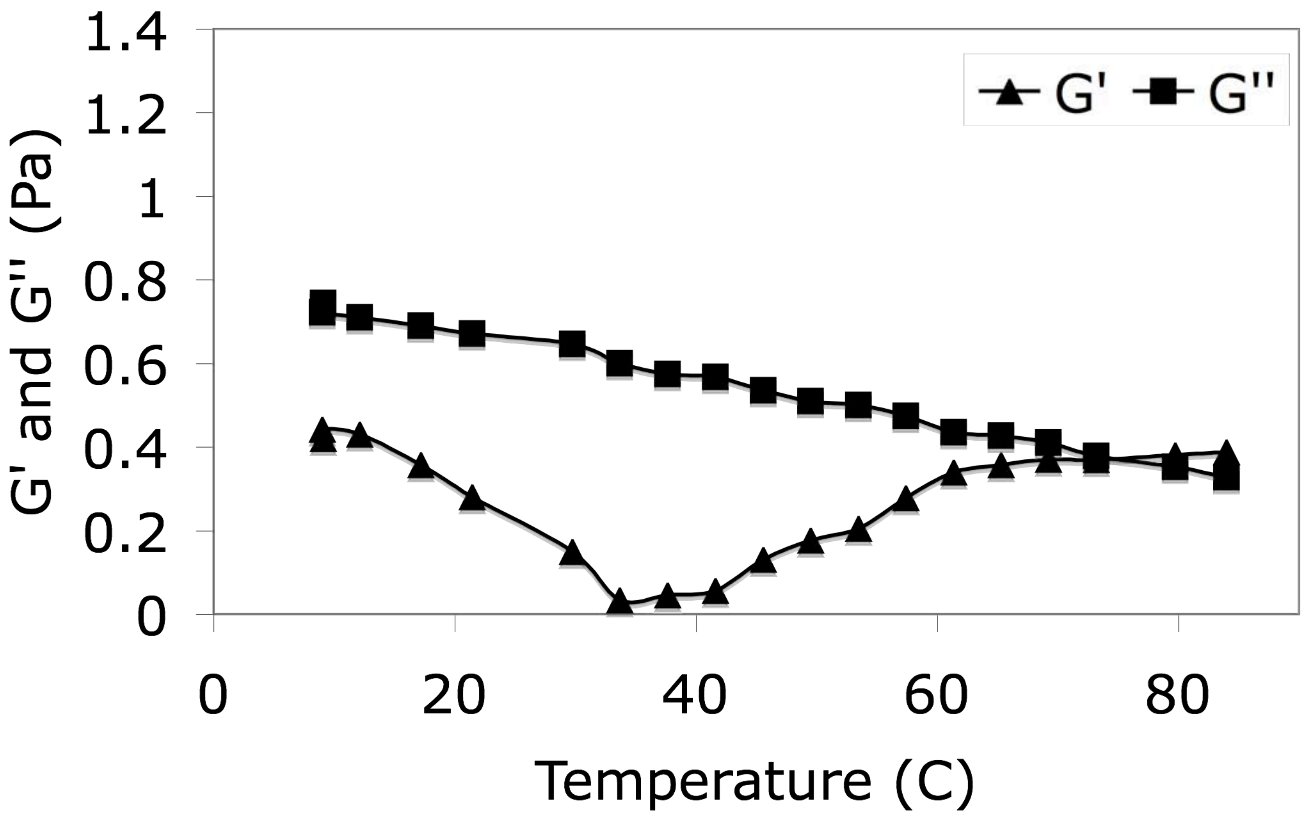
C-117. Dynamic testing of 0.250% XG with 0.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



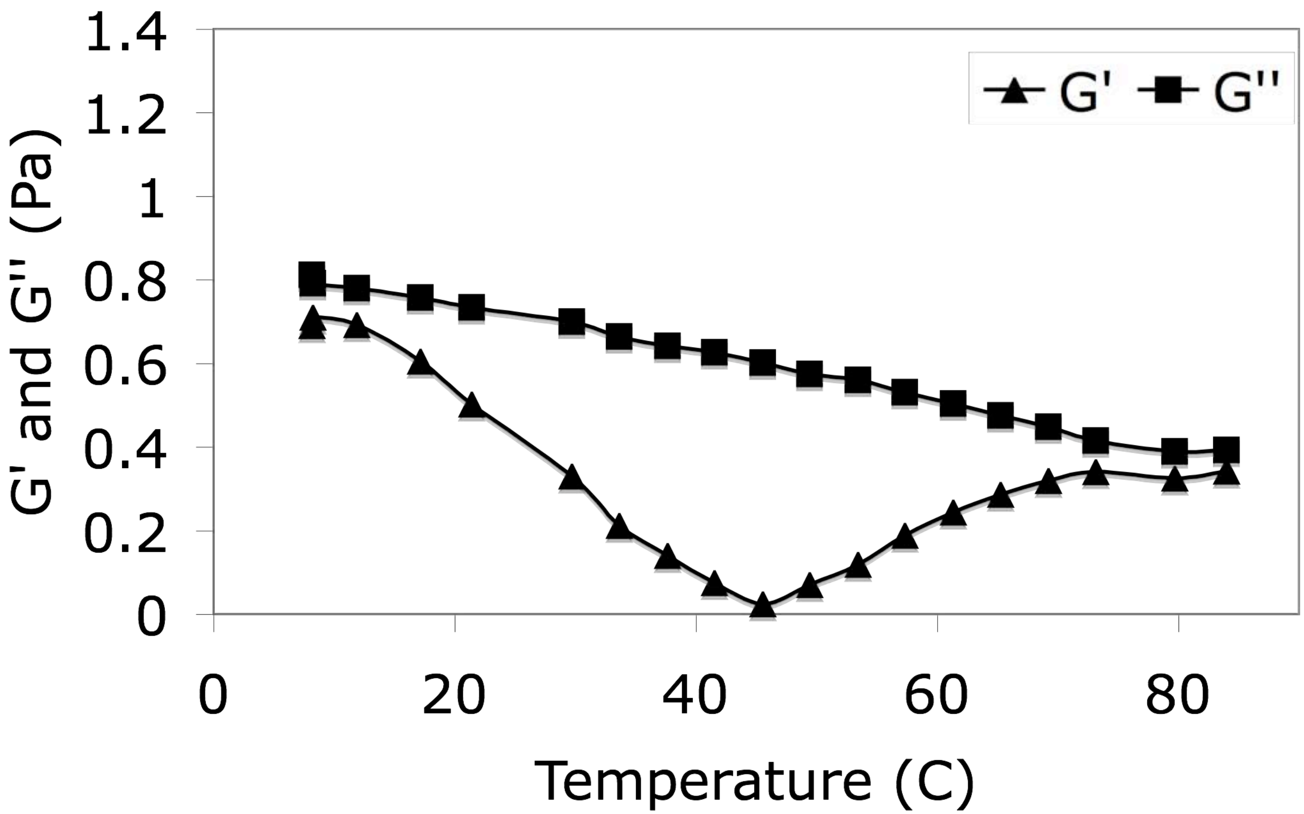
C-118. Dynamic testing of 0.250% XG with 1.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



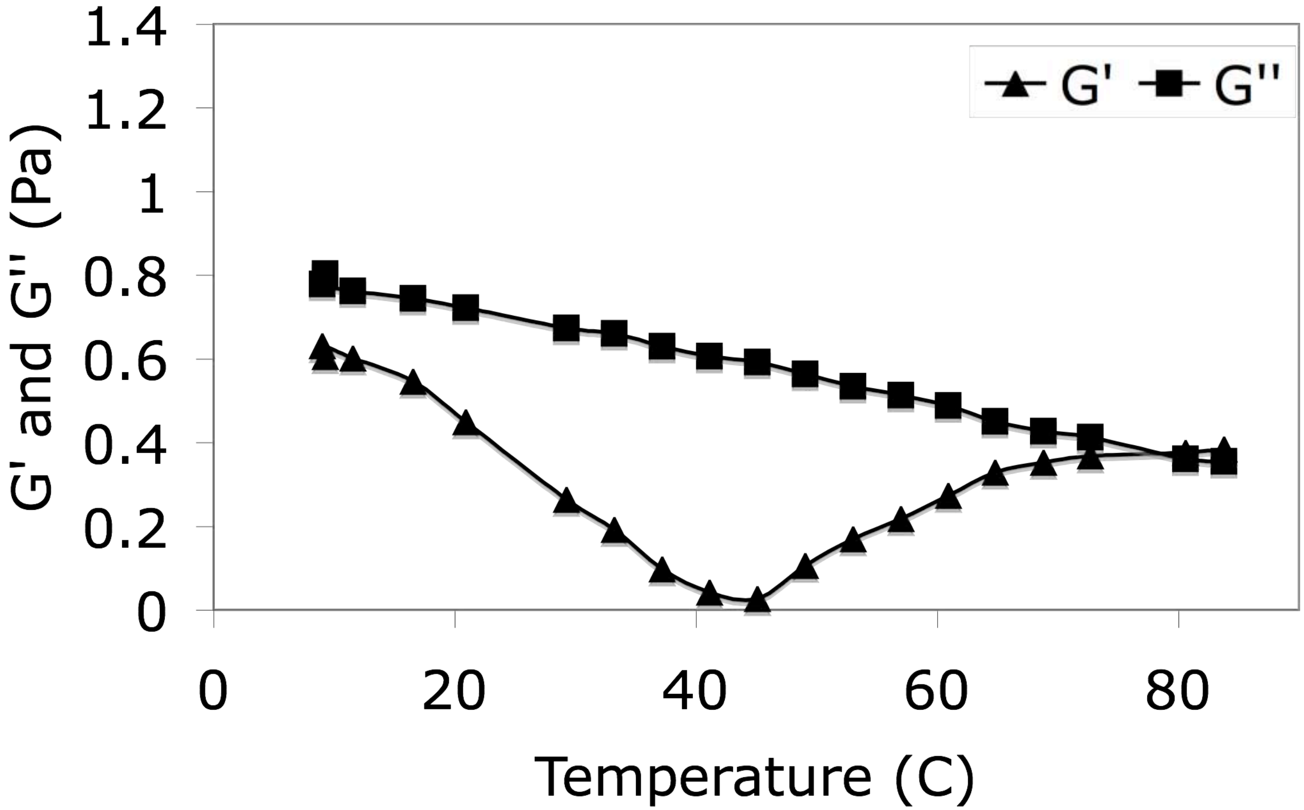
C-119. Dynamic testing of 0.250% XG with 1.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



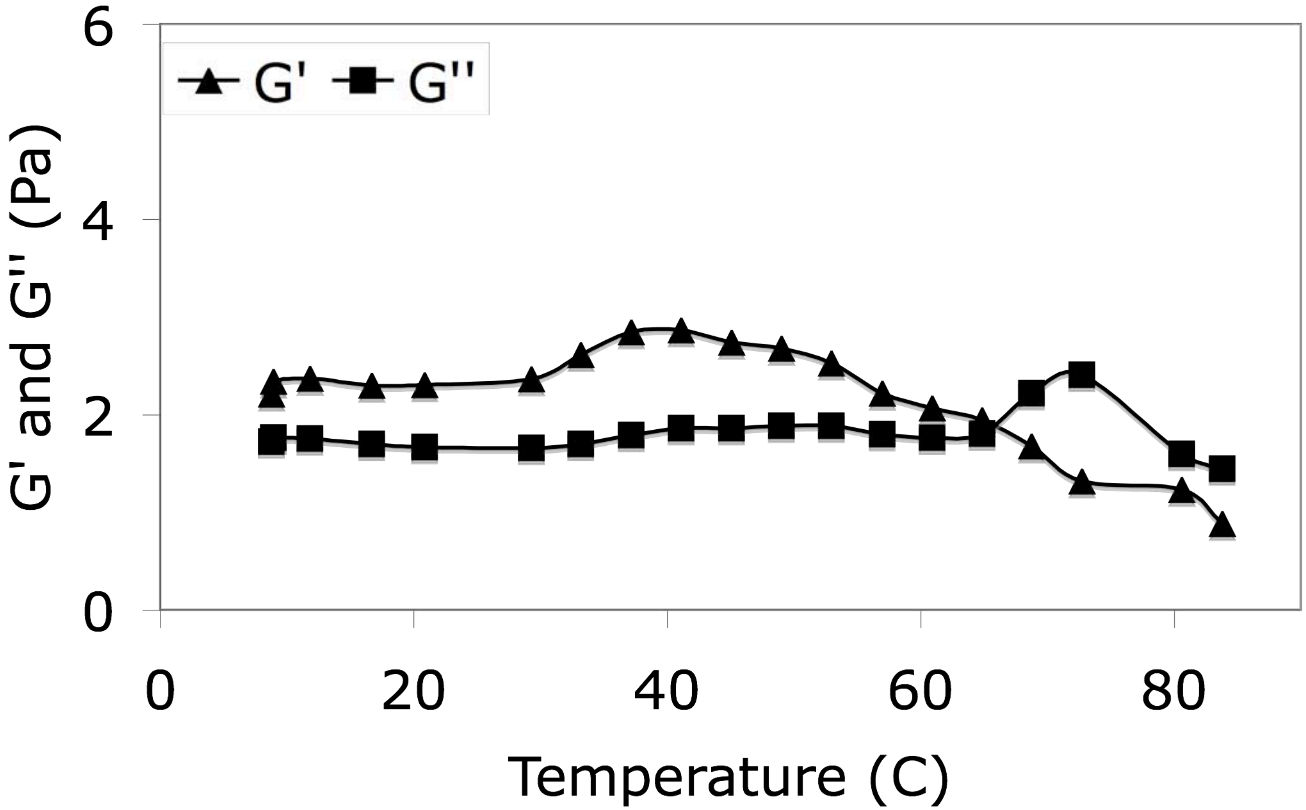
C-120. Dynamic testing of 0.250% XG with 2.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



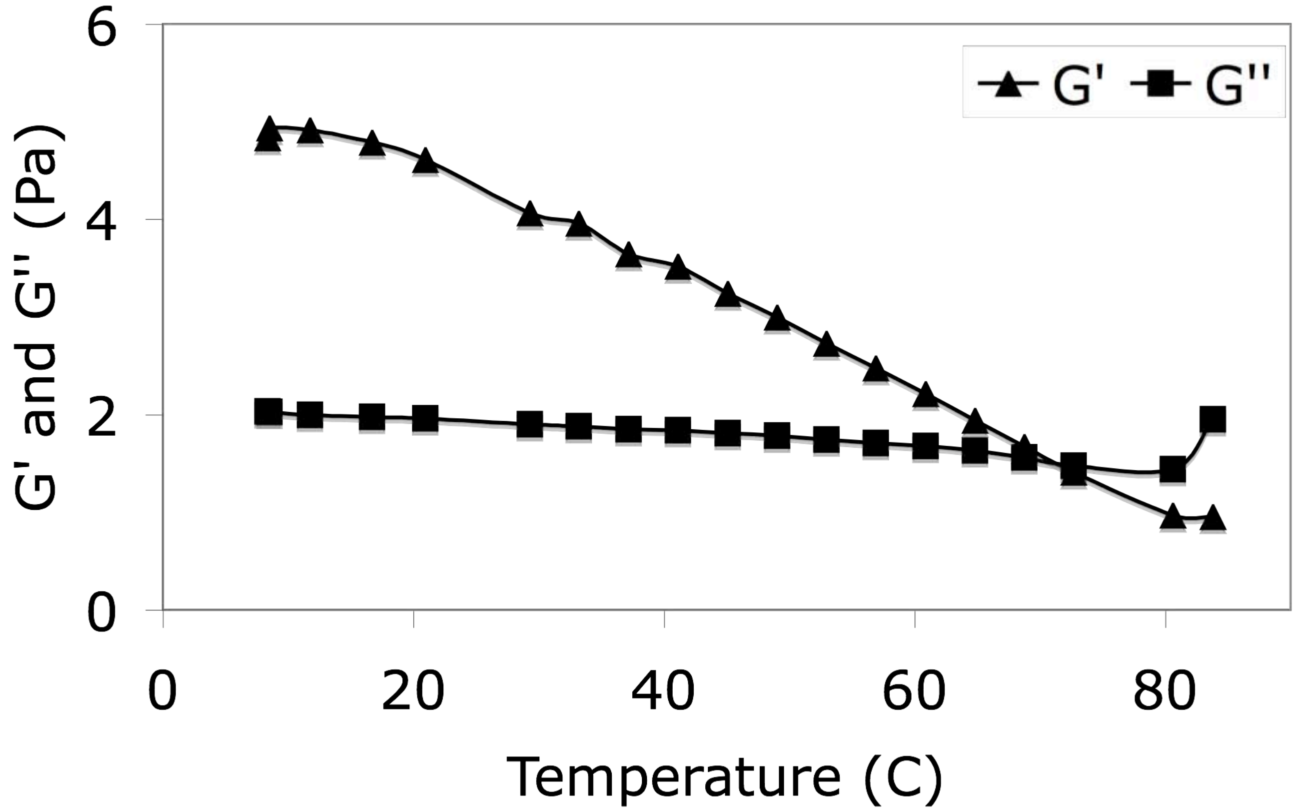
C-121. Dynamic testing of 0.250% XG with 2.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



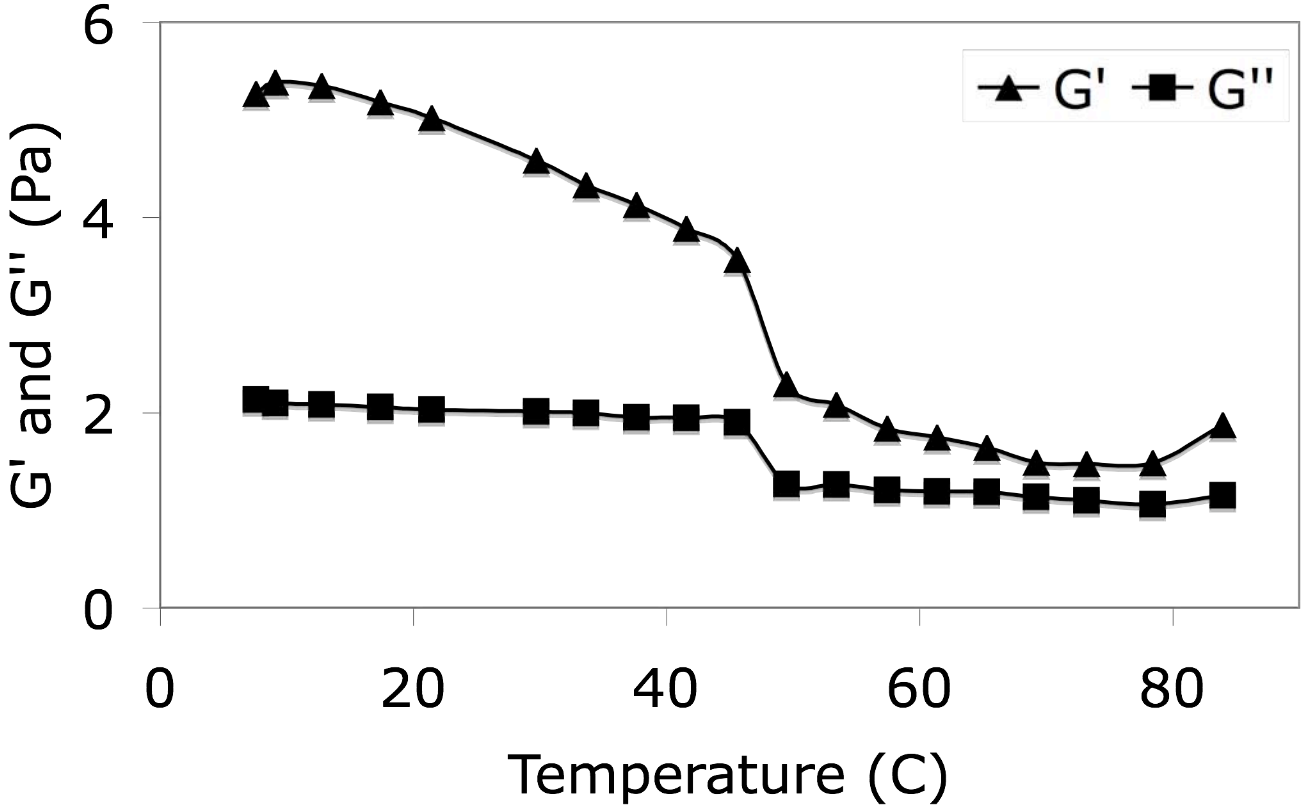
C-122. Dynamic testing of 0.250% XG with 3.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



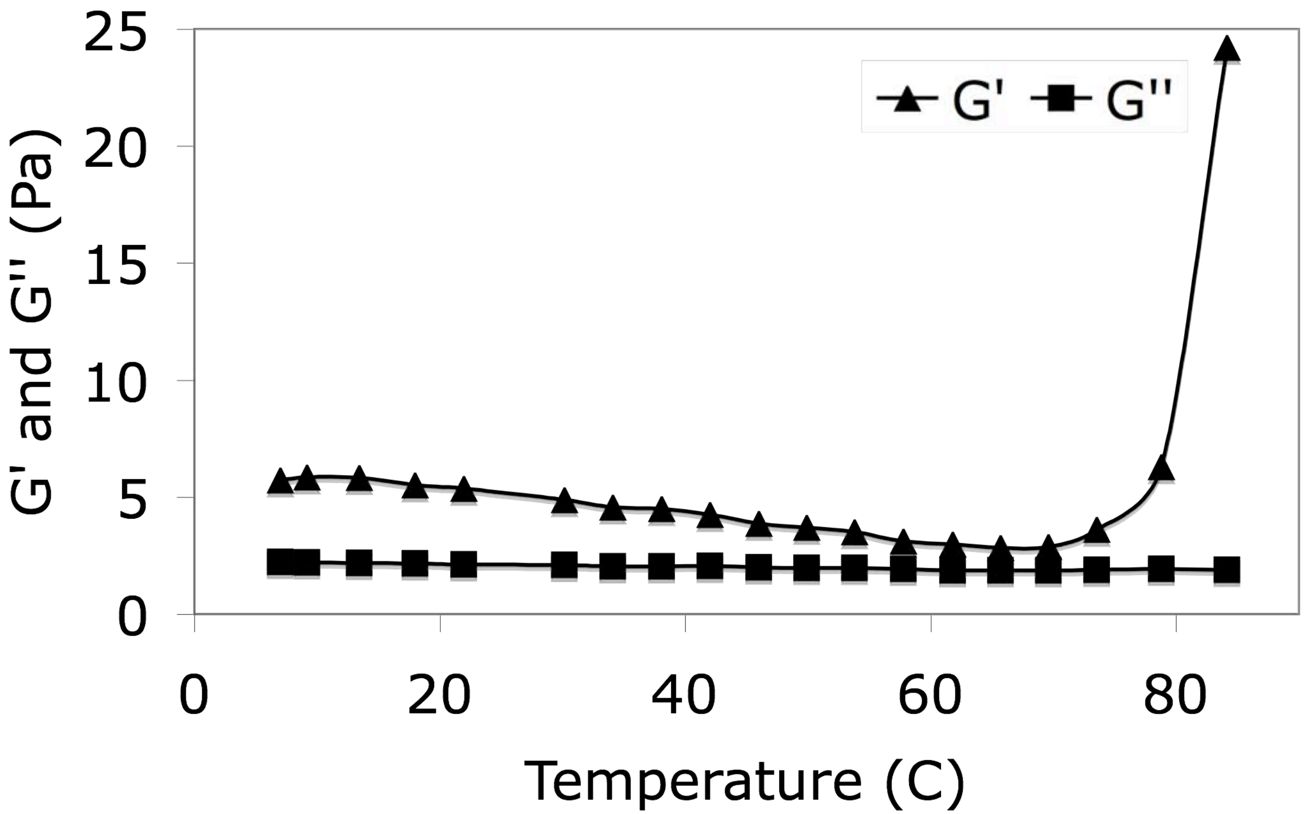
C-123. Dynamic testing of 0.500% XG with 0.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



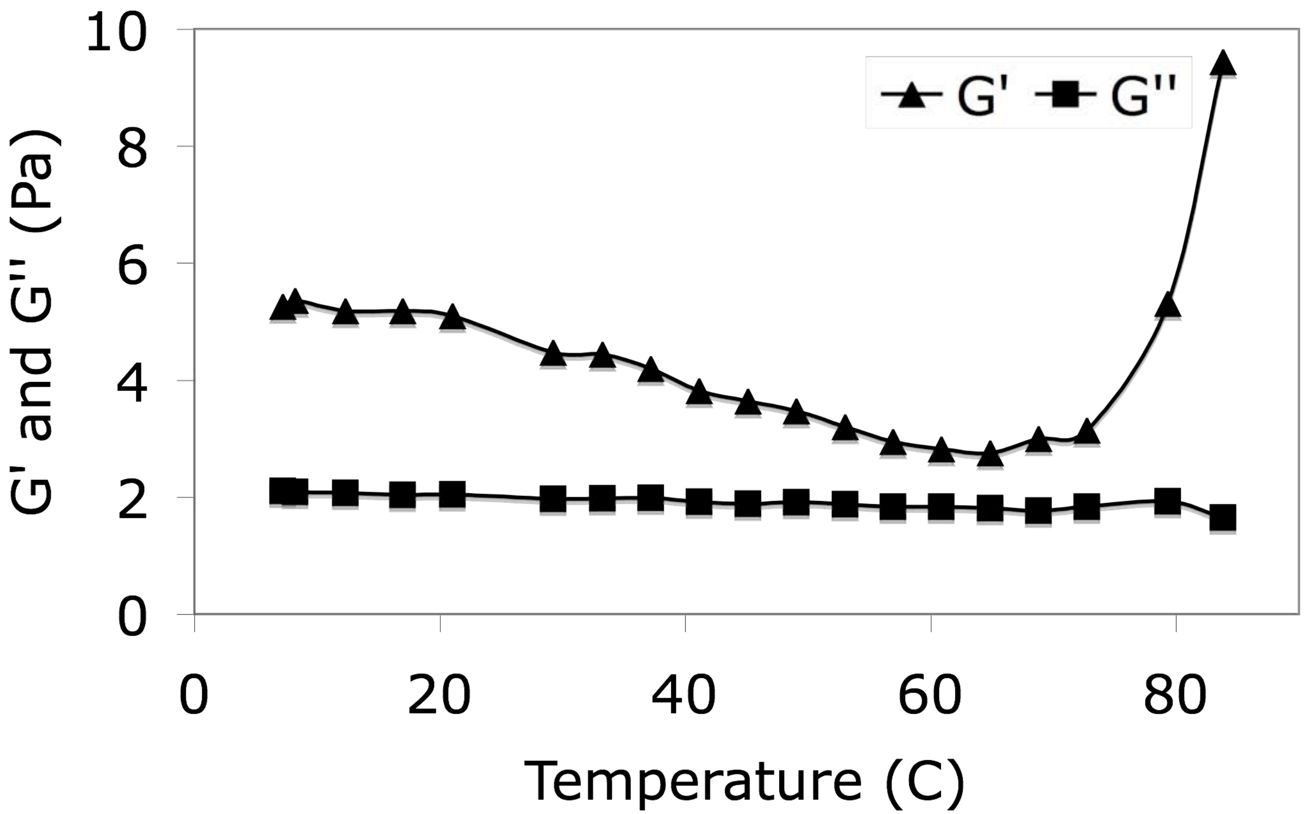
C-124. Dynamic testing of 0.500% XG with 0.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



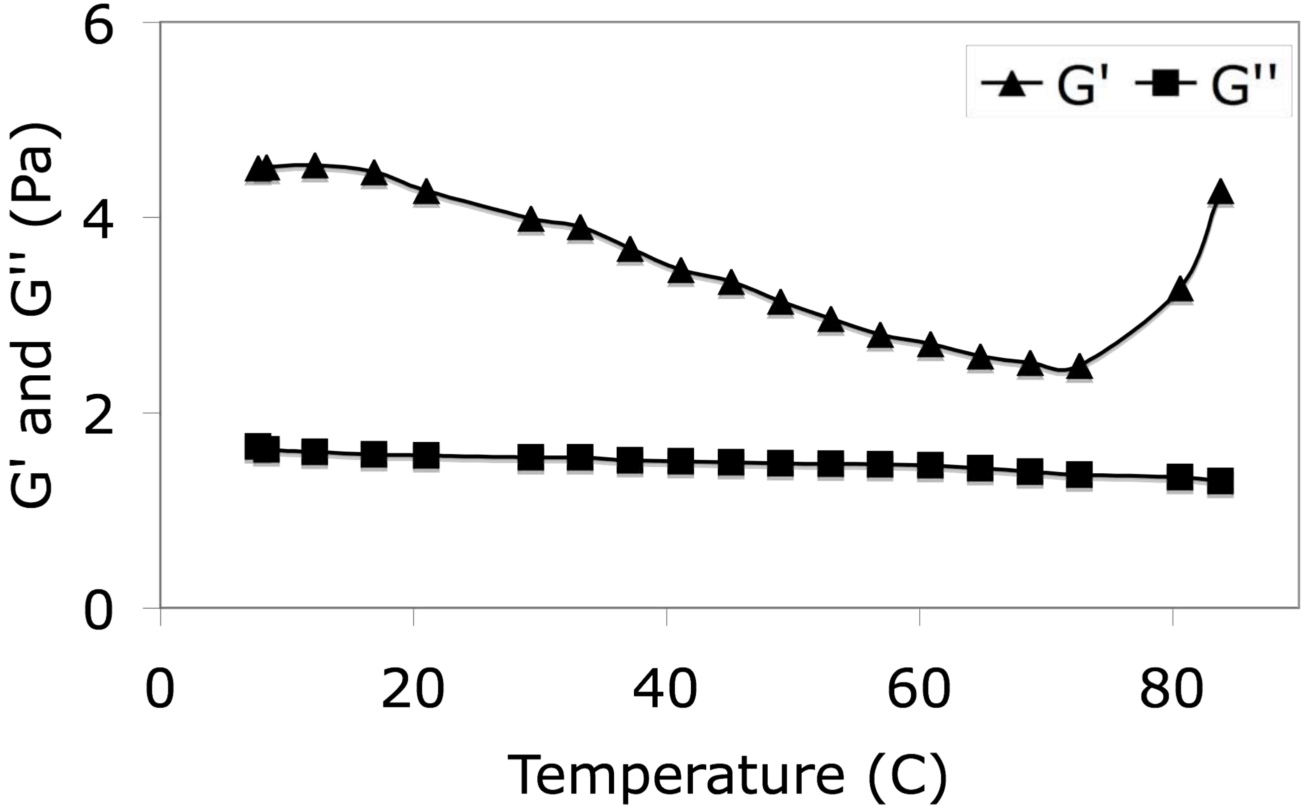
C-125. Dynamic testing of 0.500% XG with 1.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



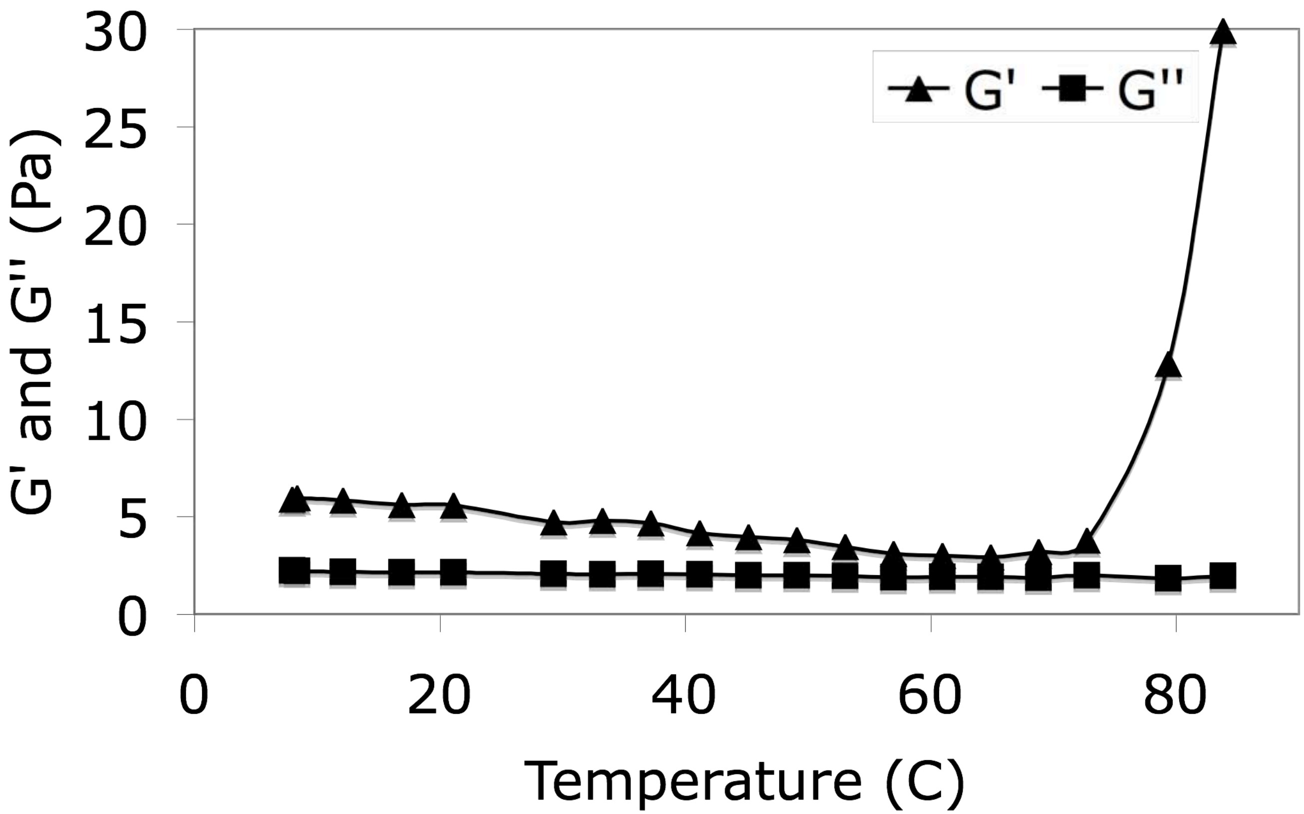
C-126. Dynamic testing of 0.500% XG with 1.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



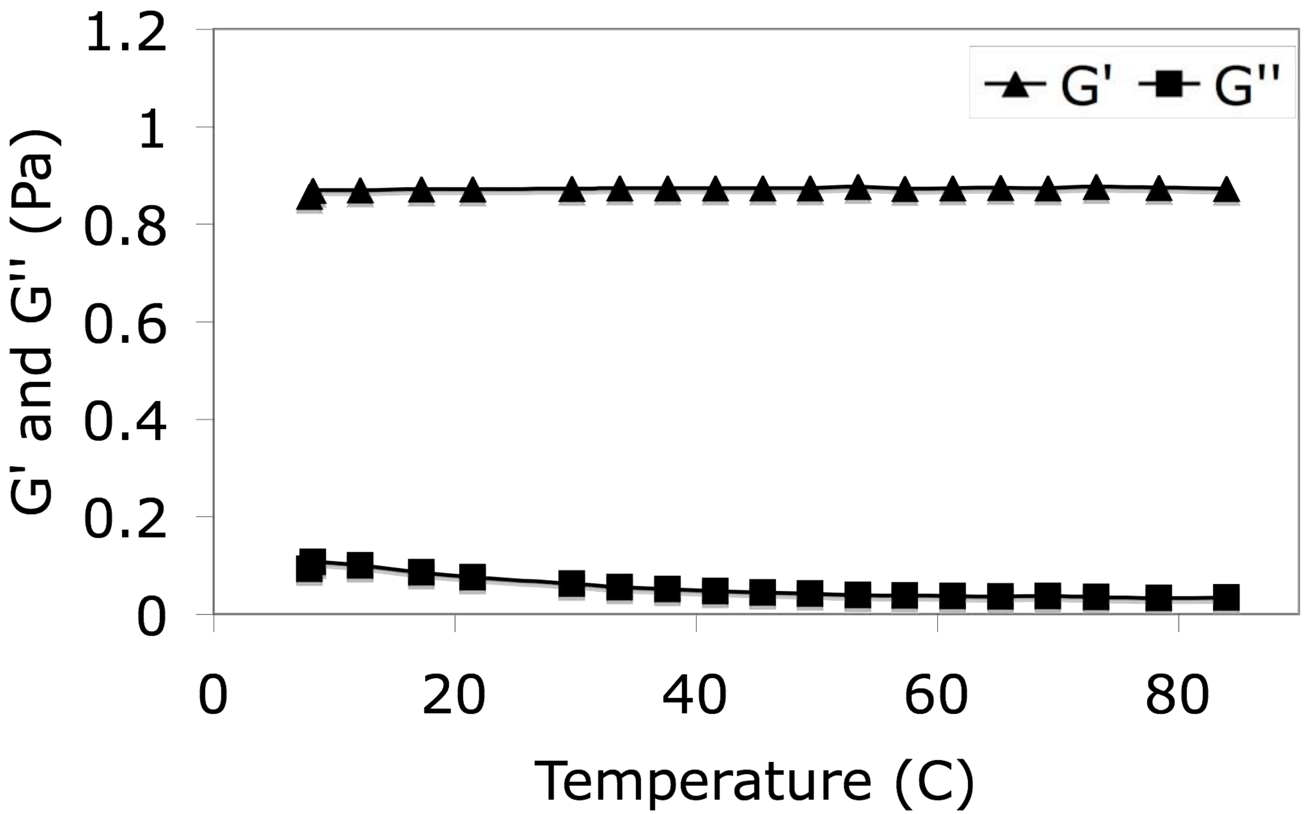
C-127. Dynamic testing of 0.500% XG with 2.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



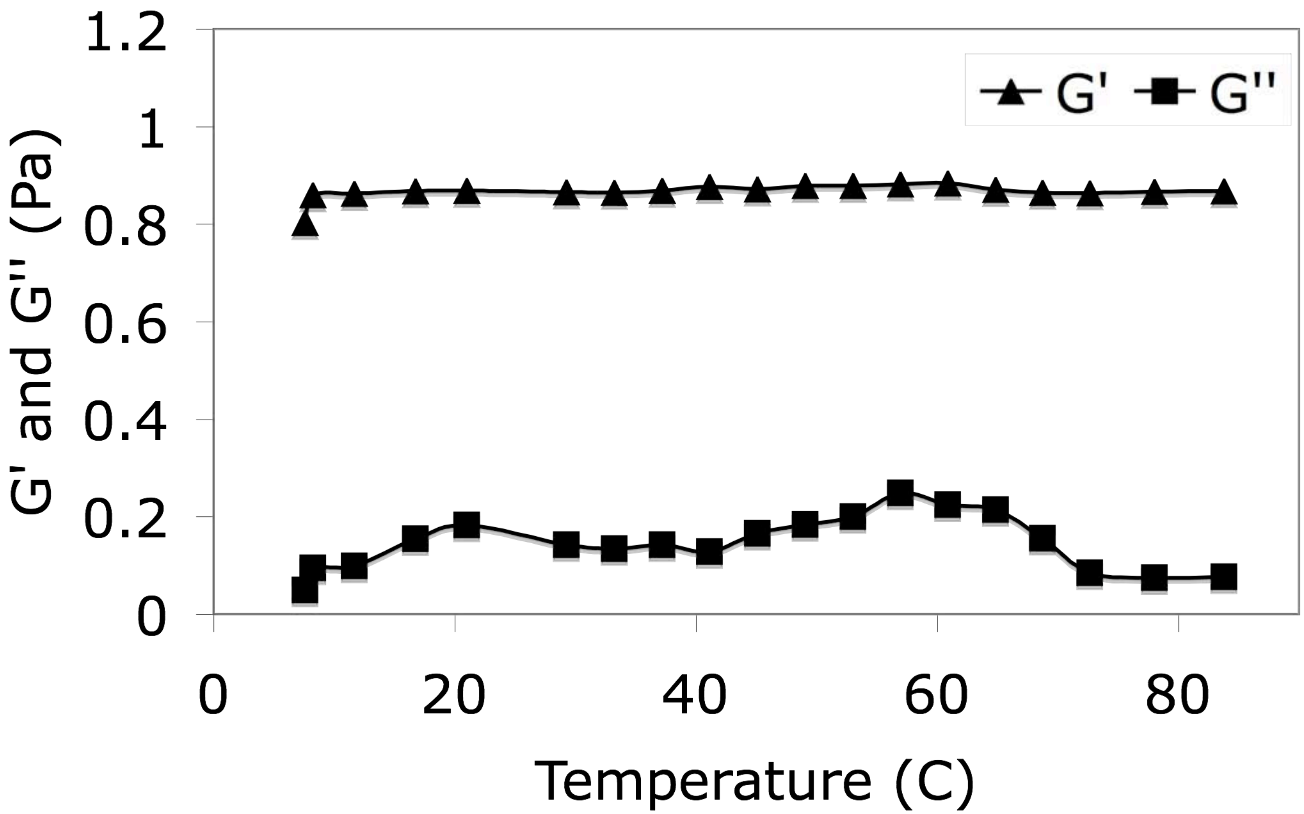
C-128. Dynamic testing of 0.500% XG with 2.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



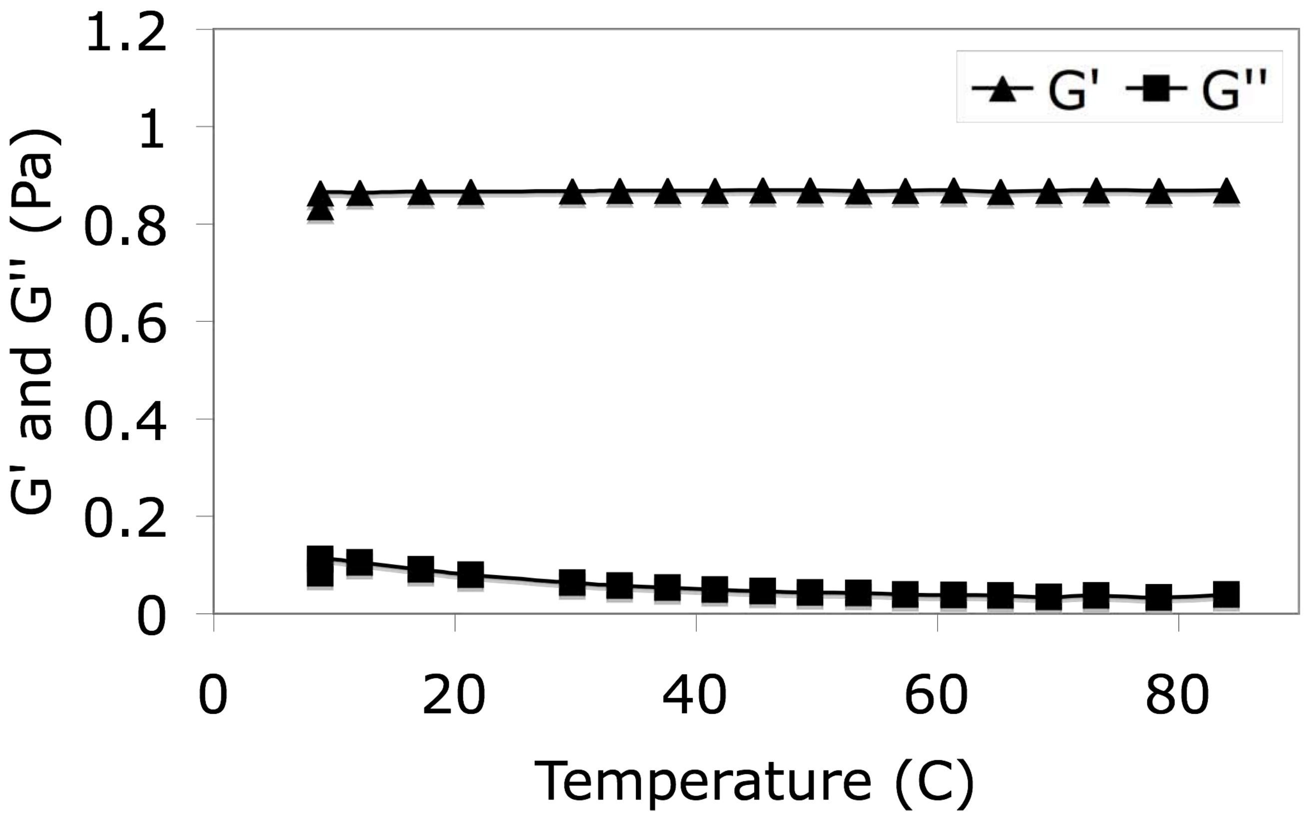
C-129. Dynamic testing of 0.500% XG with 3.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



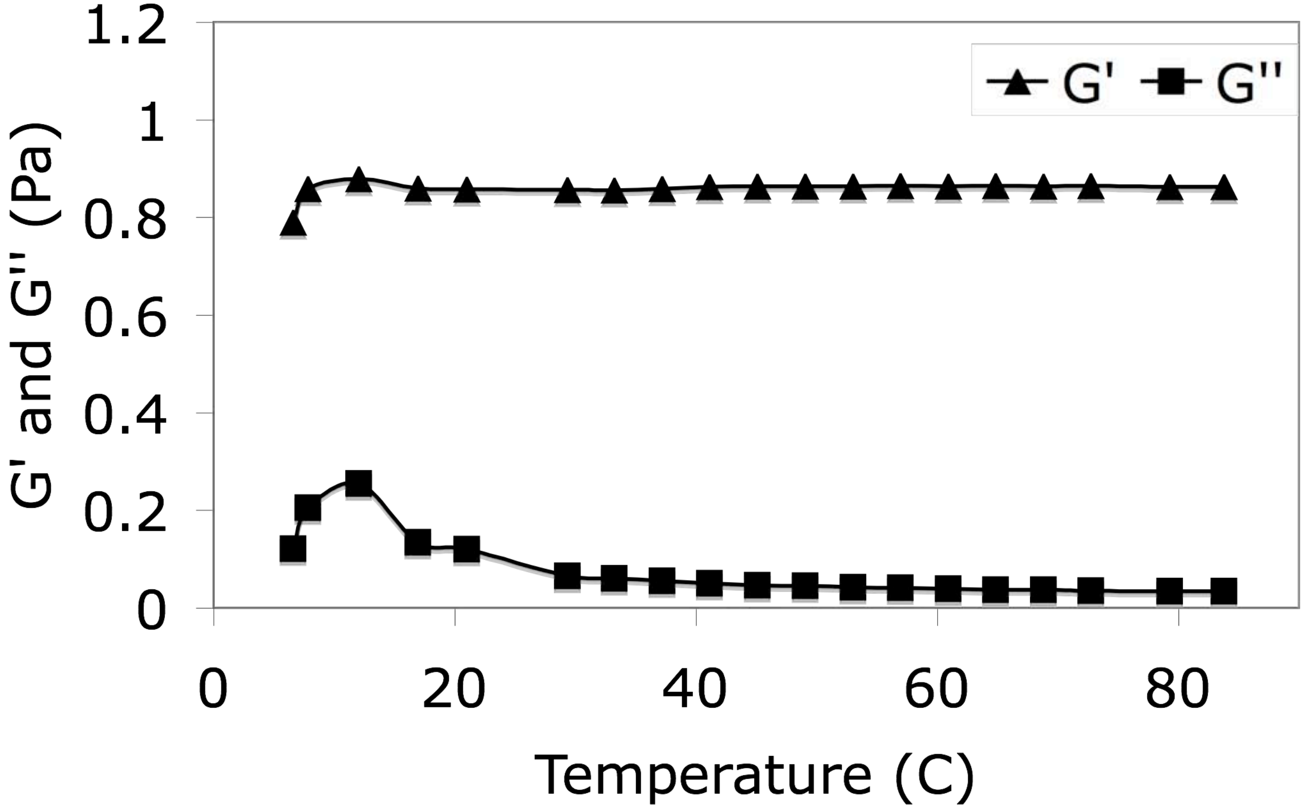
C-130. Dynamic testing of 0.125% KF with 0.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



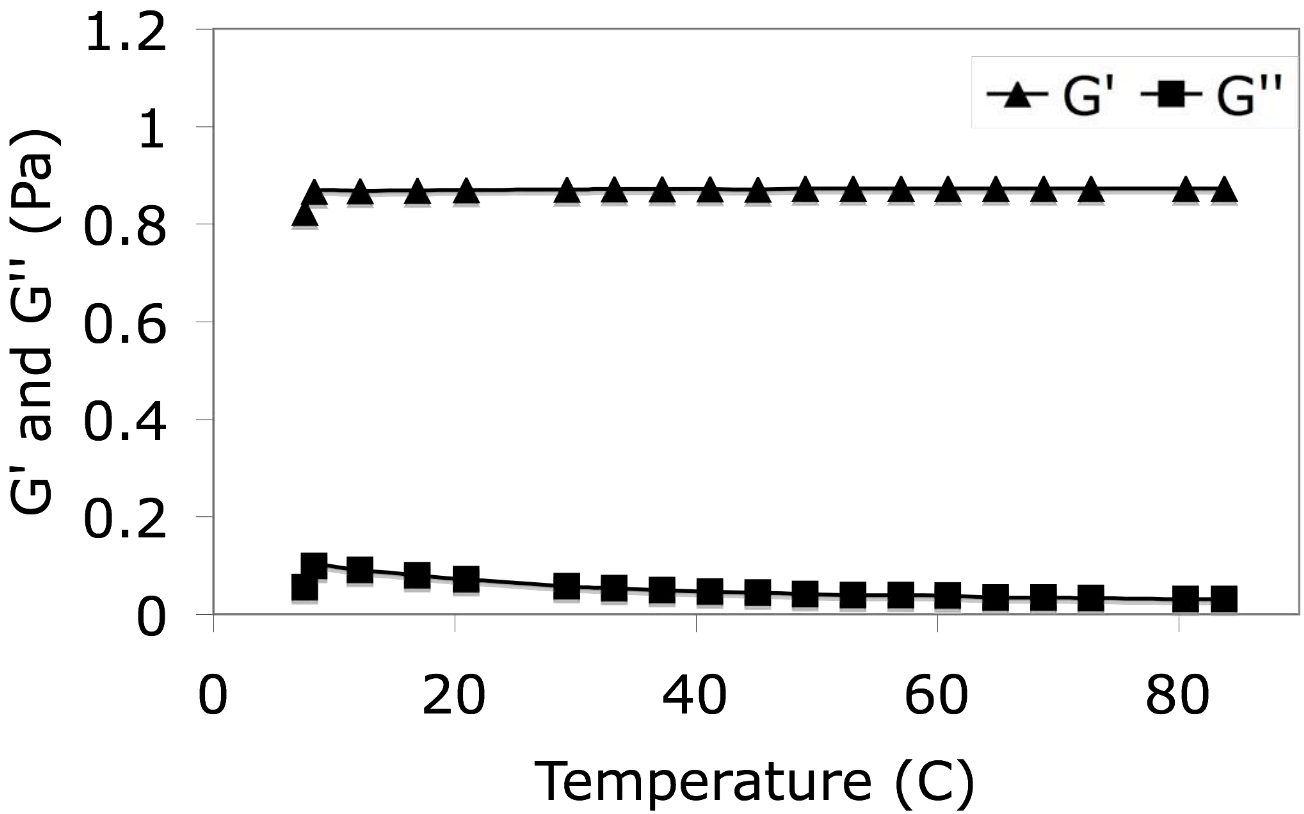
C-131. Dynamic testing of 0.125% KF with 0.500% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



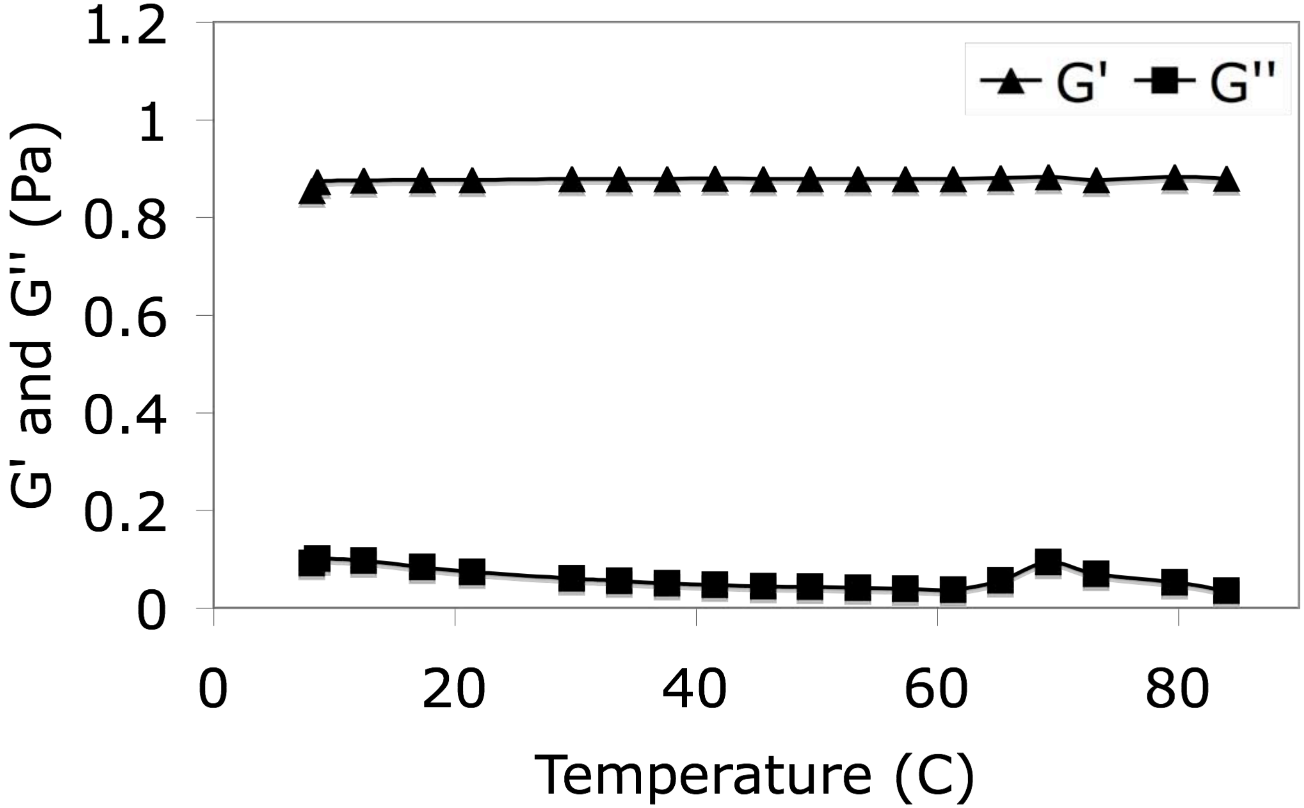
C-132. Dynamic testing of 0.125% KF with 1.000% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



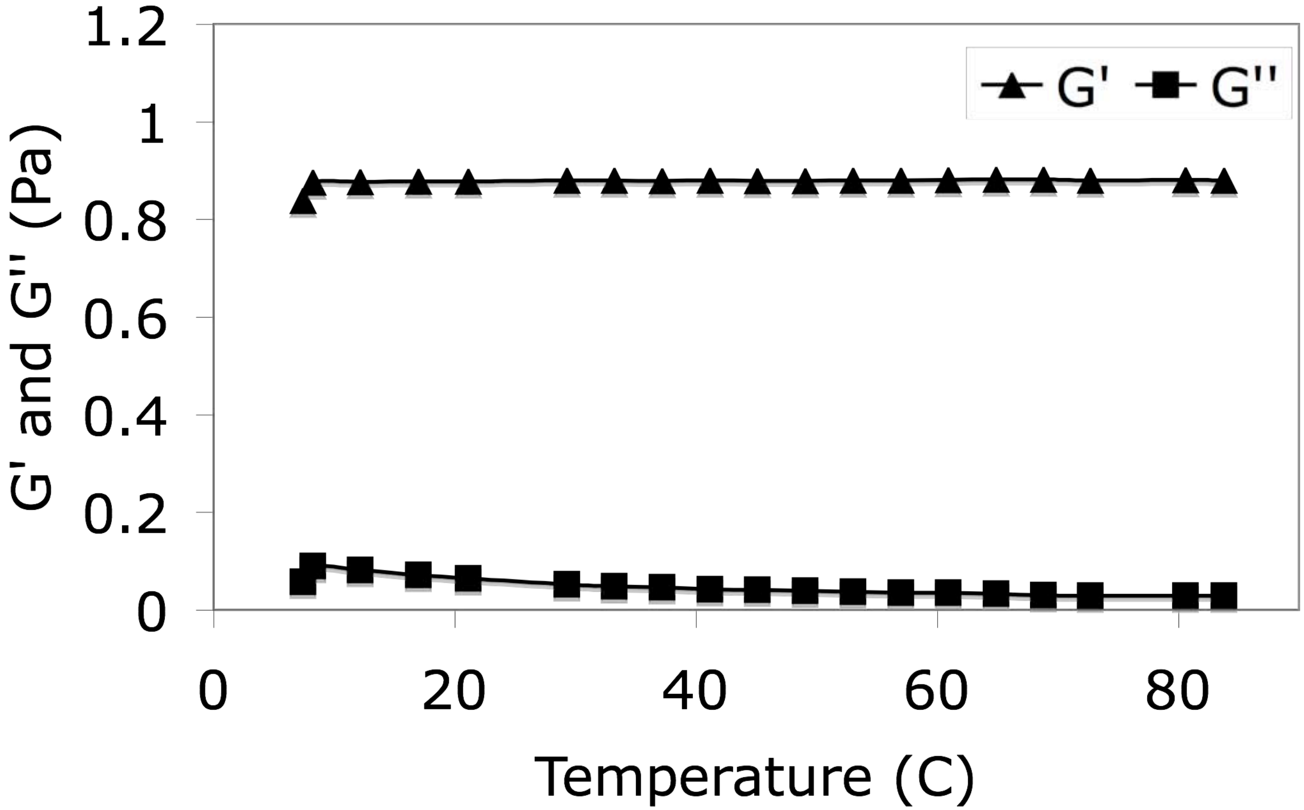
C-133. Dynamic testing of 0.125% KF with 1.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



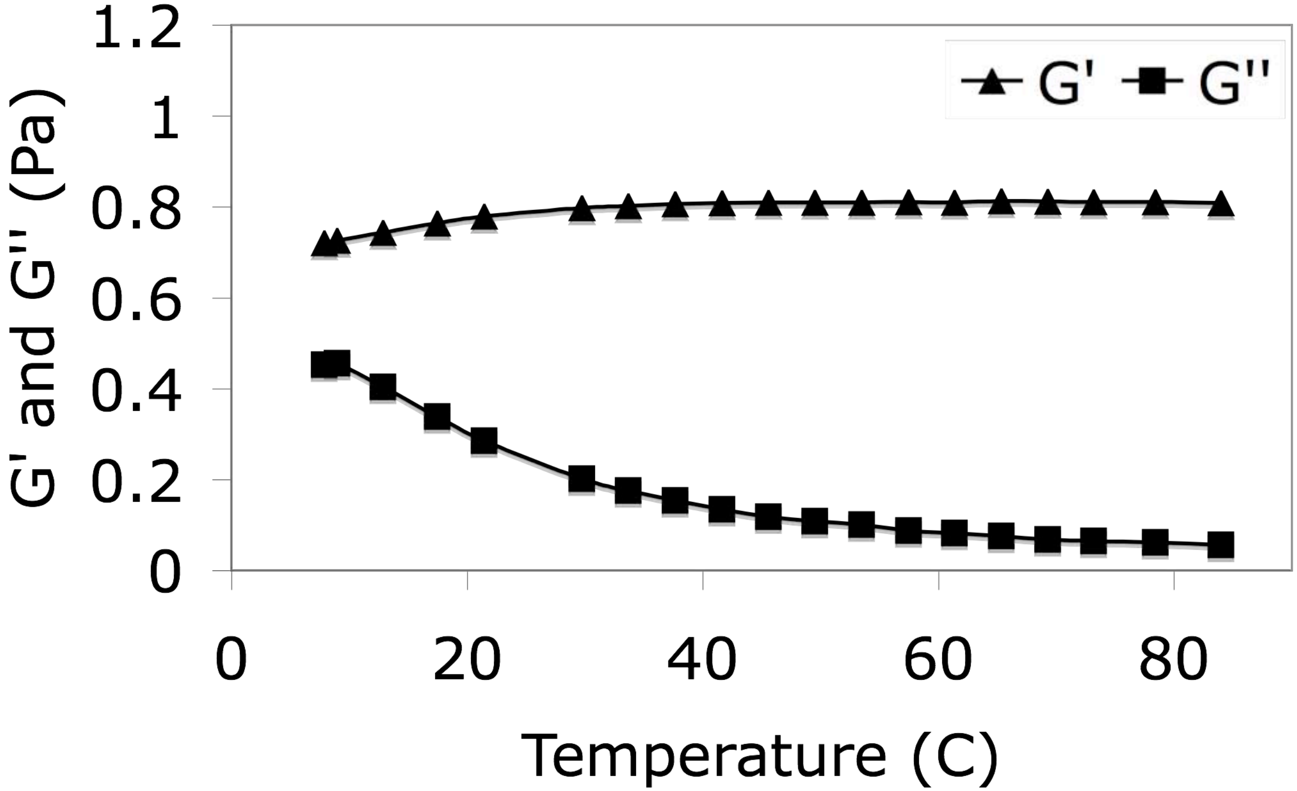
C-134. Dynamic testing of 0.125% KF with 2.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



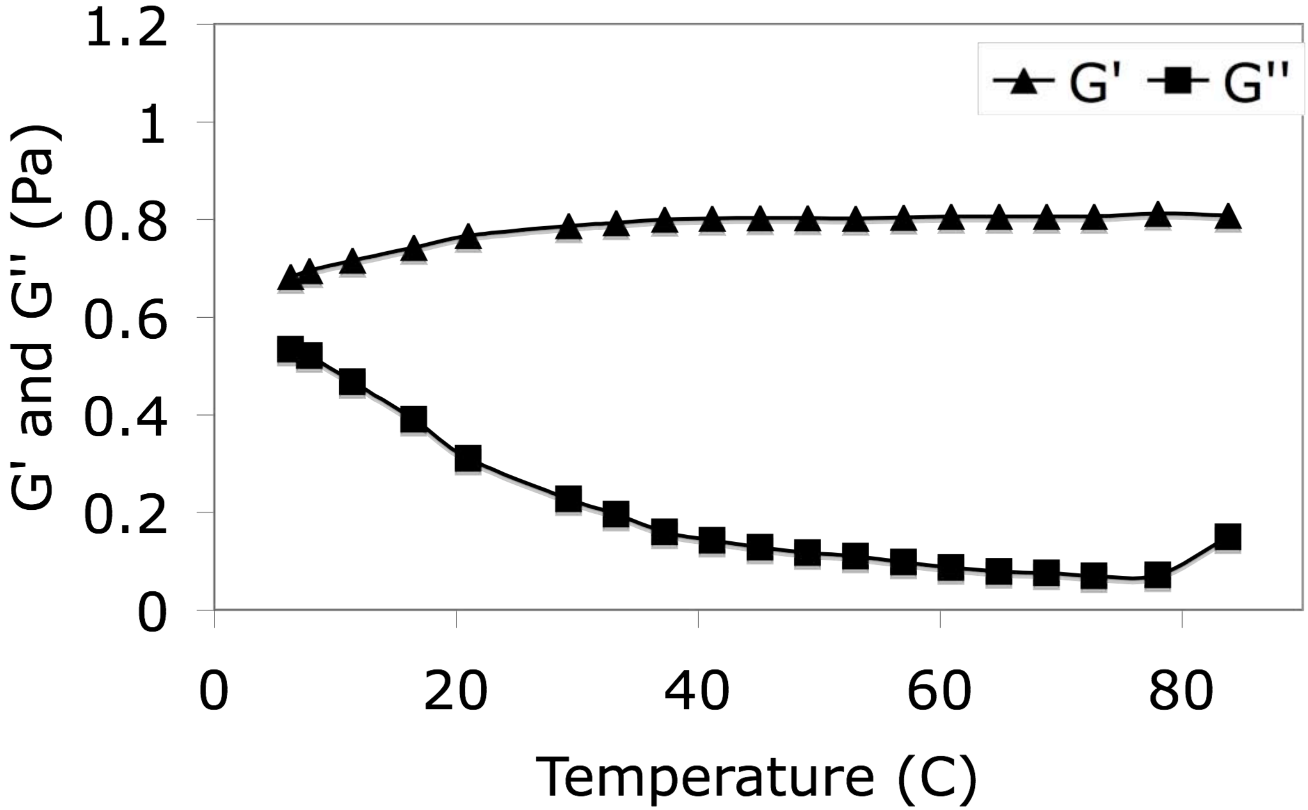
C-135. Dynamic testing of 0.125% KF with 2.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



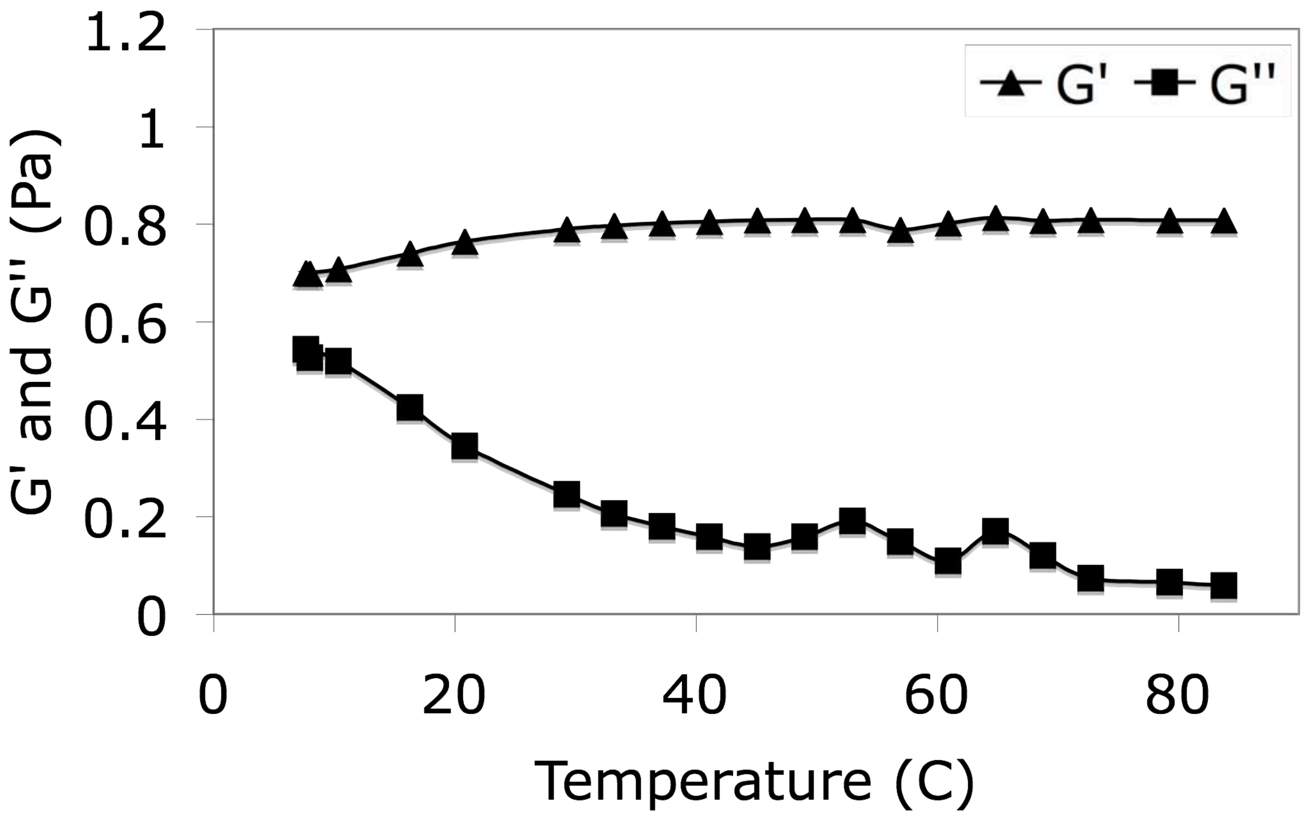
C-136. Dynamic testing of 0.125% KF with 3.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



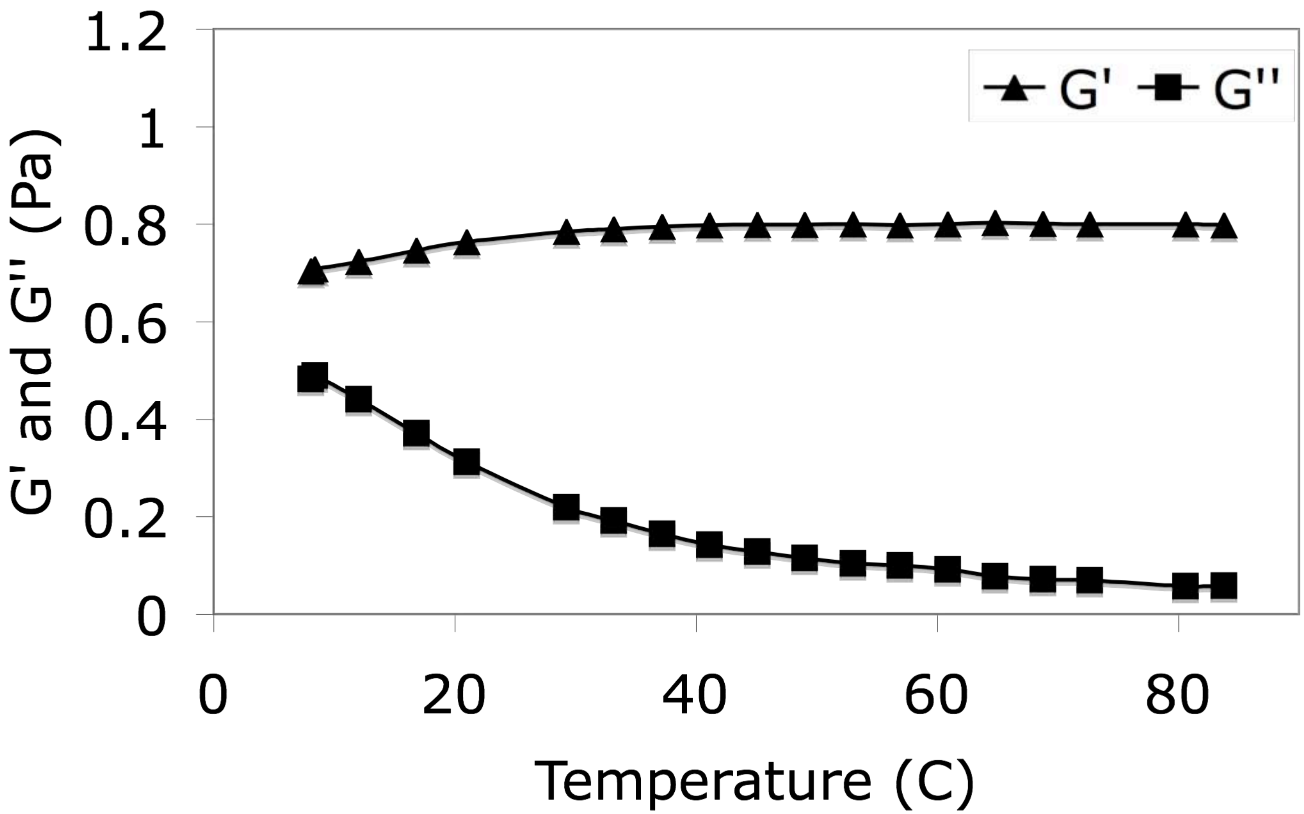
C-137. Dynamic testing of 0.250% KF with 0.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



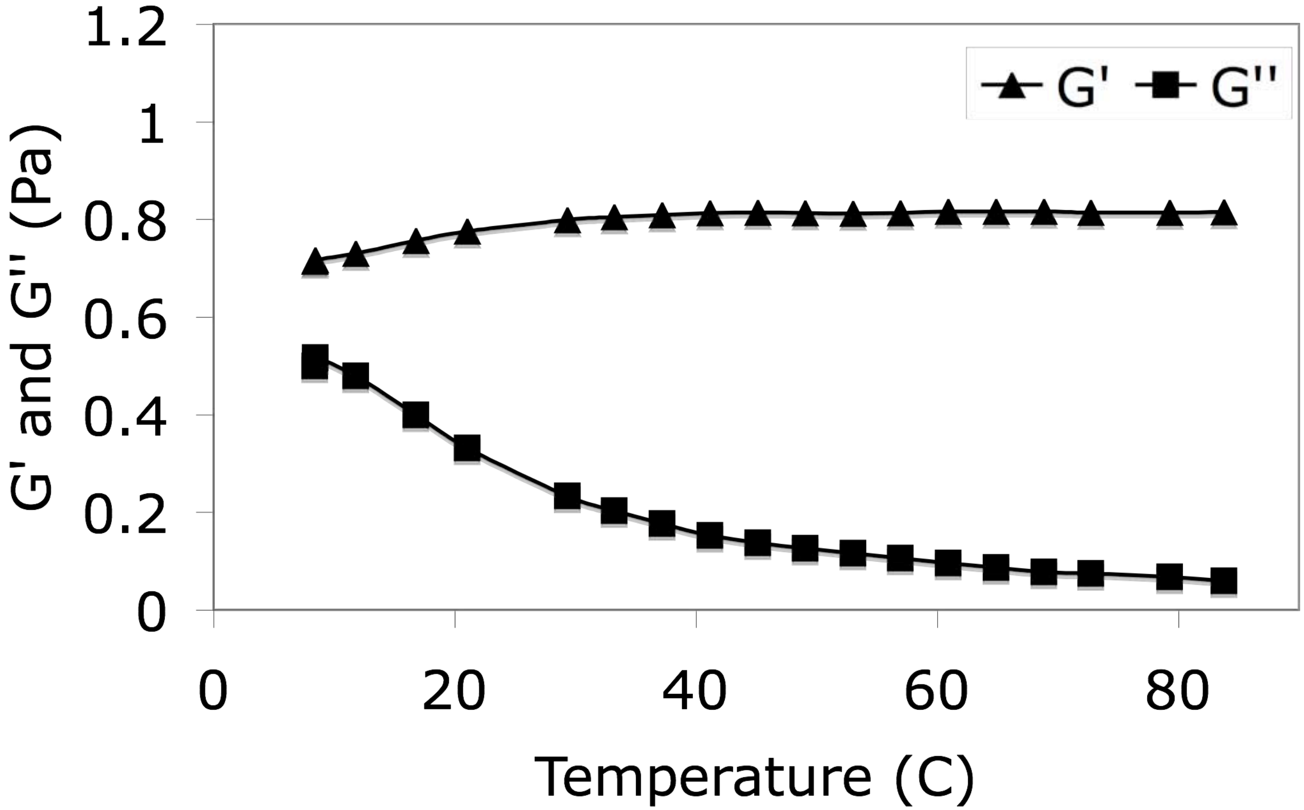
C-138. Dynamic testing of 0.250% KF with 0.500% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



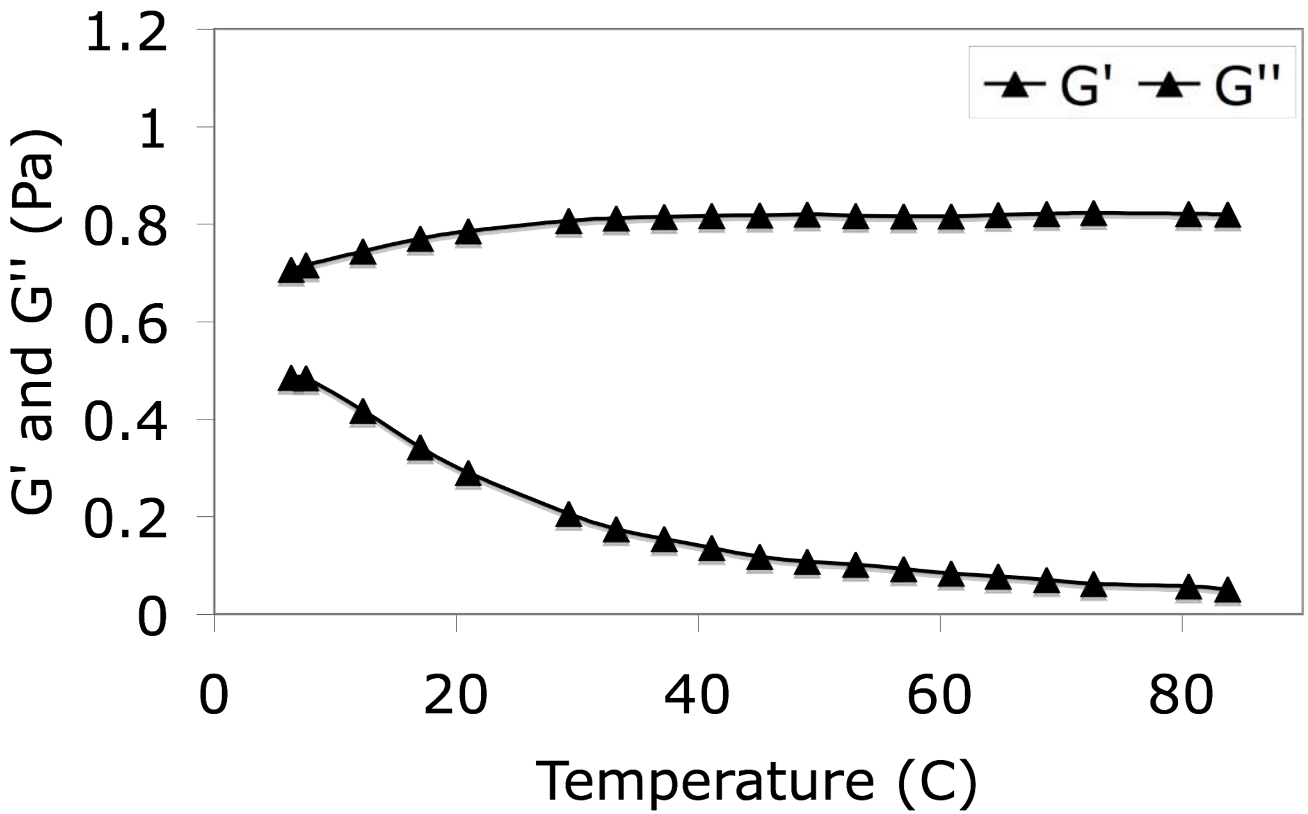
C-139. Dynamic testing of 0.250% KF with 1.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



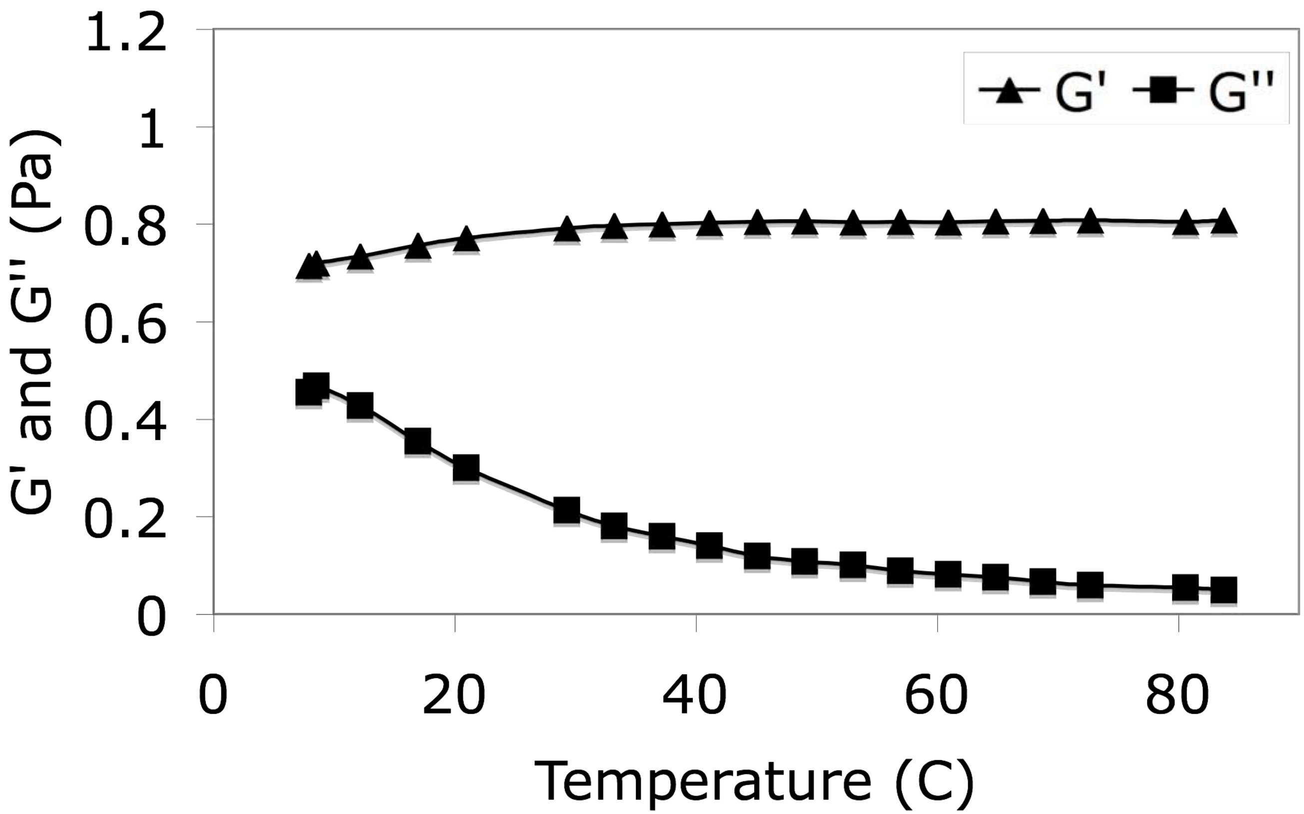
C-140. Dynamic testing of 0.250% KF with 1.500% salt for use in pork enhancement solutions at 1 Pa from 4 °C to 85 °C.



C-141. Dynamic testing of 0.250% KF with 2.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



C-142. Dynamic testing of 0.250% KF with 2.500% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.



C-143. Dynamic testing of 0.250% KF with 3.000% salt for use in pork enhancement solutions at 1 Pa from 4 ^{o}C to 85 ^{o}C.

APPENDIX D

D-1. Least square means for raw pH and CIE color space values of raw pork prior to processing.

Effect	Initial pH	Initial CIE Color Space Values		
		L*	a*	b*
RMSE[y]	0.044	1.213	0.477	0.372
Meat Source	*<0.0001*[z]	*0.0003*[z]	*0.0048*[z]	*0.0138*[z]
Normal	5.76a	51.17b	8.18	0.10b
PSE	5.39b	56.41a	9.38	0.84a
Meat Source, Day	*0.2050*[z]	*0.0601*[z]	*0.0238*[z]	*0.2968*[z]
Normal, 1			0.58	
Normal, 2			0.11	
Normal, 3			-0.39	
PSE, 1			0.83	
PSE, 2			0.93	
PSE, 3			0.76	

[abcd]Mean values within a column and effect followed by the same letter are not significantly different ($P > 0.05$).
[y]Root Mean Square Error
[z]P-value from analysis of variance tables.

D-2. Least square means for cooked pH and CIE color space values for cooked meat gels affected by meat source and buffer treatments.

Effect	Cooked pH	Cooked CIE Color Space Values L*	a*	b*
RMSE[y]	0.056	0.426	0.414	0.417
Meat Source	*0.0672*[z]	*0.0394*[z]	*0.1636*[z]	*0.1473*[z]
Normal	6.28	79.12	8.66	7.25
PSE	6.03	80.13	7.91	7.50
Buffers	*<0.0001*[z]	*<0.0001*[z]	*0.0807*[z]	*0.8128*[z]
Control	6.00	79.46	8.33	7.53
Water	5.98	80.84	7.91	7.32
NaCl+SP	5.98	80.61	8.04	7.50
$NaHCO_3$	6.30	78.83	8.35	7.27
$KHCO_3$	6.34	79.00	8.52	7.29
NH_4HCO_3	6.33	78.97	8.55	7.33
Meat Source, Day	*0.0002*[z]	*0.1471*[z]	*0.0073*[z]	*0.5455*[z]
Normal, 1	6.08		8.74	
Normal, 2	6.36		9.13	
Normal, 3	6.41		8.11	
PSE, 1	5.94		7.36	
PSE, 2	5.99		8.44	
PSE, 3	6.15		7.93	

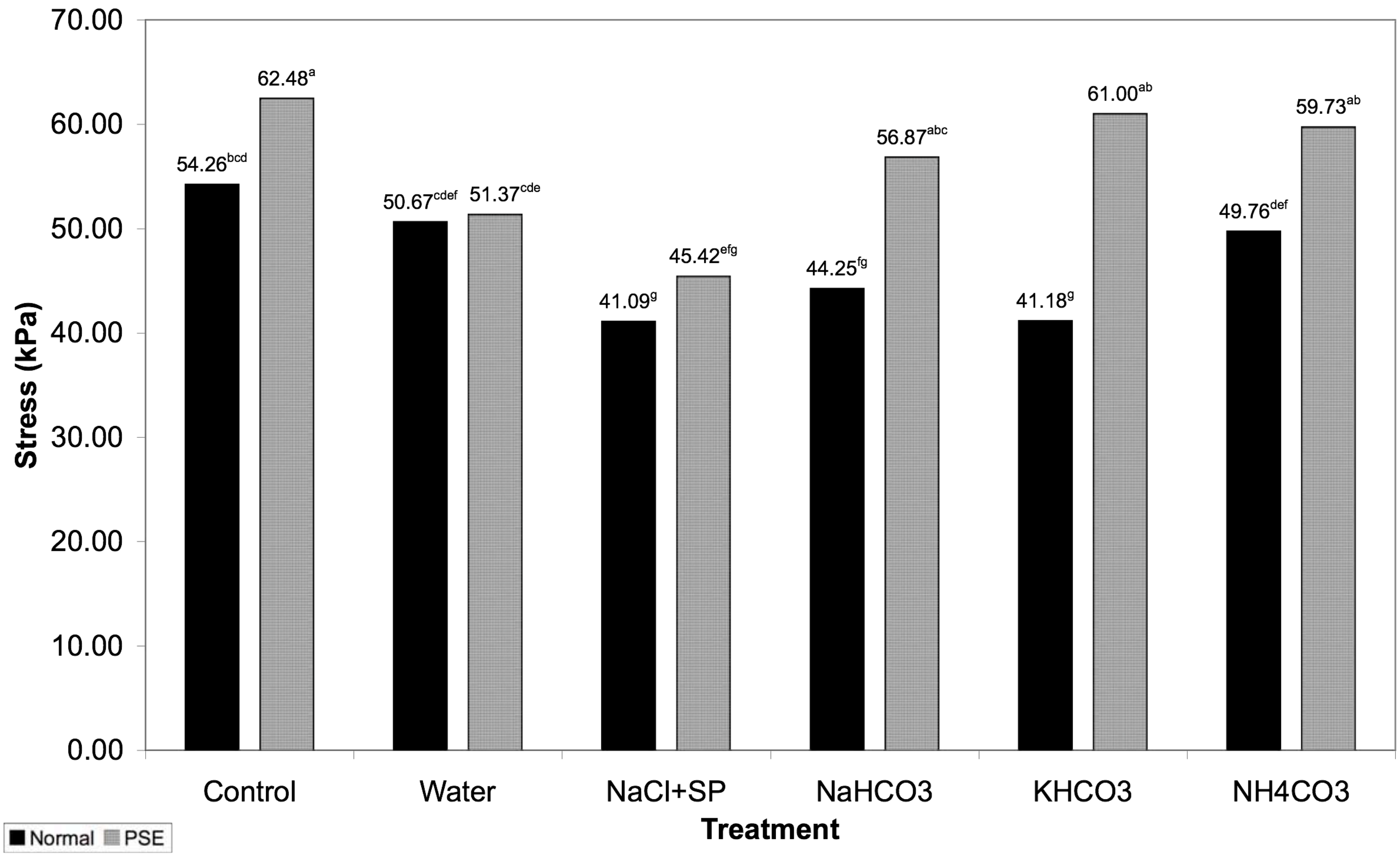
[abcd]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[y]Root Mean Square Error
[z]P-value from analysis of variance tables.

D-3. Least square means for torsion testing and texture profile analysis for cooked meat gels affected by meat source and hydrocolloid/buffer treatments.

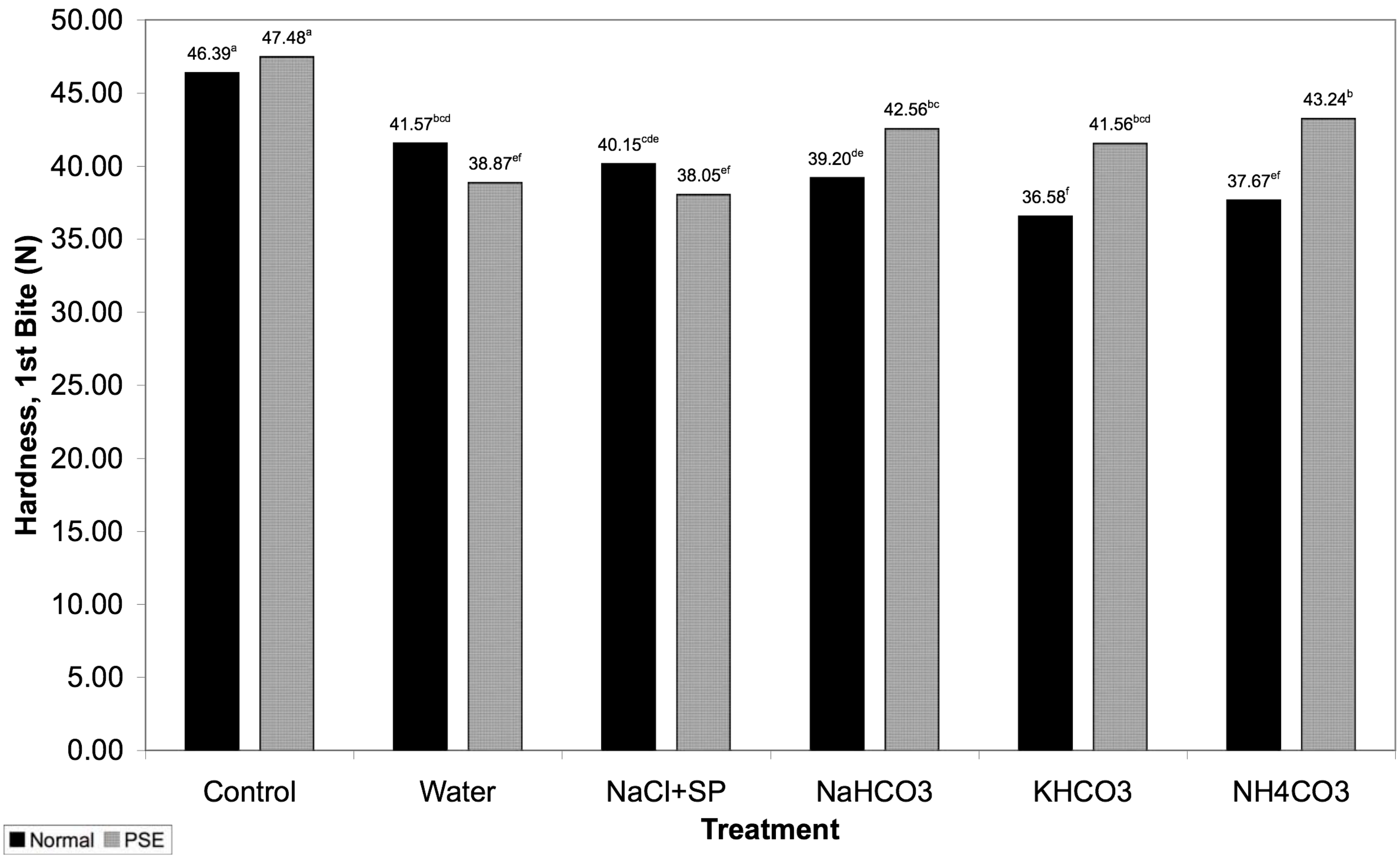
	Torison Testing		Texture Profile Analysis			
Effect	Stress (kPa)	Strain	Hardness, 1st Bite, (N)	Hardness, 2nd Bite, (N)	Cohesiveness	Gumminess
RMSE[y]	9.488	0.147	156.249	136.163	0.018	73.836
Meat Source	*0.0403*[z]	*0.1117*[z]	*0.6473*[z]	*0.7159*[z]	*0.2858*[z]	*0.9348*[z]
Normal	46.87b	1.06	1690.88	1436.51	0.33	566.58
PSE	56.14a	0.92	1762.26	1481.96	0.32	560.64
Buffers	*<0.0001*[z]	*<0.0001*[z]	*<0.0001*[z]	*<0.0001*[z]	*0.1031*[z]	*<0.0001*[z]
Control	58.37	0.89	1971.09	1641.77	0.33	649.74
Water	51.02	0.93	1689.23	1437.12	0.33	556.86
NaCl+SP	43.26	0.86	1642.18	1367.53	0.32	523.83
$NaHCO_3$	50.56	1.03	1717.12	1470.24	0.33	568.41
$KHCO_3$	51.09	1.13	1640.78	1390.38	0.32	526.44
NH_4HCO_3	54.75	1.10	1699.02	1448.38	0.32	556.39
Meat Source, Day	*0.1653*[z]	*0.0092*[z]	*<0.0001*[z]	*<0.0001*[z]	*<0.0001*[z]	*<0.0001*[z]
Normal, 1		1.02	2296.16	1952.32	0.34	790.34
Normal, 2		1.11	1756.86	1511.27	0.33	583.58
Normal, 3		1.04	1019.61	845.94	0.32	325.82
PSE, 1		0.97	2115.31	1785.84	0.31	658.93
PSE, 2		0.89	2032.28	1702.76	0.33	664.02
PSE, 3		0.91	1139.18	957.28	0.31	358.98

[abcd]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).

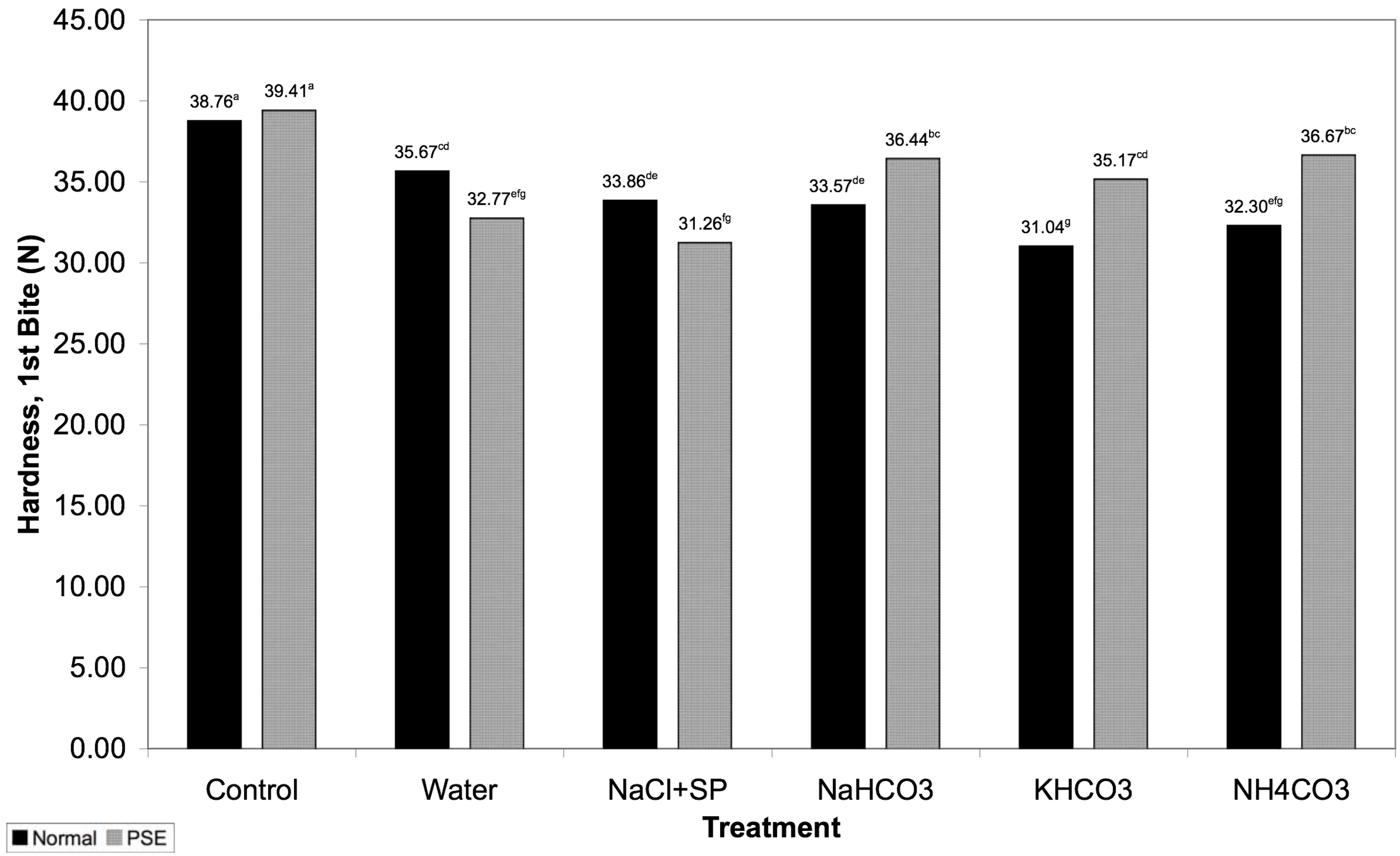
[y]Root Mean Square Error
[z]P-value from analysis of variance tables.



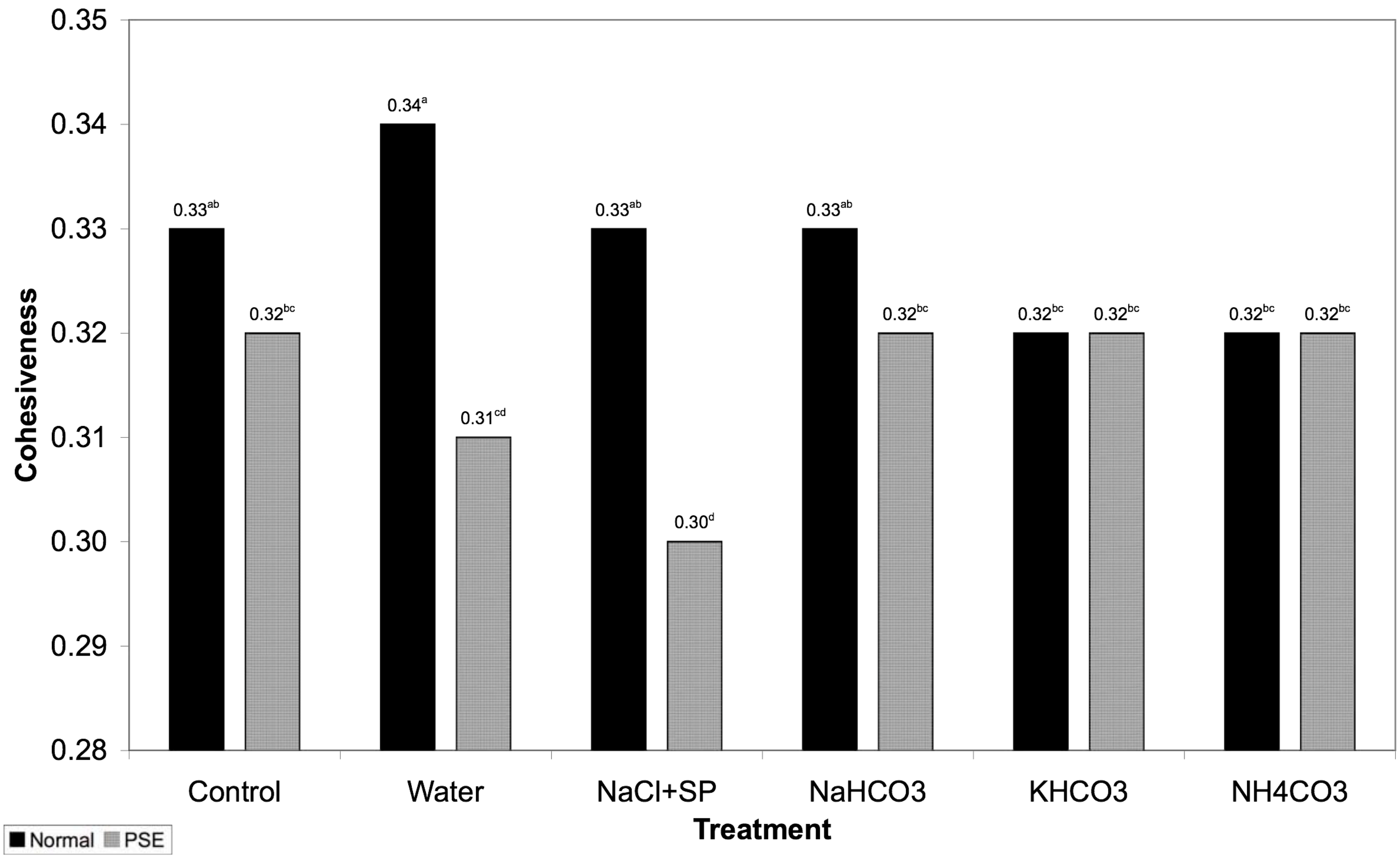
D-4. Meat by buffer treatment interaction for cooked meat gels on torsion testing attribute: Stress (kPa)



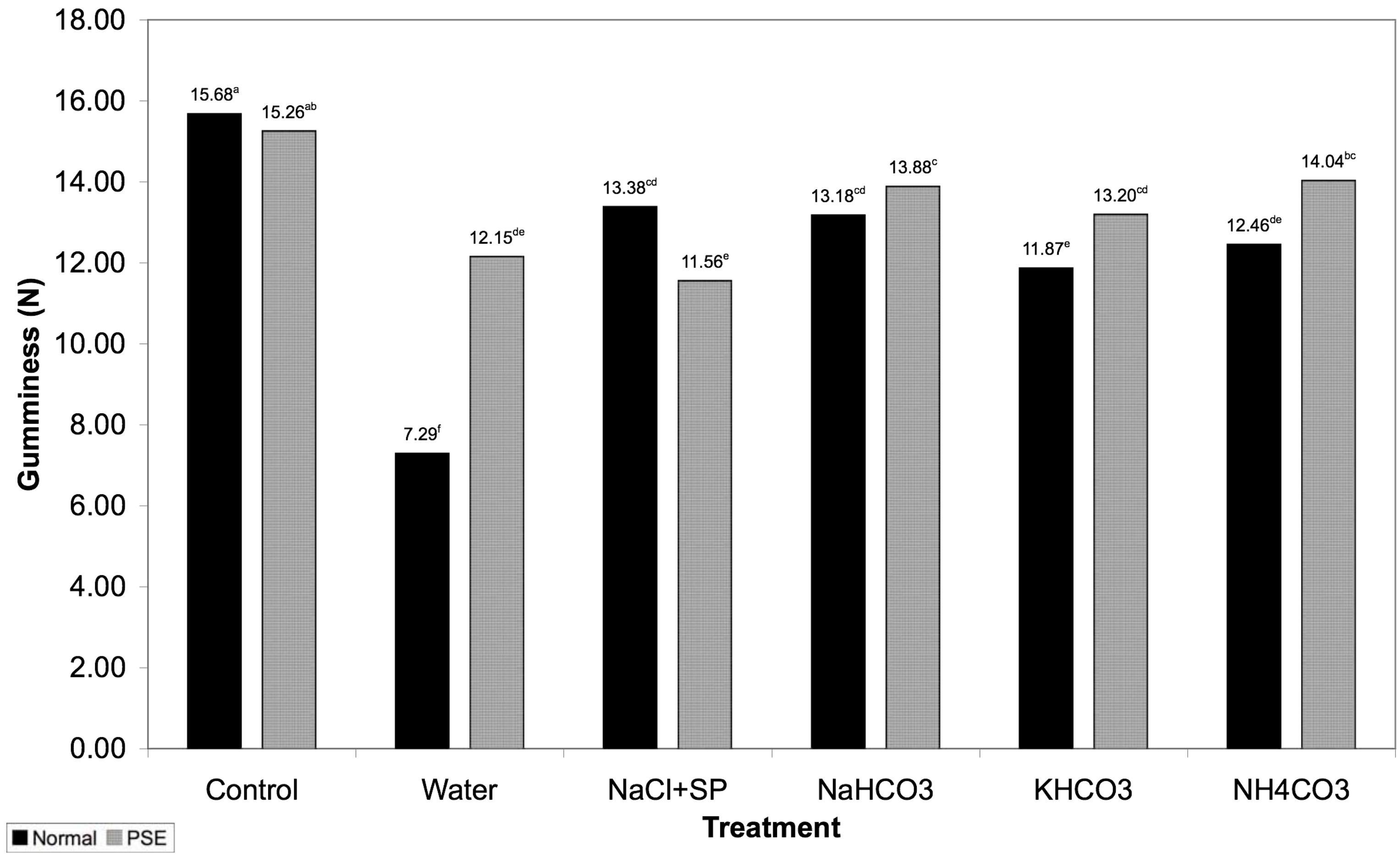
D-5. Meat by buffer treatment interaction for cooked meat gels on TPA attribute: Hardness-1st Bite (N).



D-6. Meat by buffer treatment interaction for cooked meat gels on TPA attribute: Hardness-2nd Bite (N).



D-7. Meat by buffer treatment interaction for cooked meat gels on TPA attribute: Cohesiveness.



D-8. Meat by buffer treatment interaction for cooked meat gels on TPA attribute: Gumminess (N).

D-9. P2S1: Raw data for boneless pork loins.

Date	Meat	Rep	pH	L1	a1	b1	L2	a2	b2	L3	a3	b3
9/8/07	Normal	1	5.75	50.88	6.60	-0.08	56.60	7.14	0.54	57.36	8.11	1.17
9/8/07	Normal	1	5.77	51.60	7.55	0.00	55.32	6.63	0.70	54.32	7.81	1.15
9/8/07	PSE	1	5.41	56.27	9.31	0.37	59.88	8.96	1.30	60.45	8.87	1.31
9/8/07	PSE	1	5.39	60.03	8.51	0.82	56.73	8.02	-0.22	59.34	9.57	1.40
9/11/07	Normal	2	5.82	49.80	8.94	-0.28	53.15	8.80	0.50	51.04	8.72	1.08
9/11/07	Normal	2	5.78	49.15	8.28	-0.18	44.92	6.82	-1.53	52.73	7.68	1.09
9/11/07	PSE	2	5.34	55.46	11.58	1.89	51.32	9.62	1.01	53.45	9.12	0.11
9/11/07	PSE	2	5.37	52.16	11.16	0.93	55.84	10.21	0.55	51.26	11.23	1.08
9/12/07	Normal	3	5.67	50.01	9.15	-0.29	45.27	8.96	-0.30	47.01	8.10	-1.15
9/12/07	Normal	3	5.78	49.59	9.66	0.03	50.42	9.91	-0.08	51.88	8.36	-0.57
9/12/07	PSE	3	5.45	58.15	8.14	0.09	55.34	8.00	-0.33	57.65	9.54	1.03
9/12/07	PSE	3	5.36	58.48	8.33	1.05	59.14	9.37	1.67	54.40	9.31	1.04

D-10. P2S1: Raw data for torsion testing and texture profile analysis buffer treated cooked pork gels.

Date	Meat	Buffer	Day	Sample	Stress	Strain	Bioyield	Peak1	Area1	Peak2	Area2	Hard1	Hard2	Cohesive	Gummy
9/11/07	Normal	Control	1	1	63.31	0.95	.	2366.443	8.141	2004.990	2.747	56.34	47.74	0.34	19.01
9/11/07	Normal	Control	1	2	45.75	0.84	.	2595.955	9.141	2209.879	3.137	61.81	52.62	0.34	21.21
9/11/07	Normal	Control	1	3	56.36	0.93	.	2284.594	7.820	1980.340	2.611	54.40	47.15	0.33	18.16
9/11/07	Normal	Control	1	4	53.66	0.91	889.120	2367.737	8.607	2051.272	2.854	56.37	48.84	0.33	18.69
9/11/07	Normal	Control	1	5	63.31	1.02	.	2533.732	8.314	2180.906	2.878	60.33	51.93	0.35	20.88
9/11/07	PSE	Control	1	1	81.46	0.94	710.475	2150.260	7.067	1787.354	2.257	51.20	42.56	0.32	16.35
9/11/07	PSE	Control	1	2	69.68	0.97	873.514	2451.779	8.994	1993.521	2.711	58.38	47.46	0.30	17.60
9/11/07	PSE	Control	1	3	58.10	0.66	845.628	2525.874	8.088	2122.175	2.694	60.14	50.53	0.33	20.03
9/11/07	PSE	Control	1	4	62.93	0.72	826.039	2264.979	7.705	1857.052	2.344	53.93	44.22	0.30	16.41
9/11/07	PSE	Control	1	5	51.73	0.84	871.751	2227.415	8.242	1829.196	2.466	53.03	43.55	0.30	15.87
9/11/07	Normal	H2O	1	1	33.97	0.53	.	2612.946	8.256	2178.838	2.907	62.21	51.88	0.35	21.91
9/11/07	Normal	H2O	1	2	66.01	1.11	.	2492.848	8.017	2147.362	2.880	59.35	51.13	0.36	21.32
9/11/07	Normal	H2O	1	3	67.17	1.06	.	2310.531	7.113	1989.567	2.477	55.01	47.37	0.35	19.16
9/11/07	Normal	H2O	1	4	57.91	0.94	.	2419.039	7.451	2125.439	2.668	57.60	50.61	0.36	20.62
9/11/07	Normal	H2O	1	5	47.29	1.11	.	2133.735	6.623	1806.717	2.255	50.80	43.02	0.34	17.30
9/11/07	PSE	H2O	1	1	49.80	0.93	832.164	2158.738	7.065	1850.831	2.239	51.40	44.07	0.32	16.29
9/11/07	PSE	H2O	1	2	53.08	1.09	714.990	2046.571	7.179	1711.401	2.221	48.73	40.75	0.31	15.08
9/11/07	PSE	H2O	1	3	54.63	0.97	719.136	1881.762	6.621	1543.615	1.851	44.80	36.75	0.28	12.53
9/11/07	PSE	H2O	1	4	54.24	0.96	650.155	1969.355	6.216	1692.398	1.902	46.89	40.30	0.31	14.35
9/11/07	PSE	H2O	1	5	49.80	0.97	712.134	2086.740	6.820	1782.892	2.097	49.68	42.45	0.31	15.28
9/11/07	Normal	NaHCO3	1	1	44.78	0.84	.	2459.356	8.966	2096.517	2.867	58.56	49.92	0.32	18.72
9/11/07	Normal	NaHCO3	1	2	45.55	1.11	.	2335.726	7.541	2009.588	2.598	55.61	47.85	0.34	19.16
9/11/07	Normal	NaHCO3	1	3	45.94	0.91	.	2483.067	6.936	2079.808	2.586	59.12	49.52	0.37	22.04
9/11/07	Normal	NaHCO3	1	4	42.85	1.07	.	2462.271	7.171	2125.917	2.676	58.63	50.62	0.37	21.88
9/11/07	Normal	NaHCO3	1	5	49.61	1.00	.	2215.284	6.760	1882.246	2.275	52.74	44.82	0.34	17.75
9/11/07	PSE	NaHCO3	1	1	60.61	0.96	799.510	1796.326	6.568	1439.576	1.795	42.77	34.28	0.27	11.69
9/11/07	PSE	NaHCO3	1	2	57.52	1.11	.	2117.816	6.971	1803.246	2.237	50.42	42.93	0.32	16.18
9/11/07	PSE	NaHCO3	1	3	52.50	1.12	843.780	1987.362	7.006	1705.501	2.061	47.32	40.61	0.29	13.92
9/11/07	PSE	NaHCO3	1	4	52.89	1.09	.	2176.420	6.327	1890.736	2.171	51.82	45.02	0.34	17.78
9/11/07	PSE	NaHCO3	1	5	58.29	1.11	92.510	2526.052	8.383	2195.990	2.789	60.14	52.29	0.33	20.01
9/11/07	Normal	KHCO3	1	1	45.36	0.92	.	2218.437	7.503	1887.055	2.504	52.82	44.93	0.33	17.63
9/11/07	Normal	KHCO3	1	2	49.03	1.15	.	2280.835	6.782	1932.981	2.375	54.31	46.02	0.35	19.02
9/11/07	Normal	KHCO3	1	3	44.01	1.09	.	2138.259	6.600	1798.083	2.275	50.91	42.81	0.34	17.55
9/11/07	Normal	KHCO3	1	4	61.77	1.15	.	2146.396	7.848	1698.962	2.271	51.10	40.45	0.29	14.79

9/11/07	Normal	KHCO3	1	5	49.41	1.18	.	1733.220	6.848	1374.409	2.139	41.27	32.72	0.31	12.89
9/11/07	PSE	KHCO3	1	1	80.30	1.11	.	1895.196	6.262	1600.921	1.865	45.12	38.12	0.30	13.44
9/11/07	PSE	KHCO3	1	2	61.38	1.19	811.446	2123.882	7.411	1853.013	2.376	50.57	44.12	0.32	16.21
9/11/07	PSE	KHCO3	1	3	50.96	0.97	.	1908.705	6.346	1636.585	1.977	45.45	38.97	0.31	14.16
9/11/07	PSE	KHCO3	1	4	71.80	1.18	709.253	2001.224	6.987	1702.856	2.152	47.65	40.54	0.31	14.68
9/11/07	PSE	KHCO3	1	5	.	.	.	2399.406	8.251	2007.072	2.666	57.13	47.79	0.32	18.46
9/11/07	Normal	NH4HCO	1	1	61.19	1.17	871.808	2509.232	7.964	2140.475	2.829	59.74	50.96	0.36	21.22
9/11/07	Normal	NH4HCO	1	2	59.64	1.26	.	2183.920	7.845	1877.502	2.520	52.00	44.70	0.32	16.70
9/11/07	Normal	NH4HCO	1	3	56.56	1.24	.	2184.743	6.036	1935.691	2.348	52.02	46.09	0.39	20.23
9/11/07	Normal	NH4HCO	1	4	50.57	1.00	.	1934.737	5.982	1658.863	2.023	46.07	39.50	0.34	15.58
9/11/07	Normal	NH4HCO	1	5	60.22	1.22	.	2290.348	6.839	1948.380	2.451	54.53	46.39	0.36	19.54
9/11/07	PSE	NH4HCO	1	1	52.70	1.22	.	2171.682	7.366	1830.661	2.229	51.71	43.59	0.30	15.65
9/11/07	PSE	NH4HCO	1	2	66.59	1.12	.	2072.702	7.283	1784.718	2.213	49.35	42.49	0.30	15.00
9/11/07	PSE	NH4HCO	1	3	60.22	0.85	.	2488.367	7.870	2184.011	2.749	59.25	52.00	0.35	20.69
9/11/07	PSE	NH4HCO	1	4	67.94	1.26	.	2001.155	7.098	1703.091	2.094	47.65	40.55	0.30	14.06
9/11/07	PSE	NH4HCO	1	5	62.54	0.98	.	2242.169	6.966	1966.260	2.346	53.38	46.82	0.34	17.98
9/11/07	Normal	SP	1	1	50.96	1.28	.	2141.185	6.063	1797.491	2.149	50.98	42.80	0.35	18.07
9/11/07	Normal	SP	1	2	42.85	0.63	.	2183.145	6.702	1847.264	2.349	51.98	43.98	0.35	18.22
9/11/07	Normal	SP	1	3	54.05	1.04	.	2380.567	7.390	2005.856	2.563	56.68	47.76	0.35	19.66
9/11/07	Normal	SP	1	4	50.57	1.22	.	2161.317	7.030	1807.172	2.304	51.46	43.03	0.33	16.87
9/11/07	Normal	SP	1	5	36.29	0.71	.	2325.274	7.579	1989.935	2.566	55.36	47.38	0.34	18.74
9/11/07	PSE	SP	1	1	45.75	0.66	756.369	1703.091	6.217	1370.424	1.689	40.55	32.63	0.27	11.02
9/11/07	PSE	SP	1	2	45.94	0.52	629.168	2283.809	6.435	1903.517	2.199	54.38	45.32	0.34	18.58
9/11/07	PSE	SP	1	3	46.90	0.89	706.999	1970.659	6.311	1618.679	1.881	46.92	38.54	0.30	13.98
9/11/07	PSE	SP	1	4	54.82	0.90	.	2133.906	6.646	1812.875	2.065	50.81	43.16	0.31	15.79
9/11/07	PSE	SP	1	5	51.73	0.77	585.370	1695.939	5.879	1395.135	1.693	40.38	33.22	0.29	11.63
9/12/07	Normal	Control	2	1	40.54	1.16	.	1980.559	6.139	1671.949	2.165	47.16	39.81	0.35	16.63
9/12/07	Normal	Control	2	2	44.97	1.05	.	2320.890	7.014	2032.609	2.557	55.26	48.40	0.36	20.15
9/12/07	Normal	Control	2	3	63.89	1.28	961.686	2091.950	7.145	1814.599	2.285	49.81	43.20	0.32	15.93
9/12/07	Normal	Control	2	4	26.64	0.56	599.410	2072.754	6.129	1788.715	2.310	49.35	42.59	0.38	18.60
9/12/07	Normal	Control	2	5	47.10	1.21	.	2064.983	6.219	1770.544	2.128	49.17	42.16	0.34	16.82
9/12/07	PSE	Control	2	1	52.50	0.79	622.028	2075.985	6.234	1729.989	2.178	49.43	41.19	0.35	17.27
9/12/07	PSE	Control	2	2	41.11	0.68	759.854	1971.667	7.046	1626.172	2.140	46.94	38.72	0.30	14.26
9/12/07	PSE	Control	2	3	69.49	0.97	766.756	2658.100	8.174	2274.363	2.876	63.29	54.15	0.35	22.27
9/12/07	PSE	Control	2	4	38.41	0.74	712.657	2191.775	7.028	1785.087	2.241	52.19	42.50	0.32	16.64
9/12/07	PSE	Control	2	5	50.96	0.65	679.995	2451.666	7.326	2057.559	2.465	58.37	48.99	0.34	19.64
9/12/07	Normal	H2O	2	1	54.82	0.97	.	1588.063	5.285	1405.519	1.749	37.81	33.46	0.33	12.51

9/12/07	Normal	H2O	2	2	34.55	0.96	.	2021.259	6.548	1716.184	2.290	48.13	40.86	0.35	16.83
9/12/07	Normal	H2O	2	3	43.24	0.83	.	1782.874	4.998	1517.455	1.815	42.45	36.13	0.36	15.42
9/12/07	Normal	H2O	2	4	33.78	0.94	.	1896.790	6.840	1655.029	2.318	45.16	39.41	0.34	15.30
9/12/07	Normal	H2O	2	5	44.20	1.20	.	1825.004	6.062	1563.798	2.030	43.45	37.23	0.33	14.55
9/12/07	PSE	H2O	2	1	44.40	0.80	548.237	1785.623	5.428	1483.053	1.761	42.51	35.31	0.32	13.79
9/12/07	PSE	H2O	2	2	55.59	1.02	597.376	1979.094	6.042	1620.841	1.988	47.12	38.59	0.33	15.50
9/12/07	PSE	H2O	2	3	41.11	0.92	552.217	1827.372	5.436	1552.555	1.715	43.51	36.97	0.32	13.73
9/12/07	PSE	H2O	2	4	34.94	0.81	601.456	1737.877	5.436	1458.375	1.676	41.38	34.72	0.31	12.76
9/12/07	PSE	H2O	2	5	41.69	0.75	521.247	1920.229	5.380	1629.208	1.841	45.72	38.79	0.34	15.64
9/12/07	Normal	NaHCO3	2	1	29.15	1.12	683.396	1557.580	5.213	1350.995	1.655	37.09	32.17	0.32	11.77
9/12/07	Normal	NaHCO3	2	2	42.47	1.26	.	1631.801	4.997	1401.205	1.650	38.85	33.36	0.33	12.83
9/12/07	Normal	NaHCO3	2	3	52.50	1.35	714.948	1685.117	5.484	1457.143	1.756	40.12	34.69	0.32	12.85
9/12/07	Normal	NaHCO3	2	4	47.48	1.21	.	1349.627	4.437	1155.033	1.362	32.13	27.50	0.31	9.86
9/12/07	Normal	NaHCO3	2	5	45.55	1.13	.	1711.177	5.390	1472.509	1.866	40.74	35.06	0.35	14.10
9/12/07	PSE	NaHCO3	2	1	62.35	0.91	.	1915.994	6.240	1619.375	1.961	45.62	38.56	0.31	14.34
9/12/07	PSE	NaHCO3	2	2	45.75	0.91	859.259	1900.726	6.589	1614.242	2.023	45.26	38.43	0.31	13.89
9/12/07	PSE	NaHCO3	2	3	50.96	1.04	.	2296.691	6.708	1997.244	2.466	54.68	47.55	0.37	20.10
9/12/07	PSE	NaHCO3	2	4	58.29	1.19	.	2167.123	6.846	1891.480	2.318	51.60	45.04	0.34	17.47
9/12/07	PSE	NaHCO3	2	5	59.07	0.91	.	2122.216	5.957	1852.230	2.212	50.53	44.10	0.37	18.76
9/12/07	Normal	KHCO3	2	1	29.34	1.24	.	1646.235	5.358	1431.725	1.805	39.20	34.09	0.34	13.20
9/12/07	Normal	KHCO3	2	2	32.24	1.19	.	1522.995	4.537	1307.573	1.506	36.26	31.13	0.33	12.04
9/12/07	Normal	KHCO3	2	3	38.60	1.36	.	1409.578	4.319	1220.552	1.330	33.56	29.06	0.31	10.33
9/12/07	Normal	KHCO3	2	4	52.89	1.42	.	1741.829	5.713	1537.984	1.866	41.47	36.62	0.33	13.55
9/12/07	Normal	KHCO3	2	5	20.46	1.25	.	1602.775	5.750	1364.402	1.762	38.16	32.49	0.31	11.69
9/12/07	PSE	KHCO3	2	1	61.77	1.09	969.902	2263.088	7.545	1901.772	2.459	53.88	45.28	0.33	17.56
9/12/07	PSE	KHCO3	2	2	71.80	1.18	.	1974.159	7.318	1669.644	2.243	47.00	39.75	0.31	14.41
9/12/07	PSE	KHCO3	2	3	67.94	1.17	.	1985.089	6.837	1648.373	2.049	47.26	39.25	0.30	14.16
9/12/07	PSE	KHCO3	2	4	75.86	1.32	629.990	1983.395	6.474	1697.441	2.118	47.22	40.42	0.33	15.45
9/12/07	PSE	KHCO3	2	5	73.93	1.15	.	2187.313	7.056	1832.861	2.315	52.08	43.64	0.33	17.09
9/12/07	Normal	NH4HCO	2	1	27.99	0.93	861.143	1769.384	5.820	1542.118	1.857	42.13	36.72	0.32	13.44
9/12/07	Normal	NH4HCO	2	2	48.06	1.34	.	1691.096	5.257	1465.538	1.706	40.26	34.89	0.32	13.07
9/12/07	Normal	NH4HCO	2	3	66.59	1.00	.	1577.891	4.847	1345.734	1.487	37.57	32.04	0.31	11.53
9/12/07	Normal	NH4HCO	2	4	47.10	1.08	623.812	1350.835	4.601	1164.844	1.284	32.16	27.73	0.28	8.98
9/12/07	Normal	NH4HCO	2	5	.	.	.	1753.752	5.467	1492.606	1.830	41.76	35.54	0.33	13.98
9/12/07	PSE	NH4HCO	2	1	68.33	0.87	826.876	2120.386	6.569	1771.119	2.140	50.49	42.17	0.33	16.45
9/12/07	PSE	NH4HCO	2	2	65.24	0.85	.	2144.570	6.524	1801.402	2.288	51.06	42.89	0.35	17.91
9/12/07	PSE	NH4HCO	2	3	65.24	0.85	820.471	2213.709	6.652	1844.349	2.214	52.71	43.91	0.33	17.54

9/12/07	PSE	NH4HCO	2	4	57.14	0.73	.	2148.022	6.492	1813.133	2.194	51.14	43.17	0.34	17.28
9/12/07	PSE	NH4HCO	2	5	69.87	0.90	.	2017.003	6.217	1688.094	2.010	48.02	40.19	0.32	15.53
9/12/07	Normal	SP	2	1	33.97	1.01	.	1918.699	6.232	1624.054	2.061	45.68	38.67	0.33	15.11
9/12/07	Normal	SP	2	2	34.17	1.03	.	1942.629	6.092	1641.503	2.066	46.25	39.08	0.34	15.69
9/12/07	Normal	SP	2	3	35.71	0.94	.	1684.091	5.307	1419.232	1.709	40.10	33.79	0.32	12.91
9/12/07	Normal	SP	2	4	39.18	0.94	.	1775.023	5.813	1511.400	1.841	42.26	35.99	0.32	13.38
9/12/07	Normal	SP	2	5	42.08	1.07	.	1738.496	5.356	1495.497	1.784	41.39	35.61	0.33	13.79
9/12/07	PSE	SP	2	1	40.73	0.75	482.216	1592.121	4.767	1292.939	1.410	37.91	30.78	0.30	11.21
9/12/07	PSE	SP	2	2	45.17	0.68	518.483	1717.451	5.248	1394.817	1.573	40.89	33.21	0.30	12.26
9/12/07	PSE	SP	2	3	40.15	0.73	644.286	1959.480	6.064	1545.044	1.808	46.65	36.79	0.30	13.91
9/12/07	PSE	SP	2	4	44.01	0.76	524.123	1841.792	5.510	1458.880	1.680	43.85	34.74	0.30	13.37
9/12/07	PSE	SP	2	5	38.60	0.67	536.212	1818.762	5.237	1531.099	1.706	43.30	36.45	0.33	14.11
9/13/07	Normal	Control	3	1	65.24	0.89	.	1909.455	4.490	987.942	1.365	45.46	23.52	0.30	13.82
9/13/07	Normal	Control	3	2	61.57	0.98	356.621	1160.966	3.692	979.295	1.218	27.64	23.32	0.33	9.12
9/13/07	Normal	Control	3	3	65.63	0.86	574.298	1194.657	4.019	1009.223	1.255	28.44	24.03	0.31	8.88
9/13/07	Normal	Control	3	4	56.36	0.91	.	1023.076	3.409	872.952	1.077	24.36	20.78	0.32	7.70
9/13/07	Normal	Control	3	5	59.64	0.81	516.533	1255.382	4.376	1066.527	1.412	29.89	25.39	0.32	9.64
9/13/07	PSE	Control	3	1	60.22	0.74	562.637	1418.827	4.954	1186.905	1.568	33.78	28.26	0.32	10.69
9/13/07	PSE	Control	3	2	69.10	0.86	480.559	1435.691	4.607	1206.081	1.520	34.18	28.72	0.33	11.28
9/13/07	PSE	Control	3	3	82.04	0.93	524.069	1439.503	4.834	1189.935	1.527	34.27	28.33	0.32	10.83
9/13/07	PSE	Control	3	4	64.47	0.71	496.846	1333.061	4.441	1087.148	1.393	31.74	25.88	0.31	9.96
9/13/07	PSE	Control	3	5	84.93	1.00	.	1312.841	4.451	1098.673	1.391	31.26	26.16	0.31	9.77
9/13/07	Normal	H2O	3	1	62.54	0.97	.	1106.438	3.418	937.450	1.159	26.34	22.32	0.34	8.93
9/13/07	Normal	H2O	3	2	55.59	1.16	.	1057.825	3.031	921.693	1.084	25.19	21.95	0.36	9.01
9/13/07	Normal	H2O	3	3	54.82	0.82	.	969.230	3.043	826.182	0.953	23.08	19.67	0.31	7.23
9/13/07	Normal	H2O	3	4	52.12	0.83	.	969.439	3.060	825.031	0.971	23.08	19.64	0.32	7.32
9/13/07	Normal	H2O	3	5	52.12	1.03	.	1000.916	3.145	854.931	1.064	23.83	20.36	0.34	8.06
9/13/07	PSE	H2O	3	1	50.77	0.70	393.039	1090.792	3.562	914.872	1.121	25.97	21.78	0.31	8.17
9/13/07	PSE	H2O	3	2	69.49	1.02	365.134	1035.031	3.365	862.801	1.031	24.64	20.54	0.31	7.55
9/13/07	PSE	H2O	3	3	50.96	0.73	376.655	947.538	3.140	807.965	0.910	22.56	19.24	0.29	6.53
9/13/07	PSE	H2O	3	4	54.05	0.72	373.283	1055.022	3.543	912.189	1.153	25.12	21.72	0.33	8.17
9/13/07	PSE	H2O	3	5	66.01	0.90	372.408	968.120	3.230	819.376	0.968	23.05	19.51	0.30	6.91
9/13/07	Normal	NaHCO3	3	1	35.32	0.88	.	944.116	2.943	803.738	0.945	22.48	19.14	0.32	7.22
9/13/07	Normal	NaHCO3	3	2	47.48	1.03	.	960.480	2.972	843.534	0.997	22.87	20.08	0.34	7.67
9/13/07	Normal	NaHCO3	3	3	43.62	0.92	.	919.701	2.991	780.881	0.954	21.90	18.59	0.32	6.98
9/13/07	Normal	NaHCO3	3	4	40.92	0.99	.	1073.056	3.343	926.210	1.116	25.55	22.05	0.33	8.53
9/13/07	Normal	NaHCO3	3	5	50.57	1.09	.	910.214	3.055	766.306	0.898	21.67	18.25	0.29	6.37

9/13/07	PSE	NaHCO3	3	1	34.74	0.62	.	1223.068	4.004	1046.950	1.309	29.12	24.93	0.33	9.52
9/13/07	PSE	NaHCO3	3	2	59.45	0.96	462.755	1177.080	3.725	1007.949	1.247	28.03	24.00	0.33	9.38
9/13/07	PSE	NaHCO3	3	3	73.16	1.13	.	1017.665	3.883	861.504	1.086	24.23	20.51	0.28	6.78
9/13/07	PSE	NaHCO3	3	4	71.23	1.07	.	1135.226	3.851	965.934	1.189	27.03	23.00	0.31	8.35
9/13/07	PSE	NaHCO3	3	5	56.17	0.99	588.285	1255.262	4.049	1063.468	1.367	29.89	25.32	0.34	10.09
9/13/07	Normal	KHCO3	3	1	37.83	1.23	.	956.202	2.928	849.216	0.977	22.77	20.22	0.33	7.59
9/13/07	Normal	KHCO3	3	2	35.71	1.01	.	926.617	2.714	805.067	0.927	22.06	19.17	0.34	7.53
9/13/07	Normal	KHCO3	3	3	45.36	1.15	382.921	932.880	3.115	794.508	0.968	22.21	18.92	0.31	6.90
9/13/07	Normal	KHCO3	3	4	33.59	0.99	.	867.242	2.670	754.560	0.832	20.65	17.97	0.31	6.43
9/13/07	Normal	KHCO3	3	5	42.08	1.26	.	918.923	2.950	798.734	0.925	21.88	19.02	0.31	6.86
9/13/07	PSE	KHCO3	3	1	54.43	1.25	.	1116.321	3.647	946.347	1.170	26.58	22.53	0.32	8.53
9/13/07	PSE	KHCO3	3	2	45.55	0.97	.	1103.194	3.693	913.532	1.138	26.27	21.75	0.31	8.09
9/13/07	PSE	KHCO3	3	3	46.90	1.01	.	1124.902	3.489	954.226	1.151	26.78	22.72	0.33	8.84
9/13/07	PSE	KHCO3	3	4	39.57	0.77	425.065	1092.472	3.570	909.829	1.141	26.01	21.66	0.32	8.31
9/13/07	PSE	KHCO3	3	5	49.61	0.90	.	1022.550	3.125	881.043	1.109	24.35	20.98	0.35	8.64
9/13/07	Normal	NH4HCO	3	1	38.41	1.39	.	954.186	3.101	806.552	0.967	22.72	19.20	0.31	7.09
9/13/07	Normal	NH4HCO	3	2	50.19	1.40	466.518	904.655	3.268	753.402	0.936	21.54	17.94	0.29	6.17
9/13/07	Normal	NH4HCO	3	3	50.96	1.29	.	883.397	2.822	746.315	0.882	21.03	17.77	0.31	6.58
9/13/07	Normal	NH4HCO	3	4	40.54	1.38	.	902.928	2.802	769.232	0.906	21.50	18.32	0.32	6.95
9/13/07	Normal	NH4HCO	3	5	44.01	1.21	.	840.271	3.032	703.314	0.879	20.01	16.75	0.29	5.80
9/13/07	PSE	NH4HCO	3	1	42.85	0.87	.	1224.884	3.910	1008.511	1.258	29.16	24.01	0.32	9.38
9/13/07	PSE	NH4HCO	3	2	50.96	1.16	.	1150.795	3.778	980.535	1.268	27.40	23.35	0.34	9.20
9/13/07	PSE	NH4HCO	3	3	42.47	0.96	.	1079.610	3.522	910.193	1.102	25.71	21.67	0.31	8.04
9/13/07	PSE	NH4HCO	3	4	64.47	1.15	494.200	1082.020	3.735	922.788	1.151	25.76	21.97	0.31	7.94
9/13/07	PSE	NH4HCO	3	5	59.45	1.08	.	1082.012	3.645	891.829	1.121	25.76	21.23	0.31	7.92
9/13/07	Normal	SP	3	1	38.41	0.98	.	1012.400	3.012	845.812	0.988	24.10	20.14	0.33	7.91
9/13/07	Normal	SP	3	2	41.69	0.93	396.392	1123.293	3.385	930.174	1.084	26.75	22.15	0.32	8.56
9/13/07	Normal	SP	3	3	37.64	1.02	321.786	981.507	2.979	821.960	0.959	23.37	19.57	0.32	7.52
9/13/07	Normal	SP	3	4	43.24	0.99	412.507	990.413	3.289	815.298	1.007	23.58	19.41	0.31	7.22
9/13/07	Normal	SP	3	5	35.52	0.81	.	938.367	2.868	782.080	0.914	22.34	18.62	0.32	7.12
9/13/07	PSE	SP	3	1	54.82	0.84	343.658	1014.594	3.276	829.698	0.974	24.16	19.75	0.30	7.19
9/13/07	PSE	SP	3	2	39.74	0.78	400.699	991.253	3.412	823.357	0.999	23.60	19.60	0.29	6.91
9/13/07	PSE	SP	3	3	34.74	0.67	352.010	1009.796	3.493	838.659	1.021	24.04	19.97	0.29	7.03
9/13/07	PSE	SP	3	4	42.66	0.68	.	1065.983	3.463	893.305	1.033	25.38	21.27	0.30	7.57
9/13/07	PSE	SP	3	5	55.59	1.00	.	1170.408	3.771	982.789	1.198	27.87	23.40	0.32	8.85

D-11. P2S1: Raw data for cooked buffer treated cooked pork gels.

Date	Meat	Buffer	Day	pH1	pH2	L1	a1	b1	L2	a2	b2	L3	a3	b3
9/11/07	Normal	Control	1	5.99	5.98	78.23	8.72	7.07	78.53	8.87	7.20	78.25	8.97	7.30
9/11/07	PSE	Control	1	5.85	5.86	80.11	8.15	6.50	80.42	8.16	6.81	80.03	7.75	7.05
9/11/07	Normal	H20	1	5.93	5.95	79.80	8.55	6.68	79.50	8.43	7.21	79.87	8.36	7.09
9/11/07	PSE	H20	1	5.83	5.84	82.20	7.39	6.61	81.86	7.29	6.74	81.95	7.01	7.27
9/11/07	Normal	NaHCO3	1	6.19	6.18	78.70	9.10	6.18	77.77	8.52	6.50	79.61	8.14	7.24
9/11/07	PSE	NaHCO3	1	5.97	5.98	79.86	6.57	7.36	79.82	6.67	7.61	79.87	6.72	7.37
9/11/07	Normal	KHCO3	1	6.22	6.21	78.25	9.37	7.07	78.77	9.00	6.51	79.18	8.78	6.94
9/11/07	PSE	KHCO3	1	6.10	6.10	79.99	7.20	7.26	79.42	7.44	8.12	80.08	7.35	7.67
9/11/07	Normal	NH4HCO3	1	6.19	6.20	78.90	9.39	6.71	78.42	9.38	6.66	79.01	8.93	7.10
9/11/07	PSE	NH4HCO3	1	6.09	6.09	80.05	7.63	7.21	80.04	7.39	7.22	79.33	7.32	7.33
9/11/07	Normal	SP	1	5.94	5.93	80.84	7.76	6.88	79.99	8.47	7.06	80.30	8.55	6.94
9/11/07	PSE	SP	1	5.81	5.81	81.62	7.57	6.52	81.14	7.57	7.11	81.66	7.24	6.87
9/12/07	Normal	Control	2	6.19	6.17	79.40	9.13	7.87	79.48	9.22	7.80	79.19	9.08	7.84
9/12/07	PSE	Control	2	5.81	5.83	79.44	7.84	8.39	79.10	8.18	8.46	79.15	7.90	8.65
9/12/07	Normal	H20	2	6.17	6.17	80.52	8.52	6.86	81.50	8.24	6.97	80.35	8.28	8.23
9/12/07	PSE	H20	2	5.83	5.80	79.98	8.22	7.79	80.89	7.97	7.66	81.12	7.71	7.84
9/12/07	Normal	NaHCO3	2	6.56	6.58	76.39	9.52	6.63	77.55	9.61	6.96	78.14	9.17	6.58
9/12/07	PSE	NaHCO3	2	6.17	6.17	79.30	9.00	7.13	79.00	8.80	7.41	79.38	9.15	7.41
9/12/07	Normal	KHCO3	2	6.55	6.55	77.59	9.49	6.60	77.74	9.63	6.85	77.54	9.56	7.18
9/12/07	PSE	KHCO3	2	6.16	6.14	79.06	9.18	7.17	79.43	9.28	7.50	79.62	8.97	7.25
9/12/07	Normal	NH4HCO3	2	6.53	6.52	78.57	8.83	6.61	77.79	9.70	6.75	76.70	9.40	8.34
9/12/07	PSE	NH4HCO3	2	6.17	6.17	78.89	9.06	7.22	79.24	9.23	7.51	78.33	8.96	7.81
9/12/07	Normal	SP	2	6.18	6.18	79.96	8.95	8.07	79.51	9.04	8.47	80.33	9.00	7.87
9/12/07	PSE	SP	2	5.79	5.83	80.35	7.21	8.36	81.17	7.60	8.07	80.08	7.69	8.98
9/18/07	Normal	Control	3	6.22	6.22	79.54	8.04	7.45	79.84	8.28	7.49	79.52	7.98	7.45
9/18/07	PSE	Control	3	5.96	5.94	79.02	8.21	7.33	80.51	8.14	7.41	80.59	7.40	7.46
9/18/07	Normal	H20	3	6.21	6.21	80.91	7.80	7.06	80.26	7.93	7.44	80.39	7.75	7.43
9/18/07	PSE	H20	3	5.94	5.93	80.60	7.85	7.79	80.64	7.92	7.29	82.76	7.15	7.79

9/18/07	Normal	NaHCO3	3	6.53	6.58	78.36	8.33	7.52	78.34	8.37	7.33	78.88	8.20	7.66
9/18/07	PSE	NaHCO3	3	6.36	6.37	79.06	8.07	7.80	79.53	8.30	7.87	79.42	8.13	8.27
9/18/07	Normal	KHCO3	3	6.66	6.64	78.22	8.34	7.38	78.71	8.33	7.20	78.85	8.01	7.87
9/18/07	PSE	KHCO3	3	6.36	6.36	80.37	7.85	7.45	79.84	7.81	7.46	79.42	7.72	7.72
9/18/07	Normal	NH4HCO3	3	6.62	6.64	79.23	8.33	7.32	78.86	8.23	7.54	79.02	8.23	7.53
9/18/07	PSE	NH4HCO3	3	6.34	6.35	79.89	8.06	7.62	79.37	8.04	7.57	79.88	7.80	7.91
9/18/07	Normal	SP	3	6.20	6.22	80.14	8.18	7.80	80.89	7.76	7.52	80.14	7.87	7.51
9/18/07	PSE	SP	3	5.95	5.95	79.61	8.81	6.56	81.97	7.67	7.21	81.29	7.77	7.28

D-12. P2S1: Raw ANOVA data for boneless pork loins.

Dependent Variable: pH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	0.43054167	0.08610833	43.97	0.0001
Error	6	0.01175000	0.00195833		
Corrected Total	11	0.44229167			

R-Square	Coeff Var	Root MSE	pH Mean
0.973434	0.793896	0.044253	5.574167

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.42187500	0.42187500	215.43	<.0001
Day	2	0.00051667	0.00025833	0.13	0.8789
Meat*Day	2	0.00815000	0.00407500	2.08	0.2059

Dependent Variable: xrawL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	146.3206630	29.2641326	19.90	0.0011
Error	6	8.8211889	1.4701981		
Corrected Total	11	155.1418519			

R-Square	Coeff Var	Root MSE	xrawL Mean
0.943141	2.254215	1.212517	53.78889

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	82.33787037	82.33787037	56.00	0.0003
Day	2	50.28302963	25.14151481	17.10	0.0033
Meat*Day	2	13.69976296	6.84988148	4.66	0.0601

Dependent Variable: xrawa

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	10.96011574	2.19202315	9.64	0.0078
Error	6	1.36496111	0.22749352		
Corrected Total	11	12.32507685			

R-Square	Coeff Var	Root MSE	xrawa Mean
0.889253	5.432550	0.476963	8.779722

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	4.33200833	4.33200833	19.04	0.0048
Day	2	3.24886852	1.62443426	7.14	0.0259
Meat*Day	2	3.37923889	1.68961944	7.43	0.0238

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Dependent Variable: xrawb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	2.61491852	0.52298370	3.77	0.0685
Error	6	0.83183333	0.13863889		
Corrected Total	11	3.44675185			

R-Square	Coeff Var	Root MSE	xrawb Mean
0.758662	79.31555	0.372342	0.469444

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1.63787037	1.63787037	11.81	0.0138
Day	2	0.56185741	0.28092870	2.03	0.2126
Meat*Day	2	0.41519074	0.20759537	1.50	0.2968

D-13. P2S1: Raw texture ANOVA data for pork gels.

Dependent Variable: Stress

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	11031.51725	735.43448	8.17	<.0001
Error	162	14579.96037	89.99976		
Corrected Total	177	25611.47762			

R-Square	Coeff Var	Root MSE	Stress Mean
0.430726	18.42752	9.486820	51.48180

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	1512.950013	756.475006	8.41	0.0003
Meat	1	3824.482554	3824.482554	42.49	<.0001
Meat*Day	2	327.597953	163.798976	1.82	0.1653
Buffer	5	3798.027473	759.605495	8.44	<.0001
Meat*Buffer	5	1635.162691	327.032538	3.63	0.0038

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	3824.482554	3824.482554	23.35	0.0403

Dependent Variable: Hard1

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	25831.48478	1722.09899	124.43	<.0001
Error	164	2269.70038	13.83964		
Corrected Total	179	28101.18515			

R-Square	Coeff Var	Root MSE	Hard1 Mean
0.919231	9.049603	3.720166	41.10861

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	23015.68555	11507.84277	831.51	<.0001
Meat	1	129.99901	129.99901	9.39	0.0025
Meat*Day	2	914.59986	457.29993	33.04	<.0001
Buffer	5	1301.36436	260.27287	18.81	<.0001
Meat*Buffer	5	469.83601	93.96720	6.79	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	129.9990050	129.9990050	0.28	0.6472

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The GLM Procedure

Dependent Variable: Hard2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	18885.82136	1259.05476	119.77	<.0001

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Error	164	1724.01996	10.51232		
Corrected Total	179	20609.84132			

R-Square	Coeff Var	Root MSE	Hard2 Mean
0.916350	9.331886	3.242270	34.74400

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	17033.46322	8516.73161	810.17	<.0001
Meat	1	52.66094	52.66094	5.01	0.0266
Meat*Day	2	600.10357	300.05179	28.54	<.0001
Buffer	5	802.69369	160.53874	15.27	<.0001
Meat*Buffer	5	396.89992	79.37998	7.55	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	52.66094222	52.66094222	0.18	0.7160

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The GLM Procedure

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The GLM Procedure

Dependent Variable: Cohesive

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	0.03088611	0.00205907	6.63	<.0001
Error	164	0.05096889	0.00031079		
Corrected Total	179	0.08185500			

R-Square	Coeff Var	Root MSE	Cohesive Mean
0.377327	5.443887	0.017629	0.323833

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.00449333	0.00224667	7.23	0.0010
Meat	1	0.00896056	0.00896056	28.83	<.0001
Meat*Day	2	0.00860444	0.00430222	13.84	<.0001
Buffer	5	0.00289833	0.00057967	1.87	0.1031
Meat*Buffer	5	0.00592944	0.00118589	3.82	0.0027

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.00896056	0.00896056	2.08	0.2858

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The GLM Procedure

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The GLM Procedure

Dependent Variable: Gummy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	3157.591582	210.506105	68.14	<.0001

Error	164	506.631051	3.089214		
Corrected Total	179	3664.222633			

R-Square	Coeff Var	Root MSE	Gummy Mean
0.861736	13.09759	1.757616	13.41939

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	2669.918748	1334.959374	432.14	<.0001
Meat	1	0.889014	0.889014	0.29	0.5924
Meat*Day	2	210.211121	105.105561	34.02	<.0001
Buffer	5	178.629429	35.725886	11.56	<.0001
Meat*Buffer	5	97.943269	19.588654	6.34	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.88901389	0.88901389	0.01	0.9351

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The GLM Procedure

Class Level Information

Class	Levels	Values
Meat	2	Normal PSE
Buffer	6	Control H2O KHCO3 NH4HCO NaHCO3 SP
Day	3	1 2 3

Number of Observations Read 180
Number of Observations Used 178

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The GLM Procedure

Dependent Variable: Strain

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	10	2.91867510	0.29186751	13.51	<.0001
Error	167	3.60865580	0.02160872		
Corrected Total	177	6.52733090			

R-Square	Coeff Var	Root MSE	Strain Mean
0.447147	14.87963	0.146999	0.987921

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.02617005	0.01308502	0.61	0.5470
Meat	1	0.77914757	0.77914757	36.06	<.0001
Meat*Day	2	0.20832200	0.10416100	4.82	0.0092
Buffer	5	1.92675248	0.38535050	17.83	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.77914757	0.77914757	7.48	0.1117

D-14. P2S1: Raw ANOVA data for cooked pork gels.

Dependent Variable: xcookpH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	2.12791389	0.14186093	45.53	<.0001
Error	20	0.06231111	0.00311556		
Corrected Total	35	2.19022500			

R-Square	Coeff Var	Root MSE	xcookpH Mean
0.971550	0.906736	0.055817	6.155833

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.45001667	0.22500833	72.22	<.0001
Meat	1	0.58777778	0.58777778	188.66	<.0001
Meat*Day	2	0.08777222	0.04388611	14.09	0.0002
Buffer	5	1.00164167	0.20032833	64.30	<.0001
Meat*Buffer	5	0.00070556	0.00014111	0.05	0.9986

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The GLM Procedure

Dependent Variable: xcookL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	36.87390370	2.45826025	13.55	<.0001
Error	20	3.62717407	0.18135870		
Corrected Total	35	40.50107778			

R-Square	Coeff Var	Root MSE	xcookL Mean
0.910443	0.534865	0.425862	79.62056

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	2.94551296	1.47275648	8.12	0.0026
Meat	1	9.16071111	9.16071111	50.51	<.0001
Meat*Day	2	0.76640185	0.38320093	2.11	0.1471
Buffer	5	23.45363704	4.69072741	25.86	<.0001
Meat*Buffer	5	0.54764074	0.10952815	0.60	0.6977

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The GLM Procedure

Dependent Variable: xcooka

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	13.86990710	0.92466047	5.39	0.0003
Error	20	3.43396790	0.17169840		
Corrected Total	35	17.30387500			

R-Square	Coeff Var	Root MSE	xcooka Mean
0.801549	5.001892	0.414365	8.284167

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	4.55021667	2.27510833	13.25	0.0002
Meat	1	5.07500772	5.07500772	29.56	<.0001
Meat*Day	2	2.17870432	1.08935216	6.34	0.0073
Buffer	5	1.99783611	0.39956722	2.33	0.0807
Meat*Buffer	5	0.06814228	0.01362846	0.08	0.9947

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The GLM Procedure

Dependent Variable: xcookb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	3.92827500	0.26188500	1.50	0.1948
Error	20	3.48420000	0.17421000		
Corrected Total	35	7.41247500			

R-Square	Coeff Var	Root MSE	xcookb Mean
0.529955	5.660520	0.417385	7.373611

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	2.19949630	1.09974815	6.31	0.0075
Meat	1	0.58013611	0.58013611	3.33	0.0830
Meat*Day	2	0.21768889	0.10884444	0.62	0.5455
Buffer	5	0.38641759	0.07728352	0.44	0.8128
Meat*Buffer	5	0.54453611	0.10890722	0.63	0.6825

Dependent Variable: xcookpH

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.58777778	0.58777778	13.39	0.0672

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The GLM Procedure

Dependent Variable: xcookL

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	9.16071111	9.16071111	23.91	0.0394

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The GLM Procedure

Dependent Variable: xcooka

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	5.07500772	5.07500772	4.66	0.1636

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The GLM Procedure

Dependent Variable: xcookb

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.58013611	0.58013611	5.33	0.1473

APPENDIX E

E-1. Least square means for raw pH and CIE color space values of raw pork prior to processing.

Effect	Initial pH	Initial CIE Color Space Values L*	a*	b*
RMSE[y]	0.021	1.646	0.308	0.398
Meat Source	*<0.0001*[z]	*0.0001*[z]	*0.0016*[z]	*<0.0001*[z]
Normal	5.80[a]	54.42[b]	8.36[b]	1.93[b]
PSE	5.45[b]	62.68[a]	9.32[a]	4.77[a]
Meat Source, Day	*0.0006*[z]	*0.4858*[z]	*0.0002*[z]	*0.0002*[z]
Normal, 1	5.93[a]		8.87[b]	2.43[c]
Normal, 2	5.88[b]		7.26[c]	1.52[c]
Normal, 3	5.60[c]		8.95[b]	1.84[c]
PSE, 1	5.48[d]		8.79[b]	4.57[b]
PSE, 2	5.49[d]		6.88[c]	2.08[c]
PSE, 3	5.39[e]		`12.31[a]	7.64[a]

[abcd]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[y]Root Mean Square Error
[z]P-value from analysis of variance tables.

E-2. Least square means for cooked pH and CIE color space values for cooked meat gels affected by meat source and hydrocolloid treatments.

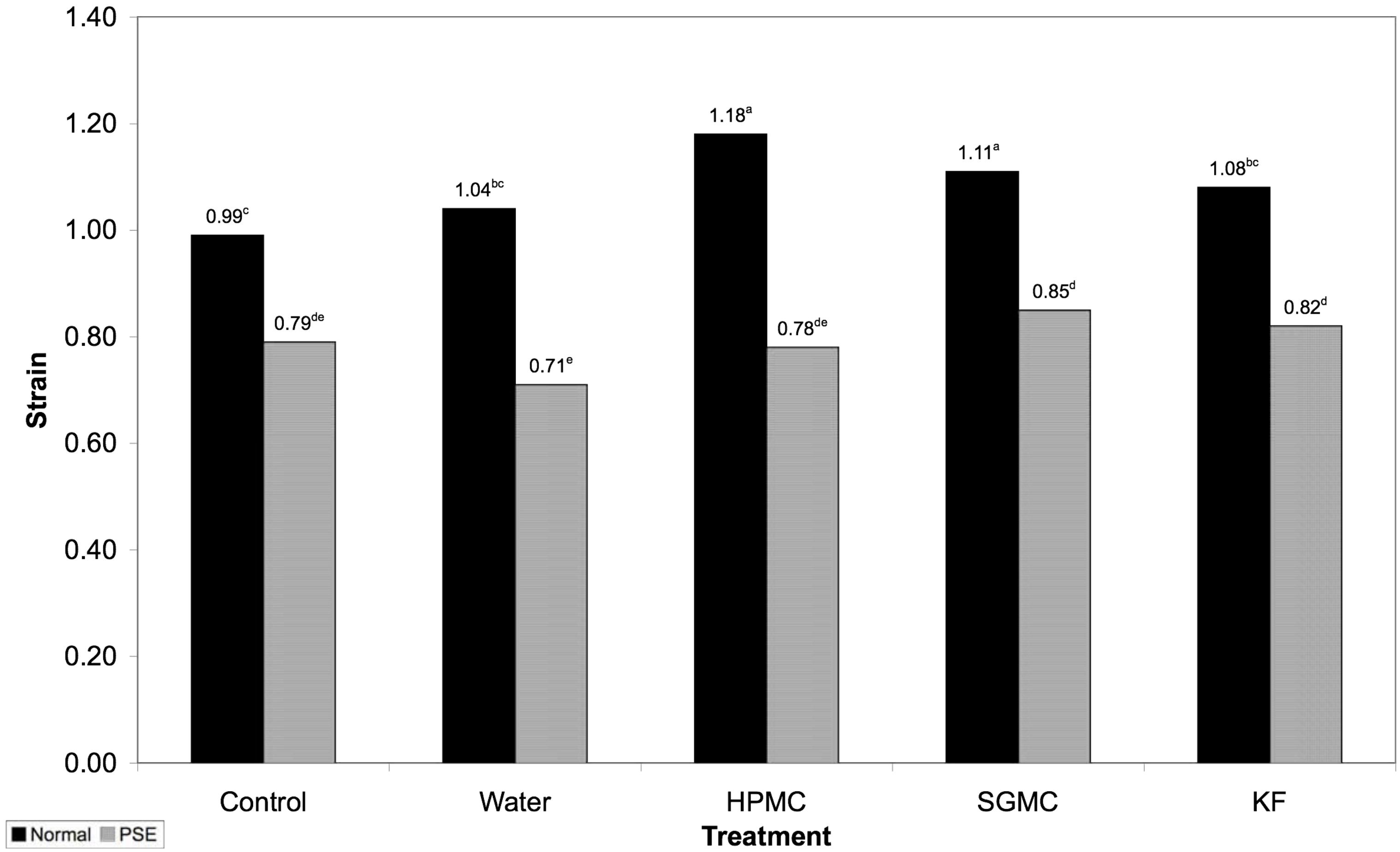
Effect	Cooked pH	Cooked CIE Color Space Values L*	a*	b*
RMSE[y]	0.033	0.573	0.487	0.390
Meat Source	*0.0131*[z]	*0.0362*[z]	*0.1270*[z]	*0.0949*[z]
Normal	6.03[a]	83.22[a]	6.27	7.79
PSE	5.56[b]	82.46[b]	4.35	8.40
Hydrocolloid	*0.7879*[z]	*<0.0001*[z]	*0.0054*[z]	*0.1030*[z]
Control	5.79	83.15[b]	6.04[a]	8.10
Water	5.81	81.36[a]	4.81[c]	7.96
HPMC	5.78	83.38[a]	5.26[bc]	8.16
SGMC	5.79	82.83[a]	5.03[bc]	8.45
KF	5.79	83.48[a]	5.41[b]	7.81
Meat Source, Day	*<0.0001*[z]	*0.6131*[z]	*<0.0001*[z]	*0.1659*[z]
Normal, 1	6.13[a]		5.57[bc]	
Normal, 2	5.95[c]		7.22[a]	
Normal, 3	6.00[b]		6.02[b]	
PSE, 1	5.59[e]		2.56[d]	
PSE, 2	5.45[f]		4.94[c]	
PSE, 3	5.64[d]		5.55[bc]	

[abcdef]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[y]Root Mean Square Error
[z]P-value from analysis of variance tables.

E-3. Least square means for torsion testing and texture profile analysis for cooked meat gels affected by meat source and hydrocolloid treatments.

	Torison Testing		Texture Profile Analysis			
Effect	Stress (kPa)	Strain	Hardness, 1st Bite, (N)	Hardness, 2nd Bite, (N)	Cohesiveness	Gumminess (N)
RMSE^{y}	8.410	0.131	8.158	7.249	0.016	3.256
Meat Source	*0.0553*^{z}	*0.0163*^{z}	*0.3226*^{z}	*0.2239*^{z}	*0.3561*^{z}	*0.3224*^{z}
Normal	48.45	1.08^{a}	54.4	46.2	0.32	17.6
PSE	37.53	0.79^{b}	51.2	42.4	0.31	16.1
Hydrocolloid	*<0.0001*^{z}	*0.0023*^{z}	*0.0001*^{z}	*<0.0001*^{z}	*<0.0001*^{z}	*<0.0001*^{z}
Control	49.83^{a}	0.89^{bc}	57.3^{a}	48.1^{a}	0.33^{a}	19.0^{a}
Water	35.43^{c}	0.88^{c}	56.2^{a}	47.7^{a}	0.31^{bc}	17.7^{ab}
HPMC	44.00^{b}	0.98^{a}	51.1^{b}	42.9^{b}	0.31^{bc}	16.2^{bc}
SGMC	44.08^{b}	0.98^{a}	49.9^{bc}	41.6^{b}	0.31^{c}	15.5^{c}
KF	41.60^{b}	0.95^{ab}	49.5^{c}	41.3^{b}	0.32^{b}	15.8^{c}
Meat Source, Day	*0.0243*^{z}	*0.0515*^{z}	*0.0346*^{z}	*0.0337*^{z}	*<0.0001*^{z}	*0.0102*^{z}
Normal, 1	40.39^{c}		62.0^{ab}	52.5^{a}	0.32^{b}	19.6^{a}
Normal, 2	47.06^{b}		41.0^{c}	34.7^{c}	0.32^{b}	13.0^{c}
Normal, 3	57.92^{a}		60.3^{ab}	51.4^{a}	0.33^{a}	20.2^{a}
PSE, 1	33.53^{d}		62.9^{a}	52.7^{a}	0.32^{b}	20.4^{a}
PSE, 2	31.07^{d}		33.3^{d}	27.3^{d}	0.30^{c}	10.2^{d}
PSE, 3	47.97^{b}		57.4^{b}	47.2^{b}	0.31^{c}	17.7^{b}

^{abcd}Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
^{y}Root Mean Square Error
^{z}P-value from analysis of variance tables.



E-4. Meat by buffer treatment interaction for cooked meat gels on torsion testing attribute: Strain.

E-5. P2S2: Raw data for boneless pork loins.

Date	Meat	Day	pH	L1	a1	b1	L2	a2	b2	L3	a3	b3
9/4/07	Normal	1	5.91	57.41	9.16	3.65	52.58	8.54	1.60	50.20	8.33	2.32
9/4/07	Normal	1	5.95	49.85	8.59	2.27	47.15	9.78	2.88	49.18	8.80	1.87
9/4/07	PSE	1	5.48	61.21	8.51	5.31	57.12	9.07	4.04	55.40	8.77	3.45
9/4/07	PSE	1	5.48	58.20	8.88	4.41	62.55	8.69	5.71	62.27	8.75	4.52
9/6/07	Normal	2	5.90	56.32	7.06	1.76	53.89	8.08	0.97	62.86	7.33	2.57
9/6/07	Normal	2	5.85	58.69	6.98	0.70	55.62	6.62	0.94	60.96	7.51	2.15
9/6/07	PSE	2	5.49	67.68	5.03	1.00	68.59	9.23	3.75	66.01	5.38	1.05
9/6/07	PSE	2	5.49	65.16	7.29	1.29	71.00	5.70	2.27	67.97	8.63	3.14
9/7/07	Normal	3	5.60	52.74	9.05	2.28	56.81	8.63	2.45	52.23	8.53	2.01
9/7/07	Normal	3	5.59	49.76	8.72	1.00	57.83	9.16	1.61	55.49	9.63	1.67
9/7/07	PSE	3	5.41	63.88	13.62	8.92	61.02	12.55	7.80	57.57	11.39	7.24
9/7/07	PSE	3	5.37	59.03	9.67	6.19	64.05	14.74	9.67	59.59	11.94	6.03

E-6. P2S2: Raw data for torsion testing and texture profile analysis hydrocolloid treated cooked pork gels.

Date	Meat	Hydro	Day	Sample	Stress	Strain	Bioyield	Peak1	Area1	Peak2	Area2	Hard1	Hard2	Cohesive	Gummy
9/6/07	Normal	Control	1	1	39.19	1.00	0.000	2558.444	6.353	2183.422	2.173	60.92	51.99	0.34	20.84
9/6/07	Normal	Control	1	2	46.90	1.03	0.000	2408.938	6.305	2055.964	2.079	57.36	48.95	0.33	18.91
9/6/07	Normal	Control	1	3	44.97	1.01	846.828	2149.014	5.963	1799.663	1.790	51.17	42.85	0.30	15.36
9/6/07	Normal	Control	1	4	48.06	1.12	0.000	2227.247	5.575	1900.829	1.821	53.03	45.26	0.33	17.32
9/6/07	Normal	Control	1	5	47.10	1.23	0.000	2689.029	6.412	2278.799	2.224	64.02	54.26	0.35	22.21
9/6/07	PSE	Control	1	1	57.91	1.06	460.934	2245.027	5.399	1848.375	1.746	53.45	44.01	0.32	17.29
9/6/07	PSE	Control	1	2	44.78	0.86	509.859	2477.028	5.556	2043.006	1.861	58.98	48.64	0.33	19.75
9/6/07	PSE	Control	1	3	53.47	1.08	513.636	2522.069	5.893	2132.447	1.969	60.05	50.77	0.33	20.06
9/6/07	PSE	Control	1	4	49.41	0.91	448.625	2534.202	5.855	2100.781	2.033	60.34	50.02	0.35	20.95
9/6/07	PSE	Control	1	5	38.88	0.88	557.093	2763.972	6.235	2310.124	2.248	65.81	55.00	0.36	23.73
9/6/07	Normal	H2O	1	1	45.94	1.32	0.000	3215.542	9.924	2758.509	3.162	76.56	65.68	0.32	24.39
9/6/07	Normal	H2O	1	2	28.18	0.97	1219.662	3104.873	9.566	2610.106	2.758	73.93	62.15	0.29	21.31
9/6/07	Normal	H2O	1	3	32.04	1.05	0.000	3211.092	9.167	2665.500	2.832	76.45	63.46	0.31	23.62
9/6/07	Normal	H2O	1	4	38.41	1.35	1217.022	2991.201	9.193	2507.913	2.766	71.22	59.71	0.30	21.43
9/6/07	Normal	H2O	1	5	35.32	1.20	0.000	3029.619	9.459	2633.327	2.921	72.13	62.70	0.31	22.28
9/6/07	PSE	H2O	1	1	30.50	0.94	0.000	3585.706	10.650	3101.516	3.456	85.37	73.85	0.32	27.70
9/6/07	PSE	H2O	1	2	27.41	0.89	1210.255	3645.321	11.100	3133.314	3.566	86.79	74.60	0.32	27.88
9/6/07	PSE	H2O	1	3	29.53	1.06	1082.952	3505.821	10.340	3017.606	3.503	83.47	71.85	0.34	28.28
9/6/07	PSE	H2O	1	4	32.04	1.01	947.711	3431.141	9.656	2990.750	3.233	81.69	71.21	0.33	27.35
9/6/07	PSE	H2O	1	5	22.58	0.88	1148.451	3378.882	9.575	2944.139	3.154	80.45	70.10	0.33	26.50
9/6/07	Normal	A150	1	1	34.36	1.05	943.595	2331.817	6.783	1969.531	1.996	55.52	46.89	0.29	16.34
9/6/07	Normal	A150	1	2	45.94	1.42	0.000	2554.558	7.141	2160.550	2.236	60.82	51.44	0.31	19.04
9/6/07	Normal	A150	1	3	42.66	1.23	0.000	2389.092	7.056	2025.425	2.010	56.88	48.22	0.28	16.20
9/6/07	Normal	A150	1	4	41.11	1.19	0.000	2454.021	6.365	2113.304	2.024	58.43	50.32	0.32	18.58
9/6/07	Normal	A150	1	5	44.78	1.26	0.000	2584.809	7.748	2146.160	2.315	61.54	51.10	0.30	18.39
9/6/07	PSE	A150	1	1	27.02	0.91	567.333	2194.675	5.266	1782.222	1.586	52.25	42.43	0.30	15.74
9/6/07	PSE	A150	1	2	31.27	1.11	639.483	2327.566	5.896	1938.004	1.838	55.42	46.14	0.31	17.28
9/6/07	PSE	A150	1	3	38.99	1.15	587.498	2375.555	6.239	1975.299	1.916	56.56	47.03	0.31	17.37
9/6/07	PSE	A150	1	4	24.71	1.07	606.299	2388.769	5.955	1968.866	1.864	56.88	46.88	0.31	17.80
9/6/07	PSE	A150	1	5	25.87	0.85	0.000	2552.917	6.539	2093.060	2.047	60.78	49.83	0.31	19.03

9/6/07	Normal	E15	1	1	41.31	1.41	0.000	2786.931	7.903	2379.705	2.484	66.36	56.66	0.31	20.86
9/6/07	Normal	E15	1	2	37.45	1.23	0.000	2521.878	7.455	2131.354	2.211	60.04	50.75	0.30	17.81
9/6/07	Normal	E15	1	3	45.17	1.36	0.000	2668.831	6.696	2235.410	2.272	63.54	53.22	0.34	21.56
9/6/07	Normal	E15	1	4	39.76	1.31	0.000	2727.076	7.420	2320.630	2.406	64.93	55.25	0.32	21.05
9/6/07	Normal	E15	1	5	34.94	1.47	0.000	2520.075	6.186	2144.632	2.052	60.00	51.06	0.33	19.90
9/6/07	PSE	E15	1	1	32.62	1.09	554.754	2259.600	6.083	1878.809	1.857	53.80	44.73	0.31	16.42
9/6/07	PSE	E15	1	2	32.04	1.07	574.888	2498.908	6.326	2049.806	2.021	59.50	48.80	0.32	19.01
9/6/07	PSE	E15	1	3	26.25	0.89	533.395	2267.440	5.921	1874.153	1.801	53.99	44.62	0.30	16.42
9/6/07	PSE	E15	1	4	30.69	1.03	615.026	2434.566	6.383	1937.459	1.928	57.97	46.13	0.30	17.51
9/6/07	PSE	E15	1	5	27.41	0.82	570.991	2328.227	6.007	1906.461	1.847	55.43	45.39	0.31	17.04
9/6/07	Normal	KF	1	1	31.66	0.95	844.169	2402.539	6.136	2036.889	2.013	57.20	48.50	0.33	18.77
9/6/07	Normal	KF	1	2	40.34	1.39	702.781	2536.019	6.216	2172.772	2.101	60.38	51.73	0.34	20.41
9/6/07	Normal	KF	1	3	35.90	1.38	771.205	2162.791	6.095	1795.038	1.801	51.50	42.74	0.30	15.22
9/6/07	Normal	KF	1	4	44.01	1.19	824.501	2286.441	5.684	1947.406	1.859	54.44	46.37	0.33	17.80
9/6/07	Normal	KF	1	5	44.20	1.39	0.000	2538.280	6.901	2200.988	2.272	60.44	52.40	0.33	19.90
9/6/07	PSE	KF	1	1	28.95	0.89	542.989	2254.204	5.139	1878.280	1.745	53.67	44.72	0.34	18.22
9/6/07	PSE	KF	1	2	32.04	1.09	0.000	2353.262	5.682	1998.666	1.875	56.03	47.59	0.33	18.49
9/6/07	PSE	KF	1	3	31.27	0.89	654.300	2645.310	6.301	2246.671	2.095	62.98	53.49	0.33	20.94
9/6/07	PSE	KF	1	4	32.43	1.07	0.000	2360.295	6.268	1937.027	1.916	56.20	46.12	0.31	17.18
9/6/07	PSE	KF	1	5	30.30	1.00	0.000	2669.113	6.162	2261.646	2.093	63.55	53.85	0.34	21.59
9/7/07	Normal	Control	2	1	53.27	1.07	685.008	1889.851	6.593	1586.215	2.082	45.00	37.77	0.32	14.21
9/7/07	Normal	Control	2	2	49.22	1.03	615.691	1793.882	5.757	1464.676	1.777	42.71	34.87	0.31	13.18
9/7/07	Normal	Control	2	3	40.92	0.74	752.158	1977.509	6.468	1681.297	2.070	47.08	40.03	0.32	15.07
9/7/07	Normal	Control	2	4	51.73	1.17	631.902	1950.776	5.803	1696.916	2.024	46.45	40.40	0.35	16.20
9/7/07	Normal	Control	2	5	57.14	1.18	655.010	1648.546	5.557	1383.167	1.693	39.25	32.93	0.30	11.96
9/7/07	PSE	Control	2	1	39.76	0.74	443.889	1744.872	4.918	1415.410	1.555	41.54	33.70	0.32	13.14
9/7/07	PSE	Control	2	2	40.73	0.68	447.427	1837.410	5.387	1541.796	1.759	43.75	36.71	0.33	14.28
9/7/07	PSE	Control	2	3	42.47	0.70	508.460	1916.220	5.443	1608.062	1.883	45.62	38.29	0.35	15.78
9/7/07	PSE	Control	2	4	43.82	0.79	489.092	1780.688	5.218	1489.141	1.744	42.40	35.46	0.33	14.17
9/7/07	PSE	Control	2	5	51.34	0.81	471.995	1753.551	4.896	1463.113	1.573	41.75	34.84	0.32	13.41
9/7/07	Normal	H2O	2	1	35.13	1.00	0.000	1603.278	4.771	1400.873	1.526	38.17	33.35	0.32	12.21
9/7/07	Normal	H2O	2	2	47.10	1.04	0.000	1621.923	4.820	1373.468	1.542	38.62	32.70	0.32	12.35
9/7/07	Normal	H2O	2	3	44.20	1.09	593.238	1772.340	5.318	1539.756	1.777	42.20	36.66	0.33	14.10

9/7/07	Normal	H2O	2	4	34.36	0.80	0.000	1585.227	4.652	1355.716	1.525	37.74	32.28	0.33	12.37
9/7/07	Normal	H2O	2	5	51.54	1.24	0.000	1808.988	5.527	1557.717	1.792	43.07	37.09	0.32	13.96
9/7/07	PSE	H2O	2	1	20.85	0.55	297.282	1262.033	3.388	1020.689	0.943	30.05	24.30	0.28	8.36
9/7/07	PSE	H2O	2	2	27.55	0.65	330.227	1347.826	3.680	1106.795	1.068	32.09	26.35	0.29	9.31
9/7/07	PSE	H2O	2	3	28.95	0.62	283.224	1222.802	3.465	1003.786	0.970	29.11	23.90	0.28	8.15
9/7/07	PSE	H2O	2	4	19.88	0.57	263.587	1185.473	3.102	974.592	0.861	28.23	23.20	0.28	7.83
9/7/07	PSE	H2O	2	5	32.81	0.62	287.467	1332.258	3.424	1106.786	1.029	31.72	26.35	0.30	9.53
9/7/07	Normal	A150	2	1	20.85	0.83	0.000	1749.619	5.331	1471.440	1.696	41.66	35.03	0.32	13.25
9/7/07	Normal	A150	2	2	42.27	1.00	0.000	1774.311	5.535	1502.305	1.755	42.25	35.77	0.32	13.39
9/7/07	Normal	A150	2	3	51.34	1.17	0.000	1771.302	5.138	1504.387	1.664	42.17	35.82	0.32	13.66
9/7/07	Normal	A150	2	4	52.50	1.08	802.196	1620.661	5.638	1372.490	1.626	38.59	32.68	0.29	11.13
9/7/07	Normal	A150	2	5	44.01	1.12	0.000	1653.115	4.990	1372.661	1.541	39.36	32.68	0.31	12.16
9/7/07	PSE	A150	2	1	33.20	0.82	290.660	1431.562	3.425	1143.770	1.087	34.08	27.23	0.32	10.82
9/7/07	PSE	A150	2	2	26.25	0.77	257.753	1276.262	3.295	1046.068	0.995	30.39	24.91	0.30	9.17
9/7/07	PSE	A150	2	3	29.34	0.84	317.621	1251.027	3.642	1005.160	0.990	29.79	23.93	0.27	8.10
9/7/07	PSE	A150	2	4	27.41	0.73	292.756	1302.448	3.203	1066.110	0.960	31.01	25.38	0.30	9.29
9/7/07	PSE	A150	2	5	34.36	0.88	279.939	1274.356	3.449	1057.843	1.027	30.34	25.19	0.30	9.03
9/7/07	Normal	E15	2	1	64.08	1.07	0.000	1673.904	4.861	1401.385	1.531	39.85	33.37	0.31	12.55
9/7/07	Normal	E15	2	2	51.92	0.98	0.000	1767.933	5.611	1537.312	1.829	42.09	36.60	0.33	13.72
9/7/07	Normal	E15	2	3	52.50	1.13	0.000	1813.875	5.701	1508.134	1.800	43.19	35.91	0.32	13.64
9/7/07	Normal	E15	2	4	58.68	1.37	0.000	1640.436	5.022	1417.495	1.550	39.06	33.75	0.31	12.05
9/7/07	Normal	E15	2	5	49.41	1.13	640.819	1650.198	5.014	1394.063	1.520	39.29	33.19	0.30	11.91
9/7/07	PSE	E15	2	1	24.71	0.56	271.937	1224.628	3.157	1005.071	0.947	29.16	23.93	0.30	8.75
9/7/07	PSE	E15	2	2	27.99	0.66	275.759	1387.165	3.522	1127.873	1.058	33.03	26.85	0.30	9.92
9/7/07	PSE	E15	2	3	29.34	0.62	283.841	1301.838	3.116	1019.194	0.882	31.00	24.27	0.28	8.77
9/7/07	PSE	E15	2	4	28.57	0.61	279.606	1339.160	3.341	1071.932	0.984	31.88	25.52	0.29	9.39
9/7/07	PSE	E15	2	5	21.43	0.50	274.152	1382.173	3.478	1174.251	1.088	32.91	27.96	0.31	10.29
9/7/07	Normal	KF	2	1	46.90	1.05	0.000	1624.661	4.716	1373.219	1.451	38.68	32.70	0.31	11.90
9/7/07	Normal	KF	2	2	45.75	1.14	0.000	1472.992	4.557	1235.516	1.364	35.07	29.42	0.30	10.50
9/7/07	Normal	KF	2	3	33.20	0.63	0.000	1694.849	5.156	1422.615	1.606	40.35	33.87	0.31	12.57
9/7/07	Normal	KF	2	4	43.62	1.07	0.000	1688.966	5.260	1424.412	1.647	40.21	33.91	0.31	12.59
9/7/07	Normal	KF	2	5	54.82	1.17	0.000	1779.419	5.367	1505.393	1.793	42.37	35.84	0.33	14.15
9/7/07	PSE	KF	2	1	25.87	0.69	224.587	1217.696	2.989	977.689	0.860	28.99	23.28	0.29	8.35

9/7/07	PSE	KF	2	2	28.37	0.62	229.576	1202.234	2.837	981.881	0.891	28.62	23.38	0.31	8.99
9/7/07	PSE	KF	2	3	26.25	0.58	264.499	1318.051	3.464	1073.720	1.070	31.38	25.56	0.31	9.69
9/7/07	PSE	KF	2	4	27.60	0.76	272.012	1411.406	3.207	1126.913	1.003	33.60	26.83	0.31	10.51
9/7/07	PSE	KF	2	5	37.83	0.87	236.566	1298.395	3.093	1057.562	0.959	30.91	25.18	0.31	9.59
9/10/07	Normal	Control	3	1	59.64	0.92	0.000	5134.204	16.490	4431.475	6.155	122.24	105.51	0.37	45.63
9/10/07	Normal	Control	3	2	62.54	0.84	0.000	2462.907	8.218	2121.459	2.754	58.64	50.51	0.34	19.65
9/10/07	Normal	Control	3	3	45.94	0.56	922.980	2633.254	8.480	2282.775	2.711	62.70	54.35	0.32	20.04
9/10/07	Normal	Control	3	4	72.58	0.94	0.000	2647.395	7.759	2256.820	2.736	63.03	53.73	0.35	22.23
9/10/07	Normal	Control	3	5	68.33	0.99	0.000	2847.254	8.738	2436.700	3.069	67.79	58.02	0.35	23.81
9/10/07	PSE	Control	3	1	45.55	0.47	747.443	2586.966	8.115	2095.000	2.508	61.59	49.88	0.31	19.04
9/10/07	PSE	Control	3	2	51.15	0.68	1047.580	3237.373	10.950	2668.177	3.619	77.08	63.53	0.33	25.48
9/10/07	PSE	Control	3	3	60.22	0.73	691.576	2180.202	7.246	1763.024	2.084	51.91	41.98	0.29	14.93
9/10/07	PSE	Control	3	4	37.64	0.71	816.775	2699.219	8.397	2141.912	2.680	64.27	51.00	0.32	20.51
9/10/07	PSE	Control	3	5	50.19	0.81	0.000	2930.849	9.403	2478.420	3.011	69.78	59.01	0.32	22.35
9/10/07	Normal	H2O	3	1	32.43	0.56	0.000	2309.967	7.017	1987.103	2.423	55.00	47.31	0.35	18.99
9/10/07	Normal	H2O	3	2	37.45	0.95	0.000	2533.886	8.313	2099.170	2.673	60.33	49.98	0.32	19.40
9/10/07	Normal	H2O	3	3	44.20	0.89	0.000	2510.594	7.708	2167.611	2.629	59.78	51.61	0.34	20.39
9/10/07	Normal	H2O	3	4	67.17	1.24	0.000	2334.655	7.291	2027.550	2.575	55.59	48.28	0.35	19.63
9/10/07	Normal	H2O	3	5	46.33	0.96	818.411	2210.702	7.016	1847.532	2.216	52.64	43.99	0.32	16.62
9/10/07	PSE	H2O	3	1	36.48	0.62	658.768	2290.418	6.877	1913.720	2.102	54.53	45.56	0.31	16.67
9/10/07	PSE	H2O	3	2	25.87	0.57	576.191	1877.864	6.640	1527.281	1.746	44.71	36.36	0.26	11.76
9/10/07	PSE	H2O	3	3	33.59	0.50	669.660	2284.922	7.161	1894.905	2.021	54.40	45.12	0.28	15.35
9/10/07	PSE	H2O	3	4	39.76	0.65	705.834	2117.022	6.765	1761.209	1.927	50.41	41.93	0.28	14.36
9/10/07	PSE	H2O	3	5	35.43	0.52	639.452	2522.803	7.069	2123.546	2.322	60.07	50.56	0.33	19.73
9/10/07	Normal	A150	3	1	63.70	1.02	0.000	2407.726	7.568	2030.052	2.477	57.33	48.33	0.33	18.76
9/10/07	Normal	A150	3	2	60.42	1.11	0.000	1967.560	6.884	1647.172	1.985	46.85	39.22	0.29	13.51
9/10/07	Normal	A150	3	3	70.65	1.07	0.000	2519.881	7.500	2183.035	2.628	60.00	51.98	0.35	21.02
9/10/07	Normal	A150	3	4	74.31	1.13	0.000	2540.237	8.486	2191.432	2.825	60.48	52.18	0.33	20.13
9/10/07	Normal	A150	3	5	66.79	1.00	873.394	2138.247	7.402	1801.367	2.219	50.91	42.89	0.30	15.26
9/10/07	PSE	A150	3	1	64.86	0.80	692.051	2254.246	7.384	1843.448	2.198	53.67	43.89	0.30	15.98
9/10/07	PSE	A150	3	2	56.94	0.76	616.985	2249.855	7.233	1842.893	2.165	53.57	43.88	0.30	16.03
9/10/07	PSE	A150	3	3	56.75	0.86	0.000	2435.502	7.320	2027.249	2.422	57.99	48.27	0.33	19.19
9/10/07	PSE	A150	3	4	27.41	0.38	748.774	2561.590	7.770	2121.400	2.525	60.99	50.51	0.32	19.82

9/10/07	PSE	A150	3	5	62.35	0.82	744.501	2516.906	8.005	2001.928	2.418	59.93	47.66	0.30	18.10
9/10/07	Normal	E15	3	1	40.34	1.17	0.000	2486.169	8.518	2112.295	2.768	59.19	50.29	0.32	19.24
9/10/07	Normal	E15	3	2	52.89	0.99	0.000	2103.309	6.529	1790.451	2.037	50.08	42.63	0.31	15.62
9/10/07	Normal	E15	3	3	60.80	1.09	0.000	2344.000	7.610	2029.310	2.506	55.81	48.32	0.33	18.38
9/10/07	Normal	E15	3	4	55.40	0.99	0.000	2423.978	8.057	2070.222	2.683	57.71	49.29	0.33	19.22
9/10/07	Normal	E15	3	5	59.45	1.07	933.549	2729.385	8.566	2332.569	2.991	64.99	55.54	0.35	22.69
9/10/07	PSE	E15	3	1	61.57	0.83	769.938	2270.664	7.942	1865.793	2.392	54.06	44.42	0.30	16.28
9/10/07	PSE	E15	3	2	51.15	0.60	839.159	2601.349	8.233	2211.401	2.631	61.94	52.65	0.32	19.79
9/10/07	PSE	E15	3	3	62.35	0.81	741.326	2150.841	6.829	1749.596	1.997	51.21	41.66	0.29	14.98
9/10/07	PSE	E15	3	4	60.80	0.92	0.000	2637.549	7.962	2222.428	2.702	62.80	52.91	0.34	21.31
9/10/07	PSE	E15	3	5	59.07	0.76	0.000	2492.058	7.633	2094.893	2.440	59.33	49.88	0.32	18.97
9/10/07	Normal	KF	3	1	71.80	0.95	777.517	2624.537	8.512	2194.040	2.951	62.49	52.24	0.35	21.66
9/10/07	Normal	KF	3	2	59.07	1.07	938.614	2366.468	8.052	2048.869	2.651	56.34	48.78	0.33	18.55
9/10/07	Normal	KF	3	3	72.58	1.03	770.605	2037.027	6.957	1696.102	2.093	48.50	40.38	0.30	14.59
9/10/07	Normal	KF	3	4	41.31	0.83	804.526	2256.438	7.072	1920.429	2.345	53.72	45.72	0.33	17.81
9/10/07	Normal	KF	3	5	61.77	0.93	0.000	2762.602	8.855	2309.477	3.097	65.78	54.99	0.35	23.00
9/10/07	PSE	KF	3	1	35.13	0.73	621.056	2517.168	7.477	2017.217	2.323	59.93	48.03	0.31	18.62
9/10/07	PSE	KF	3	2	50.38	0.94	0.000	2183.927	7.244	1748.444	2.129	52.00	41.63	0.29	15.28
9/10/07	PSE	KF	3	3	38.99	0.70	0.000	1988.375	6.472	1587.864	1.844	47.34	37.81	0.28	13.49
9/10/07	PSE	KF	3	4	42.08	0.69	711.286	2270.587	7.021	1895.668	2.164	54.06	45.13	0.31	16.66
9/10/07	PSE	KF	3	5	53.66	0.83	626.268	2409.239	7.100	1963.714	2.245	57.36	46.76	0.32	18.14

E-7. P2S2: Raw data for cooked hydrocolloid treated cooked pork gels.

Date	Meat	Hydro	Day	pH	pH	L1	a1	b1	L2	a2	b2	L3	a3	b3
9/6/07	Normal	Control	1	6.11	6.13	86.48	6.15	6.88	84.95	6.35	6.76	86.68	6.21	6.91
9/6/07	PSE	Control	1	5.59	5.60	84.38	2.87	6.91	85.70	2.73	7.33	85.88	2.98	7.27
9/6/07	Normal	H20	1	6.16	6.14	87.77	5.94	7.47	88.45	5.45	6.91	88.96	5.38	6.96
9/6/07	PSE	H20	1	5.63	5.63	85.76	2.59	8.15	87.51	2.25	7.87	87.60	2.51	7.31
9/6/07	Normal	A150	1	6.16	6.15	89.03	4.88	6.73	89.67	4.83	6.66	87.83	5.44	6.71
9/6/07	PSE	A150	1	5.58	5.59	88.19	2.76	7.28	88.45	2.33	6.93	87.20	2.38	7.33
9/6/07	Normal	E15	1	6.10	6.10	87.70	5.17	6.85	87.45	5.32	7.25	87.51	5.59	7.52
9/6/07	PSE	E15	1	5.51	5.53	87.41	2.76	8.07	86.37	2.25	7.70	87.81	2.53	7.32
9/6/07	Normal	Konjac	1	6.14	6.14	88.76	5.59	6.49	88.00	5.67	6.77	87.74	5.56	6.56
9/6/07	PSE	Konjac	1	5.59	5.60	88.83	2.28	6.83	88.28	2.55	6.84	87.17	2.68	7.45
9/7/07	Normal	Control	2	5.96	5.96	78.83	7.75	8.41	79.10	8.10	8.39	79.18	7.75	9.00
9/7/07	PSE	Control	2	5.46	5.47	78.07	5.13	9.28	78.72	5.01	9.33	78.81	4.99	9.14
9/7/07	Normal	H20	2	5.93	5.91	80.33	6.52	8.94	80.02	6.98	8.26	80.53	6.31	7.99
9/7/07	PSE	H20	2	5.45	5.49	78.46	5.27	9.23	77.50	4.52	9.88	80.09	5.00	9.20
9/7/07	Normal	A150	2	5.92	5.95	81.33	7.33	7.68	81.68	7.45	8.04	80.70	7.17	7.77
9/7/07	PSE	A150	2	5.45	5.49	78.72	4.92	9.12	80.50	4.80	9.39	79.21	5.01	9.45
9/7/07	Normal	E15	2	5.98	5.99	80.86	6.28	9.07	80.88	7.99	7.75	81.01	7.76	7.96
9/7/07	PSE	E15	2	5.42	5.44	80.33	4.92	9.29	80.52	4.85	8.90	80.52	5.04	9.27
9/7/07	Normal	Konjac	2	5.93	5.93	80.72	6.87	7.93	80.35	6.92	9.05	81.54	7.09	7.86
9/7/07	PSE	Konjac	2	5.46	5.40	80.74	4.77	9.31	78.86	4.89	9.26	80.37	4.93	9.11
9/8/07	Normal	Control	3	6.00	6.00	80.78	7.75	6.83	79.96	7.94	7.41	80.32	7.75	7.50
9/8/07	PSE	Control	3	5.68	5.71	79.56	6.17	8.28	77.90	7.02	9.33	79.18	6.04	8.36
9/8/07	Normal	H20	3	5.98	6.02	80.81	4.88	8.68	82.23	4.73	8.83	81.86	4.80	8.86
9/8/07	PSE	H20	3	5.57	5.58	80.72	4.54	9.18	80.95	4.31	9.43	81.40	4.52	8.97
9/8/07	Normal	A150	3	6.01	5.99	81.09	5.22	8.31	82.04	5.07	8.41	79.92	5.55	8.78
9/8/07	PSE	A150	3	5.63	5.61	79.04	5.41	9.47	80.58	5.07	8.98	81.59	4.94	8.70
9/8/07	Normal	E15	3	6.01	6.00	82.15	5.85	8.28	82.28	6.04	8.52	82.72	6.13	8.41
9/8/07	PSE	E15	3	5.64	5.67	81.72	5.48	8.28	81.36	5.40	8.17	82.15	5.32	8.35
9/8/07	Normal	Konjac	3	6.00	6.00	81.45	6.13	8.17	81.48	6.30	8.04	81.71	6.10	8.08
9/8/07	PSE	Konjac	3	5.64	5.63	82.31	6.84	7.29	82.07	6.22	7.66	82.17	6.04	7.79

E-8. P2S2: Raw ANOVA data for boneless pork loins.

The GLM Procedure

Class Level Information

Class	Levels	Values
Meat	2	Normal PSE
Day	3	1 2 3

Number of Observations Read 12
Number of Observations Used 12

The GLM Procedure

Dependent Variable: pH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	0.50176667	0.10035333	207.63	<.0001
Error	6	0.00290000	0.00048333		
Corrected Total	11	0.50466667			

R-Square	Coeff Var	Root MSE	pH Mean
0.994254	0.390726	0.021985	5.626667

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.36053333	0.36053333	745.93	<.0001
Day	2	0.10901667	0.05450833	112.78	<.0001
Meat*Day	2	0.03221667	0.01610833	33.33	0.0006

The GLM Procedure

Dependent Variable: xrawL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	332.4944157	66.4988831	24.55	0.0006
Error	6	16.2542611	2.7090435		
Corrected Total	11	348.7486769			

R-Square	Coeff Var	Root MSE	xrawL Mean
0.953393	2.811038	1.645917	58.55194

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	204.8204898	204.8204898	75.61	0.0001
Day	2	123.2514241	61.6257120	22.75	0.0016
Meat*Day	2	4.4225019	2.2112509	0.82	0.4858

The GLM Procedure

Dependent Variable: xrawa

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	36.91334074	7.38266815	77.98	<.0001
Error	6	0.56803333	0.09467222		
Corrected Total	11	37.48137407			

R-Square	Coeff Var	Root MSE	xrawa Mean
0.984845	3.479546	0.307689	8.842778

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	2.78403333	2.78403333	29.41	0.0016
Day	2	25.43280185	12.71640093	134.32	<.0001
Meat*Day	2	8.69650556	4.34825278	45.93	0.0002

The GLM Procedure

Dependent Variable: xrawb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	56.04014907	11.20802981	70.73	<.0001
Error	6	0.95081667	0.15846944		
Corrected Total	11	56.99096574			

R-Square	Coeff Var	Root MSE	xrawb Mean
0.983316	11.89390	0.398082	3.346944

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	24.16840833	24.16840833	152.51	<.0001
Day	2	17.43238519	8.71619259	55.00	0.0001
Meat*Day	2	14.43935556	7.21967778	45.56	0.0002

E-9. P2S2: Raw texture ANOVA data for pork loins.

Dependent Variable: Strain

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	13	5.75219467	0.44247651	25.70	<.0001
Error	136	2.34159467	0.01721761		
Corrected Total	149	8.09378933			

R-Square	Coeff Var	Root MSE	Strain Mean
0.710692	14.00483	0.131216	0.936933

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	2.02322533	1.01161267	58.75	<.0001
Meat	1	3.13348267	3.13348267	181.99	<.0001
Meat*Day	2	0.10443333	0.05221667	3.03	0.0515
Hydro	4	0.30240933	0.07560233	4.39	0.0023
Meat*Hydro	4	0.18864400	0.04716100	2.74	0.0313

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	3.13348267	3.13348267	60.01	0.0163

Dependent Variable: Stress

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	15802.18993	1755.79888	24.83	<.0001
Error	140	9900.81477	70.72011		
Corrected Total	149	25703.00469			

R-Square	Coeff Var	Root MSE	Stress Mean
0.614799	19.56167	8.409525	42.98980

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	7543.646236	3771.823118	53.33	<.0001
Meat	1	4478.622246	4478.622246	63.33	<.0001
Meat*Day	2	540.181908	270.090954	3.82	0.0243
Hydro	4	3239.739537	809.934884	11.45	<.0001

Dependent Variable: Stress

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	4478.622246	4478.622246	16.58	0.0553

Dependent Variable: Hard1

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	21165.16553	2351.68506	35.34	<.0001

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Error	140	9316.31367	66.54510		
Corrected Total	149	30481.47920			

R-Square	Coeff Var	Root MSE	Hard1 Mean
0.694361	15.44809	8.157518	52.80600

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	18682.38020	9341.19010	140.37	<.0001
Meat	1	388.87940	388.87940	5.84	0.0169
Meat*Day	2	458.50014	229.25007	3.45	0.0346
Hydro	4	1635.40579	408.85145	6.14	0.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	388.8794027	388.8794027	1.70	0.3226

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The GLM Procedure

Dependent Variable: Hard2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	15813.68776	1757.07642	33.43	<.0001
Error	140	7357.70274	52.55502		
Corrected Total	149	23171.39051			

R-Square	Coeff Var	Root MSE	Hard2 Mean
0.682466	16.35549	7.249484	44.32447

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	13544.34569	6772.17284	128.86	<.0001
Meat	1	553.07521	553.07521	10.52	0.0015
Meat*Day	2	365.01272	182.50636	3.47	0.0337
Hydro	4	1351.25414	337.81354	6.43	<.0001

Dependent Variable: Hard2

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	553.0752060	553.0752060	3.03	0.2238

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The GLM Procedure

Dependent Variable: Cohesive

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.02248067	0.00249785	9.59	<.0001
Error	140	0.03645333	0.00026038		
Corrected Total	149	0.05893400			

R-Square	Coeff Var	Root MSE	Cohesive Mean

0.381455	5.103202	0.016136	0.316200

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.00307200	0.00153600	5.90	0.0035
Meat	1	0.00459267	0.00459267	17.64	<.0001
Meat*Day	2	0.00648533	0.00324267	12.45	<.0001
Hydro	4	0.00833067	0.00208267	8.00	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.00459267	0.00459267	1.42	0.3561

The GLM Procedure

Dependent Variable: Gummy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	2557.154821	284.128313	26.79	<.0001
Error	140	1484.585603	10.604183		
Corrected Total	149	4041.740424			

R-Square	Coeff Var	Root MSE	Gummy Mean
0.632687	19.32907	3.256406	16.84720

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	2099.820292	1049.910146	99.01	<.0001
Meat	1	85.337731	85.337731	8.05	0.0052
Meat*Day	2	100.540001	50.270001	4.74	0.0102
Hydro	4	271.456797	67.864199	6.40	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	85.33773067	85.33773067	1.70	0.3224

E-10. P2S2: Raw cook ANOVA data for pork loins.

Dependent Variable: xcookpH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	13	1.83289000	0.14099154	133.12	<.0001
Error	16	0.01694667	0.00105917		
Corrected Total	29	1.84983667			

R-Square	Coeff Var	Root MSE	xcookpH Mean
0.990839	0.561861	0.032545	5.792333

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.13747167	0.06873583	64.90	<.0001
Meat	1	1.64736333	1.64736333	1555.34	<.0001
Meat*Day	2	0.04408167	0.02204083	20.81	<.0001
Hydro	4	0.00180333	0.00045083	0.43	0.7879
Meat*Hydro	4	0.00217000	0.00054250	0.51	0.7277

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The GLM Procedure

Dependent Variable: xcookL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	13	349.6325467	26.8948113	81.99	<.0001
Error	16	5.2481052	0.3280066		
Corrected Total	29	354.8806519			

R-Square	Coeff Var	Root MSE	xcookL Mean
0.985212	0.691364	0.572719	82.83889

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	325.8407496	162.9203748	496.70	<.0001
Meat	1	4.3269348	4.3269348	13.19	0.0022
Meat*Day	2	0.3309896	0.1654948	0.50	0.6131
Hydro	4	17.8707556	4.4676889	13.62	<.0001
Meat*Hydro	4	1.2631170	0.3157793	0.96	0.4546

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The GLM Procedure

Dependent Variable: xcooka

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	13	65.79352296	5.06104023	21.34	<.0001
Error	16	3.79469333	0.23716833		
Corrected Total	29	69.58821630			

R-Square	Coeff Var	Root MSE	xcooka Mean
0.945469	9.172130	0.486999	5.309556

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	23.62277630	11.81138815	49.80	<.0001
Meat	1	27.53292000	27.53292000	116.09	<.0001
Meat*Day	2	8.59042667	4.29521333	18.11	<.0001
Hydro	4	5.25464963	1.31366241	5.54	0.0054
Meat*Hydro	4	0.79275037	0.19818759	0.84	0.5222

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The GLM Procedure

Dependent Variable: xcookb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	13	19.80370556	1.52336197	10.03	<.0001
Error	16	2.42962074	0.15185130		
Corrected Total	29	22.23332630			

R-Square	Coeff Var	Root MSE	xcookb Mean
0.890722	4.813320	0.389681	8.095889

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	14.66649852	7.33324926	48.29	<.0001
Meat	1	2.77045370	2.77045370	18.24	0.0006
Meat*Day	2	0.61161407	0.30580704	2.01	0.1659
Hydro	4	1.40019852	0.35004963	2.31	0.1030
Meat*Hydro	4	0.35494074	0.08873519	0.58	0.6785

Dependent Variable: xcookpH

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1.64736333	1.64736333	74.74	0.0131

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The GLM Procedure

Dependent Variable: xcookL

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	4.32693481	4.32693481	26.15	0.0362

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The GLM Procedure

Dependent Variable: xcooka

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	27.53292000	27.53292000	6.41	0.1270

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The GLM Procedure

Dependent Variable: xcookb

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	2.77045370	2.77045370	9.06	0.0949

APPENDIX F

F-1. Least square means for raw pH and CIE color space values of raw pork prior to processing.

Effect	Initial pH	Initial CIE Color Space Values L*	a*	b*
RMSE[y]	0.092	3.235	0.920	1.042
Meat Source	*<0.0001*[z]	*<0.0001*[z]	*0.3333*[z]	*<0.0001*[z]
Normal	5.70[a]	50.91[b]	8.55	0.98[b]
PSE	5.41[b]	57.30[a]	8.30	2.48[a]
Meat Source, Day	*0.0371*[z]	*0.0008*[z]	*0.2922*[z]	*0.0147*[z]
Normal, 1	5.72[ab]	49.83[e]		0.03[d]
Normal, 2	5.63[b]	53.08[cd]		1.72[bc]
Normal, 3	5.76[a]	49.83[de]		1.20[c]
PSE, 1	5.39[c]	60.53[a]		2.54[ab]
PSE, 2	5.43[c]	54.87[bc]		2.11[abc]
PSE, 3	5.40[c]	56.50[b]		2.80[a]

[abcd]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[y]Root Mean Square Error
[z]P-value from analysis of variance tables.

F-2. P2S3: Raw data for boneless pork loins.

Date	Meat	Day	pH	L1	a1	b1	L2	a2	b2	L3	a3	b3
9/14/07	Normal	1	5.64	45.61	7.69	-0.88	47.27	8.68	0.02	45.57	9.92	-0.85
9/14/07	Normal	1	5.71	46.48	8.76	-0.92	44.47	7.98	-1.08	42.82	9.16	-1.14
9/14/07	Normal	1	5.75	47.55	9.41	0.47	47.35	7.76	-0.37	46.54	7.49	-0.72
9/14/07	Normal	1	5.71	45.72	9.00	0.03	52.50	9.13	1.53	48.98	8.05	0.19
9/14/07	Normal	1	5.83	53.59	6.92	0.04	52.61	7.59	-0.53	50.10	6.24	-1.27
9/14/07	Normal	1	5.60	53.86	7.28	0.42	48.47	7.58	-0.46	51.23	8.03	0.11
9/14/07	Normal	1	5.71	52.51	9.56	0.35	55.16	9.01	1.31	53.98	8.58	0.57
9/14/07	Normal	1	5.68	50.46	8.69	0.17	53.34	8.36	0.85	50.18	7.42	-0.83
9/14/07	Normal	1	5.75	50.76	7.82	-0.17	49.18	7.03	-0.61	51.44	8.32	0.47
9/14/07	Normal	1	5.77	48.31	7.40	0.18	51.80	7.45	0.89	56.98	9.80	3.04
9/14/07	PSE	1	5.43	59.26	7.12	1.62	56.05	6.68	-0.06	57.18	7.58	1.09
9/14/07	PSE	1	5.48	53.65	6.82	0.38	56.99	6.18	0.95	55.04	6.05	-0.63
9/14/07	PSE	1	5.41	59.09	8.41	2.47	56.97	6.33	0.95	56.97	7.06	0.76
9/14/07	PSE	1	5.36	59.90	8.66	2.69	60.66	6.27	0.95	63.07	9.18	3.86
9/14/07	PSE	1	5.46	58.86	7.21	1.27	60.02	7.15	1.07	58.85	8.66	2.07
9/14/07	PSE	1	5.40	67.23	8.64	4.79	64.24	7.60	2.88	61.61	8.92	4.60
9/14/07	PSE	1	5.37	57.36	8.49	1.57	58.41	7.98	2.24	60.08	8.30	2.93
9/14/07	PSE	1	5.22	62.00	9.08	4.32	60.00	7.55	2.78	59.66	8.98	3.59
9/14/07	PSE	1	5.45	61.65	10.13	4.35	64.59	8.54	3.42	66.05	9.22	3.71
9/14/07	PSE	1	5.32	65.64	10.61	5.25	68.35	9.12	5.34	66.32	9.23	5.00
9/18/07	Normal	2	5.65	50.01	9.36	1.30	55.05	9.34	2.12	53.16	11.29	1.92
9/18/07	Normal	2	5.71	53.31	9.52	1.41	59.45	10.18	3.62	51.89	10.12	0.53
9/18/07	Normal	2	5.63	49.48	9.70	2.53	52.33	8.92	1.43	52.64	11.28	2.53
9/18/07	Normal	2	5.60	51.14	9.92	2.71	52.34	9.61	2.05	53.14	11.04	3.40
9/18/07	Normal	2	5.61	53.80	8.39	2.14	53.89	6.88	-0.09	53.60	7.04	0.19
9/18/07	Normal	2	5.60	53.10	8.42	1.07	55.65	6.80	0.27	54.24	5.87	0.04
9/18/07	Normal	2	5.61	48.37	9.20	2.11	51.10	7.68	1.67	53.82	6.58	0.96

9/18/07	Normal	2	5.64	55.33	6.45	1.45	54.90	8.44	3.11	52.24	9.59	2.90
9/18/07	PSE	2	5.48	55.33	8.71	3.64	58.18	7.42	2.43	56.07	8.12	2.65
9/18/07	PSE	2	5.49	57.00	8.69	2.92	58.41	7.88	2.93	55.69	7.99	2.43
9/18/07	PSE	2	5.48	52.58	9.65	2.15	50.44	8.53	0.47	56.41	7.82	1.62
9/18/07	PSE	2	5.28	54.24	10.05	2.96	53.55	8.03	1.65	50.74	8.96	1.04
9/18/07	PSE	2	5.49	59.88	6.09	1.68	55.61	7.10	1.81	56.15	7.02	1.91
9/18/07	PSE	2	5.44	55.28	7.64	2.53	58.09	6.95	2.73	60.65	7.14	3.06
9/18/07	PSE	2	5.33	52.24	8.15	1.95	56.09	7.79	2.77	47.58	8.54	1.05
9/18/07	PSE	2	5.48	49.91	8.10	1.17	55.55	7.48	1.75	51.27	8.29	1.31
9/21/07	Normal	3	5.60	39.80	7.62	-1.21	44.51	7.68	-0.93	43.14	9.04	-0.28
9/21/07	Normal	3	5.60	42.81	8.49	-0.30	41.92	7.01	-0.40	42.42	7.18	-1.01
9/21/07	Normal	3	5.64	46.09	9.66	0.06	47.66	9.01	0.65	51.63	10.49	1.08
9/21/07	Normal	3	5.70	49.51	11.57	3.28	48.94	10.23	1.78	45.19	9.40	1.63
9/21/07	Normal	3	5.80	54.96	6.79	1.57	53.43	7.76	2.29	52.39	6.83	0.91
9/21/07	Normal	3	6.13	60.47	7.97	3.54	51.44	7.34	0.46	53.98	8.07	1.14
9/21/07	Normal	3	5.82	49.63	8.17	0.85	55.10	8.25	2.39	58.48	11.38	4.23
9/21/07	Normal	3	5.80	55.95	9.88	3.87	53.28	9.22	1.72	53.22	8.37	1.55
9/21/07	PSE	3	5.39	55.90	9.28	3.25	59.82	8.47	3.91	61.43	9.34	4.33
9/21/07	PSE	3	5.47	60.56	9.00	4.32	59.10	8.61	3.86	53.21	8.93	2.85
9/21/07	PSE	3	5.44	52.90	10.81	3.01	57.80	8.55	2.42	56.87	9.04	2.52
9/21/07	PSE	3	5.47	50.17	10.54	2.36	54.55	7.62	1.94	57.04	7.94	2.49
9/21/07	PSE	3	5.36	56.69	9.44	2.45	54.89	7.61	0.67	55.05	8.95	2.13
9/21/07	PSE	3	5.38	54.61	9.90	3.26	55.81	8.69	2.54	52.18	8.01	1.48
9/21/07	PSE	3	5.30	56.48	8.26	2.29	57.88	8.45	2.83	58.60	8.19	2.84
9/21/07	PSE	3	5.40	59.48	9.14	3.90	56.75	9.10	2.68	58.15	8.44	2.98

F-3. P2S3: Raw data for torsion testing and texture profile analysis hydrocolloid/buffer treated cooked pork gels.

Date	Meat	Trt	Buffer	Hydro	Day	Sample	Stress	Strain	Bioyield	Peak1	Area1	Peak2	Area2	Hard1	Hard2	Cohesive	Gummy
9/17/07	Normal	9	Na	Konjac	1	1	30.88	1.45	968.362	2204.578	7.432	1913.802	2.284	52.49	45.57	0.31	16.13
9/17/07	Normal	9	Na	Konjac	1	2	33.01	1.02	0.000	2427.946	7.903	2046.577	2.529	57.81	48.73	0.32	18.50
9/17/07	Normal	9	Na	Konjac	1	3	50.77	1.24	0.000	2478.319	7.811	2133.739	2.509	59.01	50.80	0.32	18.95
9/17/07	Normal	9	Na	Konjac	1	4	33.01	0.84	0.000	2144.648	7.070	1861.176	2.251	51.06	44.31	0.32	16.26
9/17/07	Normal	9	Na	Konjac	1	5	49.22	1.14	0.000	2181.787	7.549	1884.018	2.248	51.95	44.86	0.30	15.47
9/17/07	PSE	9	Na	Konjac	1	1	67.37	0.96	0.000	2829.589	9.114	2347.876	2.954	67.37	55.90	0.32	21.84
9/17/07	PSE	9	Na	Konjac	1	2	60.22	0.96	1241.543	2403.637	8.902	2002.999	2.539	57.23	47.69	0.29	16.32
9/17/07	PSE	9	Na	Konjac	1	3	56.17	0.95	0.000	2846.971	9.713	2497.845	3.174	67.79	59.47	0.33	22.15
9/17/07	PSE	9	Na	Konjac	1	4	67.56	1.07	0.000	3162.809	10.290	2739.367	3.516	75.30	65.22	0.34	25.73
9/17/07	PSE	9	Na	Konjac	1	5	66.01	1.16	0.000	2676.677	9.037	2270.560	2.809	63.73	54.06	0.31	19.81
9/17/07	Normal	10	K	Control	1	1	47.48	1.21	0.000	2268.546	7.257	1890.129	2.234	54.01	45.00	0.31	16.63
9/17/07	Normal	10	K	Control	1	2	38.22	0.89	0.000	2382.863	7.669	2000.872	2.483	56.73	47.64	0.32	18.37
9/17/07	Normal	10	K	Control	1	3	40.54	1.08	989.090	2348.194	7.852	1989.266	2.499	55.91	47.36	0.32	17.79
9/17/07	Normal	10	K	Control	1	4	63.12	1.42	0.000	2246.811	6.737	1954.403	2.354	53.50	46.53	0.35	18.69
9/17/07	Normal	10	K	Control	1	5	34.74	0.86	0.000	2289.067	6.739	1996.776	2.244	54.50	47.54	0.33	18.15
9/17/07	PSE	10	K	Control	1	1	65.63	0.97	1055.297	2621.059	8.733	2249.479	2.908	62.41	53.56	0.33	20.78
9/17/07	PSE	10	K	Control	1	2	57.52	0.87	1282.772	2905.369	9.851	2492.883	3.312	69.18	59.35	0.34	23.26
9/17/07	PSE	10	K	Control	1	3	55.59	0.75	0.000	3041.613	10.110	2527.112	3.225	72.42	60.17	0.32	23.10
9/17/07	PSE	10	K	Control	1	4	52.50	1.01	0.000	2808.232	8.876	2439.103	3.154	66.86	58.07	0.36	23.76
9/17/07	PSE	10	K	Control	1	5	44.40	0.94	0.000	2906.942	8.727	2480.271	2.989	69.21	59.05	0.34	23.71
9/17/07	Normal	11	K	E15	1	1	59.84	1.06	0.000	2720.230	9.386	2295.273	3.166	64.77	54.65	0.34	21.85
9/17/07	Normal	11	K	E15	1	2	55.20	1.06	0.000	2440.870	8.588	2085.840	2.709	58.12	49.66	0.32	18.33
9/17/07	Normal	11	K	E15	1	3	59.07	1.24	0.000	2334.473	8.169	2003.062	2.589	55.58	47.69	0.32	17.62
9/17/07	Normal	11	K	E15	1	4	44.40	1.19	0.000	2612.937	8.814	2206.239	2.899	62.21	52.53	0.33	20.46
9/17/07	Normal	11	K	E15	1	5	62.15	1.09	0.000	2839.679	9.520	2409.168	3.164	67.61	57.36	0.33	22.47
9/17/07	PSE	11	K	E15	1	1	74.12	1.21	0.000	2877.330	9.857	2362.053	3.083	68.51	56.24	0.31	21.43
9/17/07	PSE	11	K	E15	1	2	63.89	1.06	0.000	3086.140	11.050	2569.891	3.502	73.48	61.19	0.32	23.29
9/17/07	PSE	11	K	E15	1	3	79.33	0.99	0.000	3113.307	9.546	2634.852	3.365	74.13	62.73	0.35	26.13
9/17/07	PSE	11	K	E15	1	4	54.82	1.07	0.000	3013.332	9.943	2514.526	3.298	71.75	59.87	0.33	23.80
9/17/07	PSE	11	K	E15	1	5	64.66	0.82	0.000	2747.380	9.731	2301.795	3.050	65.41	54.80	0.31	20.50

9/17/07	Normal	12	K	A150	1	1	53.85	1.03	0.000	2497.129	9.324	2158.687	2.783	59.46	51.40	0.30	17.75
9/17/07	Normal	12	K	A150	1	2	40.54	1.22	1495.676	2551.016	8.932	2126.914	2.647	60.74	50.64	0.30	18.00
9/17/07	Normal	12	K	A150	1	3	57.14	1.03	0.000	2667.795	9.233	2276.131	2.911	63.52	54.19	0.32	20.03
9/17/07	Normal	12	K	A150	1	4	71.42	1.11	871.049	2642.510	8.581	2304.728	2.892	62.92	54.87	0.34	21.20
9/17/07	Normal	12	K	A150	1	5	70.65	1.31	1587.136	2462.144	9.507	2186.361	2.741	58.62	52.06	0.29	16.90
9/17/07	PSE	12	K	A150	1	1	90.14	0.95	0.000	2387.559	9.644	2053.506	2.650	56.85	48.89	0.27	15.62
9/17/07	PSE	12	K	A150	1	2	67.17	0.88	0.000	2714.939	10.570	2258.166	3.120	64.64	53.77	0.30	19.08
9/17/07	PSE	12	K	A150	1	3	61.19	0.81	0.000	3041.118	10.450	2642.694	3.413	72.41	62.92	0.33	23.65
9/17/07	PSE	12	K	A150	1	4	93.42	0.99	0.000	3140.228	10.060	2706.415	3.329	74.77	64.44	0.33	24.74
9/17/07	PSE	12	K	A150	1	5	73.74	0.90	1450.381	2848.865	10.010	2361.402	3.091	67.83	56.22	0.31	20.95
9/17/07	Normal	13	K	Konjac	1	1	44.20	1.14	0.000	2234.115	8.085	1919.408	2.392	53.19	45.70	0.30	15.74
9/17/07	Normal	13	K	Konjac	1	2	36.29	0.99	0.000	2422.774	7.853	2067.278	2.513	57.69	49.22	0.32	18.46
9/17/07	Normal	13	K	Konjac	1	3	43.24	1.08	0.000	2259.099	7.587	1933.593	2.306	53.79	46.04	0.30	16.35
9/17/07	Normal	13	K	Konjac	1	4	32.81	1.09	0.000	2252.725	6.737	1972.710	2.294	53.64	46.97	0.34	18.26
9/17/07	Normal	13	K	Konjac	1	5	34.36	0.94	0.000	2508.633	7.532	2077.461	2.572	59.73	49.46	0.34	20.40
9/17/07	PSE	13	K	Konjac	1	1	40.92	0.76	0.000	3044.852	9.628	2536.567	3.214	72.50	60.39	0.33	24.20
9/17/07	PSE	13	K	Konjac	1	2	47.10	0.96	0.000	3211.803	9.731	2771.929	3.486	76.47	66.00	0.36	27.39
9/17/07	PSE	13	K	Konjac	1	3	54.43	0.80	0.000	2253.708	7.067	1958.465	2.302	53.66	46.63	0.33	17.48
9/17/07	PSE	13	K	Konjac	1	4	43.43	0.89	0.000	2948.954	9.832	2442.844	3.166	70.21	58.16	0.32	22.61
9/17/07	PSE	13	K	Konjac	1	5	36.29	0.46	0.000	2348.084	8.615	1944.378	2.453	55.91	46.29	0.28	15.92
9/17/07	Normal	14	Am	Control	1	1	42.85	1.17	0.000	2791.265	8.732	2374.312	3.115	66.46	56.53	0.36	23.71
9/17/07	Normal	14	Am	Control	1	2	64.86	1.00	946.167	2387.695	7.699	1977.229	2.464	56.85	47.08	0.32	18.19
9/17/07	Normal	14	Am	Control	1	3	56.36	1.00	0.000	2516.713	7.959	2089.620	2.470	59.92	49.75	0.31	18.60
9/17/07	Normal	14	Am	Control	1	4	31.66	0.90	0.000	2327.364	7.449	1999.954	2.395	55.41	47.62	0.32	17.82
9/17/07	Normal	14	Am	Control	1	5	47.48	1.04	0.000	2702.887	9.092	2262.585	2.913	64.35	53.87	0.32	20.62
9/17/07	PSE	14	Am	Control	1	1	71.42	1.11	0.000	2658.219	8.930	2275.335	2.783	63.29	54.17	0.31	19.72
9/17/07	PSE	14	Am	Control	1	2	64.08	1.05	0.000	2871.119	9.076	2436.412	2.959	68.36	58.01	0.33	22.29
9/17/07	PSE	14	Am	Control	1	3	43.62	0.68	0.000	3160.410	9.659	2686.039	3.377	75.25	63.95	0.35	26.31
9/17/07	PSE	14	Am	Control	1	4	49.03	0.92	0.000	3015.517	9.595	2523.354	3.150	71.80	60.08	0.33	23.57
9/17/07	PSE	14	Am	Control	1	5	62.15	0.92	0.000	2606.398	8.755	2223.242	2.715	62.06	52.93	0.31	19.24
9/17/07	Normal	15	Am	E15	1	1	70.45	1.18	0.000	2729.966	8.706	2373.731	2.967	65.00	56.52	0.34	22.15
9/17/07	Normal	15	Am	E15	1	2	52.31	1.35	1168.584	2266.501	8.010	1940.530	2.334	53.96	46.20	0.29	15.72
9/17/07	Normal	15	Am	E15	1	3	43.24	1.10	1296.843	2397.285	7.764	2082.928	2.406	57.08	49.59	0.31	17.69

9/17/07	Normal	15	Am	E15	1	4	52.70	1.06	0.000	2550.936	8.895	2182.037	2.764	60.74	51.95	0.31	18.87
9/17/07	Normal	15	Am	E15	1	5	43.24	0.89	0.000	2637.664	8.566	2239.434	2.796	62.80	53.32	0.33	20.50
9/17/07	PSE	15	Am	E15	1	1	70.26	0.72	0.000	2720.031	9.258	2222.312	2.830	64.76	52.91	0.31	19.80
9/17/07	PSE	15	Am	E15	1	2	78.17	1.19	0.000	3020.373	9.284	2597.786	3.268	71.91	61.85	0.35	25.31
9/17/07	PSE	15	Am	E15	1	3	78.37	0.98	0.000	2708.728	8.399	2260.269	2.750	64.49	53.82	0.33	21.12
9/17/07	PSE	15	Am	E15	1	4	55.98	0.98	0.000	3108.560	10.350	2631.431	3.412	74.01	62.65	0.45	33.24
9/17/07	PSE	15	Am	E15	1	5	84.54	1.05	0.000	2686.906	9.266	2206.280	2.780	63.97	52.53	0.37	23.71
9/17/07	Normal	16	Am	A150	1	1	67.94	0.95	0.000	2191.875	7.597	1855.181	2.364	52.19	44.17	0.30	15.57
9/17/07	Normal	16	Am	A150	1	2	67.94	0.94	0.000	2158.225	7.502	1868.693	2.200	51.39	44.49	0.25	12.66
9/17/07	Normal	16	Am	A150	1	3	70.65	0.99	0.000	2351.117	7.923	1990.609	2.380	55.98	47.40	0.30	17.02
9/17/07	Normal	16	Am	A150	1	4	44.78	0.87	1201.459	2607.829	8.930	2241.532	2.891	62.09	53.37	0.29	17.91
9/17/07	Normal	16	Am	A150	1	5	60.03	1.24	0.000	2351.914	7.826	2001.234	2.318	56.00	47.65	0.25	14.05
9/17/07	PSE	16	Am	A150	1	1	87.25	0.97	0.000	3030.235	10.020	2598.869	3.390	72.15	61.88	0.43	31.25
9/17/07	PSE	16	Am	A150	1	2	55.78	1.02	0.000	2475.169	9.237	2084.818	2.679	58.93	49.64	0.27	15.76
9/17/07	PSE	16	Am	A150	1	3	52.12	0.79	1217.158	2599.325	9.227	2151.021	2.802	61.89	51.21	0.30	18.77
9/17/07	PSE	16	Am	A150	1	4	71.61	1.10	0.000	2995.428	9.463	2569.578	3.244	71.32	61.18	0.35	25.07
9/17/07	PSE	16	Am	A150	1	5	74.51	0.96	0.000	2858.802	10.050	2320.760	3.213	68.07	55.26	0.32	21.76
9/17/07	Normal	17	Am	Konjac	1	1	52.89	1.12	0.000	1942.126	6.165	1705.800	2.096	46.24	40.61	0.34	15.72
9/17/07	Normal	17	Am	Konjac	1	2	52.70	1.08	0.000	1806.552	6.046	1584.352	1.868	43.01	37.72	0.31	13.29
9/17/07	Normal	17	Am	Konjac	1	3	52.50	1.05	0.000	1776.196	6.053	1499.553	1.759	42.29	35.70	0.29	12.29
9/17/07	Normal	17	Am	Konjac	1	4	60.61	1.23	0.000	1666.442	5.573	1416.575	1.653	39.68	33.73	0.30	11.77
9/17/07	Normal	17	Am	Konjac	1	5	52.89	1.25	0.000	2066.448	6.454	1755.276	2.132	49.20	41.79	0.33	16.25
9/17/07	PSE	17	Am	Konjac	1	1	56.56	1.14	739.825	1917.669	6.414	1627.978	1.958	45.66	38.76	0.31	13.94
9/17/07	PSE	17	Am	Konjac	1	2	57.14	0.84	846.764	2085.544	6.879	1720.238	2.090	49.66	40.96	0.30	15.09
9/17/07	PSE	17	Am	Konjac	1	3	59.26	1.25	0.000	2133.793	7.026	1836.685	2.297	50.80	43.73	0.33	16.61
9/17/07	PSE	17	Am	Konjac	1	4	61.00	1.00	737.751	1845.212	6.234	1561.830	1.842	43.93	37.19	0.30	12.98
9/17/07	PSE	17	Am	Konjac	1	5	38.99	0.53	0.000	2293.387	7.371	1941.253	2.476	54.60	46.22	0.34	18.34
9/17/07	Normal	1	Control	Control	1	1	69.10	0.98	872.812	2214.967	7.677	1885.422	2.548	52.74	44.89	0.33	17.50
9/17/07	Normal	1	Control	Control	1	2	52.12	0.85	0.000	2338.000	7.714	1992.360	2.459	55.67	47.44	0.32	17.74
9/17/07	Normal	1	Control	Control	1	3	62.93	0.75	0.000	2729.584	8.307	2288.107	2.761	64.99	54.48	0.33	21.60
9/17/07	Normal	1	Control	Control	1	4	87.05	1.03	1183.169	2605.156	9.177	2210.828	2.913	62.03	52.64	0.32	19.69
9/17/07	Normal	1	Control	Control	1	5	54.82	0.62	0.000	2456.729	7.720	2074.619	2.623	58.49	49.40	0.34	19.87
9/17/07	PSE	1	Control	Control	1	1	82.23	0.76	773.907	2815.253	7.973	2339.585	2.826	67.03	55.70	0.35	23.76

9/17/07	PSE	1	Control	Control	1	2	78.56	0.69	0.000	2752.914	9.119	2289.125	2.820	65.55	54.50	0.31	20.27
9/17/07	PSE	1	Control	Control	1	3	63.50	0.75	699.422	2415.101	7.148	2014.649	2.327	57.50	47.97	0.33	18.72
9/17/07	PSE	1	Control	Control	1	4	89.18	0.78	804.832	2743.388	8.726	2206.385	2.745	65.32	52.53	0.31	20.55
9/17/07	PSE	1	Control	Control	1	5	81.46	0.85	798.625	2279.794	7.492	1777.844	2.190	54.28	42.33	0.29	15.87
9/17/07	Normal	2	Control	E15	1	1	64.86	0.92	0.000	2378.836	6.943	2059.601	2.522	56.64	49.04	0.36	20.57
9/17/07	Normal	2	Control	E15	1	2	92.65	1.06	650.408	2153.582	6.216	1830.099	2.162	51.28	43.57	0.35	17.83
9/17/07	Normal	2	Control	E15	1	3	28.57	0.63	0.000	1999.800	5.921	1736.914	2.020	47.61	41.36	0.34	16.24
9/17/07	Normal	2	Control	E15	1	4	54.24	0.81	0.000	2240.467	6.561	1904.397	2.281	53.34	45.34	0.35	18.55
9/17/07	Normal	2	Control	E15	1	5	.	.	0.000	2131.008	5.752	1824.759	2.104	50.74	43.45	0.37	18.56
9/17/07	PSE	2	Control	E15	1	1	63.50	0.69	651.164	2351.948	6.377	2008.184	2.185	56.00	47.81	0.34	19.19
9/17/07	PSE	2	Control	E15	1	2	84.54	0.67	745.680	2230.449	7.264	1876.407	2.333	53.11	44.68	0.32	17.06
9/17/07	PSE	2	Control	E15	1	3	49.03	0.68	590.415	2046.132	6.349	1675.932	1.997	48.72	39.90	0.31	15.32
9/17/07	PSE	2	Control	E15	1	4	58.68	0.64	0.000	2269.009	6.708	1865.849	2.192	54.02	44.42	0.33	17.65
9/17/07	PSE	2	Control	E15	1	5	69.10	0.91	595.851	2111.458	5.844	1747.043	1.917	50.27	41.60	0.33	16.49
9/17/07	Normal	3	Control	A150	1	1	37.83	0.57	0.000	2188.921	6.296	1848.082	2.354	52.12	44.00	0.37	19.49
9/17/07	Normal	3	Control	A150	1	2	57.91	0.89	710.263	1988.343	6.132	1645.995	1.898	47.34	39.19	0.31	14.65
9/17/07	Normal	3	Control	A150	1	3	64.66	1.26	571.955	2091.440	5.863	1814.582	2.109	49.80	43.20	0.36	17.91
9/17/07	Normal	3	Control	A150	1	4	67.37	0.85	0.000	1819.081	5.728	1540.777	1.794	43.31	36.69	0.31	13.57
9/17/07	Normal	3	Control	A150	1	5	56.56	1.13	0.000	2202.548	7.403	1805.911	2.323	52.44	43.00	0.31	16.46
9/17/07	PSE	3	Control	A150	1	1	51.54	0.82	0.000	1966.356	6.270	1606.897	1.925	46.82	38.26	0.31	14.37
9/17/07	PSE	3	Control	A150	1	2	50.19	0.82	518.131	1975.910	5.898	1684.865	1.928	47.05	40.12	0.33	15.38
9/17/07	PSE	3	Control	A150	1	3	44.20	0.88	0.000	2468.224	6.967	2035.796	2.348	58.77	48.47	0.34	19.81
9/17/07	PSE	3	Control	A150	1	4	52.70	0.83	646.663	2014.147	6.011	1705.744	1.971	47.96	40.61	0.33	15.72
9/17/07	PSE	3	Control	A150	1	5	44.59	0.87	434.107	1869.328	5.311	1570.251	1.746	44.51	37.39	0.33	14.63
9/17/07	Normal	4	Control	Konjac	1	1	36.29	0.72	0.000	2060.226	6.241	1760.379	2.076	49.05	41.91	0.33	16.32
9/17/07	Normal	4	Control	Konjac	1	2	49.99	0.82	0.000	1970.407	6.400	1646.801	2.095	46.91	39.21	0.33	15.36
9/17/07	Normal	4	Control	Konjac	1	3	55.01	1.01	0.000	1979.642	5.702	1680.520	1.946	47.13	40.01	0.34	16.09
9/17/07	Normal	4	Control	Konjac	1	4	38.99	0.79	0.000	2268.404	7.478	1928.487	2.416	54.01	45.92	0.32	17.45
9/17/07	Normal	4	Control	Konjac	1	5	43.62	0.73	0.000	2213.294	6.624	1888.980	2.259	52.70	44.98	0.34	17.97
9/17/07	PSE	4	Control	Konjac	1	1	60.80	0.85	0.000	2362.261	7.239	1957.593	2.372	56.24	46.61	0.33	18.43
9/17/07	PSE	4	Control	Konjac	1	2	42.47	0.62	0.000	2474.404	7.810	2072.105	2.537	58.91	49.34	0.32	19.14
9/17/07	PSE	4	Control	Konjac	1	3	49.41	0.59	0.000	1971.442	6.287	1678.643	2.005	46.94	39.97	0.32	14.97
9/17/07	PSE	4	Control	Konjac	1	4	34.36	0.44	0.000	2234.063	6.879	1858.478	2.245	53.19	44.25	0.33	17.36

9/17/07	PSE	4	Control	Konjac	1	5	61.38	0.82	0.000	2174.461	6.644	1831.097	2.164	51.77	43.60	0.33	16.86
9/17/07	Normal	5	H20	Control	1	1	61.38	1.03	527.231	2026.095	5.524	1670.760	1.953	48.24	39.78	0.35	17.06
9/17/07	Normal	5	H20	Control	1	2	39.38	0.85	0.000	1882.539	5.111	1591.155	1.731	44.82	37.88	0.34	15.18
9/17/07	Normal	5	H20	Control	1	3	50.96	1.07	565.171	2092.534	5.780	1767.728	2.084	49.82	42.09	0.36	17.96
9/17/07	Normal	5	H20	Control	1	4	52.12	0.93	579.663	2036.180	5.574	1731.317	1.999	48.48	41.22	0.36	17.39
9/17/07	Normal	5	H20	Control	1	5	36.10	0.91	0.000	1834.996	5.629	1584.606	1.883	43.69	37.73	0.33	14.62
9/17/07	PSE	5	H20	Control	1	1	47.10	0.61	0.000	2051.164	5.807	1657.144	1.907	48.84	39.46	0.33	16.04
9/17/07	PSE	5	H20	Control	1	2	54.82	0.69	785.944	2059.408	6.652	1733.771	2.121	49.03	41.28	0.32	15.63
9/17/07	PSE	5	H20	Control	1	3	49.80	0.69	577.731	2053.792	6.035	1686.700	1.879	48.90	40.16	0.31	15.22
9/17/07	PSE	5	H20	Control	1	4	35.13	0.53	0.000	2263.916	6.766	1829.980	2.170	53.90	43.57	0.32	17.29
9/17/07	PSE	5	H20	Control	1	5	.	.	614.337	1935.596	6.060	1623.685	1.899	46.09	38.66	0.31	14.44
9/17/07	Normal	6	Na	Control	1	1	31.27	0.83	0.000	1666.428	5.078	1442.875	1.593	39.68	34.35	0.31	12.45
9/17/07	Normal	6	Na	Control	1	2	45.75	1.05	0.000	1887.586	5.782	1658.215	1.921	44.94	39.48	0.33	14.93
9/17/07	Normal	6	Na	Control	1	3	38.60	.	0.000	1867.507	5.478	1637.952	1.997	44.46	39.00	0.36	16.21
9/17/07	Normal	6	Na	Control	1	4	47.48	1.10	0.000	2106.125	6.382	1827.883	2.310	50.15	43.52	0.36	18.15
9/17/07	Normal	6	Na	Control	1	5	34.94	0.91	0.000	1815.271	5.452	1565.065	1.808	43.22	37.26	0.33	14.33
9/17/07	PSE	6	Na	Control	1	1	45.17	0.64	843.240	1988.863	6.331	1708.435	2.078	47.35	40.68	0.33	15.54
9/17/07	PSE	6	Na	Control	1	2	71.03	1.14	0.000	2309.020	7.050	2009.173	2.486	54.98	47.84	0.35	19.39
9/17/07	PSE	6	Na	Control	1	3	61.19	0.97	1005.034	2496.635	7.805	2138.530	2.789	59.44	50.92	0.36	21.24
9/17/07	PSE	6	Na	Control	1	4	50.57	0.83	0.000	2246.410	6.717	1900.277	2.331	53.49	45.24	0.35	18.56
9/17/07	PSE	6	Na	Control	1	5	57.91	0.97	804.271	2304.613	7.060	1958.818	2.500	54.87	46.64	0.35	19.43
9/17/07	Normal	7	Na	E15	1	1	54.43	1.29	0.000	2081.372	6.739	1816.641	2.253	49.56	43.25	0.33	16.57
9/17/07	Normal	7	Na	E15	1	2	55.20	1.21	0.000	1969.059	6.502	1731.686	2.171	46.88	41.23	0.33	15.65
9/17/07	Normal	7	Na	E15	1	3	43.62	1.22	0.000	1951.782	6.228	1696.437	2.098	46.47	40.39	0.34	15.65
9/17/07	Normal	7	Na	E15	1	4	49.03	1.22	0.000	1991.025	6.945	1709.766	2.189	47.41	40.71	0.32	14.94
9/17/07	Normal	7	Na	E15	1	5	51.34	1.11	0.000	1873.108	5.932	1576.893	1.931	44.60	37.55	0.33	14.52
9/17/07	PSE	7	Na	E15	1	1	59.84	1.06	1394.561	2460.689	8.771	2016.936	2.738	58.59	48.02	0.31	18.29
9/17/07	PSE	7	Na	E15	1	2	52.12	0.84	0.000	2459.797	8.741	2109.139	2.852	58.57	50.22	0.33	19.11
9/17/07	PSE	7	Na	E15	1	3	44.97	0.84	0.000	2285.574	7.330	1887.030	2.365	54.42	44.93	0.32	17.56
9/17/07	PSE	7	Na	E15	1	4	63.89	1.16	0.000	2129.486	6.779	1866.231	2.255	50.70	44.43	0.33	16.87
9/17/07	PSE	7	Na	E15	1	5	63.31	1.02	0.000	2194.548	8.259	1824.809	2.408	52.25	43.45	0.29	15.23
9/17/07	Normal	8	Na	A150	1	1	50.57	1.32	0.000	1969.847	6.269	1646.303	1.978	46.90	39.20	0.32	14.80
9/17/07	Normal	8	Na	A150	1	2	50.57	1.09	0.000	1844.214	5.588	1568.464	1.864	43.91	37.34	0.33	14.65

9/17/07	Normal	8	Na	A150	1	3	45.17	1.25	0.000	2024.701	6.200	1754.399	2.079	48.21	41.77	0.34	16.16
9/17/07	Normal	8	Na	A150	1	4	52.70	1.17	0.000	2012.947	6.848	1774.805	2.236	47.93	42.26	0.33	15.65
9/17/07	Normal	8	Na	A150	1	5	44.59	1.18	0.000	1776.157	6.009	1498.776	1.839	42.29	35.69	0.31	12.94
9/17/07	PSE	8	Na	A150	1	1	73.74	1.19	0.000	2231.011	7.791	1895.649	2.345	53.12	45.13	0.30	15.99
9/17/07	PSE	8	Na	A150	1	2	65.82	1.10	0.000	2242.633	7.025	1884.158	2.386	53.40	44.86	0.34	18.14
9/17/07	PSE	8	Na	A150	1	3	54.24	1.08	1081.678	2213.636	7.823	1850.269	2.382	52.71	44.05	0.30	16.05
9/17/07	PSE	8	Na	A150	1	4	57.75	1.12	0.000	2451.616	7.833	2098.990	2.640	58.37	49.98	0.34	19.67
9/17/07	PSE	8	Na	A150	1	5	77.98	1.09	0.000	2289.454	7.617	1984.437	2.386	54.51	47.25	0.31	17.08
9/20/07	Normal	1	Control	Control	2	1	56.36	0.87	0.000	2249.893	7.350	1954.217	2.607	53.57	46.53	0.35	19.00
9/20/07	Normal	1	Control	Control	2	2	61.77	1.04	0.000	2077.302	6.993	1754.715	2.170	49.46	41.78	0.31	15.35
9/20/07	Normal	1	Control	Control	2	3	44.20	0.76	853.430	2165.592	6.869	1819.916	2.213	51.56	43.33	0.32	16.61
9/20/07	Normal	1	Control	Control	2	4	71.80	1.02	0.000	2531.997	8.404	2183.720	2.758	60.29	51.99	0.33	19.78
9/20/07	Normal	1	Control	Control	2	5	61.19	1.01	0.000	2334.614	7.665	1974.129	2.616	55.59	47.00	0.34	18.97
9/20/07	PSE	1	Control	Control	2	1	65.63	0.87	786.091	2068.317	6.837	1713.219	2.097	49.25	40.79	0.31	15.10
9/20/07	PSE	1	Control	Control	2	2	59.84	0.89	715.697	2084.017	6.557	1725.947	2.103	49.62	41.09	0.32	15.91
9/20/07	PSE	1	Control	Control	2	3	56.75	0.84	734.213	2072.703	6.765	1643.826	2.051	49.35	39.14	0.30	14.96
9/20/07	PSE	1	Control	Control	2	4	62.93	0.93	868.662	2170.952	7.302	1795.737	2.254	51.69	42.76	0.31	15.96
9/20/07	PSE	1	Control	Control	2	5	58.10	0.67	734.081	2086.742	6.934	1677.132	2.128	49.68	39.93	0.31	15.25
9/20/07	Normal	2	Control	E15	2	1	30.50	0.78	0.000	2035.297	5.921	1702.917	2.082	48.46	40.55	0.35	17.04
9/20/07	Normal	2	Control	E15	2	2	38.03	0.79	872.063	2061.639	6.557	1718.060	2.155	49.09	40.91	0.33	16.13
9/20/07	Normal	2	Control	E15	2	3	44.78	1.00	0.000	2215.314	6.380	1889.914	2.297	52.75	45.00	0.36	18.99
9/20/07	Normal	2	Control	E15	2	4	58.68	0.99	0.000	1887.599	5.559	1611.933	1.951	44.94	38.38	0.35	15.77
9/20/07	Normal	2	Control	E15	2	5	43.62	1.06	0.000	1773.469	5.540	1523.415	1.875	42.23	36.27	0.34	14.29
9/20/07	PSE	2	Control	E15	2	1	44.78	0.91	681.685	1788.140	5.805	1464.704	1.757	42.57	34.87	0.30	12.89
9/20/07	PSE	2	Control	E15	2	2	49.41	0.86	0.000	1924.415	6.229	1575.103	1.967	45.82	37.50	0.32	14.47
9/20/07	PSE	2	Control	E15	2	3	55.59	0.83	0.000	2009.239	6.331	1656.981	2.067	47.84	39.45	0.33	15.62
9/20/07	PSE	2	Control	E15	2	4	48.64	1.04	693.749	1837.227	5.787	1538.154	1.801	43.74	36.62	0.31	13.61
9/20/07	PSE	2	Control	E15	2	5	52.12	0.95	0.000	1976.426	6.513	1609.970	2.034	47.06	38.33	0.31	14.70
9/20/07	Normal	3	Control	A150	2	1	51.34	0.89	0.000	1989.759	6.302	1644.375	2.062	47.38	39.15	0.33	15.50
9/20/07	Normal	3	Control	A150	2	2	65.63	1.21	0.000	1794.938	5.872	1509.480	1.783	42.74	35.94	0.30	12.98
9/20/07	Normal	3	Control	A150	2	3	67.94	1.07	0.000	2000.675	6.535	1683.157	2.075	47.64	40.08	0.32	15.13
9/20/07	Normal	3	Control	A150	2	4	51.73	0.89	0.000	2028.413	6.507	1740.009	2.155	48.30	41.43	0.33	15.99
9/20/07	Normal	3	Control	A150	2	5	49.61	1.03	0.000	2100.959	6.902	1738.855	2.175	50.02	41.40	0.32	15.76

9/20/07	PSE	3	Control	A150	2	1	61.77	0.96	0.000	1966.918	6.455	1658.344	2.063	46.83	39.48	0.32	14.97
9/20/07	PSE	3	Control	A150	2	2	66.40	0.99	0.000	2013.389	6.695	1684.486	2.069	47.94	40.11	0.31	14.81
9/20/07	PSE	3	Control	A150	2	3	55.20	0.91	0.000	1754.177	5.638	1461.898	1.694	41.77	34.81	0.30	12.55
9/20/07	PSE	3	Control	A150	2	4	53.66	1.10	0.000	2194.668	7.274	1855.919	2.283	52.25	44.19	0.31	16.40
9/20/07	PSE	3	Control	A150	2	5	34.36	0.79	0.000	1896.856	6.235	1612.380	1.935	45.16	38.39	0.31	14.02
9/20/07	Normal	4	Control	Konjac	2	1	47.68	0.97	0.000	1806.068	5.670	1533.242	1.896	43.00	36.51	0.33	14.38
9/20/07	Normal	4	Control	Konjac	2	2	50.77	0.93	622.713	1725.745	5.194	1462.686	1.174	41.09	34.83	0.23	9.29
9/20/07	Normal	4	Control	Konjac	2	3	50.96	1.12	643.868	1881.402	5.679	1600.057	1.873	44.80	38.10	0.33	14.77
9/20/07	Normal	4	Control	Konjac	2	4	54.43	0.94	664.599	1860.014	5.672	1581.987	1.945	44.29	37.67	0.34	15.19
9/20/07	Normal	4	Control	Konjac	2	5	71.80	1.13	0.000	1922.143	5.446	1613.702	1.932	45.77	38.42	0.35	16.24
9/20/07	PSE	4	Control	Konjac	2	1	54.43	1.11	0.000	1805.223	5.683	1526.108	1.862	42.98	36.34	0.33	14.08
9/20/07	PSE	4	Control	Konjac	2	2	51.73	0.81	0.000	1708.499	4.959	1457.781	1.709	40.68	34.71	0.34	14.02
9/20/07	PSE	4	Control	Konjac	2	3	46.13	0.92	0.000	1657.342	5.046	1412.065	1.642	39.46	33.62	0.33	12.84
9/20/07	PSE	4	Control	Konjac	2	4	49.80	1.07	507.885	1747.276	5.165	1460.173	1.709	41.60	34.77	0.33	13.77
9/20/07	PSE	4	Control	Konjac	2	5	55.20	0.93	0.000	2084.498	5.870	1789.167	2.102	49.63	42.60	0.36	17.77
9/20/07	Normal	5	H2O	Control	2	1	39.18	0.85	0.000	1854.583	5.394	1516.153	1.801	44.16	36.10	0.33	14.74
9/20/07	Normal	5	H2O	Control	2	2	58.68	1.25	0.000	1570.567	4.991	1300.793	1.565	37.39	30.97	0.31	11.73
9/20/07	Normal	5	H2O	Control	2	3	50.57	1.15	495.688	1799.332	5.097	1527.462	1.742	42.84	36.37	0.34	14.64
9/20/07	Normal	5	H2O	Control	2	4	38.80	0.88	0.000	1631.453	4.738	1401.330	1.614	38.84	33.37	0.34	13.23
9/20/07	Normal	5	H2O	Control	2	5	47.29	1.18	0.000	1629.507	4.866	1364.458	1.593	38.80	32.49	0.33	12.70
9/20/07	PSE	5	H2O	Control	2	1	48.64	0.88	0.000	1665.392	5.049	1399.122	1.557	39.65	33.31	0.31	12.23
9/20/07	PSE	5	H2O	Control	2	2	47.48	1.01	584.265	1764.898	5.763	1421.372	1.709	42.02	33.84	0.30	12.46
9/20/07	PSE	5	H2O	Control	2	3	47.870	1.090	484.500	1555.632	4.627	1301.388	1.457	37.04	30.99	0.31	11.66
9/20/07	PSE	5	H2O	Control	2	4	38.990	0.840	0.000	1663.518	5.203	1385.305	1.616	39.61	32.98	0.31	12.30
9/20/07	PSE	5	H2O	Control	2	5	30.880	0.870	469.104	1803.162	5.187	1522.481	1.816	42.93	36.25	0.35	15.03
9/20/07	Normal	6	Na	Control	2	1	42.08	1.12	0.000	1827.742	5.680	1570.655	1.950	43.52	37.40	0.34	14.94
9/20/07	Normal	6	Na	Control	2	2	51.73	1.31	0.000	1665.266	5.014	1447.828	1.702	39.65	34.47	0.34	13.46
9/20/07	Normal	6	Na	Control	2	3	48.64	1.23	0.000	1630.161	5.259	1374.533	1.684	38.81	32.73	0.32	12.43
9/20/07	Normal	6	Na	Control	2	4	49.41	1.33	768.242	1662.328	5.033	1453.357	1.719	39.58	34.60	0.34	13.52
9/20/07	Normal	6	Na	Control	2	5	45.17	1.33	0.000	1770.026	5.556	1532.896	1.828	42.14	36.50	0.33	13.87
9/20/07	PSE	6	Na	Control	2	1	49.80	1.01	0.000	1728.257	4.905	1502.778	1.758	41.15	35.78	0.36	14.75
9/20/07	PSE	6	Na	Control	2	2	45.55	0.95	777.527	1822.862	5.716	1583.397	1.905	43.40	37.70	0.33	14.46
9/20/07	PSE	6	Na	Control	2	3	60.42	1.18	605.139	1693.494	5.071	1485.398	1.807	40.32	35.37	0.36	14.37

9/20/07	PSE	6	Na	Control	2	4	50.77	1.17	0.000	1883.759	5.553	1629.139	1.997	44.85	38.79	0.36	16.13
9/20/07	PSE	6	Na	Control	2	5	49.03	0.88	0.000	1754.118	5.049	1512.052	1.729	41.76	36.00	0.34	14.30
9/20/07	Normal	7	Na	E15	2	1	41.31	1.15	0.000	1468.581	4.495	1272.056	1.466	34.97	30.29	0.33	11.40
9/20/07	Normal	7	Na	E15	2	2	50.57	1.30	0.000	1454.037	4.824	1242.252	1.502	34.62	29.58	0.31	10.78
9/20/07	Normal	7	Na	E15	2	3	42.08	1.17	0.000	1670.144	5.101	1451.244	1.778	39.77	34.55	0.35	13.86
9/20/07	Normal	7	Na	E15	2	4	49.41	1.33	0.000	1759.025	5.767	1488.509	1.934	41.88	35.44	0.34	14.05
9/20/07	Normal	7	Na	E15	2	5	44.01	1.09	895.342	1661.191	5.641	1440.144	1.782	39.55	34.29	0.32	12.49
9/20/07	PSE	7	Na	E15	2	1	56.75	1.38	0.000	1665.671	5.193	1416.386	1.808	39.66	33.72	0.35	13.81
9/20/07	PSE	7	Na	E15	2	2	48.64	1.27	0.000	1817.345	5.319	1569.918	1.941	43.27	37.38	0.36	15.79
9/20/07	PSE	7	Na	E15	2	3	49.99	1.19	0.000	1872.531	6.007	1604.403	2.104	44.58	38.20	0.35	15.62
9/20/07	PSE	7	Na	E15	2	4	39.38	1.04	0.000	1724.466	5.450	1466.821	1.767	41.06	34.92	0.32	13.31
9/20/07	PSE	7	Na	E15	2	5	48.26	1.03	0.000	1591.049	4.825	1389.269	1.523	37.88	33.08	0.32	11.96
9/20/07	Normal	8	Na	A150	2	1	56.36	1.27	699.966	1705.359	5.564	1487.709	1.803	40.60	35.42	0.32	13.16
9/20/07	Normal	8	Na	A150	2	2	52.50	1.30	0.000	1613.159	4.865	1420.085	1.625	38.41	33.81	0.33	12.83
9/20/07	Normal	8	Na	A150	2	3	65.82	1.47	0.000	1723.706	5.019	1500.881	1.736	41.04	35.74	0.35	14.20
9/20/07	Normal	8	Na	A150	2	4	48.26	1.40	0.000	1748.159	5.309	1548.025	1.926	41.62	36.86	0.36	15.10
9/20/07	Normal	8	Na	A150	2	5	53.47	1.69	0.000	1435.071	4.746	1213.706	1.458	34.17	28.90	0.31	10.50
9/20/07	PSE	8	Na	A150	2	1	50.77	1.12	0.000	1999.394	6.115	1714.729	2.151	47.60	40.83	0.35	16.75
9/20/07	PSE	8	Na	A150	2	2	60.22	1.17	895.863	1714.021	5.966	1470.362	1.897	40.81	35.01	0.32	12.98
9/20/07	PSE	8	Na	A150	2	3	45.55	1.07	0.000	1675.789	5.481	1386.111	1.671	39.90	33.00	0.30	12.16
9/20/07	PSE	8	Na	A150	2	4	48.26	1.17	0.000	1793.609	5.454	1547.854	1.912	42.70	36.85	0.35	14.97
9/20/07	PSE	8	Na	A150	2	5	59.64	1.14	0.000	1512.532	4.936	1287.610	1.542	36.01	30.66	0.31	11.25
9/20/07	Normal	9	Na	Konjac	2	1	47.87	1.11	533.475	1663.123	5.064	1434.698	1.702	39.60	34.16	0.34	13.31
9/20/07	Normal	9	Na	Konjac	2	2	52.50	1.39	0.000	1688.634	4.722	1459.227	1.638	40.21	34.74	0.35	13.95
9/20/07	Normal	9	Na	Konjac	2	3	51.34	1.41	645.580	1752.725	5.064	1554.821	1.810	41.73	37.02	0.36	14.92
9/20/07	Normal	9	Na	Konjac	2	4	40.54	1.46	473.651	1523.471	4.661	1328.362	1.506	36.27	31.63	0.32	11.72
9/20/07	Normal	9	Na	Konjac	2	5	39.38	0.87	0.000	1504.467	4.746	1282.040	1.534	35.82	30.52	0.32	11.58
9/20/07	PSE	9	Na	Konjac	2	1	50.19	1.00	0.000	1845.115	5.369	1611.860	1.925	43.93	38.38	0.36	15.75
9/20/07	PSE	9	Na	Konjac	2	2	41.31	1.18	0.000	1808.897	5.679	1528.004	1.986	43.07	36.38	0.35	15.06
9/20/07	PSE	9	Na	Konjac	2	3	50.96	1.12	0.000	1864.476	5.683	1583.131	1.965	44.39	37.69	0.35	15.35
9/20/07	PSE	9	Na	Konjac	2	4	51.15	0.97	0.000	1750.836	5.404	1481.567	1.794	41.69	35.28	0.33	13.84
9/20/07	PSE	9	Na	Konjac	2	5	49.41	1.07	0.000	1908.359	5.855	1635.321	2.066	45.44	38.94	0.35	16.03
9/20/07	Normal	10	K	Control	2	1	43.24	1.11	0.000	1934.917	6.111	1586.295	2.026	46.07	37.77	0.33	15.27

9/20/07	Normal	10	K	Control	2	2	53.08	1.10	0.000	1746.298	5.638	1467.607	1.812	41.58	34.94	0.32	13.36
9/20/07	Normal	10	K	Control	2	3	49.61	1.19	0.000	1646.619	5.452	1399.139	1.713	39.21	33.31	0.31	12.32
9/20/07	Normal	10	K	Control	2	4	59.45	1.41	0.000	1698.817	5.411	1452.053	1.775	40.45	34.57	0.33	13.27
9/20/07	Normal	10	K	Control	2	5	40.15	0.92	0.000	1749.665	5.308	1504.971	1.805	41.66	35.83	0.34	14.17
9/20/07	PSE	10	K	Control	2	1	49.22	0.94	0.000	1974.729	5.943	1715.359	2.101	47.02	40.84	0.35	16.62
9/20/07	PSE	10	K	Control	2	2	57.14	0.93	0.000	1730.022	5.578	1485.116	2.026	41.19	35.36	0.36	14.96
9/20/07	PSE	10	K	Control	2	3	33.97	0.86	0.000	1974.465	6.145	1645.031	2.055	47.01	39.17	0.33	15.72
9/20/07	PSE	10	K	Control	2	4	52.70	0.89	0.000	2114.892	6.378	1789.545	2.225	50.35	42.61	0.35	17.57
9/20/07	PSE	10	K	Control	2	5	59.26	1.20	0.000	1908.193	5.912	1681.520	2.018	45.43	40.04	0.34	15.51
9/20/07	Normal	11	K	E15	2	1	47.10	0.96	0.000	1902.540	6.314	1626.052	1.975	45.30	38.72	0.31	14.17
9/20/07	Normal	11	K	E15	2	2	56.36	1.01	0.000	1763.454	5.719	1534.949	1.834	41.99	36.55	0.32	13.46
9/20/07	Normal	11	K	E15	2	3	56.56	0.89	0.000	1778.410	5.248	1538.547	1.813	42.34	36.63	0.35	14.63
9/20/07	Normal	11	K	E15	2	4	53.66	1.05	0.000	1814.841	6.039	1571.474	1.994	43.21	37.42	0.33	14.27
9/20/07	Normal	11	K	E15	2	5	61.19	1.16	743.079	1533.503	5.443	1295.444	1.595	36.51	30.84	0.29	10.70
9/20/07	PSE	11	K	E15	2	1	45.94	0.80	0.000	1923.282	6.115	1686.604	2.060	45.79	40.16	0.34	15.43
9/20/07	PSE	11	K	E15	2	2	57.71	0.90	767.854	1713.692	5.801	1466.823	1.823	40.80	34.92	0.31	12.82
9/20/07	PSE	11	K	E15	2	3	59.07	0.85	0.000	1964.830	6.807	1559.918	2.105	46.78	37.14	0.31	14.47
9/20/07	PSE	11	K	E15	2	4	52.70	0.99	0.000	1899.881	5.924	1657.789	2.049	45.24	39.47	0.35	15.65
9/20/07	PSE	11	K	E15	2	5	60.22	0.87	0.000	1897.997	5.914	1641.361	1.984	45.19	39.08	0.34	15.16
9/20/07	Normal	12	K	A150	2	1	56.94	1.26	0.000	1810.739	5.394	1567.770	1.907	43.11	37.33	0.35	15.24
9/20/07	Normal	12	K	A150	2	2	54.63	1.40	0.000	1805.421	5.554	1566.460	1.892	42.99	37.30	0.34	14.64
9/20/07	Normal	12	K	A150	2	3	54.82	1.18	0.000	1518.059	4.724	1321.746	1.513	36.14	31.47	0.32	11.58
9/20/07	Normal	12	K	A150	2	4	50.77	1.08	0.000	1681.729	4.784	1479.578	1.700	40.04	35.23	0.36	14.23
9/20/07	Normal	12	K	A150	2	5	36.67	0.79	0.000	1689.560	5.306	1471.750	1.843	40.23	35.04	0.35	13.97
9/20/07	PSE	12	K	A150	2	1	72.19	1.01	0.000	1978.138	5.972	1703.322	2.156	47.10	40.56	0.36	17.00
9/20/07	PSE	12	K	A150	2	2	48.26	0.76	0.000	1892.024	5.661	1624.241	2.025	45.05	38.67	0.36	16.11
9/20/07	PSE	12	K	A150	2	3	61.38	1.13	0.000	1888.383	5.471	1638.063	2.015	44.96	39.00	0.37	16.56
9/20/07	PSE	12	K	A150	2	4	62.35	1.05	0.000	1886.796	6.280	1601.922	2.045	44.92	38.14	0.33	14.63
9/20/07	PSE	12	K	A150	2	5	50.38	0.90	0.000	1724.215	5.496	1487.828	1.830	41.05	35.42	0.33	13.67
9/20/07	Normal	13	K	Konjac	2	1	44.01	1.00	0.000	1799.995	5.201	1575.180	1.851	42.86	37.50	0.36	15.25
9/20/07	Normal	13	K	Konjac	2	2	41.31	0.87	0.000	1628.743	5.331	1422.956	1.724	38.78	33.88	0.32	12.54
9/20/07	Normal	13	K	Konjac	2	3	52.50	1.26	0.000	1725.844	6.021	1464.643	2.026	41.09	34.87	0.34	13.83
9/20/07	Normal	13	K	Konjac	2	4	46.33	1.13	0.000	1553.792	4.661	1354.269	1.547	37.00	32.24	0.33	12.28

9/20/07	Normal	13	K	Konjac	2	5	42.85	1.06	0.000	1868.469	5.727	1618.467	1.961	44.49	38.53	0.34	15.23
9/20/07	PSE	13	K	Konjac	2	1	53.27	1.05	0.000	1631.385	5.493	1364.160	1.712	38.84	32.48	0.31	12.11
9/20/07	PSE	13	K	Konjac	2	2	64.08	1.19	0.000	2024.001	6.473	1722.221	2.191	48.19	41.01	0.34	16.31
9/20/07	PSE	13	K	Konjac	2	3	67.94	1.21	0.000	2094.083	6.374	1819.268	2.311	49.86	43.32	0.36	18.08
9/20/07	PSE	13	K	Konjac	2	4	46.71	0.89	0.000	1757.550	5.438	1552.719	1.800	41.85	36.97	0.33	13.85
9/20/07	PSE	13	K	Konjac	2	5	55.98	1.09	0.000	1798.113	5.641	1519.210	1.834	42.81	36.17	0.33	13.92
9/20/07	Normal	14	Am	Control	2	1	49.61	0.85	917.621	1887.026	5.876	1605.204	1.965	44.93	38.22	0.33	15.02
9/20/07	Normal	14	Am	Control	2	1	51.73	1.39	0.000	1733.267	5.646	1484.672	1.864	41.27	35.35	0.33	13.62
9/20/07	Normal	14	Am	Control	2	3	42.85	1.01	0.000	1647.050	5.251	1417.776	1.690	39.22	33.76	0.32	12.62
9/20/07	Normal	14	Am	Control	2	4	42.66	1.13	0.000	1760.601	5.762	1511.873	1.877	41.92	36.00	0.33	13.66
9/20/07	Normal	14	Am	Control	2	5	49.03	1.10	0.000	1653.156	5.350	1485.586	1.776	39.36	35.37	0.33	13.07
9/20/07	PSE	14	Am	Control	2	1	56.75	0.91	655.350	1699.358	5.328	1511.538	1.848	40.46	35.99	0.35	14.03
9/20/07	PSE	14	Am	Control	2	2	51.15	1.01	0.000	1820.284	6.067	1578.696	1.923	43.34	37.59	0.32	13.74
9/20/07	PSE	14	Am	Control	2	3	52.89	1.08	0.000	1893.749	5.967	1614.634	1.992	45.09	38.44	0.33	15.05
9/20/07	PSE	14	Am	Control	2	4	49.99	0.86	0.000	1822.129	5.347	1548.030	1.878	43.38	36.86	0.35	15.24
9/20/07	PSE	14	Am	Control	2	5	60.22	1.19	0.000	1993.539	6.338	1682.762	2.184	47.47	40.07	0.34	16.36
9/20/07	Normal	15	Am	E15	2	1	55.59	1.13	0.000	1779.810	5.894	1545.414	1.872	42.38	36.80	0.32	13.46
9/20/07	Normal	15	Am	E15	2	2	61.38	0.99	0.000	1911.796	5.817	1659.220	2.046	45.52	39.51	0.35	16.01
9/20/07	Normal	15	Am	E15	2	3	49.99	1.08	892.801	1736.038	5.385	1466.982	1.740	41.33	34.93	0.32	13.36
9/20/07	Normal	15	Am	E15	2	4	65.24	1.24	0.000	1924.256	6.301	1637.206	2.039	45.82	38.98	0.32	14.83
9/20/07	Normal	15	Am	E15	2	5	53.85	1.25	1118.567	2102.118	6.760	1725.046	2.192	50.05	41.07	0.32	16.23
9/20/07	PSE	15	Am	E15	2	1	65.05	0.96	0.000	1891.627	6.327	1589.078	1.993	45.04	37.84	0.31	14.19
9/20/07	PSE	15	Am	E15	2	2	62.54	1.01	0.000	1804.117	6.861	1535.140	2.086	42.96	36.55	0.30	13.06
9/20/07	PSE	15	Am	E15	2	3	63.31	1.12	0.000	1713.790	5.515	1474.537	1.777	40.80	35.11	0.32	13.15
9/20/07	PSE	15	Am	E15	2	4	55.59	0.95	0.000	2126.593	6.802	1828.581	2.354	50.63	43.54	0.35	17.52
9/20/07	PSE	15	Am	E15	2	5	48.64	0.97	0.000	1937.663	5.958	1670.571	2.080	46.13	39.78	0.35	16.11
9/20/07	Normal	16	Am	A150	2	1	50.96	0.99	0.000	1764.145	6.328	1495.089	1.951	42.00	35.60	0.31	12.95
9/20/07	Normal	16	Am	A150	2	2	70.65	1.33	0.000	1747.071	6.474	1486.533	1.899	41.60	35.39	0.29	12.20
9/20/07	Normal	16	Am	A150	2	3	58.29	1.25	0.000	1652.079	5.961	1394.620	1.785	39.34	33.21	0.30	11.78
9/20/07	Normal	16	Am	A150	2	4	55.20	1.07	0.000	1813.464	5.949	1543.930	1.968	43.18	36.76	0.33	14.28
9/20/07	Normal	16	Am	A150	2	5	49.03	0.86	1030.106	1749.723	6.355	1515.486	1.924	41.66	36.08	0.30	12.61
9/20/07	PSE	16	Am	A150	2	1	56.75	1.03	0.000	1801.458	6.303	1547.051	2.024	42.89	36.83	0.32	13.77
9/20/07	PSE	16	Am	A150	2	2	62.15	1.19	808.965	1912.899	6.388	1636.040	2.102	45.55	38.95	0.33	14.99

9/20/07	PSE	16	Am	A150	2	3	64.66	1.13	0.000	1939.919	6.310	1636.600	2.054	46.19	38.97	0.33	15.04
9/20/07	PSE	16	Am	A150	2	4	62.93	1.03	758.427	1783.300	5.990	1496.329	1.870	42.46	35.63	0.31	13.26
9/20/07	PSE	16	Am	A150	2	5	58.68	1.05	1053.687	1893.951	6.587	1607.671	2.024	45.09	38.28	0.31	13.86
9/20/07	Normal	17	Am	Konjac	2	1	40.92	0.91	0.000	1792.465	5.549	1510.536	1.779	42.68	35.97	0.32	13.68
9/20/07	Normal	17	Am	Konjac	2	2	47.10	0.88	0.000	1787.430	6.309	1507.652	1.984	42.56	35.90	0.31	13.38
9/20/07	Normal	17	Am	Konjac	2	3	37.83	0.88	0.000	1810.032	5.830	1563.375	1.954	43.10	37.22	0.34	14.44
9/20/07	Normal	17	Am	Konjac	2	4	40.34	0.93	985.248	1825.354	5.715	1572.619	2.008	43.46	37.44	0.35	15.27
9/20/07	Normal	17	Am	Konjac	2	5	47.48	1.25	860.368	1605.516	5.607	1359.177	1.676	38.23	32.36	0.30	11.43
9/20/07	PSE	17	Am	Konjac	2	1	48.64	1.01	902.082	2006.626	6.020	1707.447	2.084	47.78	40.65	0.35	16.54
9/20/07	PSE	17	Am	Konjac	2	2	52.12	1.03	0.000	1905.227	6.220	1664.196	2.124	45.36	39.62	0.34	15.49
9/20/07	PSE	17	Am	Konjac	2	3	42.08	0.80	0.000	2078.772	6.528	1823.303	2.260	49.49	43.41	0.35	17.14
9/20/07	PSE	17	Am	Konjac	2	4	59.45	1.13	0.000	1882.553	6.221	1603.305	2.032	44.82	38.17	0.33	14.64
9/20/07	PSE	17	Am	Konjac	2	5	50.36	1.08	0.000	1712.608	6.043	1450.770	1.909	40.78	34.54	0.32	12.88
9/24/07	Normal	1	Control	Control	3	1	71.42	0.88	0.000	1650.300	5.498	1394.781	2.051	39.29	33.21	0.37	14.66
9/24/07	Normal	1	Control	Control	3	2	79.72	1.02	0.000	1893.194	6.284	1569.254	2.271	45.08	37.36	0.36	16.29
9/24/07	Normal	1	Control	Control	3	3	73.35	1.02	0.000	1697.036	5.424	1464.317	2.023	40.41	34.86	0.37	15.07
9/24/07	Normal	1	Control	Control	3	4	75.28	1.20	0.000	1549.917	5.090	1332.689	1.767	36.90	31.73	0.35	12.81
9/24/07	Normal	1	Control	Control	3	5	51.15	0.71	686.961	1642.717	5.752	1374.704	1.959	39.11	32.73	0.34	13.32
9/24/07	PSE	1	Control	Control	3	1	72.77	1.05	0.000	1467.282	5.185	1234.393	1.703	34.94	29.39	0.33	11.47
9/24/07	PSE	1	Control	Control	3	2	76.05	0.81	714.624	1723.673	6.217	1401.348	1.943	41.04	33.37	0.31	12.83
9/24/07	PSE	1	Control	Control	3	3	79.53	0.98	600.033	1438.983	5.141	1231.211	1.655	34.26	29.31	0.32	11.03
9/24/07	PSE	1	Control	Control	3	4	81.84	0.92	621.705	1563.203	5.268	1271.647	1.618	37.22	30.28	0.31	11.43
9/24/07	PSE	1	Control	Control	3	5	70.26	0.79	0.000	1647.172	5.816	1391.633	1.901	39.22	33.13	0.33	12.82
9/24/07	Normal	2	Control	E15	3	1	57.14	1.24	0.000	1416.515	4.687	1190.597	1.668	33.73	28.35	0.36	12.00
9/24/07	Normal	2	Control	E15	3	2	71.03	1.35	0.000	1383.575	4.525	1193.079	1.625	32.94	28.41	0.36	11.83
9/24/07	Normal	2	Control	E15	3	3	48.45	0.94	0.000	1475.983	4.515	1261.369	1.580	35.14	30.03	0.35	12.30
9/24/07	Normal	2	Control	E15	3	4	.	.	0.000	1440.315	4.858	1228.527	1.696	34.29	29.25	0.35	11.97
9/24/07	Normal	2	Control	E15	3	5	64.47	1.18	0.000	1524.173	4.879	1254.141	1.624	36.29	29.86	0.33	12.08
9/24/07	PSE	2	Control	E15	3	1	62.93	1.02	530.810	1283.745	4.233	1079.564	1.307	30.57	25.70	0.31	9.44
9/24/07	PSE	2	Control	E15	3	2	39.18	0.80	0.000	1331.283	4.177	1100.243	1.376	31.70	26.20	0.33	10.44
9/24/07	PSE	2	Control	E15	3	3	59.84	0.95	0.000	1337.570	4.138	1099.285	1.331	31.85	26.17	0.32	10.24
9/24/07	PSE	2	Control	E15	3	4	56.17	1.15	406.169	1343.163	4.200	1121.919	1.369	31.98	26.71	0.33	10.42
9/24/07	PSE	2	Control	E15	3	5	60.61	1.10	0.000	1221.494	3.538	1025.855	1.188	29.08	24.43	0.34	9.77

9/24/07	Normal	3	Control	A150	3	1	31.27	0.58	0.000	1340.660	4.394	1139.863	1.437	31.92	27.14	0.33	10.44
9/24/07	Normal	3	Control	A150	3	2	22.78	0.39	0.000	1308.435	4.352	1119.192	1.493	31.15	26.65	0.34	10.69
9/24/07	Normal	3	Control	A150	3	3	20.85	0.40	0.000	1215.683	3.871	1036.215	1.187	28.94	24.67	0.31	8.88
9/24/07	Normal	3	Control	A150	3	4	39.76	0.84	0.000	1453.146	4.648	1225.548	1.550	34.60	29.18	0.33	11.54
9/24/07	Normal	3	Control	A150	3	5	39.76	0.83	0.000	1313.180	4.285	1096.887	1.405	31.27	26.12	0.33	10.25
9/24/07	PSE	3	Control	A150	3	1	23.93	0.48	0.000	1370.799	4.165	1116.790	1.280	32.64	26.59	0.31	10.03
9/24/07	PSE	3	Control	A150	3	2	35.71	0.67	0.000	1401.213	4.213	1179.438	1.346	33.36	28.08	0.32	10.66
9/24/07	PSE	3	Control	A150	3	3	33.59	0.80	0.000	1308.220	4.244	1070.742	1.260	31.15	25.49	0.30	9.25
9/24/07	PSE	3	Control	A150	3	4	44.78	0.71	466.207	1366.482	4.319	1145.302	1.359	32.54	27.27	0.31	10.24
9/24/07	PSE	3	Control	A150	3	5	48.84	0.89	0.000	1324.479	4.088	1097.923	1.324	31.54	26.14	0.32	10.21
9/24/07	Normal	4	Control	Konjac	3	1	84.93	1.37	0.000	1535.825	4.500	1269.831	1.607	36.57	30.23	0.36	13.06
9/24/07	Normal	4	Control	Konjac	3	2	64.08	1.15	0.000	1400.168	4.387	1201.724	1.520	33.34	28.61	0.35	11.55
9/24/07	Normal	4	Control	Konjac	3	3	80.68	1.36	0.000	1385.816	4.207	1162.468	1.379	33.00	27.68	0.33	10.82
9/24/07	Normal	4	Control	Konjac	3	4	75.09	1.08	0.000	1332.276	4.278	1111.734	1.398	31.72	26.47	0.33	10.37
9/24/07	Normal	4	Control	Konjac	3	5	80.11	1.27	0.000	1351.491	4.403	1140.000	1.441	32.18	27.14	0.33	10.53
9/24/07	PSE	4	Control	Konjac	3	1	50.77	0.73	490.736	1460.941	4.612	1217.747	1.490	34.78	28.99	0.32	11.24
9/24/07	PSE	4	Control	Konjac	3	2	75.47	0.99	443.614	1337.366	4.205	1128.871	1.364	31.84	26.88	0.32	10.33
9/24/07	PSE	4	Control	Konjac	3	3	87.05	1.07	0.000	1280.201	3.873	1090.469	1.262	30.48	25.96	0.33	9.93
9/24/07	PSE	4	Control	Konjac	3	4	78.75	1.17	0.000	1342.367	4.397	1138.568	1.360	31.96	27.11	0.31	9.89
9/24/07	PSE	4	Control	Konjac	3	5	75.67	1.23	0.000	1322.683	3.963	1116.844	1.314	31.49	26.59	0.33	10.44
9/24/07	Normal	5	H2O	Control	3	1	46.90	0.85	0.000	1405.123	4.400	1201.452	1.512	33.46	28.61	0.34	11.50
9/24/07	Normal	5	H2O	Control	3	2	60.61	1.09	0.000	1549.811	4.817	1294.505	1.672	36.90	30.82	0.35	12.81
9/24/07	Normal	5	H2O	Control	3	3	62.35	1.17	0.000	1404.460	4.333	1193.246	1.511	33.44	28.41	0.35	11.66
9/24/07	Normal	5	H2O	Control	3	4	59.07	1.07	615.988	1454.875	4.454	1247.124	1.529	34.64	29.69	0.34	11.89
9/24/07	Normal	5	H2O	Control	3	5	.	.	0.000	1652.758	5.113	1434.702	1.805	39.35	34.16	0.35	13.89
9/24/07	PSE	5	H2O	Control	3	1	65.63	0.96	0.000	1557.054	4.891	1318.705	1.572	37.07	31.40	0.32	11.92
9/24/07	PSE	5	H2O	Control	3	2	68.91	1.01	0.000	1574.595	5.036	1325.770	1.620	37.49	31.57	0.32	12.06
9/24/07	PSE	5	H2O	Control	3	3	85.70	1.21	0.000	1480.613	4.581	1233.084	1.456	35.25	29.36	0.32	11.20
9/24/07	PSE	5	H2O	Control	3	4	63.70	0.79	0.000	1429.773	4.386	1191.360	1.403	34.04	28.37	0.32	10.89
9/24/07	PSE	5	H2O	Control	3	5	67.17	0.96	0.000	1503.496	4.679	1304.925	1.501	35.80	31.07	0.32	11.48
9/24/07	Normal	6	Na	Control	3	1	59.84	1.36	530.482	1074.540	3.636	904.442	1.108	25.58	21.53	0.30	7.80
9/24/07	Normal	6	Na	Control	3	2	52.31	1.26	0.000	1244.233	3.879	1071.543	1.284	29.62	25.51	0.33	9.81
9/24/07	Normal	6	Na	Control	3	3	47.87	1.11	0.000	1093.525	3.508	936.793	1.086	26.04	22.30	0.31	8.06

9/24/07	Normal	6	Na	Control	3	4	44.01	0.87	0.000	1351.460	3.793	1138.185	1.335	32.18	27.10	0.35	11.33
9/24/07	Normal	6	Na	Control	3	5	54.82	1.10	0.000	1236.194	3.653	1064.736	1.256	29.43	25.35	0.34	10.12
9/24/07	PSE	6	Na	Control	3	1	48.26	0.98	0.000	1399.593	4.580	1179.093	1.516	33.32	28.07	0.33	11.03
9/24/07	PSE	6	Na	Control	3	2	49.80	1.01	0.000	1397.149	4.213	1183.831	1.415	33.27	28.19	0.34	11.17
9/24/07	PSE	6	Na	Control	3	3	45.17	0.80	525.391	1284.190	4.093	1045.798	1.208	30.58	24.90	0.30	9.02
9/24/07	PSE	6	Na	Control	3	4	54.82	1.26	0.000	1374.668	3.898	1153.807	1.345	32.73	27.47	0.35	11.29
9/24/07	PSE	6	Na	Control	3	5	50.96	0.94	0.000	1262.996	3.675	1047.956	1.192	30.07	24.95	0.32	9.75
9/24/07	Normal	7	Na	E15	3	1	51.15	1.36	575.587	1161.123	3.901	992.938	1.172	27.65	23.64	0.30	8.31
9/24/07	Normal	7	Na	E15	3	2	45.55	1.40	0.000	1170.936	3.919	1026.443	1.253	27.88	24.44	0.32	8.91
9/24/07	Normal	7	Na	E15	3	3	49.80	1.20	0.000	1234.566	3.586	1031.171	1.200	29.39	24.55	0.33	9.84
9/24/07	Normal	7	Na	E15	3	4	51.73	1.12	0.000	1207.002	4.150	1043.109	1.285	28.74	24.84	0.31	8.90
9/24/07	Normal	7	Na	E15	3	5	57.33	1.50	0.000	1235.924	4.085	1088.606	1.312	29.43	25.92	0.32	9.45
9/24/07	PSE	7	Na	E15	3	1	57.91	1.21	616.384	1408.119	4.339	1213.989	1.421	33.53	28.90	0.33	10.98
9/24/07	PSE	7	Na	E15	3	2	55.98	1.12	0.000	1470.623	4.436	1243.387	1.514	35.01	29.60	0.34	11.95
9/24/07	PSE	7	Na	E15	3	3	49.41	1.09	0.000	1376.229	4.420	1185.987	1.497	32.77	28.24	0.34	11.10
9/24/07	PSE	7	Na	E15	3	4	43.43	1.16	0.000	1519.530	4.782	1299.072	1.586	36.18	30.93	0.33	12.00
9/24/07	PSE	7	Na	E15	3	5	50.19	1.00	0.000	1291.845	4.002	1109.083	1.250	30.76	26.41	0.31	9.61
9/24/07	Normal	8	Na	A150	3	1	42.08	1.24	0.000	1360.265	4.106	1181.243	1.410	32.39	28.12	0.34	11.12
9/24/07	Normal	8	Na	A150	3	2	45.36	1.21	0.000	1116.338	3.273	982.130	1.061	26.58	23.38	0.32	8.62
9/24/07	Normal	8	Na	A150	3	3	50.19	1.22	594.377	1165.208	3.959	1000.359	1.204	27.74	23.82	0.30	8.44
9/24/07	Normal	8	Na	A150	3	4	46.90	1.32	0.000	1134.668	3.710	960.405	1.160	27.02	22.87	0.31	8.45
9/24/07	Normal	8	Na	A150	3	5	46.33	1.24	0.000	1416.957	4.256	1225.760	1.454	33.74	29.18	0.34	11.53
9/24/07	PSE	8	Na	A150	3	1	33.39	0.80	523.225	1225.587	3.917	1052.748	1.193	29.18	25.07	0.30	8.89
9/24/07	PSE	8	Na	A150	3	2	49.99	1.17	564.078	1247.444	4.084	1069.187	1.253	29.70	25.46	0.31	9.11
9/24/07	PSE	8	Na	A150	3	3	43.43	1.11	418.989	1339.451	4.163	1174.771	1.347	31.89	27.97	0.32	10.32
9/24/07	PSE	8	Na	A150	3	4	48.84	1.22	694.616	1564.632	4.918	1350.061	1.715	37.25	32.14	0.35	12.99
9/24/07	PSE	8	Na	A150	3	5	63.31	1.26	0.000	1424.968	4.403	1235.683	1.461	33.93	29.42	0.33	11.26
9/24/07	Normal	9	Na	Konjac	3	1	33.01	0.76	0.000	1336.748	4.248	1138.665	1.376	31.83	27.11	0.32	10.31
9/24/07	Normal	9	Na	Konjac	3	2	29.53	0.85	0.000	1355.676	4.353	1134.708	1.358	32.28	27.02	0.31	10.07
9/24/07	Normal	9	Na	Konjac	3	3	50.96	0.97	596.428	1456.330	4.672	1228.839	1.483	34.67	29.26	0.32	11.01
9/24/07	Normal	9	Na	Konjac	3	4	49.41	1.29	0.000	1389.107	4.245	1182.078	1.373	33.07	28.14	0.32	10.70
9/24/07	Normal	9	Na	Konjac	3	5	39.38	1.15	0.000	1347.641	3.892	1109.419	1.277	32.09	26.41	0.33	10.53
9/24/07	PSE	9	Na	Konjac	3	1	45.75	1.27	0.000	1327.077	4.460	1155.216	1.410	31.60	27.51	0.32	9.99

9/24/07	PSE	9	Na	Konjac	3	2	38.80	1.21	0.000	1326.270	4.230	1130.206	1.371	31.58	26.91	0.32	10.23
9/24/07	PSE	9	Na	Konjac	3	3	47.68	1.21	0.000	1229.256	4.028	1056.800	1.240	29.27	25.16	0.31	9.01
9/24/07	PSE	9	Na	Konjac	3	4	43.24	1.24	0.000	1244.302	4.527	1063.261	1.344	29.63	25.32	0.30	8.80
9/24/07	PSE	9	Na	Konjac	3	5	44.78	0.74	677.962	1275.461	4.126	1076.571	1.289	30.37	25.63	0.31	9.49
9/24/07	Normal	10	K	Control	3	1	35.13	1.40	0.000	1378.972	3.957	1165.442	1.398	32.83	27.75	0.35	11.60
9/24/07	Normal	10	K	Control	3	2	23.93	0.91	0.000	1625.098	2.035	1484.642	1.448	38.69	35.35	0.71	27.53
9/24/07	Normal	10	K	Control	3	3	29.92	1.15	0.000	1398.118	4.154	1221.603	1.480	33.29	29.09	0.36	11.86
9/24/07	Normal	10	K	Control	3	4	33.20	1.07	0.000	1307.046	3.727	1116.613	1.356	31.12	26.59	0.36	11.32
9/24/07	Normal	10	K	Control	3	5	34.94	0.92	0.000	1178.692	3.639	1020.918	1.255	28.06	24.31	0.34	9.68
9/24/07	PSE	10	K	Control	3	1	52.12	1.12	0.000	1754.934	5.318	1496.568	1.820	41.78	35.63	0.34	14.30
9/24/07	PSE	10	K	Control	3	2	60.61	1.52	0.000	1474.298	4.671	1257.006	1.559	35.10	29.93	0.33	11.72
9/24/07	PSE	10	K	Control	3	3	34.74	0.78	680.132	1412.732	4.539	1199.690	1.416	33.64	28.56	0.31	10.49
9/24/07	PSE	10	K	Control	3	4	36.87	0.76	0.000	1492.733	4.833	1263.903	1.597	35.54	30.09	0.33	11.74
9/24/07	PSE	10	K	Control	3	5	27.02	0.62	0.000	1589.240	5.550	1370.588	1.877	37.84	32.63	0.34	12.80
9/24/07	Normal	11	K	E15	3	1	48.26	1.24	0.000	1386.905	4.555	1149.767	1.457	33.02	27.38	0.32	10.56
9/24/07	Normal	11	K	E15	3	2	56.36	1.26	0.000	1236.830	4.212	1055.130	1.256	29.45	25.12	0.30	8.78
9/24/07	Normal	11	K	E15	3	3	41.89	1.43	595.613	1101.295	3.635	933.237	1.084	26.22	22.22	0.30	7.82
9/24/07	Normal	11	K	E15	3	4	55.98	1.26	0.000	1204.350	3.760	1044.388	1.245	28.68	24.87	0.33	9.49
9/24/07	Normal	11	K	E15	3	5	45.17	1.08	657.005	1214.981	4.379	1038.572	1.314	28.93	24.73	0.30	8.68
9/24/07	PSE	11	K	E15	3	1	47.10	0.80	0.000	1426.405	5.173	1196.938	1.597	33.96	28.50	0.31	10.48
9/24/07	PSE	11	K	E15	3	2	46.52	0.81	0.000	1499.120	4.707	1262.110	1.562	35.69	30.05	0.33	11.84
9/24/07	PSE	11	K	E15	3	3	50.96	1.03	591.403	1294.573	4.306	1096.235	1.394	30.82	26.10	0.32	9.98
9/24/07	PSE	11	K	E15	3	4	35.13	0.80	597.446	1279.112	4.549	1084.301	1.302	30.46	25.82	0.29	8.72
9/24/07	PSE	11	K	E15	3	5	61.19	1.24	0.000	1517.955	4.836	1263.010	1.618	36.14	30.07	0.33	12.09
9/24/07	Normal	12	K	A150	3	1	50.77	1.04	0.000	1261.905	4.291	1099.351	1.347	30.05	26.18	0.31	9.43
9/24/07	Normal	12	K	A150	3	2	43.62	1.32	0.000	1171.884	4.084	965.260	1.175	27.90	22.98	0.29	8.03
9/24/07	Normal	12	K	A150	3	3	49.80	1.15	0.000	1234.381	4.013	1064.857	1.283	29.39	25.35	0.32	9.40
9/24/07	Normal	12	K	A150	3	4	39.96	1.18	0.000	1246.047	4.034	1059.248	1.319	29.67	25.22	0.33	9.70
9/24/07	Normal	12	K	A150	3	5	30.88	0.86	0.000	1156.574	3.877	980.293	1.191	27.54	23.34	0.31	8.46
9/24/07	PSE	12	K	A150	3	1	37.06	0.81	0.000	1413.287	4.372	1230.801	1.445	33.65	29.30	0.33	11.12
9/24/07	PSE	12	K	A150	3	2	54.05	1.18	0.000	1533.244	4.818	1315.846	1.640	36.51	31.33	0.34	12.43
9/24/07	PSE	12	K	A150	3	3	42.47	1.01	0.000	1452.278	4.699	1228.442	1.518	34.58	29.25	0.32	11.17
9/24/07	PSE	12	K	A150	3	4	56.36	1.08	0.000	1399.649	4.539	1181.932	1.505	33.32	28.14	0.33	11.05

9/24/07	PSE	12	K	A150	3	5	46.90	1.08	0.000	1393.127	4.286	1196.702	1.428	33.17	28.49	0.33	11.05
9/24/07	Normal	13	K	Konjac	3	1	45.94	1.23	0.000	1365.601	4.214	1197.119	1.445	32.51	28.50	0.34	11.15
9/24/07	Normal	13	K	Konjac	3	2	39.94	0.79	0.000	1469.001	4.725	1275.041	1.617	34.98	30.36	0.34	11.97
9/24/07	Normal	13	K	Konjac	3	3	40.92	0.94	0.000	1200.298	44.085	1012.967	1.234	28.58	24.12	0.03	0.80
9/24/07	Normal	13	K	Konjac	3	4	47.68	1.15	0.000	1337.560	4.081	1170.118	1.436	31.85	27.86	0.35	11.21
9/24/07	Normal	13	K	Konjac	3	5	43.43	0.92	0.000	1277.842	3.948	1100.456	1.274	30.42	26.20	0.32	9.82
9/24/07	PSE	13	K	Konjac	3	1	44.40	0.95	0.000	1562.019	4.775	1323.584	1.643	37.19	31.51	0.34	12.80
9/24/07	PSE	13	K	Konjac	3	2	42.66	0.90	0.000	1590.270	4.697	1395.078	1.674	37.86	33.22	0.36	13.49
9/24/07	PSE	13	K	Konjac	3	3	37.25	0.73	0.000	1523.806	4.359	1333.033	1.569	36.28	31.74	0.36	13.06
9/24/07	PSE	13	K	Konjac	3	4	43.43	0.95	0.000	1738.083	5.275	1491.553	1.870	41.38	35.51	0.35	14.67
9/24/07	PSE	13	K	Konjac	3	5	52.50	1.09	0.000	1602.212	4.972	1394.695	1.746	38.15	33.21	0.35	13.40
9/24/07	Normal	14	Am	Control	3	1	31.66	0.81	449.246	1072.159	3.418	920.293	1.051	25.53	21.91	0.31	7.85
9/24/07	Normal	14	Am	Control	3	2	40.92	0.99	0.000	1277.861	3.675	1089.595	1.328	30.43	25.94	0.36	10.99
9/24/07	Normal	14	Am	Control	3	3	33.20	0.75	0.000	1223.002	3.459	1078.127	1.235	29.12	25.67	0.36	10.40
9/24/07	Normal	14	Am	Control	3	4	32.81	0.89	0.000	1117.572	3.478	937.338	1.135	26.61	22.32	0.33	8.68
9/24/07	Normal	14	Am	Control	3	5	38.22	1.24	0.000	1249.716	3.368	1126.345	1.376	29.76	26.82	0.41	12.16
9/24/07	PSE	14	Am	Control	3	1	42.47	0.94	0.000	1243.500	3.951	1081.094	1.284	29.61	25.74	0.32	9.62
9/24/07	PSE	14	Am	Control	3	2	40.15	0.80	509.287	1433.020	4.454	1243.161	1.504	34.12	29.60	0.34	11.52
9/24/07	PSE	14	Am	Control	3	3	40.92	0.97	581.538	1310.249	4.252	1088.963	1.353	31.20	25.93	0.32	9.93
9/24/07	PSE	14	Am	Control	3	4	35.13	0.60	0.000	1318.024	4.044	1155.406	1.402	31.38	27.51	0.35	10.88
9/24/07	PSE	14	Am	Control	3	5	31.85	0.67	0.000	1478.759	4.301	1272.963	1.593	35.21	30.31	0.37	13.04
9/24/07	Normal	15	Am	E15	3	1	39.76	0.82	0.000	1373.005	3.901	1207.434	1.383	32.69	28.75	0.35	11.59
9/24/07	Normal	15	Am	E15	3	2	49.22	1.03	0.000	1397.697	4.305	1175.603	1.543	33.28	27.99	0.36	11.93
9/24/07	Normal	15	Am	E15	3	3	33.59	0.72	0.000	1272.299	3.699	1100.182	1.287	30.29	26.19	0.35	10.54
9/24/07	Normal	15	Am	E15	3	4	42.85	1.01	0.000	1624.440	4.868	1380.545	1.799	38.68	32.87	0.37	14.29
9/24/07	Normal	15	Am	E15	3	5	35.32	1.02	0.000	1318.920	3.795	1152.222	1.373	31.40	27.43	0.36	11.36
9/24/07	PSE	15	Am	E15	3	1	62.54	1.15	0.000	1205.576	4.447	973.835	1.235	28.70	23.19	0.28	7.97
9/24/07	PSE	15	Am	E15	3	2	57.91	1.05	0.000	1371.045	4.433	1177.149	1.457	32.64	28.03	0.33	10.73
9/24/07	PSE	15	Am	E15	3	3	63.89	1.14	0.000	1530.736	4.791	1294.129	1.611	36.45	30.81	0.34	12.26
9/24/07	PSE	15	Am	E15	3	4	59.45	1.03	0.000	1592.232	5.300	1315.677	1.740	37.91	31.33	0.33	12.45
9/24/07	PSE	15	Am	E15	3	5	52.12	0.85	590.800	1378.307	4.831	1186.727	1.553	32.82	28.26	0.32	10.55
9/24/07	Normal	16	Am	A150	3	1	53.66	1.08	676.575	1253.654	4.509	1094.415	1.396	29.85	26.06	0.31	9.24
9/24/07	Normal	16	Am	A150	3	2	48.26	0.98	0.000	1422.986	4.581	1204.376	1.487	33.88	28.68	0.32	11.00

9/24/07	Normal	16	Am	A150	3	3	36.87	0.71	0.000	1414.556	5.025	1207.592	1.543	33.68	28.75	0.31	10.34
9/24/07	Normal	16	Am	A150	3	4	43.24	1.07	637.920	1260.174	4.259	1091.308	1.287	30.00	25.98	0.30	9.07
9/24/07	Normal	16	Am	A150	3	5	53.66	1.18	0.000	1509.649	5.136	1317.687	1.730	35.94	31.37	0.34	12.11
9/24/07	PSE	16	Am	A150	3	1	52.89	1.28	0.000	1316.040	4.069	1131.726	1.440	31.33	26.95	0.35	11.09
9/24/07	PSE	16	Am	A150	3	2	50.96	1.26	0.000	1216.551	4.143	1025.183	1.345	28.97	24.41	0.32	9.40
9/24/07	PSE	16	Am	A150	3	3	42.08	1.27	0.000	1228.210	3.720	1072.264	1.229	29.24	25.53	0.33	9.66
9/24/07	PSE	16	Am	A150	3	4	51.92	1.35	0.000	1438.886	4.228	1199.262	1.449	34.26	28.55	0.34	11.74
9/24/07	PSE	16	Am	A150	3	5	52.70	1.32	0.000	1179.740	3.602	1039.560	1.197	28.09	24.75	0.33	9.33
9/24/07	Normal	17	Am	Konjac	3	1	.	.	0.000	1330.608	4.237	1146.125	1.440	31.68	27.29	0.34	10.77
9/24/07	Normal	17	Am	Konjac	3	2	49.99	1.19	0.000	1531.873	5.076	1306.209	1.704	36.47	31.10	0.34	12.24
9/24/07	Normal	17	Am	Konjac	3	3	39.76	0.95	696.144	1355.223	4.469	1185.210	1.464	32.27	28.22	0.33	10.57
9/24/07	Normal	17	Am	Konjac	3	4	46.33	1.22	0.000	1461.858	4.506	1246.139	1.534	34.81	29.67	0.34	11.85
9/24/07	Normal	17	Am	Konjac	3	5	44.40	1.12	647.567	1349.249	4.152	1177.834	1.377	32.12	28.04	0.33	10.65
9/24/07	PSE	17	Am	Konjac	3	1	52.89	1.13	0.000	1350.349	4.382	1170.859	1.413	32.15	27.88	0.32	10.37
9/24/07	PSE	17	Am	Konjac	3	2	58.87	1.07	0.000	1534.982	4.589	1330.504	1.604	36.55	31.68	0.35	12.77
9/24/07	PSE	17	Am	Konjac	3	3	40.92	0.86	656.481	1488.164	4.438	1297.263	1.545	35.43	30.89	0.35	12.34
9/24/07	PSE	17	Am	Konjac	3	4	47.68	1.13	0.000	1391.829	4.232	1194.299	1.448	33.14	28.44	0.34	11.34
9/24/07	PSE	17	Am	Konjac	3	5	62.35	1.57	0.000	1370.432	4.761	1181.592	1.459	32.63	28.13	0.31	10.00

F-4. P2S3: Raw data for cooked hydrocolloid/buffer treated cooked pork gels.

Date	Meat	Trt	Buffer	Hydro	Day	pH	pH	L1	a1	b1	L2	a2	b2	L3	a3	b3
9/18/07	Normal	1	Control	Control	1	6.17	6.18	79.40	8.24	7.85	79.10	9.24	7.24	79.33	8.92	7.42
9/18/07	PSE	1	Control	Control	1	5.85	5.85	80.12	7.48	7.17	80.50	8.09	7.15	80.59	7.72	6.85
9/18/07	Normal	2	H2O	E15	1	6.16	6.16	80.57	8.43	7.07	80.11	8.44	7.27	80.78	8.12	7.19
9/18/07	PSE	2	H2O	E15	1	5.84	5.84	81.09	8.22	7.37	80.60	7.63	7.56	78.12	7.27	7.86
9/18/07	Normal	3	H2O	A150	1	6.17	6.16	78.61	8.61	7.76	80.36	8.08	7.77	80.76	8.02	7.28
9/18/07	PSE	3	H2O	A150	1	5.84	5.85	82.24	7.33	7.09	82.32	6.87	6.99	82.92	6.82	7.06
9/18/07	Normal	4	H2O	Konjac	1	6.16	6.16	80.33	8.67	7.00	79.49	8.50	7.43	80.42	8.05	7.74
9/18/07	PSE	4	H2O	Konjac	1	5.84	5.84	83.35	7.07	6.73	82.77	6.36	7.24	82.58	5.96	7.65
9/18/07	Normal	5	H2O	Control	1	6.15	6.16	79.37	8.06	7.36	80.90	7.61	7.79	79.25	7.38	8.09
9/18/07	PSE	5	H2O	Control	1	5.84	5.85	82.06	7.40	6.97	82.11	7.48	6.82	82.27	6.95	7.21
9/18/07	Normal	6	Na	Control	1	6.59	6.58	78.21	8.81	7.81	77.78	8.43	8.36	78.56	8.47	7.50
9/18/07	PSE	6	Na	Control	1	6.25	6.24	80.88	7.65	6.87	79.26	7.39	7.33	80.01	6.87	7.52
9/18/07	Normal	7	Na	E15	1	6.54	6.54	79.14	8.66	7.34	77.67	8.63	7.30	76.90	8.37	8.57
9/18/07	PSE	7	Na	E15	1	6.20	6.20	79.68	7.56	7.10	80.59	7.63	7.40	81.18	7.70	7.22
9/18/07	Normal	8	Na	A150	1	6.49	6.49	78.57	8.86	7.29	78.67	8.57	7.24	79.67	8.47	7.19
9/18/07	PSE	8	Na	A150	1	6.22	6.21	80.65	8.27	6.85	80.10	8.29	7.06	80.66	7.96	7.23
9/18/07	Normal	9	Na	Konjac	1	6.57	6.56	78.92	8.74	6.81	78.19	8.40	7.80	79.51	8.65	7.18
9/18/07	PSE	9	Na	Konjac	1	6.15	6.16	80.82	8.04	6.82	80.55	7.74	7.12	80.10	7.64	7.42
9/18/07	Normal	10	K	Control	1	6.60	6.61	78.83	8.82	7.27	79.64	8.53	7.30	79.16	8.73	7.00
9/18/07	PSE	10	K	Control	1	6.21	6.22	79.24	7.71	7.22	80.08	7.80	7.00	80.17	7.99	6.94
9/18/07	Normal	11	K	E15	1	6.58	6.56	78.96	8.83	7.31	78.96	8.53	7.64	79.00	8.88	7.24
9/18/07	PSE	11	K	E15	1	6.20	6.20	79.72	7.10	7.32	80.20	7.52	7.63	79.74	8.00	7.21
9/18/07	Normal	12	K	A150	1	6.55	6.54	79.07	8.88	6.74	79.00	8.51	7.15	79.53	8.30	7.20
9/18/07	PSE	12	K	A150	1	6.25	6.25	79.46	8.42	6.53	79.05	8.34	6.62	80.13	7.82	7.26
9/18/07	Normal	13	K	Konjac	1	6.53	6.53	79.32	8.65	7.20	79.21	8.44	7.43	78.83	8.31	7.64
9/18/07	PSE	13	K	Konjac	1	6.23	6.23	79.05	7.69	7.53	79.86	7.48	7.78	80.80	7.47	7.45
9/18/07	Normal	14	Am	Control	1	6.49	6.50	79.58	8.65	6.98	79.53	8.52	7.24	79.13	8.56	7.73
9/18/07	PSE	14	Am	Control	1	6.26	6.25	80.39	8.22	6.78	79.95	8.14	7.40	80.11	7.56	7.19
9/18/07	Normal	15	Am	E15	1	6.62	6.64	79.84	8.39	7.25	79.54	8.32	7.24	79.78	8.23	7.78
9/18/07	PSE	15	Am	E15	1	6.23	6.24	80.16	7.68	7.05	80.28	7.84	7.01	80.56	7.60	7.44

9/18/07	Normal	16	Am	A150	1	6.46	6.55	79.37	8.79	7.02	79.26	8.64	7.17	79.22	8.72	7.12
9/18/07	PSE	16	Am	A150	1	6.20	6.20	79.80	8.07	6.92	79.65	7.85	7.13	80.65	7.85	7.29
9/18/07	Normal	17	Am	Konjac	1	6.49	6.50	79.23	8.83	7.05	79.12	8.59	7.20	78.67	8.46	7.52
9/18/07	PSE	17	Am	Konjac	1	6.20	6.20	80.83	8.08	6.62	80.57	7.94	6.99	80.71	7.87	7.21
9/21/07	Normal	1	Control	Control	2	6.02	6.00	79.34	9.22	6.96	80.46	8.99	6.94	80.97	8.79	6.88
9/21/07	PSE	1	Control	Control	2	5.87	5.87	81.03	9.06	6.07	80.69	8.41	6.79	81.13	8.43	6.39
9/21/07	Normal	2	H2O	E15	2	6.00	6.00	81.58	8.26	6.43	81.86	8.35	6.57	81.66	8.45	6.61
9/21/07	PSE	2	H2O	E15	2	5.88	5.88	83.04	7.54	6.71	81.46	7.69	7.15	82.67	7.89	6.95
9/21/07	Normal	3	H2O	A150	2	6.01	6.01	81.72	8.44	6.73	80.59	8.28	7.30	81.12	8.47	6.92
9/21/07	PSE	3	H2O	A150	2	5.88	5.89	82.99	7.77	6.48	83.28	7.39	6.62	83.06	7.60	6.85
9/21/07	Normal	4	H2O	Konjac	2	6.00	6.01	80.77	8.59	7.20	81.65	8.16	7.66	80.70	7.50	8.02
9/21/07	PSE	4	H2O	Konjac	2	5.88	5.87	82.20	7.34	6.65	82.29	7.34	6.20	83.85	7.36	6.46
9/21/07	Normal	5	H2O	Control	2	6.00	6.02	81.43	8.53	6.66	79.14	8.66	7.79	80.84	7.98	7.91
9/21/07	PSE	5	H2O	Control	2	5.89	5.88	79.65	8.74	6.87	83.19	7.22	6.22	83.87	6.73	6.83
9/21/07	Normal	6	Na	Control	2	6.43	6.42	78.86	8.96	6.69	80.79	8.69	7.26	79.71	8.67	8.36
9/21/07	PSE	6	Na	Control	2	6.30	6.30	80.75	7.98	7.22	80.02	8.06	7.55	80.39	7.75	7.16
9/21/07	Normal	7	Na	E15	2	6.46	6.45	79.60	9.20	6.33	80.21	8.94	6.71	79.54	8.75	6.89
9/21/07	PSE	7	Na	E15	2	6.30	6.32	80.05	8.37	6.61	80.40	8.05	7.63	81.05	8.25	6.95
9/21/07	Normal	8	Na	A150	2	6.38	6.39	80.63	8.87	6.47	79.98	8.99	6.65	80.29	8.91	6.69
9/21/07	PSE	8	Na	A150	2	6.27	6.27	81.05	7.91	6.66	80.89	8.29	6.74	81.15	8.20	6.94
9/21/07	Normal	9	Na	Konjac	2	6.40	6.40	79.71	8.87	6.95	76.21	8.63	8.35	77.98	9.10	7.52
9/21/07	PSE	9	Na	Konjac	2	6.27	6.28	80.97	8.22	6.50	79.18	8.15	7.76	80.56	7.98	6.83
9/21/07	Normal	10	K	Control	2	6.44	6.44	79.48	8.81	6.71	80.13	8.73	7.37	80.07	8.90	6.88
9/21/07	PSE	10	K	Control	2	6.27	6.27	81.28	8.04	6.85	81.11	7.87	7.14	81.04	7.66	7.27
9/21/07	Normal	11	K	E15	2	6.40	6.41	80.48	8.89	6.61	80.44	8.86	6.98	80.23	8.73	6.67
9/21/07	PSE	11	K	E15	2	6.27	6.29	80.89	7.55	7.26	80.30	7.72	7.21	81.03	7.66	7.17
9/21/07	Normal	12	K	A150	2	6.40	6.40	79.85	9.08	6.52	79.60	8.88	6.48	79.41	8.88	6.59
9/21/07	PSE	12	K	A150	2	6.27	6.29	80.53	7.94	6.64	77.40	7.75	8.31	80.68	7.93	7.33
9/21/07	Normal	13	K	Konjac	2	6.43	6.42	76.69	9.40	7.11	79.82	9.00	6.80	79.48	9.03	6.62
9/21/07	PSE	13	K	Konjac	2	6.29	6.30	80.54	7.97	7.44	80.94	7.76	7.27	81.18	7.95	6.91
9/21/07	Normal	14	Am	Control	2	6.40	6.40	79.65	9.05	6.90	80.33	8.91	7.07	80.53	8.88	6.67
9/21/07	PSE	14	Am	Control	2	6.29	6.27	80.94	8.38	6.54	79.90	7.21	8.35	81.45	8.19	6.74
9/21/07	Normal	15	Am	E15	2	6.38	6.36	79.58	8.34	6.74	80.17	8.66	7.06	79.88	8.49	6.78

9/21/07	PSE	15	Am	E15	2	6.26	6.25	80.80	8.06	6.47	81.35	7.90	7.01	81.33	8.19	6.78
9/21/07	Normal	16	Am	A150	2	6.37	6.38	79.37	9.10	6.19	80.07	8.93	6.45	80.09	8.74	6.73
9/21/07	PSE	16	Am	A150	2	6.23	6.25	80.34	7.88	7.70	80.67	8.23	6.46	80.73	8.13	6.39
9/21/07	Normal	17	Am	Konjac	2	6.37	6.36	80.66	8.67	6.27	80.32	8.67	7.21	80.66	8.54	6.82
9/21/07	PSE	17	Am	Konjac	2	6.24	6.24	79.70	7.57	8.02	78.21	7.72	8.63	81.70	7.55	7.60
9/26/07	Normal	1	Control	Control	3	6.20	6.20	77.97	8.53	7.23	78.03	8.56	7.31	79.24	8.41	7.74
9/26/07	PSE	1	Control	Control	3	5.94	5.85	80.67	8.85	6.87	80.35	8.48	7.24	79.26	8.93	7.38
9/26/07	Normal	2	H2O	E15	3	6.18	6.16	79.92	8.12	7.51	80.08	7.97	7.25	80.16	7.74	7.61
9/26/07	PSE	2	H2O	E15	3	5.85	5.84	82.66	7.69	7.15	82.06	7.45	7.39	81.83	7.19	7.38
9/26/07	Normal	3	H2O	A150	3	6.15	6.16	79.34	8.22	7.89	80.21	8.34	7.31	80.52	7.84	7.43
9/26/07	PSE	3	H2O	A150	3	5.84	5.84	81.79	8.01	6.95	82.03	7.91	7.09	82.75	7.46	6.98
9/26/07	Normal	4	H2O	Konjac	3	6.21	6.20	81.28	8.25	7.35	80.95	8.08	7.21	80.98	7.62	7.13
9/26/07	PSE	4	H2O	Konjac	3	5.86	5.84	81.40	7.76	7.44	80.38	7.87	7.77	82.12	7.58	7.27
9/26/07	Normal	5	H2O	Control	3	6.18	6.18	80.57	7.99	7.50	81.33	7.30	7.88	81.02	7.52	7.21
9/26/07	PSE	5	H2O	Control	3	5.85	5.85	81.94	7.54	7.28	82.29	7.23	6.96	82.63	7.14	7.51
9/26/07	Normal	6	Na	Control	3	6.57	6.57	79.61	8.62	7.18	79.25	8.57	7.04	79.55	8.36	7.04
9/26/07	PSE	6	Na	Control	3	6.28	6.28	80.45	7.82	7.69	79.80	7.45	8.35	79.10	7.67	7.90
9/26/07	Normal	7	Na	E15	3	6.58	6.57	78.66	8.81	7.61	78.89	8.59	7.89	78.83	8.65	7.90
9/26/07	PSE	7	Na	E15	3	6.28	6.27	79.82	7.64	7.77	79.74	7.80	7.82	79.46	7.56	9.42
9/26/07	Normal	8	Na	A150	3	6.55	6.56	79.30	8.57	7.78	79.46	8.25	7.74	78.34	8.27	8.22
9/26/07	PSE	8	Na	A150	3	6.27	6.27	80.22	7.82	7.52	80.20	7.36	8.19	80.53	7.57	7.87
9/26/07	Normal	9	Na	Konjac	3	6.55	6.54	78.64	8.22	7.88	79.12	8.24	7.95	78.52	8.39	8.03
9/26/07	PSE	9	Na	Konjac	3	6.25	6.26	81.04	8.14	7.58	79.64	7.66	7.93	80.42	7.41	8.32
9/26/07	Normal	10	K	Control	3	6.55	6.53	78.50	7.69	8.10	78.36	8.33	9.01	79.12	7.45	8.05
9/26/07	PSE	10	K	Control	3	6.21	6.22	80.95	7.80	7.46	79.19	7.66	8.42	79.65	7.48	8.37
9/26/07	Normal	11	K	E15	3	6.54	6.53	78.14	8.25	7.89	77.99	8.50	8.35	78.79	7.76	8.76
9/26/07	PSE	11	K	E15	3	6.23	6.24	79.55	8.06	7.46	79.31	7.47	8.49	79.72	7.51	8.60
9/26/07	Normal	12	K	A150	3	6.54	6.53	76.76	9.29	7.64	70.49	8.69	8.32	78.54	8.32	7.70
9/26/07	PSE	12	K	A150	3	6.22	6.21	80.76	7.94	7.39	78.49	7.92	8.36	79.51	7.81	8.14
9/26/07	Normal	13	K	Konjac	3	6.54	6.53	78.27	8.73	7.66	77.52	8.47	8.21	75.33	9.02	8.29
9/26/07	PSE	13	K	Konjac	3	6.23	6.23	80.75	7.77	7.72	80.62	7.25	8.19	79.89	7.58	8.20
9/26/07	Normal	14	Am	Control	3	6.58	6.58	78.67	8.33	7.98	79.53	7.64	7.69	79.83	7.89	7.63
9/26/07	PSE	14	Am	Control	3	6.15	6.14	81.44	7.50	7.43	79.64	7.19	8.01	78.98	7.11	9.30

9/26/07	Normal	15	Am	E15	3	6.47	6.44	78.45	7.81	8.41	77.13	8.45	9.58	78.06	7.40	9.35
9/26/07	PSE	15	Am	E15	3	6.25	6.22	80.52	7.42	7.84	80.09	7.08	8.41	80.10	7.16	8.01
9/26/07	Normal	16	Am	A150	3	6.45	6.47	80.34	7.55	7.45	81.02	7.83	7.33	79.76	7.46	7.74
9/26/07	PSE	16	Am	A150	3	6.23	6.24	79.60	8.69	7.22	79.36	8.76	6.75	79.80	8.49	7.33
9/26/07	Normal	17	Am	Konjac	3	6.52	6.51	78.07	8.13	8.46	78.74	7.97	7.66	79.00	7.48	8.11
9/26/07	PSE	17	Am	Konjac	3	6.20	6.20	80.81	7.73	7.29	79.79	6.83	8.57	80.63	7.32	7.70

F-5. P2S3: Raw ANOVA data for boneless pork loins.

Dependent Variable: pH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	1.22179808	0.24435962	29.14	<.0001
Error	46	0.38570000	0.00838478		
Corrected Total	51	1.60749808			

R-Square	Coeff Var	Root MSE	pH Mean
0.760062	1.648340	0.091568	5.555192

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1.11258036	1.11258036	132.69	<.0001
Day	2	0.01924808	0.00962404	1.15	0.3263
Meat*Day	2	0.05939423	0.02969712	3.54	0.0371

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The GLM Procedure

Dependent Variable: xrawL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	799.744888	159.948978	15.28	<.0001
Error	46	481.536211	10.468178		
Corrected Total	51	1281.281099			

R-Square	Coeff Var	Root MSE	xrawL Mean
0.624176	5.970776	3.235456	54.18821

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	524.0580017	524.0580017	50.06	<.0001
Day	2	37.0170104	18.5085052	1.77	0.1821
Meat*Day	2	176.3404856	88.1702428	8.42	0.0008

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The GLM Procedure

Dependent Variable: xrawa

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	6.25027697	1.25005539	1.48	0.2161
Error	46	38.96230167	0.84700656		
Corrected Total	51	45.21257863			

R-Square	Coeff Var	Root MSE	xrawa Mean
0.138242	10.94845	0.920330	8.406026

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.80965433	0.80965433	0.96	0.3333
Day	2	3.34272085	1.67136043	1.97	0.1506
Meat*Day	2	2.14105269	1.07052635	1.26	0.2922

The GLM Procedure

Dependent Variable: xrawb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	48.12958470	9.62591694	8.86	<.0001
Error	46	49.98497000	1.08662978		
Corrected Total	51	98.11455470			

R-Square	Coeff Var	Root MSE	xrawb Mean
0.490545	61.32318	1.042415	1.699872

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	28.92857143	28.92857143	26.62	<.0001
Day	2	5.69111803	2.84555902	2.62	0.0837
Meat*Day	2	10.06947863	5.03473932	4.63	0.0147

F-6. P2S3: Raw texture ANOVA data for pork gels.

Dependent Variable: Hard1

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	37	55076.56708	1488.55587	65.71	<.0001
Error	472	10692.67882	22.65398		
Corrected Total	509	65769.24590			

R-Square	Coeff Var	Root MSE	Hard1 Mean
0.837421	10.75620	4.759620	44.25002

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	47882.18687	23941.09343	1056.82	<.0001
Meat	1	1425.04569	1425.04569	62.90	<.0001
Meat*Day	2	800.40462	400.20231	17.67	<.0001
Trt	16	4084.51175	255.28198	11.27	<.0001
Meat*Trt	16	884.41816	55.27613	2.44	0.0015

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1425.045686	1425.045686	3.56	0.1998

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The GLM Procedure

Dependent Variable: Hard2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	37	38591.15481	1043.00418	62.70	<.0001
Error	472	7851.79053	16.63515		
Corrected Total	509	46442.94534			

R-Square	Coeff Var	Root MSE	Hard2 Mean
0.830937	10.84139	4.078621	37.62084

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	33822.88768	16911.44384	1016.61	<.0001
Meat	1	766.00490	766.00490	46.05	<.0001
Meat*Day	2	455.83831	227.91915	13.70	<.0001
Trt	16	2774.07923	173.37995	10.42	<.0001
Meat*Trt	16	772.34469	48.27154	2.90	0.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	766.0049037	766.0049037	3.36	0.2082

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The GLM Procedure

Dependent Variable: Cohesive

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	37	0.06552784	0.00177102	2.09	0.0003
Error	472	0.39966902	0.00084676		
Corrected Total	509	0.46519686			

R-Square	Coeff Var	Root MSE	Cohesive Mean
0.140860	8.851563	0.029099	0.328745

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.00265569	0.00132784	1.57	0.2095
Meat	1	0.00025412	0.00025412	0.30	0.5841
Meat*Day	2	0.00319529	0.00159765	1.89	0.1527
Trt	16	0.02890353	0.00180647	2.13	0.0065
Meat*Trt	16	0.03051922	0.00190745	2.25	0.0037

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.00025412	0.00025412	0.16	0.7286

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The GLM Procedure

Dependent Variable: Gummy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	37	5836.004113	157.729841	31.71	<.0001
Error	472	2347.843236	4.974244		
Corrected Total	509	8183.847349			

R-Square	Coeff Var	Root MSE	Gummy Mean
0.713113	15.31279	2.230301	14.56496

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	4816.228391	2408.114195	484.12	<.0001
Meat	1	146.467365	146.467365	29.45	<.0001
Meat*Day	2	123.596906	61.798453	12.42	<.0001
Trt	16	506.475573	31.654723	6.36	<.0001
Meat*Trt	16	243.235878	15.202242	3.06	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	146.4673649	146.4673649	2.37	0.2636

Dependent Variable: Stress

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	21	24800.12285	1180.95823	10.67	<.0001
Error	483	53470.37034	110.70470		
Corrected Total	504	78270.49318			

R-Square	Coeff Var	Root MSE	Stress Mean
0.316851	19.96996	10.52163	52.68729

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	2924.52545	1462.26272	13.21	<.0001
Meat	1	3926.58856	3926.58856	35.47	<.0001
Meat*Day	2	1149.02812	574.51406	5.19	0.0059
Trt	16	16830.46793	1051.90425	9.50	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	3926.588556	3926.588556	6.83	0.1204

Dependent Variable: Strain

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	21	6.54778812	0.31179943	11.13	<.0001
Error	482	13.50009442	0.02800849		
Corrected Total	503	20.04788254			

R-Square	Coeff Var	Root MSE	Strain Mean
0.326607	16.42036	0.167357	1.019206

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.74825761	0.37412881	13.36	<.0001
Meat	1	1.32794848	1.32794848	47.41	<.0001
Meat*Day	2	0.16955639	0.08477819	3.03	0.0494
Trt	16	4.30170286	0.26885643	9.60	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1.32794848	1.32794848	15.66	0.0583

F-7. P2S3: Raw cook ANOVA data for pork gels.

Dependent Variable: xcookpH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	37	4.99319510	0.13495122	155.93	<.0001
Error	64	0.05538922	0.00086546		
Corrected Total	101	5.04858431			

R-Square	Coeff Var	Root MSE	xcookpH Mean
0.989029	0.470226	0.029419	6.256275

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.05820196	0.02910098	33.63	<.0001
Meat	1	1.65176863	1.65176863	1908.55	<.0001
Meat*Day	2	0.20282549	0.10141275	117.18	<.0001
Trt	16	3.07307598	0.19206725	221.93	<.0001
Meat*Trt	16	0.00732304	0.00045769	0.53	0.9219

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The GLM Procedure

Dependent Variable: xcookL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	37	125.5034437	3.3919850	7.64	<.0001
Error	64	28.4132627	0.4439572		
Corrected Total	101	153.9167064			

R-Square	Coeff Var	Root MSE	xcookL Mean
0.815398	0.832170	0.666301	80.06788

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	14.18254989	7.09127495	15.97	<.0001
Meat	1	41.44281318	41.44281318	93.35	<.0001
Meat*Day	2	1.20735773	0.60367887	1.36	0.2640
Trt	16	61.67115643	3.85444728	8.68	<.0001
Meat*Trt	16	6.99956645	0.43747290	0.99	0.4830

The GLM Procedure

Dependent Variable: xcooka

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	37	23.99405065	0.64848786	8.33	<.0001
Error	64	4.98209107	0.07784517		
Corrected Total	101	28.97614172			

R-Square	Coeff Var	Root MSE	xcooka Mean
0.828062	3.442717	0.279007	8.104281

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	2.54610283	1.27305142	16.35	<.0001
Meat	1	13.40947985	13.40947985	172.26	<.0001
Meat*Day	2	0.83511721	0.41755861	5.36	0.0070
Trt	16	5.89328431	0.36833027	4.73	<.0001
Meat*Trt	16	1.31006645	0.08187915	1.05	0.4180

The GLM Procedure

Dependent Variable: xcookb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	37	17.38254248	0.46979845	3.60	<.0001
Error	64	8.36259085	0.13066548		
Corrected Total	101	25.74513333			

R-Square	Coeff Var	Root MSE	xcookb Mean
0.675178	4.920283	0.361477	7.346667

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	11.75252353	5.87626176	44.97	<.0001
Meat	1	0.15167756	0.15167756	1.16	0.2853
Meat*Day	2	0.39293747	0.19646874	1.50	0.2301
Trt	16	3.02171481	0.18885718	1.45	0.1498
Meat*Trt	16	2.06368911	0.12898057	0.99	0.4813

Dependent Variable: xcookpH

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1.65176863	1.65176863	16.29	0.0563

The GLM Procedure

Dependent Variable: xcookL

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	41.44281318	41.44281318	68.65	0.0143

The GLM Procedure

Dependent Variable: xcooka

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	13.40947985	13.40947985	32.11	0.0298

The GLM Procedure

Dependent Variable: xcookb

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.15167756	0.15167756	0.77	0.4723

APPENDIX G

G-1. Least square means for raw pH and CIE color space values of raw pork prior to processing.

Effect	Initial pH	Initial CIE Color Space Values L*	a*	b*
RMSE[y]	0.134	2.208	1.227	1.129
Meat Source	*<0.0001*[z]	*<0.0001*[z]	*0.8988*[z]	*0.8988*[z]
Normal	5.84[a]	50.08[b]	9.85	1.85
PSE	5.38[b]	57.33[a]	9.79	2.37
Meat Source, Day	*0.3964*[z]	*0.3997*[z]	*0.8578*[z]	*0.1080*[z]
Normal, 1	5.67	54.56	12.38	5.23
Normal, 2	5.92	47.38	8.50	0.32
Normal, 3	5.92	48.30	8.67	0.00
PSE, 1	5.33	60.14	11.92	4.35
PSE, 2	5.43	55.98	8.65	1.92
PSE, 3	5.40	55.87	8.79	0.84

[abc]Mean values within a column and effect followed by the same letter are not significantly different (P > 0.05).
[y]Root Mean Square Error
[z]P-value from analysis of variance tables.

G-2. P2S4: Raw data for boneless pork loins.

Date	Meat	Day	pH	L1	a1	b1	L2	a2	b2	L3	a3	b3	L4	a4	b4	L5	a5	b5	L6	a6	b6
10/23/07	Normal	1	5.62	51.43	10.90	3.23	54.57	10.62	3.79	52.47	10.39	3.46	54.24	12.28	4.60	47.96	10.68	3.07	55.40	10.28	3.46
10/23/07	Normal	1	5.67	46.82	9.78	3.46	49.50	11.07	4.17	48.48	10.66	2.35	48.81	9.89	2.34	50.12	11.02	4.13	49.16	11.31	4.40
10/23/07	Normal	1	5.68	62.52	12.04	8.64	55.65	14.66	7.43	57.83	10.93	5.81	61.36	12.58	5.48	57.78	12.06	3.65	57.60	12.51	4.33
10/23/07	Normal	1	5.72	60.87	17.14	11.42	56.01	20.14	12.30	57.71	18.00	10.22	54.15	13.50	4.39	56.22	12.61	3.92	62.67	12.06	5.38
10/23/07	PSE	1	5.36	58.18	11.44	4.29	58.67	12.27	4.58	59.78	12.20	3.17	59.37	12.42	4.46	59.09	11.50	4.54	58.85	10.96	3.10
10/23/07	PSE	1	5.37	59.16	10.79	2.89	59.89	11.63	3.76	61.02	12.86	4.70	62.21	9.79	4.11	60.02	11.24	5.01	57.90	11.89	3.39
10/23/07	PSE	1	5.27	61.10	11.82	4.22	60.31	12.69	4.87	54.22	13.93	3.51	62.31	9.90	3.77	61.74	9.88	4.36	60.65	10.20	2.65
10/23/07	PSE	1	5.31	64.92	13.09	6.42	61.58	13.63	5.67	58.98	14.32	5.10	62.01	13.21	6.36	59.84	11.38	4.16	61.62	13.07	5.37
12/3/07	Normal	2	6.07	47.12	8.47	0.46	46.97	8.96	-0.11	51.96	6.88	0.34	47.87	9.49	1.23	50.62	6.15	-0.46	48.65	6.39	-1.14
12/3/07	Normal	2	6.18	48.56	6.64	-1.67	47.42	7.59	0.08	48.07	7.96	0.31	46.30	8.21	0.66	49.45	8.16	1.25	49.00	6.88	-0.10
12/3/07	Normal	2	5.70	43.89	9.53	0.25	49.09	9.66	1.04	49.93	8.83	1.15	42.13	9.47	-0.38	50.81	8.74	0.88	44.39	8.24	-0.34
12/3/07	Normal	2	5.73	44.45	9.97	0.10	46.17	9.48	1.28	47.31	9.50	0.47	46.69	10.08	0.80	46.22	9.64	1.24	43.95	9.09	0.37
12/3/07	PSE	2	5.39	53.40	7.94	1.77	56.39	6.68	1.78	54.39	6.20	0.85	55.65	6.56	1.32	54.82	8.41	1.64	58.27	7.48	3.21
12/3/07	PSE	2	5.44	54.66	10.11	3.34	53.35	10.13	2.76	58.84	9.80	4.30	58.48	9.44	3.90	53.58	9.69	2.11	54.06	8.13	1.49
12/3/07	PSE	2	5.45	55.97	11.28	3.28	57.93	8.01	1.56	58.39	8.41	1.73	56.54	9.79	1.44	53.96	8.58	-0.23	58.68	7.08	0.61
12/3/07	PSE	2	5.43	57.80	8.51	1.47	57.14	9.09	1.84	57.85	8.74	1.91	55.21	9.45	2.16	56.30	8.84	1.07	51.88	9.17	0.87
11/1/07	Normal	3	5.81	47.27	9.11	1.04	48.44	5.30	-0.86	53.08	9.42	2.16	48.50	7.15	0.14	44.94	5.62	-1.87	42.31	7.95	-0.82
11/1/07	Normal	3	5.70	47.93	7.83	-0.84	50.75	7.57	-0.51	49.57	7.66	-1.02	43.24	9.72	0.09	43.95	8.79	0.00	49.56	9.90	1.38
11/1/07	Normal	3	6.05	49.48	9.90	-0.10	51.57	10.47	-0.65	53.37	10.04	0.77	46.11	8.84	0.14	44.67	8.59	-0.34	40.80	8.61	-0.97
11/1/07	Normal	3	6.10	46.16	9.51	-0.09	53.11	7.39	0.30	49.54	7.00	-0.72	50.02	9.53	0.71	49.68	11.43	-0.15	55.04	10.73	2.17
11/1/07	PSE	3	5.27	58.39	9.21	2.37	60.31	9.26	3.59	50.84	8.87	1.31	55.20	9.10	1.63	58.14	9.41	3.31	58.58	8.95	2.44
11/1/07	PSE	3	5.41	54.46	10.91	2.58	55.69	8.33	1.15	53.04	9.03	0.75	53.02	8.31	0.01	55.28	8.81	1.69	57.42	10.47	2.86
11/1/07	PSE	3	5.45	54.53	8.28	-0.92	56.21	7.70	-0.20	58.81	8.05	0.69	56.02	9.18	-0.68	57.71	7.44	-0.65	58.64	7.88	0.07
11/1/07	PSE	3	5.46	52.77	9.57	-0.75	51.73	8.71	-1.16	55.73	7.83	-1.30	55.39	9.16	0.55	56.05	8.77	0.61	57.00	7.67	0.20

G-3. P2S4: Raw data for torsion testing and texture profile analysis hydrocolloid/buffer/salt/sodium phosphate treated cooked pork gels.

Date	Meat	Trt	Buffer	Hydro	SP	Day	Sample	Stress	Strain	Bioyield	Peak1	Area1	Peak2	Area2	Hard1	Hard2	Cohesive	Gummy
10/25/07	Normal	1	Control	Control	Control	1	1	56.94	0.62	.	3387.715	12.380	2815.701	3.963	80.66	67.04	0.32	25.82
10/25/07	Normal	1	Control	Control	Control	1	2	75.28	0.79	1559.182	3516.142	12.750	2792.509	3.890	83.72	66.49	0.31	25.54
10/25/07	Normal	1	Control	Control	Control	1	3	82.23	0.87	2166.553	4316.261	16.900	3543.471	5.412	102.77	84.37	0.32	32.91
10/25/07	Normal	1	Control	Control	Control	1	4	80.49	0.80	2127.945	4223.472	15.840	3403.984	4.879	100.56	81.05	0.31	30.97
10/25/07	Normal	1	Control	Control	Control	1	5	70.45	0.70	1530.831	3648.587	12.490	3044.622	4.060	86.87	72.49	0.33	28.24
10/25/07	PSE	1	Control	Control	Control	1	1	82.61	0.89	1635.865	3594.137	13.920	2820.419	4.258	85.57	67.15	0.31	26.18
10/25/07	PSE	1	Control	Control	Control	1	2	64.08	0.58	1308.369	3287.013	12.580	2751.703	3.970	78.26	65.52	0.32	24.70
10/25/07	PSE	1	Control	Control	Control	1	3	68.52	0.58	1725.131	3927.818	14.880	3198.122	4.828	93.52	76.15	0.32	30.34
10/25/07	PSE	1	Control	Control	Control	1	4	57.14	0.56	.	4355.213	14.460	3629.997	5.078	103.70	86.43	0.35	36.42
10/25/07	PSE	1	Control	Control	Control	1	5	69.87	0.51	1288.881	3627.948	12.190	3097.445	4.009	86.38	73.75	0.33	28.41
10/25/07	Normal	2	H2O	H2O	H2O	1	1	54.43	0.85	1363.602	3349.073	11.560	2881.926	3.991	79.74	68.62	0.35	27.53
10/25/07	Normal	2	H2O	H2O	H2O	1	2	65.24	0.83	.	3657.763	13.110	3075.591	4.505	87.09	73.23	0.34	29.93
10/25/07	Normal	2	H2O	H2O	H2O	1	3	54.43	0.77	.	3102.142	10.440	2547.606	3.522	73.86	60.66	0.34	24.92
10/25/07	Normal	2	H2O	H2O	H2O	1	4	68.72	0.99	.	3275.854	12.160	2767.252	3.883	78.00	65.89	0.32	24.91
10/25/07	Normal	2	H2O	H2O	H2O	1	5	60.80	0.89	.	3057.136	10.770	2485.232	3.417	72.79	59.17	0.32	23.09
10/25/07	PSE	2	H2O	H2O	H2O	1	1	42.08	0.56	1363.302	3349.073	11.560	2881.926	3.991	79.74	68.62	0.35	27.53
10/25/07	PSE	2	H2O	H2O	H2O	1	2	46.71	0.61	.	3657.763	13.110	3075.591	4.505	87.09	73.23	0.34	29.93
10/25/07	PSE	2	H2O	H2O	H2O	1	3	52.89	0.75	.	3102.142	10.440	2547.606	3.522	73.86	60.66	0.34	24.92
10/25/07	PSE	2	H2O	H2O	H2O	1	4	42.08	0.50	.	3275.854	12.160	2767.252	3.883	78.00	65.89	0.32	24.91
10/25/07	PSE	2	H2O	H2O	H2O	1	5	42.47	0.58	.	3057.136	10.770	2485.232	3.417	72.79	59.17	0.32	23.09
10/25/07	Normal	3	H2O	H2O	SP	1	1	54.82	0.80	1246.221	2951.666	10.150	2402.319	3.118	70.28	57.20	0.31	21.59
10/25/07	Normal	3	H2O	H2O	SP	1	2	61.57	0.75	1506.523	3486.478	12.190	2881.584	3.851	83.01	68.61	0.32	26.22
10/25/07	Normal	3	H2O	H2O	SP	1	3	52.89	0.67	.	3370.585	11.430	2852.589	3.837	80.25	67.92	0.34	26.94
10/25/07	Normal	3	H2O	H2O	SP	1	4	50.96	0.72	.	3472.349	11.680	2875.593	3.911	82.67	68.47	0.33	27.68
10/25/07	Normal	3	H2O	H2O	SP	1	5	47.10	0.74	.	3204.991	11.200	2570.112	3.362	76.31	61.19	0.30	22.91
10/25/07	PSE	3	H2O	H2O	SP	1	1	50.57	0.67	.	3179.238	10.870	2615.035	3.489	75.70	62.26	0.32	24.30
10/25/07	PSE	3	H2O	H2O	SP	1	2	48.26	0.60	.	3748.343	12.350	3076.707	4.212	89.25	73.25	0.34	30.44
10/25/07	PSE	3	H2O	H2O	SP	1	3	45.36	0.53	.	3428.781	11.970	2782.159	3.721	81.64	66.24	0.31	25.38

10/25/07	PSE	3	H2O	H2O	SP	1	4	47.10	0.57	.	3289.027	11.980	2673.647	3.572	78.31	63.66	0.30	23.35
10/25/07	PSE	3	H2O	H2O	SP	1	5	37.25	0.65	1172.214	3307.283	10.810	2818.616	3.619	78.74	67.11	0.33	26.36
10/25/07	Normal	4	K	H2O	H2O	1	1	56.94	0.86	2294.796	3658.770	13.170	3171.032	4.425	87.11	75.50	0.34	29.27
10/25/07	Normal	4	K	H2O	H2O	1	2	51.92	0.92	1559.615	2909.716	11.340	2483.969	3.356	69.28	59.14	0.30	20.50
10/25/07	Normal	4	K	H2O	H2O	1	3	52.50	1.02	1767.187	2863.205	12.060	2451.550	3.520	68.17	58.37	0.29	19.90
10/25/07	Normal	4	K	H2O	H2O	1	4	57.91	1.02	.	3622.640	13.060	3071.491	4.411	86.25	73.13	0.34	29.13
10/25/07	Normal	4	K	H2O	H2O	1	5	49.99	0.95	.	3320.729	12.110	2923.111	4.124	79.06	69.60	0.34	26.93
10/25/07	PSE	4	K	H2O	H2O	1	1	62.93	1.07	1614.042	3410.048	11.900	2879.703	3.953	81.19	68.56	0.33	26.97
10/25/07	PSE	4	K	H2O	H2O	1	2	69.68	1.15	.	3482.296	12.430	2981.231	4.116	82.91	70.98	0.33	27.45
10/25/07	PSE	4	K	H2O	H2O	1	3	51.15	0.92	.	3662.689	12.130	3148.406	4.301	87.21	74.96	0.35	30.92
10/25/07	PSE	4	K	H2O	H2O	1	4	61.77	0.92	1746.460	3206.069	12.070	3694.845	3.556	76.33	87.97	0.29	22.49
10/25/07	PSE	4	K	H2O	H2O	1	5	50.19	0.91	.	3519.706	12.350	2998.487	4.045	83.80	71.39	0.33	27.45
10/25/07	Normal	5	Am	H2O	H2O	1	1	.	.	1370.173	3100.196	10.970	2638.674	3.476	73.81	62.83	0.32	23.39
10/25/07	Normal	5	Am	H2O	H2O	1	2	47.87	0.92	.	2713.685	10.350	2259.701	3.123	64.61	53.80	0.30	19.50
10/25/07	Normal	5	Am	H2O	H2O	1	3	42.47	0.93	1534.399	2972.107	10.910	2538.385	3.578	70.76	60.44	0.33	23.21
10/25/07	Normal	5	Am	H2O	H2O	1	4	44.01	0.95	.	2913.703	9.730	2484.351	3.280	69.37	59.15	0.34	23.39
10/25/07	Normal	5	Am	H2O	H2O	1	5	46.71	0.94	1160.761	2770.898	9.582	2335.920	3.185	65.97	55.62	0.33	21.93
10/25/07	PSE	5	Am	H2O	H2O	1	1	45.94	0.87	1012.029	2989.035	9.975	2576.506	3.551	71.17	61.35	0.36	25.33
10/25/07	PSE	5	Am	H2O	H2O	1	2	57.14	1.13	1053.136	3034.566	10.200	2552.890	3.518	72.25	60.78	0.34	24.92
10/25/07	PSE	5	Am	H2O	H2O	1	3	59.84	0.98	1281.641	3377.385	10.940	2881.181	3.931	80.41	68.60	0.36	28.89
10/25/07	PSE	5	Am	H2O	H2O	1	4	54.24	1.13	1164.939	2878.740	9.692	2344.523	3.129	68.54	55.82	0.32	22.13
10/25/07	PSE	5	Am	H2O	H2O	1	5	42.85	0.83	.	3135.342	11.130	2683.925	3.776	74.65	63.90	0.34	25.33
10/25/07	Normal	6	H2O	Konjac	H2O	1	1	35.52	0.75	1212.037	3104.985	10.800	2536.959	3.439	73.93	60.40	0.32	23.54
10/25/07	Normal	6	H2O	Konjac	H2O	1	2	53.27	0.89	.	3591.133	11.320	3064.343	3.913	85.50	72.96	0.35	29.56
10/25/07	Normal	6	H2O	Konjac	H2O	1	3	51.15	0.70	1215.857	3304.283	11.110	2740.516	3.769	78.67	65.25	0.34	26.69
10/25/07	Normal	6	H2O	Konjac	H2O	1	4	60.61	0.83	.	3471.314	10.900	2932.946	4.000	82.65	69.83	0.37	30.33
10/25/07	Normal	6	H2O	Konjac	H2O	1	5	60.80	0.92	.	2963.436	10.820	2537.853	3.378	70.56	60.43	0.31	22.03
10/25/07	PSE	6	H2O	Konjac	H2O	1	1	66.01	0.90	.	3621.913	11.240	3079.229	4.043	86.24	73.31	0.36	31.02
10/25/07	PSE	6	H2O	Konjac	H2O	1	2	55.98	0.70	.	3202.308	11.840	2631.059	3.795	76.25	62.64	0.32	24.44
10/25/07	PSE	6	H2O	Konjac	H2O	1	3	66.40	0.83	1264.944	3567.636	12.340	2930.791	4.163	84.94	69.78	0.34	28.66
10/25/07	PSE	6	H2O	Konjac	H2O	1	4	47.87	0.76	.	3346.372	11.400	2703.246	3.728	79.68	64.36	0.33	26.06
10/25/07	PSE	6	H2O	Konjac	H2O	1	5	55.98	0.75	1136.510	3543.960	11.090	2980.248	3.910	84.38	70.96	0.35	29.75
10/25/07	Normal	7	H2O	E15	H2O	1	1	59.45	0.89	1711.593	3815.694	13.380	3261.158	4.588	90.85	77.65	0.34	31.15

10/25/07	Normal	7	H2O	E15	H2O	1	2	66.79	0.86	1423.070	3115.571	12.090	2666.448	3.936	74.18	63.49	0.33	24.15
10/25/07	Normal	7	H2O	E15	H2O	1	3	44.97	0.79	.	3543.079	12.290	2988.598	4.278	84.36	71.16	0.35	29.36
10/25/07	Normal	7	H2O	E15	H2O	1	4	62.54	0.94	.	3707.162	12.720	3256.728	4.495	88.27	77.54	0.35	31.19
10/25/07	Normal	7	H2O	E15	H2O	1	5	53.66	1.00	.	3472.059	12.660	2887.155	4.245	82.67	68.74	0.34	27.72
10/25/07	PSE	7	H2O	E15	H2O	1	1	51.73	0.69	.	3645.941	12.030	3090.914	4.165	86.81	73.59	0.35	30.05
10/25/07	PSE	7	H2O	E15	H2O	1	2	53.66	0.63	.	3539.505	11.190	2934.174	3.864	84.27	69.86	0.35	29.10
10/25/07	PSE	7	H2O	E15	H2O	1	3	64.08	0.74	1270.710	3630.751	12.380	3096.424	4.226	86.45	73.72	0.34	29.51
10/25/07	PSE	7	H2O	E15	H2O	1	4	52.89	0.63	1211.347	3087.583	10.980	2568.548	3.587	73.51	61.16	0.33	24.02
10/25/07	PSE	7	H2O	E15	H2O	1	5	53.66	0.69	.	3169.335	11.800	2603.111	3.709	75.46	61.98	0.31	23.72
10/25/07	Normal	8	K	Konjac	H2O	1	1	49.03	1.01	.	3187.827	10.710	2756.345	3.758	75.90	65.63	0.35	26.63
10/25/07	Normal	8	K	Konjac	H2O	1	2	52.50	0.96	.	2607.931	9.336	2217.031	2.980	62.09	52.79	0.32	19.82
10/25/07	Normal	8	K	Konjac	H2O	1	3	46.33	1.05	1563.128	3134.049	11.200	2741.837	3.766	74.62	65.28	0.34	25.09
10/25/07	Normal	8	K	Konjac	H2O	1	4	58.68	1.23	.	3030.401	11.140	2605.474	3.623	72.15	62.04	0.33	23.47
10/25/07	Normal	8	K	Konjac	H2O	1	5	57.52	1.04	1397.768	2547.312	9.708	2182.847	3.033	60.65	51.97	0.31	18.95
10/25/07	PSE	8	K	Konjac	H2O	1	1	40.92	0.96	.	3442.538	11.790	2950.430	4.177	81.97	70.25	0.35	29.04
10/25/07	PSE	8	K	Konjac	H2O	1	2	72.96	1.14	.	3766.804	13.350	3222.919	4.581	89.69	76.74	0.34	30.78
10/25/07	PSE	8	K	Konjac	H2O	1	3	59.45	0.96	.	3442.002	11.430	2982.173	4.109	81.95	71.00	0.36	29.46
10/25/07	PSE	8	K	Konjac	H2O	1	4	69.68	1.08	.	3320.770	11.820	3840.733	3.939	79.07	91.45	0.33	26.35
10/25/07	PSE	8	K	Konjac	H2O	1	5	61.00	1.02	.	3575.136	13.380	3009.076	4.450	85.12	71.64	0.33	28.31
10/25/07	Normal	9	K	Konjac	SP	1	1	39.96	1.07	.	3031.050	10.660	2557.184	3.570	72.17	60.89	0.33	24.17
10/25/07	Normal	9	K	Konjac	SP	1	2	49.03	1.33	.	3054.665	10.640	2647.543	3.710	72.73	63.04	0.35	25.36
10/25/07	Normal	9	K	Konjac	SP	1	3	49.41	1.22	.	3202.925	11.450	2786.136	3.804	76.26	66.34	0.33	25.34
10/25/07	Normal	9	K	Konjac	SP	1	4	50.19	0.92	1199.997	2635.848	9.662	2201.471	3.069	62.76	52.42	0.32	19.93
10/25/07	Normal	9	K	Konjac	SP	1	5	55.20	1.22	1576.591	3109.225	10.300	2689.595	3.495	74.03	64.04	0.34	25.12
10/25/07	PSE	9	K	Konjac	SP	1	1	51.73	1.06	.	3238.594	10.690	2712.569	3.676	77.11	64.58	0.34	26.52
10/25/07	PSE	9	K	Konjac	SP	1	2	59.64	1.01	1400.329	3166.837	11.190	2706.626	3.776	75.40	64.44	0.34	25.44
10/25/07	PSE	9	K	Konjac	SP	1	3	51.73	0.89	1461.709	3576.952	11.900	3053.002	4.271	85.17	72.69	0.36	30.57
10/25/07	PSE	9	K	Konjac	SP	1	4	60.22	0.80	.	3491.646	11.670	3042.304	4.168	83.13	72.44	0.36	29.69
10/25/07	PSE	9	K	Konjac	SP	1	5	60.03	1.04	1431.089	2929.313	10.330	2493.790	3.342	69.75	59.38	0.32	22.56
10/25/07	Normal	10	Am	E15	H2O	1	1	53.08	1.33	1387.596	3171.854	10.900	2746.818	3.788	75.52	65.40	0.35	26.25
10/25/07	Normal	10	Am	E15	H2O	1	2	64.66	1.23	1047.855	2645.648	9.201	2335.146	3.184	62.99	55.60	0.35	21.80
10/25/07	Normal	10	Am	E15	H2O	1	3	53.66	1.15	.	3354.603	11.280	2842.505	4.010	79.87	67.68	0.36	28.39
10/25/07	Normal	10	Am	E15	H2O	1	4	59.07	1.09	.	3045.387	10.820	2554.972	3.558	72.51	60.83	0.33	23.84

10/25/07	Normal	10	Am	E15	H2O	1	5	52.50	1.12	.	3095.055	9.992	2734.850	3.676	73.69	65.12	0.37	27.11
10/25/07	PSE	10	Am	E15	H2O	1	1	54.43	0.97	.	3620.479	12.140	3115.646	4.170	86.20	74.18	0.34	29.61
10/25/07	PSE	10	Am	E15	H2O	1	2	49.99	0.81	.	3742.434	12.570	3280.585	4.746	89.11	78.11	0.38	33.64
10/25/07	PSE	10	Am	E15	H2O	1	3	37.64	0.49	1334.903	3076.505	10.860	2591.498	3.656	73.25	61.70	0.34	24.66
10/25/07	PSE	10	Am	E15	H2O	1	4	67.17	1.03	1411.495	3406.961	11.120	2936.755	4.087	81.12	69.92	0.37	29.81
10/25/07	PSE	10	Am	E15	H2O	1	5	59.45	1.05	.	3452.478	11.090	2993.414	4.083	82.20	71.27	0.37	30.26
10/25/07	Normal	11	Am	E15	SP	1	1	61.38	1.22	.	3148.362	11.500	2750.853	3.895	74.96	65.50	0.34	25.39
10/25/07	Normal	11	Am	E15	SP	1	2	56.75	1.24	.	3151.950	10.620	2784.043	3.661	75.05	66.29	0.34	25.87
10/25/07	Normal	11	Am	E15	SP	1	3	52.50	1.12	1628.379	2944.949	11.250	2514.773	3.696	70.12	59.88	0.33	23.04
10/25/07	Normal	11	Am	E15	SP	1	4	49.80	1.09	.	3432.256	11.420	2950.799	4.136	81.72	70.26	0.36	29.60
10/25/07	Normal	11	Am	E15	SP	1	5	45.94	1.03	.	3072.890	10.460	2661.836	3.625	73.16	63.38	0.35	25.36
10/25/07	PSE	11	Am	E15	SP	1	1	53.66	1.01	1601.374	3642.282	12.010	3138.705	4.278	86.72	74.73	0.36	30.89
10/25/07	PSE	11	Am	E15	SP	1	2	55.20	0.90	.	3843.860	12.940	3285.228	4.606	91.52	78.22	0.36	32.58
10/25/07	PSE	11	Am	E15	SP	1	3	48.84	0.97	1711.637	3322.757	11.850	2822.730	3.996	79.11	67.21	0.34	26.68
10/25/07	PSE	11	Am	E15	SP	1	4	62.35	1.16	1507.172	3074.870	10.430	2668.841	3.444	73.21	63.54	0.33	24.17
10/25/07	PSE	11	Am	E15	SP	1	5	44.01	0.83	1501.027	3291.458	11.020	2911.044	4.033	78.37	69.31	0.37	28.68
12/6/07	Normal	1	Control	Control	Control	2	1	83.39	1.00	.	7425.873	25.600	6292.172	9.049	176.81	149.81	0.35	62.50
12/6/07	Normal	1	Control	Control	Control	2	2	55.20	0.69	.	6858.750	23.360	5800.095	8.213	163.30	138.10	0.35	57.41
12/6/07	Normal	1	Control	Control	Control	2	3	77.98	0.95	.	6528.499	24.120	5609.749	8.266	155.44	133.57	0.34	53.27
12/6/07	Normal	1	Control	Control	Control	2	4	78.75	0.99	.	7116.283	22.500	6057.190	7.865	169.44	144.22	0.35	59.23
12/6/07	Normal	1	Control	Control	Control	2	5	78.37	1.22	.	6009.396	20.760	5247.611	7.168	143.08	124.94	0.35	49.40
12/6/07	PSE	1	Control	Control	Control	2	1	73.54	0.72	.	7424.995	25.660	6415.988	9.027	176.79	152.76	0.35	62.19
12/6/07	PSE	1	Control	Control	Control	2	2	74.89	0.88	.	6852.038	24.890	5635.981	8.157	163.14	134.19	0.33	53.47
12/6/07	PSE	1	Control	Control	Control	2	3	58.29	0.68	.	6082.615	20.850	5073.317	6.750	144.82	120.79	0.32	46.89
12/6/07	PSE	1	Control	Control	Control	2	4	40.73	0.70	.	6923.007	24.210	5843.209	8.211	164.83	139.12	0.34	55.90
12/6/07	PSE	1	Control	Control	Control	2	5	62.35	0.74	.	6194.539	22.060	5128.010	7.229	147.49	122.10	0.33	48.33
12/6/07	Normal	2	H2O	H2O	H2O	2	1	52.12	0.98	.	6116.995	20.370	5243.883	7.266	145.64	124.85	0.36	51.95
12/6/07	Normal	2	H2O	H2O	H2O	2	2	59.64	1.13	.	4692.935	16.470	4024.468	5.629	111.74	95.82	0.34	38.19
12/6/07	Normal	2	H2O	H2O	H2O	2	3	60.61	1.22	.	5271.956	18.260	4519.211	6.269	125.52	107.60	0.34	43.09
12/6/07	Normal	2	H2O	H2O	H2O	2	4	47.10	1.03	.	5919.878	21.030	4904.601	7.165	140.95	116.78	0.34	48.02
12/6/07	Normal	2	H2O	H2O	H2O	2	5	38.22	0.75	.	5998.132	19.400	5176.054	7.030	142.81	123.24	0.36	51.75
12/6/07	PSE	2	H2O	H2O	H2O	2	1	56.75	0.80	.	5319.194	17.580	4354.805	5.858	126.65	103.69	0.33	42.20
12/6/07	PSE	2	H2O	H2O	H2O	2	2	47.87	0.66	.	5767.815	20.020	4852.565	6.962	137.33	115.54	0.35	47.76

12/6/07	PSE	2	H2O	H2O	H2O	2	3	49.03	0.82	.	6218.460	19.370	5318.739	6.768	148.06	126.64	0.35	51.73
12/6/07	PSE	2	H2O	H2O	H2O	2	4	56.36	1.01	.	4954.345	17.160	4087.722	5.744	117.96	97.33	0.33	39.49
12/6/07	PSE	2	H2O	H2O	H2O	2	5	58.68	0.98	.	4625.839	16.580	3892.122	5.307	110.14	92.67	0.32	35.25
12/6/07	Normal	3	H2O	H2O	SP	2	1	45.55	0.95	.	5604.763	18.240	4836.198	6.486	133.45	115.15	0.36	47.45
12/6/07	Normal	3	H2O	H2O	SP	2	2	51.34	1.00	.	5385.374	18.300	4544.705	6.304	128.22	108.21	0.34	44.17
12/6/07	Normal	3	H2O	H2O	SP	2	3	47.10	0.89	.	5218.144	17.240	4360.196	6.096	124.24	103.81	0.35	43.93
12/6/07	Normal	3	H2O	H2O	SP	2	4	39.96	1.00	.	5199.821	17.940	4426.589	6.075	123.81	105.39	0.34	41.92
12/6/07	Normal	3	H2O	H2O	SP	2	5	40.15	1.02	.	5505.485	16.420	4650.818	5.842	131.08	110.73	0.36	46.64
12/6/07	PSE	3	H2O	H2O	SP	2	1	51.15	0.75	.	4999.979	17.230	3978.578	5.582	119.05	94.73	0.32	38.57
12/6/07	PSE	3	H2O	H2O	SP	2	2	55.98	1.07	.	4906.055	14.980	4012.384	5.291	116.81	95.53	0.35	41.26
12/6/07	PSE	3	H2O	H2O	SP	2	3	45.75	0.89	.	5159.044	17.150	4151.568	5.566	122.83	98.85	0.32	39.87
12/6/07	PSE	3	H2O	H2O	SP	2	4	49.80	0.82	.	4812.039	16.340	3968.016	5.540	114.57	94.48	0.34	38.85
12/6/07	PSE	3	H2O	H2O	SP	2	5	42.85	0.87	.	4929.412	16.140	3990.758	5.426	117.37	95.02	0.34	39.46
12/6/07	Normal	4	K	H2O	H2O	2	1	40.92	0.95	.	3991.683	14.740	3389.851	4.559	95.04	80.71	0.31	29.40
12/6/07	Normal	4	K	H2O	H2O	2	2	43.62	1.17	.	4590.949	14.860	3924.086	5.058	109.31	93.43	0.34	37.21
12/6/07	Normal	4	K	H2O	H2O	2	3	47.48	1.09	.	4839.150	16.760	4077.875	5.659	115.22	97.09	0.34	38.90
12/6/07	Normal	4	K	H2O	H2O	2	4	49.80	1.30	.	4350.463	15.110	3592.250	4.900	103.58	85.53	0.32	33.59
12/6/07	Normal	4	K	H2O	H2O	2	5	44.97	1.25	.	4521.015	16.910	3766.739	5.353	107.64	89.68	0.32	34.08
12/6/07	PSE	4	K	H2O	H2O	2	1	54.43	1.09	.	5044.114	17.700	4174.283	6.025	120.10	99.39	0.34	40.88
12/6/07	PSE	4	K	H2O	H2O	2	2	66.98	1.16	2028.590	5225.990	17.250	4401.870	6.001	124.43	104.81	0.35	43.29
12/6/07	PSE	4	K	H2O	H2O	2	3	53.27	0.93	.	5208.520	17.250	4284.229	5.940	124.01	102.01	0.34	42.70
12/6/07	PSE	4	K	H2O	H2O	2	4	62.54	0.96	.	5587.107	19.560	4703.789	6.502	133.03	111.99	0.33	44.22
12/6/07	PSE	4	K	H2O	H2O	2	5	41.11	0.53	.	6148.864	21.150	5221.292	7.408	146.40	124.32	0.35	51.28
12/6/07	Normal	5	Am	H2O	H2O	2	1	40.54	0.65	.	4577.061	15.670	3845.021	5.354	108.98	91.55	0.34	37.23
12/6/07	Normal	5	Am	H2O	H2O	2	2	44.01	1.08	.	4636.479	16.020	3902.761	5.411	110.39	92.92	0.34	37.29
12/6/07	Normal	5	Am	H2O	H2O	2	3	51.34	1.29	.	4807.423	17.270	3999.999	5.808	114.46	95.24	0.34	38.49
12/6/07	Normal	5	Am	H2O	H2O	2	4	40.92	1.01	.	4983.862	16.200	4188.395	5.628	118.66	99.72	0.35	41.22
12/6/07	Normal	5	Am	H2O	H2O	2	5	43.24	1.13	.	4314.854	14.610	3585.292	4.719	102.73	85.36	0.32	33.18
12/6/07	PSE	5	Am	H2O	H2O	2	1	61.38	1.03	.	5346.529	18.140	4509.214	5.969	127.30	107.36	0.33	41.89
12/6/07	PSE	5	Am	H2O	H2O	2	2	62.15	1.04	.	5595.928	17.240	4719.973	6.416	133.24	112.38	0.37	49.58
12/6/07	PSE	5	Am	H2O	H2O	2	3	62.15	0.97	1635.380	5042.091	15.920	4212.066	5.566	120.05	100.29	0.35	41.97
12/6/07	PSE	5	Am	H2O	H2O	2	4	59.64	0.90	.	5114.933	17.260	4340.607	5.664	121.78	103.35	0.33	39.96
12/6/07	PSE	5	Am	H2O	H2O	2	5	41.69	0.58	.	5849.101	18.730	4828.793	6.788	139.26	114.97	0.36	50.47

12/6/07	Normal	6	H2O	H2O	H2O	2	1	66.40	1.10	.	4955.521	16.430	4193.808	5.785	117.99	99.85	0.35	41.54
12/6/07	Normal	6	H2O	Konjac	H2O	2	2	50.96	0.91	.	4944.676	16.410	4262.794	5.646	117.73	101.50	0.34	40.51
12/6/07	Normal	6	H2O	Konjac	H2O	2	3	47.29	0.77	.	4543.306	16.880	3818.483	5.477	108.17	90.92	0.32	35.10
12/6/07	Normal	6	H2O	Konjac	H2O	2	4	63.31	1.18	.	5590.406	18.600	4772.483	6.757	133.10	113.63	0.36	48.35
12/6/07	Normal	6	H2O	Konjac	H2O	2	5	65.63	1.25	.	4985.640	16.340	4126.745	5.768	118.71	98.26	0.35	41.90
12/6/07	PSE	6	H2O	Konjac	H2O	2	1	42.85	0.52	.	5065.927	17.740	4144.333	6.255	120.62	98.67	0.35	42.53
12/6/07	PSE	6	H2O	Konjac	H2O	2	2	68.33	0.99	.	5077.637	16.270	4165.448	5.657	120.90	99.18	0.35	42.03
12/6/07	PSE	6	H2O	Konjac	H2O	2	3	73.16	0.93	.	5252.413	18.260	4364.064	6.145	125.06	103.91	0.34	42.09
12/6/07	PSE	6	H2O	Konjac	H2O	2	4	65.63	1.10	.	4572.919	16.510	3595.334	5.010	108.88	85.60	0.30	33.04
12/6/07	PSE	6	H2O	Konjac	H2O	2	5	64.86	0.89	.	4902.063	17.350	4056.072	5.827	116.72	96.57	0.34	39.20
12/6/07	Normal	7	H2O	Konjac	H2O	2	1	55.98	1.05	.	4873.416	15.220	4152.676	5.419	116.03	98.87	0.36	41.31
12/6/07	Normal	7	H2O	E15	H2O	2	2	52.70	1.08	1698.726	4389.435	14.680	3748.453	4.992	104.51	89.25	0.34	35.54
12/6/07	Normal	7	H2O	E15	H2O	2	3	53.27	0.74	.	4518.869	16.520	3773.123	5.546	107.59	89.84	0.34	36.12
12/6/07	Normal	7	H2O	E15	H2O	2	4	48.06	0.73	.	5389.725	17.080	4623.930	6.379	128.33	110.09	0.37	47.93
12/6/07	Normal	7	H2O	E15	H2O	2	5	63.12	1.25	.	5560.259	19.830	4693.417	6.700	132.39	111.75	0.34	44.73
12/6/07	PSE	7	H2O	E15	H2O	2	1	66.79	0.94	.	4357.029	14.400	3617.479	4.895	103.74	86.13	0.34	35.26
12/6/07	PSE	7	H2O	E15	H2O	2	2	54.43	0.99	.	5272.029	17.380	4286.935	5.742	125.52	102.07	0.33	41.47
12/6/07	PSE	7	H2O	E15	H2O	2	3	86.47	0.86	1490.604	5345.536	17.170	4498.378	5.971	127.27	107.10	0.35	44.26
12/6/07	PSE	7	H2O	E15	H2O	2	4	72.96	1.04	.	4893.934	16.610	4034.893	5.643	116.52	96.07	0.34	39.59
12/6/07	PSE	7	H2O	E15	H2O	2	5	47.48	0.84	.	5578.768	17.660	4574.354	6.013	132.83	108.91	0.34	45.23
12/6/07	Normal	8	K	E15	H2O	2	1	43.43	1.02	2094.856	4376.640	15.500	3828.613	5.235	104.21	91.16	0.34	35.19
12/6/07	Normal	8	K	Konjac	H2O	2	2	40.92	1.30	1667.577	3725.470	13.000	3172.339	4.193	88.70	75.53	0.32	28.61
12/6/07	Normal	8	K	Konjac	H2O	2	3	28.18	0.82	1684.491	4167.785	13.970	3528.991	4.824	99.23	84.02	0.35	34.27
12/6/07	Normal	8	K	Konjac	H2O	2	4	48.26	1.38	2252.153	3984.525	13.790	3357.103	4.614	94.87	79.93	0.33	31.74
12/6/07	Normal	8	K	Konjac	H2O	2	5	51.15	1.29	1659.781	4479.970	13.580	3825.865	5.053	106.67	91.09	0.37	39.69
12/6/07	PSE	8	K	Konjac	H2O	2	1	61.00	0.95	.	4862.776	16.550	4022.253	5.800	115.78	95.77	0.35	40.58
12/6/07	PSE	8	K	Konjac	H2O	2	2	67.94	0.96	.	4832.771	17.890	4168.168	6.151	115.07	99.24	0.34	39.56
12/6/07	PSE	8	K	Konjac	H2O	2	3	64.47	0.96	.	4519.644	15.210	3771.491	5.053	107.61	89.80	0.33	35.75
12/6/07	PSE	8	K	Konjac	H2O	2	4	50.77	0.70	.	5543.036	18.770	4622.098	6.604	131.98	110.05	0.35	46.43
12/6/07	PSE	8	K	Konjac	H2O	2	5	81.46	1.21	.	4566.380	14.940	3886.322	5.115	108.72	92.53	0.34	37.22
12/6/07	Normal	9	K	Konjac	SP	2	1	37.45	0.90	1684.983	3969.320	14.550	3335.409	4.663	94.51	79.41	0.32	30.29
12/6/07	Normal	9	K	Konjac	SP	2	2	38.41	1.18	1928.409	4020.421	14.260	3310.398	4.584	95.72	78.82	0.32	30.77
12/6/07	Normal	9	K	Konjac	SP	2	3	37.64	1.32	.	4298.933	15.340	3560.185	4.903	102.36	84.77	0.32	32.72

12/6/07	Normal	9	K	Konjac	SP	2	4	51.92	1.32	.	4766.291	16.130	4040.958	5.502	113.48	96.21	0.34	38.71
12/6/07	Normal	9	K	Konjac	SP	2	5	45.94	1.23	.	3655.500	12.970	3048.127	4.106	87.04	72.57	0.32	27.55
12/6/07	PSE	9	K	Konjac	SP	2	1	62.93	0.89	.	5156.561	17.270	4320.850	5.887	122.78	102.88	0.34	41.85
12/6/07	PSE	9	K	Konjac	SP	2	2	50.57	0.81	.	6447.802	20.480	5441.128	7.330	153.52	129.55	0.36	54.95
12/6/07	PSE	9	K	Konjac	SP	2	3	71.03	0.98	.	6163.271	21.620	5265.081	7.402	146.74	125.36	0.34	50.24
12/6/07	PSE	9	K	Konjac	SP	2	4	75.28	1.01	.	5619.627	19.510	4641.824	6.416	133.80	110.52	0.33	44.00
12/6/07	PSE	9	K	Konjac	SP	2	5	66.98	1.04	2224.313	4982.678	18.290	4086.018	5.822	118.64	97.29	0.32	37.76
12/6/07	Normal	10	Am	Konjac	H2O	2	1	47.10	1.08	.	4342.872	14.660	3670.249	4.589	103.40	87.39	0.31	32.37
12/6/07	Normal	10	Am	E15	H2O	2	2	53.27	1.39	2557.835	4218.395	15.510	3533.743	4.631	100.44	84.14	0.30	29.99
12/6/07	Normal	10	Am	E15	H2O	2	3	59.26	1.30	.	4566.203	15.760	3872.729	5.234	108.72	92.21	0.33	36.11
12/6/07	Normal	10	Am	E15	H2O	2	4	62.15	1.55	.	4006.770	14.350	3406.104	4.581	95.40	81.10	0.32	30.45
12/6/07	Normal	10	Am	E15	H2O	2	5	54.63	1.29	.	3993.018	14.190	3386.156	4.524	95.07	80.62	0.32	30.31
12/6/07	PSE	10	Am	E15	H2O	2	1	70.26	0.83	.	5766.372	18.750	4904.269	6.378	137.29	116.77	0.34	46.70
12/6/07	PSE	10	Am	E15	H2O	2	2	74.12	1.05	.	6250.790	22.130	5312.501	7.526	148.83	126.49	0.34	50.61
12/6/07	PSE	10	Am	E15	H2O	2	3	90.72	1.21	.	5617.986	20.700	4616.489	6.612	133.76	109.92	0.32	42.73
12/6/07	PSE	10	Am	E15	H2O	2	4	84.93	1.190	.	5992.555	20.230	4937.253	6.609	142.68	117.55	0.33	46.61
12/6/07	PSE	10	Am	E15	H2O	2	5	83.58	1.060	.	6303.919	21.620	5359.871	7.496	150.09	127.62	0.35	52.04
12/6/07	Normal	11	Am	E15	SP	2	1	44.20	1.19	.	4147.130	15.010	3451.980	4.732	98.74	82.19	0.32	31.13
12/6/07	Normal	11	Am	E15	SP	2	2	40.15	1.63	.	4375.278	14.320	3819.959	5.051	104.17	90.95	0.35	36.74
12/6/07	Normal	11	Am	E15	SP	2	3	53.85	1.46	.	3787.380	14.180	3068.754	4.283	90.18	73.07	0.30	27.24
12/6/07	Normal	11	Am	E15	SP	2	4	47.29	1.18	.	4283.436	14.510	3647.484	4.745	101.99	86.84	0.33	33.35
12/6/07	Normal	11	Am	E15	SP	2	5	51.34	1.35	.	4646.052	15.210	3956.734	5.222	110.62	94.21	0.34	37.98
12/6/07	PSE	11	Am	E15	SP	2	1	70.26	0.96	.	6253.072	21.710	5265.864	7.745	148.88	125.38	0.36	53.11
12/6/07	PSE	11	Am	E15	SP	2	2	85.70	1.32	.	6592.960	22.460	5698.342	7.910	156.98	135.67	0.35	55.28
12/6/07	PSE	11	Am	E15	SP	2	3	76.82	1.06	.	5547.333	19.970	4788.245	6.958	132.08	114.01	0.35	46.02
12/6/07	PSE	11	Am	E15	SP	2	4	74.89	1.08	.	4712.519	17.230	3925.289	5.205	112.20	93.46	0.30	33.90
12/6/07	PSE	11	Am	E15	SP	2	5	81.07	0.97	.	5900.904	20.270	5020.064	6.943	140.50	119.53	0.34	48.12
11/5/07	Normal	1	Control	E15	Control	3	1	74.12	0.98	.	3441.212	11.650	3020.739	4.437	81.93	71.92	0.38	31.21
11/5/07	Normal	1	Control	Control	Control	3	2	63.70	0.99	1890.743	3661.737	12.890	3185.240	4.777	87.18	75.84	0.37	32.31
11/5/07	Normal	1	Control	Control	Control	3	3	54.82	0.89	.	3717.444	12.770	3236.173	4.883	88.51	77.05	0.38	33.84
11/5/07	Normal	1	Control	Control	Control	3	4	56.94	1.00	.	3526.000	12.760	2995.672	4.572	83.95	71.33	0.36	30.08
11/5/07	Normal	1	Control	Control	Control	3	5	39.76	0.54	1401.996	3254.007	11.500	2730.839	4.074	77.48	65.02	0.35	27.45
11/5/07	PSE	1	Control	Control	Control	3	1	47.87	0.52	.	4328.405	16.190	3750.286	5.768	103.06	89.29	0.36	36.72

11/5/07	PSE	1	Control	Control	Control	3	2	74.70	0.81	.	3997.793	14.740	3454.554	5.204	95.19	82.25	0.35	33.61
11/5/07	PSE	1	Control	Control	Control	3	3	69.87	0.72	.	3714.811	14.370	3079.303	4.674	88.45	73.32	0.33	28.77
11/5/07	PSE	1	Control	Control	Control	3	4	89.56	1.05	.	3813.827	14.040	3299.624	4.819	90.81	78.56	0.34	31.17
11/5/07	PSE	1	Control	Control	Control	3	5	71.80	0.89	.	3915.486	14.940	3357.633	5.129	93.23	79.94	0.34	32.01
11/5/07	Normal	2	H2O	Control	H2O	3	1	30.88	0.74	.	3042.025	10.340	2571.813	3.721	72.43	61.23	0.36	26.06
11/5/07	Normal	2	H2O	H2O	H2O	3	2	39.57	0.93	.	3006.553	10.450	2563.330	3.802	71.58	61.03	0.36	26.04
11/5/07	Normal	2	H2O	H2O	H2O	3	3	47.48	0.93	.	2795.760	10.140	2393.799	3.472	66.57	57.00	0.34	22.79
11/5/07	Normal	2	H2O	H2O	H2O	3	4	42.47	0.96	.	2658.541	9.549	2319.619	3.269	63.30	55.23	0.34	21.67
11/5/07	Normal	2	H2O	H2O	H2O	3	5	44.40	0.95	.	3293.790	10.340	2858.361	3.942	78.42	68.06	0.38	29.90
11/5/07	PSE	2	H2O	H2O	H2O	3	1	60.61	0.97	1280.503	3274.084	10.410	2817.122	3.614	77.95	67.07	0.35	27.06
11/5/07	PSE	2	H2O	H2O	H2O	3	2	45.55	0.73	1178.135	2939.678	10.490	2565.632	3.528	69.99	61.09	0.34	23.54
11/5/07	PSE	2	H2O	H2O	H2O	3	3	53.27	0.83	.	3214.004	10.120	2762.255	4.180	76.52	65.77	0.41	31.61
11/5/07	PSE	2	H2O	H2O	H2O	3	4	54.43	0.85	.	3350.411	11.870	2833.479	4.058	79.77	67.46	0.34	27.27
11/5/07	PSE	2	H2O	H2O	H2O	3	5	58.49	1.03	.	3693.899	13.240	3073.591	4.526	87.95	73.18	0.34	30.07
11/5/07	Normal	3	H2O	H2O	SP	3	1	50.57	1.10	.	2930.084	10.380	2537.087	3.600	69.76	60.41	0.35	24.20
11/5/07	Normal	3	H2O	H2O	SP	3	2	53.66	1.08	1268.583	2961.095	10.850	2512.123	3.683	70.50	59.81	0.34	23.93
11/5/07	Normal	3	H2O	H2O	SP	3	3	43.43	1.04	.	2782.631	9.934	2342.769	3.455	66.25	55.78	0.35	23.04
11/5/07	Normal	3	H2O	H2O	SP	3	4	48.26	1.11	.	2763.239	9.957	2359.524	3.358	65.79	56.18	0.34	22.19
11/5/07	Normal	3	H2O	H2O	SP	3	5	51.34	1.16	.	3062.164	10.940	2600.525	3.760	72.91	61.92	0.34	25.06
11/5/07	PSE	3	H2O	H2O	SP	3	1	50.77	0.78	.	3040.101	10.270	2574.906	3.385	72.38	61.31	0.33	23.86
11/5/07	PSE	3	H2O	H2O	SP	3	2	53.66	0.75	1391.830	3358.665	11.860	2867.504	3.835	79.97	68.27	0.32	25.86
11/5/07	PSE	3	H2O	H2O	SP	3	3	.	.	.	3268.660	11.080	2711.359	3.740	77.83	64.56	0.34	26.27
11/5/07	PSE	3	H2O	H2O	SP	3	4	44.40	0.82	1489.662	3530.156	12.310	3049.470	4.163	84.05	72.61	0.34	28.42
11/5/07	PSE	3	H2O	H2O	SP	3	5	60.61	1.11	1414.955	3093.875	11.250	2586.638	3.583	73.66	61.59	0.32	23.46
11/5/07	Normal	4	K	H2O	H2O	3	1	37.45	1.24	.	2356.662	8.167	1999.911	2.642	56.11	47.62	0.32	18.15
11/5/07	Normal	4	K	H2O	H2O	3	2	34.94	1.38	1281.864	2431.868	8.979	2046.764	2.848	57.90	48.73	0.32	18.37
11/5/07	Normal	4	K	H2O	H2O	3	3	25.48	1.00	.	2611.307	9.389	2226.933	3.256	62.17	53.02	0.35	21.56
11/5/07	Normal	4	K	H2O	H2O	3	4	40.54	1.13	.	2431.205	9.416	2063.589	3.025	57.89	49.13	0.32	18.60
11/5/07	Normal	4	K	H2O	H2O	3	5	32.43	1.14	.	2414.802	8.739	2071.740	2.823	57.50	49.33	0.32	18.57
11/5/07	PSE	4	K	H2O	H2O	3	1	59.07	1.10	.	3877.256	13.200	3351.896	4.864	92.32	79.81	0.37	34.02
11/5/07	PSE	4	K	H2O	H2O	3	2	45.55	0.98	.	3190.300	11.380	2725.642	4.135	75.96	64.90	0.36	27.60
11/5/07	PSE	4	K	H2O	H2O	3	3	53.08	1.11	.	3545.225	13.210	3100.297	4.765	84.41	73.82	0.36	30.45
11/5/07	PSE	4	K	H2O	H2O	3	4	64.08	1.16	.	3056.232	10.270	2632.593	3.560	72.77	62.68	0.35	25.22

11/5/07	PSE	4	K	H2O	H2O	3	5	.	.	.	3362.468	11.850	2875.984	4.199	80.06	68.48	0.35	28.37
11/5/07	Normal	5	Am	H2O	H2O	3	1	37.83	1.01	.	2233.695	7.828	1907.830	2.481	53.18	45.42	0.32	16.86
11/5/07	Normal	5	Am	H2O	H2O	3	2	37.06	1.15	.	2362.127	8.528	2024.570	2.866	56.24	48.20	0.34	18.90
11/5/07	Normal	5	Am	H2O	H2O	3	3	30.50	1.00	.	2544.617	8.578	2159.317	2.893	60.59	51.41	0.34	20.43
11/5/07	Normal	5	Am	H2O	H2O	3	4	34.74	1.06	811.162	2309.246	7.450	1954.589	2.641	54.98	46.54	0.35	19.49
11/5/07	Normal	5	Am	H2O	H2O	3	5	41.69	1.34	1123.755	2308.688	8.282	1980.826	2.658	54.97	47.16	0.32	17.64
11/5/07	PSE	5	Am	H2O	H2O	3	1	39.57	0.96	.	2918.444	10.270	2492.125	3.463	69.49	59.34	0.34	23.43
11/5/07	PSE	5	Am	H2O	H2O	3	2	52.89	1.05	.	2971.502	11.840	2601.500	3.967	70.75	61.94	0.34	23.70
11/5/07	PSE	5	Am	H2O	H2O	3	3	50.96	1.10	.	3046.172	11.480	2590.916	3.935	72.53	61.69	0.34	24.86
11/5/07	PSE	5	Am	H2O	H2O	3	4	55.01	0.85	.	2899.797	10.540	2453.261	3.626	69.04	58.41	0.34	23.75
11/5/07	PSE	5	Am	H2O	H2O	3	5	34.17	1.29	.	3144.623	11.730	2711.922	4.003	74.87	64.57	0.34	25.55
11/5/07	Normal	6	H2O	H2O	H2O	3	1	39.38	0.89	1256.602	2715.420	10.310	2315.896	3.584	64.65	55.14	0.35	22.47
11/5/07	Normal	6	H2O	Konjac	H2O	3	2	50.38	1.07	.	2686.510	9.182	2347.540	3.350	63.96	55.89	0.36	23.34
11/5/07	Normal	6	H2O	Konjac	H2O	3	3	45.36	1.12	.	2445.911	8.552	2108.500	3.203	58.24	50.20	0.37	21.81
11/5/07	Normal	6	H2O	Konjac	H2O	3	4	43.43	0.82	1172.045	2734.630	9.599	2299.444	3.287	65.11	54.75	0.34	22.30
11/5/07	Normal	6	H2O	Konjac	H2O	3	5	39.38	0.85	.	3227.343	10.440	2733.796	3.856	76.84	65.09	0.37	28.38
11/5/07	PSE	6	H2O	Konjac	H2O	3	1	53.66	0.66	.	2974.142	10.080	2525.365	3.565	70.81	60.13	0.35	25.04
11/5/07	PSE	6	H2O	Konjac	H2O	3	2	52.89	0.60	.	3393.333	11.630	2932.181	4.265	80.79	69.81	0.37	29.63
11/5/07	PSE	6	H2O	Konjac	H2O	3	3	81.26	1.05	.	3534.870	11.960	3045.122	4.382	84.16	72.50	0.37	30.84
11/5/07	PSE	6	H2O	Konjac	H2O	3	4	54.63	0.76	.	3199.499	11.070	2723.879	3.829	76.18	64.85	0.35	26.35
11/5/07	PSE	6	H2O	Konjac	H2O	3	5	62.73	0.77	.	3065.659	10.510	2603.533	3.609	72.99	61.99	0.34	25.06
11/5/07	Normal	7	H2O	Konjac	H2O	3	1	40.92	0.93	.	3164.994	11.240	2677.951	4.014	75.36	63.76	0.36	26.91
11/5/07	Normal	7	H2O	E15	H2O	3	2	48.64	0.89	.	2922.603	10.320	2517.865	3.740	69.59	59.95	0.36	25.22
11/5/07	Normal	7	H2O	E15	H2O	3	3	62.15	1.32	.	3235.978	11.080	2842.348	4.173	77.05	67.67	0.38	29.02
11/5/07	Normal	7	H2O	E15	H2O	3	4	53.85	1.21	.	3137.068	11.130	2694.088	4.077	74.69	64.14	0.37	27.36
11/5/07	Normal	7	H2O	E15	H2O	3	5	57.91	1.28	.	3179.418	10.540	2756.510	4.033	75.70	65.63	0.38	28.97
11/5/07	PSE	7	H2O	E15	H2O	3	1	62.15	0.86	.	3578.292	13.720	2958.665	4.669	85.20	70.44	0.34	28.99
11/5/07	PSE	7	H2O	E15	H2O	3	2	46.71	0.68	.	3790.888	14.510	3155.818	4.912	90.26	75.14	0.34	30.56
11/5/07	PSE	7	H2O	E15	H2O	3	3	45.75	0.67	.	3536.511	11.900	2979.778	4.337	84.20	70.95	0.36	30.69
11/5/07	PSE	7	H2O	E15	H2O	3	4	63.89	0.97	.	3067.626	12.580	2488.434	3.876	73.04	59.25	0.31	22.50
11/5/07	PSE	7	H2O	E15	H2O	3	5	67.75	0.96	.	3657.018	13.350	3120.892	4.580	87.07	74.31	0.34	29.87
11/5/07	Normal	8	K	E15	H2O	3	1	32.04	0.98	.	2397.553	8.708	2014.739	2.872	57.08	47.97	0.33	18.83
11/5/07	Normal	8	K	Konjac	H2O	3	2	33.97	1.14	.	2423.538	8.201	2112.336	2.895	57.70	50.29	0.35	20.37

11/5/07	Normal	8	K	Konjac	H2O	3	3	36.10	1.06	1407.352	2863.394	10.050	2444.967	3.515	68.18	58.21	0.35	23.84
11/5/07	Normal	8	K	Konjac	H2O	3	4	38.60	1.08	.	2602.206	8.745	2231.667	2.969	61.96	53.13	0.34	21.04
11/5/07	Normal	8	K	Konjac	H2O	3	5	34.17	1.19	.	2638.932	9.661	2270.440	3.149	62.83	54.06	0.33	20.48
11/5/07	PSE	8	K	Konjac	H2O	3	1	59.64	1.26	1825.581	3029.319	11.130	2565.878	3.744	72.13	61.09	0.34	24.26
11/5/07	PSE	8	K	Konjac	H2O	3	2	42.27	0.88	1735.541	2997.739	11.210	2522.898	3.644	71.37	60.07	0.33	23.20
11/5/07	PSE	8	K	Konjac	H2O	3	3	45.36	1.03	.	3140.098	12.060	2670.616	3.921	74.76	63.59	0.33	24.31
11/5/07	PSE	8	K	Konjac	H2O	3	4	49.80	1.02	.	3369.949	12.210	2894.816	4.249	80.24	68.92	0.35	27.92
11/5/07	PSE	8	K	Konjac	H2O	3	5	48.64	0.99	.	3247.214	11.530	2808.082	4.167	77.31	66.86	0.36	27.94
11/5/07	Normal	9	K	Konjac	SP	3	1	33.01	1.17	.	2410.241	8.288	2104.837	2.767	57.39	50.12	0.33	19.16
11/5/07	Normal	9	K	Konjac	SP	3	2	33.20	1.21	.	2313.377	8.127	2035.498	2.673	55.08	48.46	0.33	18.12
11/5/07	Normal	9	K	Konjac	SP	3	3	33.97	1.30	997.512	2105.132	8.081	1777.367	2.438	50.12	42.32	0.30	15.12
11/5/07	Normal	9	K	Konjac	SP	3	4	28.95	1.08	.	2410.981	8.419	2063.827	2.684	57.40	49.14	0.32	18.30
11/5/07	Normal	9	K	Konjac	SP	3	5	40.34	1.31	1461.318	2478.764	9.404	2119.284	2.931	59.02	50.46	0.31	18.39
11/5/07	PSE	9	K	Konjac	SP	3	1	42.66	1.20	1712.422	3009.891	11.240	2617.917	3.840	71.66	62.33	0.34	24.48
11/5/07	PSE	9	K	Konjac	SP	3	2	51.73	1.25	.	2935.394	10.350	2585.755	3.598	69.89	61.57	0.35	24.30
11/5/07	PSE	9	K	Konjac	SP	3	3	47.68	1.38	.	2966.107	11.020	2538.132	3.716	70.62	60.43	0.34	23.81
11/5/07	PSE	9	K	Konjac	SP	3	4	54.82	1.18	1558.307	2613.557	10.410	2231.375	3.283	62.23	53.13	0.32	19.62
11/5/07	PSE	9	K	Konjac	SP	3	5	55.98	1.18	.	3039.154	10.480	2703.448	3.764	72.36	64.37	0.36	25.99
11/5/07	Normal	10	Am	Konjac	H2O	3	1	32.04	0.88	.	2488.632	8.795	2183.033	3.005	59.25	51.98	0.34	20.25
11/5/07	Normal	10	Am	E15	H2O	3	2	37.06	1.05	998.815	2329.411	8.672	2036.625	2.911	55.46	48.49	0.34	18.62
11/5/07	Normal	10	Am	E15	H2O	3	3	47.10	1.18	.	2602.696	8.583	2239.368	3.031	61.97	53.32	0.35	21.88
11/5/07	Normal	10	Am	E15	H2O	3	4	38.80	1.13	.	2333.391	8.490	2039.678	2.749	55.56	48.56	0.32	17.99
11/5/07	Normal	10	Am	E15	H2O	3	5	39.57	0.98	.	2378.295	8.361	2014.577	2.887	56.63	47.97	0.35	19.55
11/5/07	PSE	10	Am	E15	H2O	3	1	46.71	1.06	1582.577	3124.213	12.420	2711.048	4.150	74.39	64.55	0.33	24.86
11/5/07	PSE	10	Am	E15	H2O	3	2	50.57	0.95	.	3147.067	11.410	2703.893	3.848	74.93	64.38	0.34	25.27
11/5/07	PSE	10	Am	E15	H2O	3	3	45.55	0.95	1696.330	2989.220	11.810	2456.163	3.703	71.17	58.48	0.31	22.32
11/5/07	PSE	10	Am	E15	H2O	3	4	60.03	1.21	.	3313.505	12.290	2860.099	4.307	78.89	68.10	0.35	27.65
11/5/07	PSE	10	Am	E15	H2O	3	5	66.98	1.11	.	2915.362	11.030	2532.839	3.683	69.41	60.31	0.33	23.18
11/5/07	Normal	11	Am	E15	SP	3	1	32.62	1.26	1153.113	2330.885	9.141	2020.122	2.957	55.50	48.10	0.32	17.95
11/5/07	Normal	11	Am	E15	SP	3	2	40.34	1.40	.	2751.823	9.163	2416.946	3.367	65.52	57.55	0.37	24.08
11/5/07	Normal	11	Am	E15	SP	3	3	33.78	1.22	.	2576.480	8.991	2227.816	3.165	61.34	53.04	0.35	21.59
11/5/07	Normal	11	Am	E15	SP	3	4	38.60	1.34	.	2071.192	7.727	1761.208	2.355	49.31	41.93	0.30	15.03
11/5/07	Normal	11	Am	E15	SP	3	5	32.43	1.10	.	2323.839	8.266	1964.116	2.651	55.33	46.76	0.32	17.74

11/5/07	PSE	11	Am	E15	SP	3	1	35.13	0.91	.	3145.877	10.720	2688.428	3.867	74.90	64.01	0.36	27.02
11/5/07	PSE	11	Am	E15	SP	3	2	52.12	1.15	.	3090.599	11.270	2593.397	3.731	73.59	61.75	0.33	24.36
11/5/07	PSE	11	Am	E15	SP	3	3	44.40	1.04	.	3238.673	12.190	2795.498	4.116	77.11	66.56	0.34	26.04
11/5/07	PSE	11	Am	E15	SP	3	4	50.19	1.24	.	3093.473	11.270	2600.559	3.954	73.65	61.92	0.35	25.84
11/5/07	PSE	11	Am	E15	SP	3	5	47.48	1.13	.	2946.477	10.260	2522.497	3.525	70.15	60.06	0.34	24.10

G-4. P2S4: Raw data for cooked hydrocolloid/buffer/salt/sodium phosphate treated cooked pork gels.

Date	Meat	Trt	Buffer	Hydro	SP	Day	pH	pH	L1	a1	b1	L2	a2	b2	L3	a3	b3	Moisture1	Moisture2	Moisture3
10/26/07	Normal	1	Control	Control	Control	1	6.01	6.00	78.42	7.50	8.66	78.94	7.25	9.05	79.36	7.56	8.43	69.26	69.15	68.75
10/26/07	PSE	1	Control	Control	Control	1	5.62	5.63	77.54	6.38	8.28	76.92	5.97	8.41	76.89	5.87	9.00	70.57	70.11	70.45
10/26/07	Normal	2	H2O	H2O	H2O	1	5.99	5.99	77.23	7.12	7.10	80.65	7.18	8.12	80.32	6.97	8.74	72.17	72.41	72.41
10/26/07	PSE	2	H2O	H2O	H2O	1	5.62	5.63	75.78	5.73	8.28	78.69	5.61	8.35	76.38	5.68	8.07	72.22	71.75	71.92
10/26/07	Normal	3	H2O	H2O	SP	1	6.00	5.99	79.66	7.27	8.56	80.89	7.38	7.91	78.31	7.48	8.40	72.14	72.07	72.03
10/26/07	PSE	3	H2O	H2O	SP	1	5.64	5.64	80.47	5.11	8.20	79.25	5.42	8.48	80.34	5.54	7.95	71.18	71.58	71.08
10/26/07	Normal	4	K	H2O	H2O	1	6.48	6.47	76.83	8.48	7.78	77.44	8.71	8.17	77.38	8.63	8.50	73.93	74.16	74.02
10/26/07	PSE	4	K	H2O	H2O	1	6.09	6.09	77.06	7.53	8.52	78.99	7.80	7.83	79.52	7.51	7.72	73.43	73.25	73.15
10/26/07	Normal	5	Am	H2O	H2O	1	6.43	6.43	73.30	7.96	8.24	75.03	8.07	7.55	74.58	8.06	7.94	74.14	74.27	74.22
10/26/07	PSE	5	Am	H2O	H2O	1	6.08	6.08	74.90	6.58	8.56	77.28	7.08	8.30	77.07	6.89	8.55	73.31	73.25	73.17
10/26/07	Normal	6	H2O	Konjac	H2O	1	5.99	6.00	78.04	6.75	9.52	79.36	6.44	9.21	76.61	7.22	9.63	71.96	71.21	68.32
10/26/07	PSE	6	H2O	Konjac	H2O	1	5.63	5.62	75.07	5.75	9.09	79.08	5.08	8.40	75.43	5.72	8.86	73.51	72.77	72.65
10/26/07	Normal	7	H2O	E15	H2O	1	6.00	5.99	79.32	6.71	8.71	79.53	6.64	8.41	80.97	6.14	8.56	71.52	71.42	71.63
10/26/07	PSE	7	H2O	E15	H2O	1	5.65	5.65	79.38	5.10	9.48	80.14	5.02	8.39	80.88	4.79	8.73	71.82	71.53	71.82
10/26/07	Normal	8	K	Konjac	H2O	1	6.42	6.42	78.93	8.63	7.73	78.71	8.62	7.98	77.39	8.47	7.78	73.97	74.04	74.54
10/26/07	PSE	8	K	Konjac	H2O	1	6.07	6.07	76.31	6.47	8.99	78.46	6.96	7.82	78.39	6.94	8.60	72.62	72.56	72.70
10/26/07	Normal	9	K	Konjac	SP	1	6.40	6.40	76.81	8.20	9.56	77.81	7.83	8.52	77.83	7.78	8.68	73.55	74.31	74.52
10/26/07	PSE	9	K	Konjac	SP	1	6.14	6.12	76.78	7.06	9.33	74.98	7.07	9.56	77.43	7.22	9.06	73.37	73.70	73.94
10/26/07	Normal	10	Am	E15	H2O	1	6.37	6.36	76.78	7.78	9.32	75.93	7.75	8.98	77.17	8.00	9.25	74.06	73.77	74.16
10/26/07	PSE	10	Am	E15	H2O	1	6.02	6.02	75.46	6.66	8.65	78.14	6.62	8.39	78.24	6.53	8.92	72.86	72.82	67.37
10/26/07	Normal	11	Am	E15	SP	1	6.34	6.34	77.27	8.63	7.72	75.17	8.47	8.79	75.18	8.25	8.79	73.30	73.95	73.65
10/26/07	PSE	11	Am	E15	SP	1	6.03	6.04	74.28	7.22	9.25	78.43	6.84	8.01	74.85	7.41	9.16	73.15	73.09	73.21
1/13/04	Normal	1	Control	Control	Control	2	6.26	6.26	77.89	9.48	7.82	78.98	9.24	7.81	78.32	8.98	7.99	73.85	73.94	73.90
12/5/07	PSE	1	Control	Control	Control	2	5.86	5.88	80.44	7.91	7.14	80.18	8.39	7.37	79.94	8.20	7.64	70.67	70.54	70.79
12/5/07	Normal	2	H2O	H2O	H2O	2	6.27	6.27	80.53	8.55	7.14	80.72	8.39	6.95	81.26	7.97	7.27	75.13	74.85	74.83
12/5/07	PSE	2	H2O	H2O	H2O	2	5.87	5.86	81.15	7.42	6.90	81.51	7.29	7.06	80.65	7.06	7.82	72.32	72.46	72.41
12/5/07	Normal	3	H2O	H2O	SP	2	6.27	6.27	78.61	8.19	8.27	79.98	8.10	8.12	80.88	8.19	7.85	74.94	75.25	75.21
12/5/07	PSE	3	H2O	H2O	SP	2	5.88	5.87	82.06	6.92	8.04	80.10	7.38	7.86	80.92	6.88	8.10	72.77	72.74	72.61
12/5/07	Normal	4	K	H2O	H2O	2	6.70	6.68	75.00	9.05	7.10	76.84	9.41	7.60	77.26	9.29	8.07	76.98	76.96	77.03
12/5/07	PSE	4	K	H2O	H2O	2	6.14	6.14	79.15	7.77	8.36	80.39	7.08	8.30	78.79	7.15	8.47	72.87	72.90	72.62

12/5/07	Normal	5	Am	H2O	H2O	2	6.64	6.65	77.91	9.03	7.78	77.77	9.21	7.64	77.94	9.10	7.88	77.47	77.23	77.08
12/5/07	PSE	5	Am	H2O	H2O	2	6.13	6.13	77.52	7.20	8.78	80.94	6.41	8.56	79.75	6.92	8.68	72.99	72.96	73.06
12/5/07	Normal	6	H2O	Konjac	H2O	2	6.27	6.26	80.33	7.74	7.90	79.96	7.78	7.96	79.41	7.23	8.52	74.56	74.83	74.60
12/5/07	PSE	6	H2O	Konjac	H2O	2	5.94	5.93	79.96	7.25	8.82	80.87	6.91	8.62	80.98	6.63	8.18	73.66	73.51	73.29
12/5/07	Normal	7	H2O	E15	H2O	2	6.27	6.27	80.27	7.15	8.11	79.09	7.74	8.55	79.43	7.14	8.77	73.60	73.00	73.50
12/5/07	PSE	7	H2O	E15	H2O	2	5.86	5.86	78.20	9.00	8.91	81.44	6.92	8.17	80.74	6.46	9.11	72.14	72.05	71.93
12/5/07	Normal	8	K	Konjac	H2O	2	6.69	6.68	76.13	9.21	8.82	77.80	8.89	7.90	76.96	8.92	8.33	77.50	77.55	77.46
12/5/07	PSE	8	K	Konjac	H2O	2	6.11	6.10	80.09	6.89	8.04	79.52	7.45	8.59	80.77	6.92	8.03	73.06	73.05	72.98
12/5/07	Normal	9	K	Konjac	SP	2	6.68	6.66	77.48	9.40	6.65	77.28	9.34	6.79	77.40	8.99	7.19	77.59	77.41	77.48
12/5/07	PSE	9	K	Konjac	SP	2	6.05	6.05	79.41	7.43	7.98	80.39	6.97	8.27	79.86	7.17	8.40	72.60	72.66	72.48
12/5/07	Normal	10	Am	E15	H2O	2	6.53	6.62	77.70	8.97	7.82	77.73	9.00	7.80	78.16	8.98	7.83	76.99	76.65	76.51
12/5/07	PSE	10	Am	E15	H2O	2	6.02	6.00	79.46	6.65	8.41	80.32	6.72	8.10	78.84	6.87	8.11	71.48	71.63	71.76
12/5/07	Normal	11	Am	E15	SP	2	6.63	6.62	77.87	8.70	7.82	77.53	8.78	7.55	77.59	8.87	8.01	76.81	76.81	76.78
12/5/07	PSE	11	Am	E15	SP	2	6.04	6.03	80.06	7.00	8.16	80.30	7.21	8.43	79.49	7.30	8.21	71.25	71.45	71.38
11/7/07	Normal	1	Control	Control	Control	3	6.26	6.27	79.03	9.43	7.62	78.46	9.41	7.75	78.69	9.04	7.88	74.63	74.61	74.50
11/7/07	PSE	1	Control	Control	Control	3	5.84	5.84	79.65	6.08	8.04	79.52	6.10	8.03	79.76	5.71	8.66	70.75	70.71	70.91
11/7/07	Normal	2	H2O	H2O	H2O	3	6.25	6.26	80.14	7.83	8.29	79.63	7.11	8.68	80.12	7.51	8.40	74.53	74.83	74.58
11/7/07	PSE	2	H2O	H2O	H2O	3	5.82	5.82	80.80	5.65	8.48	81.58	6.01	8.20	79.83	5.46	8.46	72.18	72.25	72.33
11/7/07	Normal	3	H2O	H2O	SP	3	6.24	6.25	80.75	8.05	7.76	79.43	8.13	9.39	79.61	7.66	8.70	74.69	74.86	74.65
11/7/07	PSE	3	H2O	H2O	SP	3	5.81	5.82	80.87	5.64	7.92	80.50	4.97	8.86	80.61	5.21	8.51	72.40	72.43	72.38
11/7/07	Normal	4	K	H2O	H2O	3	6.71	6.71	77.96	8.64	7.41	78.73	8.80	7.62	78.27	8.50	8.58	76.20	76.18	76.19
11/7/07	PSE	4	K	H2O	H2O	3	6.27	6.27	79.81	7.92	7.22	79.13	7.86	7.33	79.71	7.60	7.38	74.43	74.56	74.73
11/7/07	Normal	5	Am	H2O	H2O	3	6.64	6.56	79.13	8.78	7.76	78.85	8.76	8.02	79.06	8.16	8.35	76.18	76.11	76.32
11/7/07	PSE	5	Am	H2O	H2O	3	6.21	6.21	80.32	6.89	7.63	80.90	7.40	7.57	80.26	7.28	7.58	73.98	74.04	73.92
11/7/07	Normal	6	H2O	Konjac	H2O	3	5.95	6.26	80.87	8.02	7.74	80.90	7.54	7.95	80.63	7.77	7.75	74.29	74.12	74.24
11/7/07	PSE	6	H2O	Konjac	H2O	3	5.81	5.81	82.59	5.40	7.91	82.15	5.53	8.12	81.89	5.25	7.99	72.25	72.17	72.25
11/7/07	Normal	7	H2O	E15	H2O	3	6.24	6.24	80.89	7.75	7.75	81.35	7.82	8.05	80.54	7.37	8.36	72.86	73.27	73.23
11/7/07	PSE	7	H2O	E15	H2O	3	5.80	5.80	81.11	4.98	8.45	82.21	5.04	7.96	81.41	4.99	8.48	71.68	71.68	71.74
11/7/07	Normal	8	K	Konjac	H2O	3	6.63	6.65	78.48	8.59	7.52	78.56	8.32	7.80	77.95	8.86	8.43	76.73	76.81	76.71
11/7/07	PSE	8	K	Konjac	H2O	3	6.25	6.25	81.14	7.62	7.24	79.33	7.39	7.64	80.27	7.40	7.57	73.75	73.66	73.70
11/7/07	Normal	9	K	Konjac	SP	3	6.58	6.59	78.61	8.80	7.41	77.75	8.57	7.48	78.60	8.53	7.99	76.15	76.21	75.95
11/7/07	PSE	9	K	Konjac	SP	3	6.24	6.24	80.47	7.70	6.88	80.34	7.83	6.96	80.41	7.74	6.99	74.48	74.66	74.43
11/7/07	Normal	10	Am	E15	H2O	3	6.56	6.56	79.43	8.44	7.44	79.62	7.99	8.45	79.82	8.25	7.61	76.02	75.83	76.04

11/7/07	PSE	10	Am	E15	H2O	3	6.19	6.19	81.02	7.56	7.03	80.89	7.00	7.32	81.05	6.88	7.49	72.90	72.18	72.98
11/7/07	Normal	11	Am	E15	SP	3	6.59	6.59	79.14	8.84	7.61	79.56	8.70	7.61	79.84	8.31	7.82	76.39	76.32	76.64
11/7/07	PSE	11	Am	E15	SP	3	6.18	6.18	80.50	7.26	7.42	80.77	6.84	7.56	80.63	6.99	7.66	73.03	73.66	73.40

G-5. P2S4: Raw ANOVA data for boneless pork loins.

The GLM Procedure

Class Level Information

Class	Levels	Values
Meat	2	Normal PSE
Day	3	1 2 3

Number of Observations Read 24
Number of Observations Used 24

The GLM Procedure

Dependent Variable: pH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	1.40520000	0.28104000	15.76	<.0001
Error	18	0.32100000	0.01783333		
Corrected Total	23	1.72620000			

R-Square	Coeff Var	Root MSE	pH Mean
0.814042	2.380419	0.133542	5.610000

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1.22401667	1.22401667	68.64	<.0001
Day	2	0.14642500	0.07321250	4.11	0.0340
Meat*Day	2	0.03475833	0.01737917	0.97	0.3964

The GLM Procedure

Dependent Variable: xrawL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	485.4705468	97.0941094	19.91	<.0001
Error	18	87.7840903	4.8768939		
Corrected Total	23	573.2546370			

R-Square	Coeff Var	Root MSE	xrawL Mean
0.846867	4.112121	2.208369	53.70389

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	315.9552667	315.9552667	64.79	<.0001
Day	2	160.0978544	80.0489272	16.41	<.0001
Meat*Day	2	9.4174257	4.7087128	0.97	0.3997

The GLM Procedure

Dependent Variable: xrawa

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	65.90065475	13.18013095	8.75	0.0002
Error	18	27.09795625	1.50544201		
Corrected Total	23	92.99861100			

R-Square	Coeff Var	Root MSE	xrawa Mean
0.708620	12.49782	1.226965	9.817431

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.02502604	0.02502604	0.02	0.8988
Day	2	65.40973218	32.70486609	21.72	<.0001
Meat*Day	2	0.46589653	0.23294826	0.15	0.8578

The GLM Procedure

Dependent Variable: xrawb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	96.1882992	19.2376598	15.09	<.0001
Error	18	22.9429396	1.2746078		
Corrected Total	23	119.1312388			

R-Square	Coeff Var	Root MSE	xrawb Mean
0.807415	53.49761	1.128985	2.110347

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1.64413900	1.64413900	1.29	0.2710
Day	2	88.10733426	44.05366713	34.56	<.0001
Meat*Day	2	6.43682593	3.21841296	2.53	0.1080

G-6. P2S4: Raw texture ANOVA data for pork gels.

Dependent Variable: Hard1

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	25	209386.2134	8375.4485	97.84	<.0001
Error	304	26024.6304	85.6073		
Corrected Total	329	235410.8438			

R-Square	Coeff Var	Root MSE	Hard1 Mean
0.889450	10.15021	9.252423	91.15500

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	173131.6861	86565.8431	1011.20	<.0001
Meat	1	9375.8964	9375.8964	109.52	<.0001
Meat*Day	2	1649.2083	824.6041	9.63	<.0001
Trt	10	19849.0358	1984.9036	23.19	<.0001
Meat*Trt	10	5380.3868	538.0387	6.28	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	9375.896425	9375.896425	11.37	0.0778

Dependent Variable: Hard2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	25	141196.1363	5647.8455	76.02	<.0001
Error	304	22585.7946	74.2954		
Corrected Total	329	163781.9309			

R-Square	Coeff Var	Root MSE	Hard2 Mean
0.862098	11.15762	8.619477	77.25191

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	116404.3723	58202.1861	783.39	<.0001
Meat	1	6156.2594	6156.2594	82.86	<.0001
Meat*Day	2	783.2832	391.6416	5.27	0.0056
Trt	10	13087.6738	1308.7674	17.62	<.0001
Meat*Trt	10	4764.5476	476.4548	6.41	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	6156.259421	6156.259421	15.72	0.0581

Dependent Variable: Cohesive

Sum of

Source	DF	Squares	Mean Square	F Value	Pr > F
Model	25	0.02142576	0.00085703	3.15	<.0001
Error	304	0.08268485	0.00027199		
Corrected Total	329	0.10411061			

R-Square	Coeff Var	Root MSE	Cohesive Mean
0.205798	4.861452	0.016492	0.339242

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.00411697	0.00205848	7.57	0.0006
Meat	1	0.00041485	0.00041485	1.53	0.2178
Meat*Day	2	0.00061152	0.00030576	1.12	0.3263
Trt	10	0.00650061	0.00065006	2.39	0.0097
Meat*Trt	10	0.00978182	0.00097818	3.60	0.0002

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.00041485	0.00041485	1.36	0.3642

Dependent Variable: Gummy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	25	24493.39545	979.73582	58.45	<.0001
Error	304	5095.75109	16.76234		

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Corrected Total	329	29589.14654			

R-Square	Coeff Var	Root MSE	Gummy Mean
0.827783	13.21319	4.094184	30.98558

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	19675.31134	9837.65567	586.89	<.0001
Meat	1	1163.49615	1163.49615	69.41	<.0001
Meat*Day	2	126.48787	63.24393	3.77	0.0241
Trt	10	2452.80425	245.28043	14.63	<.0001
Meat*Trt	10	1075.29584	107.52958	6.41	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1163.496150	1163.496150	18.40	0.0503

Dependent Variable: Stress

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	23608.06350	1573.87090	18.49	<.0001
Error	311	26478.15202	85.13875		
Corrected Total	326	50086.21552			

R-Square	Coeff Var	Root MSE	Stress Mean
0.471349	17.25360	9.227066	53.47908

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	5136.910626	2568.455313	30.17	<.0001
Meat	1	5543.371362	5543.371362	65.11	<.0001
Meat*Day	2	2778.123225	1389.061612	16.32	<.0001
Trt	10	9969.502307	996.950231	11.71	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	5543.371362	5543.371362	3.99	0.1838

Dependent Variable: Strain

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	7.46569500	0.49771300	22.72	<.0001
Error	311	6.81332947	0.02190781		
Corrected Total	326	14.27902446			

R-Square	Coeff Var	Root MSE	Strain Mean
0.522843	15.13263	0.148013	0.978104

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	1.22155888	0.61077944	27.88	<.0001
Meat	1	1.56931782	1.56931782	71.63	<.0001

Meat*Day	2	0.08631388	0.04315694	1.97	0.1412
Trt	10	4.56012661	0.45601266	20.82	<.0001

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1.56931782	1.56931782	36.36	0.0264

G-7. P2S4: Raw cook ANOVA data for pork gels.

Dependent Variable: xcookpH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	25	5.67190758	0.22687630	73.31	<.0001
Error	40	0.12379091	0.00309477		
Corrected Total	65	5.79569848			

R-Square	Coeff Var	Root MSE	xcookpH Mean
0.978641	0.901410	0.055631	6.171515

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	0.52473939	0.26236970	84.78	<.0001
Meat	1	2.77775152	2.77775152	897.56	<.0001
Meat*Day	2	0.05460303	0.02730152	8.82	0.0007
Trt	10	2.29836515	0.22983652	74.27	<.0001
Meat*Trt	10	0.01644848	0.00164485	0.53	0.8574

Dependent Variable: xcookpH

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	2.77775152	2.77775152	101.74	0.0097

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The GLM Procedure

Dependent Variable: xcookL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	25	141.6847396	5.6673896	6.27	<.0001
Error	40	36.1434256	0.9035856		
Corrected Total	65	177.8281652			

R-Square	Coeff Var	Root MSE	xcookL Mean
0.796751	1.203409	0.950571	78.98985

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	64.04971616	32.02485808	35.44	<.0001
Meat	1	13.29608906	13.29608906	14.71	0.0004
Meat*Day	2	11.49789529	5.74894764	6.36	0.0040
Trt	10	45.21306700	4.52130670	5.00	0.0001
Meat*Trt	10	7.62797205	0.76279721	0.84	0.5902

Dependent Variable: xcookL

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	13.29608906	13.29608906	2.31	0.2677

The GLM Procedure

Dependent Variable: xcooka

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	25	70.45781027	2.81831241	10.61	<.0001
Error	40	10.62060673	0.26551517		
Corrected Total	65	81.07841700			

R-Square	Coeff Var	Root MSE	xcooka Mean
0.869008	6.915641	0.515282	7.450960

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	9.02534983	4.51267492	17.00	<.0001
Meat	1	38.46182239	38.46182239	144.86	<.0001
Meat*Day	2	0.59151751	0.29575875	1.11	0.3382
Trt	10	21.57788923	2.15778892	8.13	<.0001
Meat*Trt	10	0.80123131	0.08012313	0.30	0.9765

Dependent Variable: xcooka

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	38.46182239	38.46182239	130.04	0.0076

The GLM Procedure

Dependent Variable: xcookb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	25	9.52899411	0.38115976	1.63	0.0819
Error	40	9.34959057	0.23373976		
Corrected Total	65	18.87858468			

R-Square	Coeff Var	Root MSE	xcookb Mean
0.504752	5.944887	0.483466	8.132475

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	5.56563670	2.78281835	11.91	<.0001
Meat	1	0.12077593	0.12077593	0.52	0.4764
Meat*Day	2	0.85964680	0.42982340	1.84	0.1722
Trt	10	2.43109394	0.24310939	1.04	0.4291
Meat*Trt	10	0.55184074	0.05518407	0.24	0.9906

Dependent Variable: xcookb

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.12077593	0.12077593	0.28	0.6490

The GLM Procedure

Dependent Variable: xMoisture

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	25	227.2183892	9.0887356	24.04	<.0001
Error	40	15.1251805	0.3781295		
Corrected Total	65	242.3435697			

R-Square	Coeff Var	Root MSE	xMoisture Mean
0.937588	0.835668	0.614922	73.58455

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	38.91404343	19.45702172	51.46	<.0001
Meat	1	74.65309158	74.65309158	197.43	<.0001
Meat*Day	2	28.14017609	14.07008805	37.21	<.0001
Trt	10	70.54935488	7.05493549	18.66	<.0001
Meat*Trt	10	14.96172323	1.49617232	3.96	0.0008

Dependent Variable: xMoisture

Tests of Hypotheses Using the Type III MS for Meat*Day as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	74.65309158	74.65309158	5.31	0.1478

APPENDIX H

H-1. P2S5: Raw data for torsion testing and texture profile analysis for frankfurters.

Date	Rep	Meat	Trt	Sample	Stress	Strain	Peak1	Area1	Peak2	Area2	Hard1	Hard2	Cohesive	Gummy
4/1/08	1	Normal	1	1	38.22	2.14	1515.761	10.610	1287.949	2.91	36.09	30.67	0.27	9.89
4/1/08	1	Normal	1	2	12.74	1.72	1787.622	12.170	1165.722	2.88	42.56	27.76	0.24	10.06
4/1/08	1	Normal	1	3	9.46	0.84	1238.903	9.517	425.234	0.84	29.50	10.12	0.09	2.60
4/1/08	1	Normal	1	4	32.62	1.76	1775.616	11.940	1016.145	2.18	42.28	24.19	0.18	7.73
4/1/08	1	Normal	1	5	28.76	1.66	1993.968	11.830	1271.411	3.07	47.48	30.27	0.26	12.31
4/1/08	1	PSE	1	1	44.01	1.91	1661.911	13.180	1500.040	2.85	39.57	35.72	0.22	8.56
4/1/08	1	PSE	1	2	45.75	1.90	1652.531	15.050	1303.581	2.95	39.35	31.04	0.20	7.72
4/1/08	1	PSE	1	3	38.22	2.07	1316.587	8.973	781.090	1.82	31.35	18.60	0.20	6.34
4/1/08	1	PSE	1	4	51.34	1.80	1626.225	13.750	1239.263	2.75	38.72	29.51	0.20	7.75
4/1/08	1	PSE	1	5	47.48	2.01	1414.577	8.624	841.461	1.36	33.68	20.03	0.16	5.29
4/1/08	1	Normal	2	1	43.62	2.14	1617.005	11.300	1433.663	3.02	38.50	34.13	0.27	10.27
4/1/08	1	Normal	2	2	35.71	1.78	1316.990	13.000	1168.218	2.59	31.36	27.81	0.20	6.26
4/1/08	1	Normal	2	3	26.83	1.61	1177.604	12.160	1032.074	2.23	28.04	24.57	0.18	5.13
4/1/08	1	Normal	2	4	27.80	1.87	1305.874	8.933	910.036	1.97	31.09	21.67	0.22	6.85
4/1/08	1	Normal	2	5	36.29	2.06	1391.284	9.406	1183.678	2.43	33.13	28.18	0.26	8.54
4/1/08	1	PSE	2	1	36.29	2.13	1597.743	14.240	1278.681	2.94	38.04	30.44	0.21	7.86
4/1/08	1	PSE	2	2	36.48	2.11	1319.959	9.932	902.760	1.84	31.43	21.49	0.19	5.83
4/1/08	1	PSE	2	3	29.15	1.92	1448.578	12.440	1279.902	2.67	34.49	30.47	0.21	7.41
4/1/08	1	PSE	2	4	28.18	2.04	1782.104	21.170	1519.430	3.34	42.43	36.18	0.16	6.69
4/1/08	1	PSE	2	5	40.73	1.98	1451.906	12.570	995.787	2.23	34.57	23.71	0.18	6.12
4/1/08	1	Normal	3	1	32.04	2.15	1200.168	11.800	1033.186	1.78	28.58	24.60	0.15	4.30
4/1/08	1	Normal	3	2	32.24	1.95	1472.534	14.010	1340.111	2.73	35.06	31.91	0.20	6.84
4/1/08	1	Normal	3	3	34.74	1.76	1621.491	11.790	1011.177	2.20	38.61	24.08	0.19	7.20
4/1/08	1	Normal	3	4	40.92	1.81	1445.162	9.657	890.091	1.80	34.41	21.19	0.19	6.43
4/1/08	1	Normal	3	5	37.45	2.23	1336.161	8.944	1154.761	2.45	31.81	27.49	0.27	8.73
4/1/08	1	PSE	3	1	18.14	1.65	1717.405	12.380	1273.093	3.26	40.89	30.31	0.26	10.76
4/1/08	1	PSE	3	2	30.50	1.96	1568.094	9.849	1051.705	2.53	37.34	25.04	0.26	9.59
4/1/08	1	PSE	3	3	24.90	2.31	1272.040	8.097	839.517	1.86	30.29	19.99	0.23	6.96

4/1/08	1	PSE	3	4	32.81	1.53	1537.714	12.650	1321.224	2.70	36.61	31.46	0.21	7.80
4/1/08	1	PSE	3	5	23.93	1.98	1232.110	10.630	724.376	1.65	29.34	17.25	0.16	4.56
4/1/08	1	Normal	4	1	38.41	1.81	1501.417	12.450	1233.677	2.88	35.75	29.37	0.23	8.28
4/1/08	1	Normal	4	2	37.25	1.75	1409.402	9.146	1262.370	2.73	33.56	30.06	0.30	10.03
4/1/08	1	Normal	4	3	28.95	1.39	1651.537	13.860	1407.256	3.07	39.32	33.51	0.22	8.71
4/1/08	1	Normal	4	4	35.52	2.02	1812.035	13.490	1612.417	3.61	43.14	38.39	0.27	11.55
4/1/08	1	Normal	4	5	35.13	1.52	1405.550	13.930	1140.009	2.85	33.47	27.14	0.20	6.84
4/1/08	1	PSE	4	1	35.71	1.79	1314.044	11.680	1011.552	2.22	31.29	24.08	0.19	5.95
4/1/08	1	PSE	4	2	28.95	1.68	1296.581	12.220	1092.071	2.20	30.87	26.00	0.18	5.55
4/1/08	1	PSE	4	3	27.02	1.77	1207.544	14.380	1081.680	2.37	28.75	25.75	0.16	4.73
4/1/08	1	PSE	4	4	25.67	1.97	1312.674	8.230	956.662	1.90	31.25	22.78	0.23	7.20
4/1/08	1	PSE	4	5	26.64	1.74	1644.146	13.470	1236.208	2.94	39.15	29.43	0.22	8.55
4/1/08	2	Normal	1	1	52.31	1.80	1789.585	14.720	1639.997	3.69	42.61	39.05	0.25	10.68
4/1/08	2	Normal	1	2	51.54	2.01	1885.947	12.530	1434.857	3.57	44.90	34.16	0.28	12.79
4/1/08	2	Normal	1	3	18.92	1.18	1852.675	15.400	1506.794	3.73	44.11	35.88	0.24	10.68
4/1/08	2	Normal	1	4	43.62	2.19	1620.340	12.490	1204.350	2.62	38.58	28.68	0.21	8.08
4/1/08	2	Normal	1	5	50.38	1.87	1960.944	13.540	1650.346	3.99	46.69	39.29	0.29	13.76
4/1/08	2	PSE	1	1	36.48	1.97	1598.577	10.960	1172.264	2.68	38.06	27.91	0.24	9.30
4/1/08	2	PSE	1	2	44.40	1.93	1641.686	13.570	1165.508	2.76	39.09	27.75	0.20	7.95
4/1/08	2	PSE	1	3	56.75	1.89	1716.425	11.120	1225.105	2.34	40.87	29.17	0.21	8.59
4/1/08	2	PSE	1	4	64.08	1.90	1720.393	16.040	1240.313	2.97	40.96	29.53	0.18	7.58
4/1/08	2	PSE	1	5	44.97	1.83	1991.195	12.800	1563.398	4.07	47.41	37.22	0.32	15.06
4/1/08	2	Normal	2	1	42.47	1.71	1304.741	12.460	824.990	1.89	31.07	19.64	0.15	4.72
4/1/08	2	Normal	2	2	39.76	1.71	1682.055	12.400	1434.651	3.06	40.05	34.16	0.25	9.90
4/1/08	2	Normal	2	3	25.09	1.93	1705.259	12.220	1506.575	3.85	40.60	35.87	0.31	12.78
4/1/08	2	Normal	2	4	43.62	1.77	1454.998	13.790	1198.039	2.67	34.64	28.52	0.19	6.70
4/1/08	2	Normal	2	5	45.36	2.00	1578.071	13.740	1163.666	2.87	37.57	27.71	0.21	7.84
4/1/08	2	PSE	2	1	30.88	1.95	1604.044	16.430	1309.577	3.15	38.19	31.18	0.19	7.32
4/1/08	2	PSE	2	2	36.67	1.45	1298.788	13.230	1058.482	2.03	30.92	25.20	0.15	4.75
4/1/08	2	PSE	2	3	13.70	0.99	1539.727	12.380	1024.528	2.11	36.66	24.39	0.17	6.23
4/1/08	2	PSE	2	4	29.34	1.45	1642.677	15.980	1562.401	3.48	39.11	37.20	0.22	8.51

4/1/08	2	PSE	2	5	17.37	1.19	1423.615	13.790	1316.766	2.91	33.90	31.35	0.21	7.14
4/1/08	2	Normal	3	1	43.43	1.85	1822.344	15.350	1468.677	3.16	43.39	34.97	0.21	8.94
4/1/08	2	Normal	3	2	35.52	1.86	1728.691	12.670	1313.480	2.98	41.16	31.27	0.24	9.68
4/1/08	2	Normal	3	3	44.59	2.34	2104.420	14.720	1418.548	3.50	50.11	33.77	0.24	11.92
4/1/08	2	Normal	3	4	27.80	1.82	1796.548	13.070	1678.681	3.49	42.77	39.97	0.27	11.44
4/1/08	2	Normal	3	5	33.78	1.88	1687.769	13.210	1276.221	3.00	40.18	30.39	0.23	9.12
4/1/08	2	PSE	3	1	24.51	1.42	1834.639	12.510	1299.856	2.81	43.68	30.95	0.22	9.81
4/1/08	2	PSE	3	2	44.40	1.78	1168.392	6.982	874.813	1.83	27.82	20.83	0.26	7.29
4/1/08	2	PSE	3	3	43.24	1.68	1694.053	14.340	1462.787	3.17	40.33	34.83	0.22	8.90
4/1/08	2	PSE	3	4	24.51	1.47	1516.744	14.840	1359.041	2.90	36.11	32.36	0.20	7.07
4/1/08	2	PSE	3	5	26.25	1.87	1803.581	13.830	1164.525	2.77	42.94	27.73	0.20	8.61
4/1/08	2	Normal	4	1	42.08	1.90	1212.234	9.300	889.427	1.87	28.86	21.18	0.20	5.81
4/1/08	2	Normal	4	2	41.69	1.83	1321.059	11.120	1075.936	2.24	31.45	25.62	0.20	6.34
4/1/08	2	Normal	4	3	40.92	1.94	1591.559	13.790	1356.978	2.94	37.89	32.31	0.21	8.09
4/1/08	2	Normal	4	4	33.20	1.93	1366.847	9.994	1166.871	2.41	32.54	27.78	0.24	7.86
4/1/08	2	Normal	4	5	38.99	1.83	1444.283	10.280	788.885	1.67	34.39	18.78	0.16	5.58
4/1/08	2	PSE	4	1	39.96	2.10	1497.436	12.910	1335.363	2.77	35.65	31.79	0.21	7.66
4/1/08	2	PSE	4	2	29.53	2.10	1305.425	12.300	1247.141	2.33	31.08	29.69	0.19	5.89
4/1/08	2	PSE	4	3	35.13	1.87	1523.312	12.350	1298.367	2.66	36.27	30.91	0.21	7.80
4/1/08	2	PSE	4	4	41.89	1.89	1787.635	12.400	1521.086	3.32	42.56	36.22	0.27	11.38
4/1/08	2	PSE	4	5	26.44	1.50	1421.968	13.470	1143.173	2.97	33.86	27.22	0.22	7.46
4/1/08	3	Normal	1	1	73.16	1.72	2257.258	15.980	1729.977	4.16	53.74	41.19	0.26	14.00
4/1/08	3	Normal	1	2	37.06	1.46	2254.245	17.650	1766.773	4.25	47.24	35.04	0.26	12.22
4/1/08	3	Normal	1	3	52.31	1.47	1984.280	15.350	1471.838	3.97	54.97	45.26	0.31	16.97
4/1/08	3	Normal	1	4	58.68	1.79	2308.696	14.810	1900.711	4.57	41.58	25.95	0.19	7.70
4/1/08	3	Normal	1	5	58.87	1.72	1746.444	12.420	1089.992	2.30	36.11	30.44	0.19	6.92
4/1/08	3	PSE	1	1	44.20	1.45	1516.822	14.150	1278.540	2.71	43.37	21.68	0.14	6.26
4/1/08	3	PSE	1	2	52.89	1.72	1821.650	12.500	910.705	1.81	38.63	31.52	0.21	8.01
4/1/08	3	PSE	1	3	54.63	1.77	1622.336	14.210	1323.985	2.95	33.78	19.25	0.12	3.98
4/1/08	3	PSE	1	4	41.31	1.46	1418.585	13.300	808.335	1.57	40.42	34.30	0.20	8.12
4/1/08	3	PSE	1	5	43.04	1.68	1697.761	15.990	1440.445	3.21	27.36	19.06	0.15	4.11

4/1/08	3	Normal	2	1	33.59	1.58	1149.079	8.956	800.386	1.35	29.48	26.52	0.27	8.01
4/1/08	3	Normal	2	2	36.87	1.89	1238.048	9.824	1113.888	2.67	34.96	29.87	0.21	7.49
4/1/08	3	Normal	2	3	37.64	1.79	1468.521	12.090	1254.714	2.59	42.95	36.87	0.27	11.61
4/1/08	3	Normal	2	4	48.84	1.82	1803.845	11.720	1548.682	3.17	37.67	33.81	0.22	8.11
4/1/08	3	Normal	2	5	31.85	1.60	1582.272	13.510	1420.099	2.91	35.01	29.48	0.19	6.58
4/1/08	3	PSE	2	1	42.08	1.96	1470.380	14.720	1238.135	2.77	37.00	26.97	0.21	7.69
4/1/08	3	PSE	2	2	45.94	1.91	1553.906	12.710	1132.686	2.64	38.44	31.46	0.22	8.43
4/1/08	3	PSE	2	3	51.34	1.93	1614.592	13.690	1321.527	3.00	40.27	33.03	0.21	8.58
4/1/08	3	PSE	2	4	30.88	1.58	1691.353	12.790	1387.213	2.72	42.73	35.54	0.24	10.27
4/1/08	3	PSE	2	5	44.20	1.67	1794.744	13.300	1492.554	3.20	35.43	25.49	0.20	6.97
4/1/08	3	Normal	3	1	44.20	1.98	1488.241	12.680	1070.676	2.49	35.43	25.49	0.20	6.97
4/1/08	3	Normal	3	2	33.78	1.59	1618.008	12.530	1401.215	4.23	38.52	33.36	0.34	12.99
4/1/08	3	Normal	3	3	33.80	1.87	1778.297	13.900	1437.105	3.76	42.34	34.22	0.27	11.45
4/1/08	3	Normal	3	4	41.69	1.84	1457.327	13.140	1216.270	2.55	34.70	28.96	0.19	6.73
4/1/08	3	Normal	3	5	35.52	1.64	1876.076	15.210	1638.609	3.75	44.67	39.01	0.25	11.02
4/1/08	3	PSE	3	1	63.50	1.93	1667.473	14.180	1336.769	3.00	39.70	31.83	0.21	8.39
4/1/08	3	PSE	3	2	35.90	1.67	1705.026	11.880	1350.690	2.87	40.60	32.16	0.24	9.79
4/1/08	3	PSE	3	3	35.32	1.66	1636.625	12.500	1256.597	2.65	38.97	29.92	0.21	8.26
4/1/08	3	PSE	3	4	45.17	1.71	1759.674	13.480	1306.230	2.94	41.90	31.10	0.22	9.13
4/1/08	3	PSE	3	5	.	.	1566.900	13.980	1210.714	2.41	37.31	28.83	0.17	6.42
4/1/08	3	Normal	4	1	38.80	1.94	1483.002	12.150	1183.964	2.66	35.31	28.19	0.22	7.72
4/1/08	3	Normal	4	2	38.22	1.60	1322.937	12.810	1098.514	2.39	31.50	26.16	0.19	5.87
4/1/08	3	Normal	4	3	34.74	1.82	1394.136	12.030	1055.775	2.63	33.19	25.14	0.22	7.25
4/1/08	3	Normal	4	4	43.24	1.93	1721.721	11.610	1331.690	3.27	40.99	31.71	0.28	11.56
4/1/08	3	Normal	4	5	37.25	2.18	1495.205	12.460	1259.928	2.65	35.60	30.00	0.21	7.58
4/1/08	3	PSE	4	1	31.46	1.63	1543.639	10.740	983.841	2.17	36.75	23.42	0.20	7.42
4/1/08	3	PSE	4	2	61.96	1.96	1465.563	12.070	1167.203	2.30	34.89	27.79	0.19	6.64
4/1/08	3	PSE	4	3	42.08	1.76	1426.209	12.660	1138.795	2.10	33.96	27.11	0.17	5.63
4/1/08	3	PSE	4	4	42.27	1.81	1776.923	14.670	1463.540	3.59	42.31	34.85	0.24	10.36
4/1/08	3	PSE	4	5	33.01	2.04	1581.071	10.680	1462.031	3.28	37.64	34.81	0.31	11.57

H-2. P2S5: Raw data for cooked color, pH, and moisture for frankfurters.

Date	Rep	Meat	Trt	ph1	ph2	IL1	Ia1	Ib1	IL2	Ia2	Ib2	IL3	Ia3	Ib3
4-8-8	1	Normal	1	6.19	6.19	57.35	16.51	8.86	56.84	16.62	9.09	58.60	16.62	9.19
4-8-8	1	PSE	1	5.92	6.05	59.57	16.38	8.50	60.38	16.11	8.57	60.58	16.57	8.60
4-8-8	1	Normal	2	6.64	6.28	55.32	16.12	9.15	55.90	14.73	8.80	55.57	14.71	8.45
4-8-8	1	PSE	2	6.24	6.40	59.20	14.23	9.67	57.23	14.88	9.37	58.34	14.79	9.63
4-8-8	1	Normal	3	6.36	6.20	57.57	15.71	9.67	56.06	14.82	9.23	58.33	14.61	9.95
4-8-8	1	PSE	3	6.05	6.16	55.60	16.45	9.21	55.41	15.96	9.12	55.77	16.61	9.70
4-8-8	1	Normal	4	6.03	5.93	57.76	15.11	9.69	57.69	14.88	9.41	57.97	14.86	9.49
4-8-8	1	PSE	4	6.14	6.13	59.92	16.73	9.15	58.56	16.86	9.05	58.56	16.79	9.09
4-8-8	2	Normal	1	6.34	6.36	56.43	17.61	9.03	56.90	17.20	8.21	56.67	16.87	8.47
4-8-8	2	PSE	1	6.43	6.40	58.70	17.45	8.79	58.97	17.16	8.84	58.33	17.25	9.12
4-8-8	2	Normal	2	6.33	6.44	56.47	16.95	9.08	56.07	16.54	8.80	56.68	16.65	8.58
4-8-8	2	PSE	2	6.30	6.20	56.09	17.26	8.64	56.45	16.80	8.26	56.69	16.68	8.21
4-8-8	2	Normal	3	6.15	6.21	55.47	16.17	8.74	54.77	16.16	8.78	54.89	16.49	9.11
4-8-8	2	PSE	3	6.08	5.87	55.98	16.83	8.70	55.36	16.07	8.36	57.49	16.95	8.64
4-8-8	2	Normal	4	5.97	6.09	56.75	16.68	9.16	57.26	16.51	8.94	56.37	16.54	8.61
4-8-8	2	PSE	4	5.88	5.90	57.51	17.17	9.52	57.43	16.78	8.80	55.52	16.61	8.97
4-8-8	3	Normal	1	5.85	5.78	57.85	17.22	8.23	58.66	17.31	8.90	57.67	17.45	8.11
4-8-8	3	PSE	1	5.83	5.65	58.06	16.40	8.10	58.95	17.65	8.69	57.77	16.05	7.57
4-8-8	3	Normal	2	6.06	6.07	58.09	15.69	8.47	57.94	15.63	8.35	56.06	16.38	8.53
4-8-8	3	PSE	2	5.99	6.02	57.82	16.87	8.54	56.89	16.51	7.84	57.76	16.60	8.31
4-8-8	3	Normal	3	6.09	5.99	57.25	16.72	9.35	54.91	16.56	8.89	55.44	15.72	8.43
4-8-8	3	PSE	3	6.16	6.28	56.70	17.40	8.69	56.25	16.84	7.98	56.41	17.22	8.64
4-8-8	3	Normal	4	6.32	6.42	55.50	16.45	8.32	54.85	16.32	7.93	53.84	16.60	8.25
4-8-8	3	PSE	4	6.45	6.48	57.62	16.90	8.73	56.84	17.23	8.71	57.61	17.46	9.31

EL1	Ea1	Eb1	EL2	Ea2	Eb2	EL3	Ea3	Eb3	Moist1	Moist2	Moist3	Fat1	Fat2	Fat3
54.74	18.29	16.82	56.18	18.11	15.22	54.61	18.48	16.63	68.53	67.51	67.42	8.84	9.68	9.48
54.29	18.61	18.95	54.93	18.36	18.73	53.95	18.91	18.11	67.24	68.11	67.32	9.92	9.21	10.31
53.31	15.72	18.52	52.64	14.82	18.26	52.32	14.57	18.65	67.96	67.77	67.88	8.84	9.09	8.91
53.62	15.79	16.94	54.48	14.48	16.84	54.60	14.09	16.14	68.43	68.14	68.52	8.69	8.58	8.27
53.96	16.18	19.26	53.00	15.24	16.96	54.29	15.01	16.83	67.63	66.83	68.91	9.24	9.04	8.30
56.05	9.67	16.06	55.54	10.87	16.76	55.80	12.00	17.99	69.38	69.07	68.69	9.05	8.89	9.55
52.98	15.47	20.94	54.19	14.74	20.16	54.14	14.57	20.03	67.58	68.62	67.83	9.36	8.43	8.77
54.08	17.79	20.07	52.02	18.69	19.96	53.73	18.33	20.28	67.65	67.21	66.64	9.42	9.30	9.72
50.86	14.53	15.23	49.33	15.61	17.37	49.55	19.56	22.88	64.92	65.18	65.81	10.48	10.15	9.89
48.90	19.81	22.54	41.73	19.67	24.32	51.07	20.40	23.49	65.04	64.96	64.18	11.06	11.15	11.28
48.31	18.56	22.93	48.42	17.96	22.84	50.41	18.23	20.67	64.43	65.27	64.17	10.11	9.22	10.10
49.38	18.93	23.11	47.73	18.99	23.80	48.66	19.85	23.05	64.21	64.28	64.78	10.05	9.90	9.77
47.85	16.07	23.77	48.77	16.35	24.40	46.42	16.04	24.14	65.64	66.00	65.06	9.36	8.47	9.46
49.50	17.16	23.55	48.67	18.31	24.20	49.68	17.74	22.65	65.68	65.01	65.28	9.57	9.80	10.41
46.94	18.53	24.05	47.75	17.36	22.65	50.28	19.73	22.67	64.88	64.70	64.26	10.49	10.61	11.07
50.18	19.29	22.59	49.74	19.52	22.83	50.77	19.47	23.28	64.23	63.65	65.53	10.93	11.77	10.34
57.06	15.41	14.18	55.28	15.58	16.24	53.82	17.07	18.56	67.00	65.79	66.71	9.20	10.19	9.53
53.57	17.60	19.11	52.61	17.72	19.60	51.39	19.19	21.15	65.00	66.40	65.49	11.01	9.74	10.71
50.21	17.62	22.25	49.61	17.80	22.68	50.36	18.12	22.47	65.03	65.87	65.41	9.65	9.53	9.82
51.96	18.68	21.34	51.14	18.70	22.22	52.18	20.12	23.63	65.39	64.56	65.43	9.49	9.62	8.96
49.19	17.98	25.21	54.28	12.85	18.73	52.33	14.67	21.78	64.79	63.88	64.55	10.38	10.82	10.83
51.40	16.66	21.24	50.94	17.17	21.03	50.45	17.40	21.87	64.96	65.69	65.69	9.97	9.47	9.72
49.44	17.58	22.19	50.48	15.35	20.20	49.90	15.84	20.73	65.18	64.85	65.06	10.22	10.77	10.67
51.80	19.87	24.16	52.21	18.55	23.07	53.05	19.69	25.10	64.61	65.60	64.87	9.64	9.69	10.18

H-3. P2S5: Raw data for consumer sensory evaluation for frankfurters.

Date	Rep	Session	Trt	Order	Sample	Con	Age	Sex	Ethnic	Ocolor	Icolor	Osample	Oflavor	Iflavor	Otexture	Juice	Pur	Comments
3/26/08	1	1	1	1	842	1	2	1	1	5	3	7	7	6	5	8	7	
3/26/08	1	1	5	2	432	1	2	1	1	5	4	6	7	6	4	5	6	
3/26/08	1	1	3	3	817	1	2	1	1	5	4	6	6	6	5	5	5	
3/26/08	1	1	2	4	913	1	2	1	1	5	5	5	5	5	5	4	5	
3/26/08	1	1	4	5	952	1	2	1	1	4	4	4	5	4	4	4	4	
3/26/08	1	1	6	6	894	1	2	1	1	5	5	7	7	7	5	7	7	
3/26/08	1	1	7	7	628	1	2	1	1	5	3	6	4	5	4	4	4	
3/26/08	1	1	8	8	862	1	2	1	1	5	4	5	5	6	5	5	5	
3/26/08	1	1	1	1	842	2	1	1	3	7	5	5	4	4	5	5	7	
3/26/08	1	1	5	2	432	2	1	1	3	6	5	7	7	6	5	6	3	
3/26/08	1	1	3	3	817	2	1	1	3	7	5	7	7	6	5	6	6	
3/26/08	1	1	2	4	913	2	1	1	3	5	4	4	4	4	8	4	4	
3/26/08	1	1	4	5	952	2	1	1	3	5	5	5	5	3	5	4	2	
3/26/08	1	1	6	6	894	2	1	1	3	5	6	5	5	5	5	9	5	
3/26/08	1	1	7	7	628	2	1	1	3	5	5	5	5	5	5	5	3	
3/26/08	1	1	8	8	862	2	1	1	3	5	5	5	5	5	5	5	5	
3/26/08	1	1	1	1	842	3	1	2	1	7	3	6	7	5	4	3	6	
3/26/08	1	1	5	2	432	3	1	2	1	3	5	2	2	3	3	4	2	
3/26/08	1	1	3	3	817	3	1	2	1	6	7	7	8	5	4	5	6	
3/26/08	1	1	2	4	913	3	1	2	1	5	7	7	6	4	8	7	7	
3/26/08	1	1	4	5	952	3	1	2	1	6	5	6	5	5	3	3	4	
3/26/08	1	1	6	6	894	3	1	2	1	6	6	6	4	4	3	7	4	I didn't like the little bits of mystery meat in there
3/26/08	1	1	7	7	628	3	1	2	1	7	3	8	8	5	8	7	8	
3/26/08	1	1	8	8	862	3	1	2	1	7	6	6	6	5	6	6	5	
3/26/08	1	1	1	1	842	4	2	2	1	8	3	3	3	3	4	7	3	
3/26/08	1	1	5	2	432	4	2	2	1	8	6	8	9	7	9	6	1	
3/26/08	1	1	3	3	817	4	2	2	1	9	7	8	8	7	6	7	3	very chewy
3/26/08	1	1	2	4	913	4	2	2	1	8	8	7	6	8	4	7	5	don't like the texture on

																		outside
3/26/08	1	1	4	5	952	4	2	2	1	2	4	1	1	9	1	5	1	
3/26/08	1	1	6	6	894	4	2	2	1	8	7	2	1	9	3	2	1	dry
3/26/08	1	1	7	7	628	4	2	2	1	2	2	1	1	1	1	1	1	
3/26/08	1	1	8	8	862	4	2	2	1	2	2	9	9	7	9	7	9	flavor is not too strong and texture is soft
3/26/08	1	1	1	1	842	5	2	2	1	8	3	8	9	6	4	9	6	chewy
3/26/08	1	1	5	2	432	5	2	2	1	7	5	7	8	8	6	9	8	
3/26/08	1	1	3	3	817	5	2	2	1	.	4	5	6	4	6	6	4	
3/26/08	1	1	2	4	913	5	2	2	1	7	6	4	7	8	7	8	5	salty
3/26/08	1	1	4	5	952	5	2	2	1	6	4	6	7	8	6	8	6	
3/26/08	1	1	6	6	894	5	2	2	1	6	6	.	7	7	4	8	3	the outside of hotdog is thick
3/26/08	1	1	7	7	628	5	2	2	1	4	4	2	3	3	1	6	2	very chewy
3/26/08	1	1	8	8	862	5	2	2	1	3	1	7	7	7	6	8	7	
3/26/08	1	1	1	1	842	6	1	2	1	6	3	6	7	4	4	6	4	
3/26/08	1	1	5	2	432	6	1	2	1	6	5	6	6	4	4	6	4	
3/26/08	1	1	3	3	817	6	1	2	1	7	5	6	6	5	5	5	4	
3/26/08	1	1	2	4	913	6	1	2	1	7	6	6	6	5	5	6	4	
3/26/08	1	1	4	5	952	6	1	2	1	6	5	5	5	6	4	5	4	
3/26/08	1	1	6	6	894	6	1	2	1	5	5	4	4	5	4	5	4	
3/26/08	1	1	7	7	628	6	1	2	1	5	5	5	6	5	5	5	4	
3/26/08	1	1	8	8	862	6	1	2	1	5	4	5	4	4	4	6	4	
3/26/08	1	1	1	1	842	7	1	2	4	5	5	4	3	3	6	3	2	
3/26/08	1	1	5	2	432	7	1	2	4	6	6	2	2	4	7	2	2	
3/26/08	1	1	3	3	817	7	1	2	4	3	7	4	4	2	8	5	2	
3/26/08	1	1	2	4	913	7	1	2	4	9	6	7	8	7	7	7	8	
3/26/08	1	1	4	5	952	7	1	2	4	5	6	5	5	4	7	3	2	the flavor reminds me of indian spices
3/26/08	1	1	6	6	894	7	1	2	4	5	7	1	1	7	5	4	1	
3/26/08	1	1	7	7	628	7	1	2	4	5	8	3	4	6	7	5	5	
3/26/08	1	1	8	8	862	7	1	2	4	1	2	1	1	8	5	5	1	
3/26/08	1	1	1	1	842	8	2	1	4	4	2	6	4	2	6	4	7	it had a good size through. It was a good with

3/26/08	1	1	5	2	432	8	2	1	4	4	4	4	4	6	5	6	5	also a very good width of hotdog
3/26/08	1	1	3	3	817	8	2	1	4	3	5	6	4	6	3	5	4	none
3/26/08	1	1	2	4	913	8	2	1	4	3	6	4	3	7	6	7	4	good dog, but outer layer was too tough
3/26/08	1	1	4	5	952	8	2	1	4	3	6	6	4	5	7	5	6	out layer was way too tough
3/26/08	1	1	6	6	894	8	2	1	4	7	5	7	8	7	7	7	7	that badboy was good!
3/26/08	1	1	7	7	628	8	2	1	4	5	4	6	4	5	6	4	4	kind of tough to chew
3/26/08	1	1	8	8	862	8	2	1	4	3	2	7	7	6	7	6	6	if the dog was alittle bit more darker we would have a winner
3/26/08	1	2	6	1	894	9	1	2	1	9	4	7	8	6	3	6	5	
3/26/08	1	2	8	2	862	9	1	2	1	8	5	6	7	6	3	6	7	
3/26/08	1	2	4	3	952	9	1	2	1	7	6	6	8	6	2	6	6	1st 3 samples look the same
3/26/08	1	2	1	4	842	9	1	2	1	7	6	4	4	6	1	6	6	looks the same
3/26/08	1	2	2	5	913	9	1	2	1	7	6	4	6	5	1	6	5	all very similar if not the same and same rubbery texture not good
3/26/08	1	2	5	6	432	9	1	2	1	6	5	6	6	6	1	6	5	rubbery
3/26/08	1	2	3	7	817	9	1	2	1	7	6	5	7	6	1	6	5	rubbery
3/26/08	1	2	7	8	628	9	1	2	1	7	6	4	7	6	1	6	1	all rubbery texture
3/26/08	1	2	6	1	894	10	1	2	3	6	5	7	7	6	7	7	7	
3/26/08	1	2	8	2	862	10	1	2	3	5	5	6	6	7	6	7	7	
3/26/08	1	2	4	3	952	10	1	2	3	5	5	5	5	6	4	6	4	
3/26/08	1	2	1	4	842	10	1	2	3	4	5	3	3	7	3	7	4	the sample was too tough
3/26/08	1	2	2	5	913	10	1	2	3	6	4	3	3	7	3	7	3	the sample was too tough
3/26/08	1	2	5	6	432	10	1	2	3	4	4	6	4	7	4	7	5	
3/26/08	1	2	3	7	817	10	1	2	3	5	5	5	3	7	3	6	4	
3/26/08	1	2	7	8	628	10	1	2	3	6	5	7	6	6	7	7	6	
3/26/08	1	2	6	1	894	11	2	2	2	8	4	8	8	7	9	8	8	
3/26/08	1	2	8	2	862	11	2	2	2	8	8	7	4	8	8	6	4	flavor/aftertaste is not great
3/26/08	1	2	4	3	952	11	2	2	2	8	7	7	7	6	7	6	5	not juicy enough, rubbery

																		texture
3/26/08	1	2	1	4	842	11	2	2	2	4	4	6	6	5	7	6	7	
3/26/08	1	2	2	5	913	11	2	2	2	7	6	9	8	5	8	7	9	low intensity of lavor is good
3/26/08	1	2	5	6	432	11	2	2	2	4	4	6	5	6	5	5	4	too bland and boring
3/26/08	1	2	3	7	817	11	2	2	2	8	7	9	9	6	5	6	8	
3/26/08	1	2	7	8	628	11	2	2	2	4	5	8	9	6	8	6	8	good
3/26/08	1	2	6	1	894	12	2	1	1	3	7	2	2	8	2	4	1	
3/26/08	1	2	8	2	862	12	2	1	1	6	5	6	6	4	6	7	5	
3/26/08	1	2	4	3	952	12	2	1	1	6	5	6	6	4	4	6	4	
3/26/08	1	2	1	4	842	12	2	1	1	3	7	3	3	7	3	5	2	
3/26/08	1	2	2	5	913	12	2	1	1	5	6	4	4	6	4	5	4	
3/26/08	1	2	5	6	432	12	2	1	1	4	6	5	4	6	4	3	2	
3/26/08	1	2	3	7	817	12	2	1	1	4	6	3	3	8	1	4	1	
3/26/08	1	2	7	8	628	12	2	1	1	5	6	3	4	6	3	7	1	
3/26/08	1	2	6	1	894	13	2	2	1	8	6	8	8	6	3	4	6	
3/26/08	1	2	8	2	862	13	2	2	1	7	5	6	5	6	7	5	5	had a funny after flavor
3/26/08	1	2	4	3	952	13	2	2	1	7	5	4	3	6	8	5	3	
3/26/08	1	2	1	4	842	13	2	2	1	2	3	4	3	6	5	5	2	had a werid chemical flavor
3/26/08	1	2	2	5	913	13	2	2	1	3	3	5	4	5	6	4	5	
3/26/08	1	2	5	6	432	13	2	2	1	5	3	4	5	5	6	2	5	
3/26/08	1	2	3	7	817	13	2	2	1	3	1	6	5	4	6	5	4	
3/26/08	1	2	7	8	628	13	2	2	1	4	2	5	5	6	6	5	4	
3/26/08	1	2	6	1	894	14	2	2	1	7	4	6	7	6	3	5	4	too chewy
3/26/08	1	2	8	2	862	14	2	2	1	7	4	6	7	3	4	5	4	
3/26/08	1	2	4	3	952	14	2	2	1	7	3	.	5	6	7	6	5	
3/26/08	1	2	1	4	842	14	2	2	1	4	3	5	7	6	8	7	4	
3/26/08	1	2	2	5	913	14	2	2	1	8	7	7	7	6	7	6	4	
3/26/08	1	2	5	6	432	14	2	2	1	3	2	6	7	7	7	7	4	
3/26/08	1	2	3	7	817	14	2	2	1	6	6	6	4	4	7	5	4	
3/26/08	1	2	7	8	628	14	2	2	1	6	5	6	6	6	6	7	4	
3/26/08	1	2	6	1	894	15	2	1	1	1	4	3	2	5	3	7	1	bigger than expected

3/26/08	1	2	8	2	862	15	2	1	1	1	5	1	5	5	5	7	1	?
3/26/08	1	2	4	3	952	15	2	1	1	7	5	7	5	5	8	7	5	?
3/26/08	1	2	1	4	842	15	2	1	1	9	5	9	9	6	7	7	6	pretty good!
3/26/08	1	2	2	5	913	15	2	1	1	9	3	9	9	3	6	7	9	better than last sample
3/26/08	1	2	5	6	432	15	2	1	1	5	5	5	5	1	5	4	1	not as juicy! Very bland!
3/26/08	1	2	3	7	817	15	2	1	1	5	7	5	5	2	5	4	6	?
3/26/08	1	2	7	8	628	15	2	1	1	5	7	4	4	3	6	5	1	?
3/26/08	1	2	6	1	894	16	2	1	1	6	4	8	8	3	7	3	7	
3/26/08	1	2	8	2	862	16	2	1	1	6	3	5	6	3	7	6	5	
3/26/08	1	2	4	3	952	16	2	1	1	3	2	6	7	4	7	7	5	too pale
3/26/08	1	2	1	4	842	16	2	1	1	3	3	3	2	1	7	2	1	
3/26/08	1	2	2	5	913	16	2	1	1	6	3	6	6	4	5	5	4	
3/26/08	1	2	5	6	432	16	2	1	1	7	3	8	8	6	7	6	8	good taste, could be darker in color though
3/26/08	1	2	3	7	817	16	2	1	1	6	6	6	6	7	3	6	6	
3/26/08	1	2	7	8	628	16	2	1	1	1	1	6	6	6	8	9	6	I feel I just ate 6 samples of the same hotdog
3/26/08	1	3	3	1	817	17	2	2	1	6	6	5	3	4	7	4	3	
3/26/08	1	3	8	2	862	17	2	2	1	5	5	5	2	6	4	6	2	
3/26/08	1	3	6	3	894	17	2	2	1	5	6	5	3	6	5	6	2	
3/26/08	1	3	2	4	913	17	2	2	1	5	5	5	1	6	5	6	1	
3/26/08	1	3	5	5	432	17	2	2	1	5	4	5	3	6	5	6	1	
3/26/08	1	3	7	6	628	17	2	2	1	5	3	5	1	6	5	6	1	
3/26/08	1	3	4	7	952	17	2	2	1	5	5	5	3	6	4	6	1	
3/26/08	1	3	1	8	842	17	2	2	1	6	5	5	1	7	4	5	1	this one left an awful aftertaste
3/26/08	1	3	3	1	817	18	3	1	1	8	6	8	6	3	6	5	6	
3/26/08	1	3	8	2	862	18	3	1	1	7	6	7	8	7	7	7	8	
3/26/08	1	3	6	3	894	18	3	1	1	8	7	8	4	5	7	7	6	
3/26/08	1	3	2	4	913	18	3	1	1	7	6	7	8	6	9	7	8	
3/26/08	1	3	5	5	432	18	3	1	1	6	5	5	7	5	7	6	6	
3/26/08	1	3	7	6	628	18	3	1	1	7	6	7	8	7	8	8	8	
3/26/08	1	3	4	7	952	18	3	1	1	7	8	8	5	6	3	5	5	

3/26/08	1	3	1	8	842	18	3	1	1	7	6	8	7	7	8	6	6	
3/26/08	1	3	3	1	817	19	1	2	3	9	5	9	9	7	8	5	9	
3/26/08	1	3	8	2	862	19	1	2	3	5	4	8	8	7	7	6	8	
3/26/08	1	3	6	3	894	19	1	2	3	5	7	8	8	6	5	6	8	
3/26/08	1	3	2	4	913	19	1	2	3	5	6	6	6	6	5	5	8	
3/26/08	1	3	5	5	432	19	1	2	3	5	5	8	8	7	5	6	8	
3/26/08	1	3	7	6	628	19	1	2	3	5	4	3	3	5	5	5	5	
3/26/08	1	3	4	7	952	19	1	2	3	5	4	5	5	6	5	6	5	
3/26/08	1	3	1	8	842	19	1	2	3	5	6	4	4	5	5	5	5	
3/26/08	1	3	3	1	817	20	2	2	1	5	3	7	6	6	5	7	5	
3/26/08	1	3	8	2	862	20	2	2	1	6	5	7	6	7	5	5	6	
3/26/08	1	3	6	3	894	20	2	2	1	9	2	3	2	7	1	7	1	
3/26/08	1	3	2	4	913	20	2	2	1	4	4	.	3	1	1	2	2	
3/26/08	1	3	5	5	432	20	2	2	1	4	3	5	5	6	3	4	5	
3/26/08	1	3	7	6	628	20	2	2	1	3	1	6	6	3	7	6	6	
3/26/08	1	3	4	7	952	20	2	2	1	8	6	8	8	7	7	7	7	
3/26/08	1	3	1	8	842	20	2	2	1	7	5	5	4	7	2	4	3	
3/26/08	1	3	3	1	817	21	2	2	2	6	5	3	3	4	2	5	3	
3/26/08	1	3	8	2	862	21	2	2	2	5	6	4	4	6	5	6	5	
3/26/08	1	3	6	3	894	21	2	2	2	5	6	5	6	5	5	6	6	
3/26/08	1	3	2	4	913	21	2	2	2	4	5	6	4	4	5	4	4	
3/26/08	1	3	5	5	432	21	2	2	2	4	4	5	4	5	5	6	5	
3/26/08	1	3	7	6	628	21	2	2	2	3	6	6	6	.	8	6	7	
3/26/08	1	3	4	7	952	21	2	2	2	1	4	3	5	4	2	4	3	
3/26/08	1	3	1	8	842	21	2	2	2	5	6	7	7	5	5	7	8	
3/26/08	1	3	3	1	817	22	1	2	1	6	2	4	4	5	4	6	4	not bad, but not amazing
3/26/08	1	3	8	2	862	22	1	2	1	7	6	6	8	7	3	5	6	good taste, texture on the outside was very rubbery
3/26/08	1	3	6	3	894	22	1	2	1	7	5	4	5	5	4	5	5	
3/26/08	1	3	2	4	913	22	1	2	1	6	5	7	7	3	7	6	8	very good
3/26/08	1	3	5	5	432	22	1	2	1	7	4	8	8	2	8	6	7	great taste, uneven color
3/26/08	1	3	7	6	628	22	1	2	1	6	4	7	7	3	6	6	7	

3/26/08	1	3	4	7	952	22	1	2	1	3	2	3	3	4	3	5	4	
3/26/08	1	3	1	8	842	22	1	2	1	7	6	6	8	2	3	7	5	thick skin
3/26/08	1	3	3	1	817	23	2	2	2	3	4	4	7	4	3	7	3	the skin was tougher than to be expected
3/26/08	1	3	8	2	862	23	2	2	2	5	4	6	6	2	6	3	3	
3/26/08	1	3	6	3	894	23	2	2	2	6	6	7	8	7	7	6	6	
3/26/08	1	3	2	4	913	23	2	2	2	5	4	2	2	1	5	3	1	
3/26/08	1	3	5	5	432	23	2	2	2	5	3	.	8	7	7	8	7	
3/26/08	1	3	7	6	628	23	2	2	2	5	4	1	2	2	6	6	1	
3/26/08	1	3	4	7	952	23	2	2	2	3	2	.	3	3	7	5	2	
3/26/08	1	3	1	8	842	23	2	2	2	6	6	4	4	5	5	7	2	
3/26/08	1	3	3	1	817	24	2	1	1	7	7	7	4	3	6	6	5	not strong on flavor
3/26/08	1	3	8	2	862	24	2	1	1	7	7	7	5	5	4	5	5	
3/26/08	1	3	6	3	894	24	2	1	1	8	7	8	7	6	7	6	6	
3/26/08	1	3	2	4	913	24	2	1	1	7	6	7	6	3	6	7	5	
3/26/08	1	3	5	5	432	24	2	1	1	4	3	4	5	7	5	6	5	
3/26/08	1	3	7	6	628	24	2	1	1	5	5	5	6	5	6	6	5	
3/26/08	1	3	4	7	952	24	2	1	1	7	6	7	7	6	6	3	4	
3/26/08	1	3	1	8	842	24	2	1	1	5	4	4	5	7	4	2	2	
3/26/08	1	4	6	1	894	25	2	1	3	6	5	5	6	4	4	5	4	
3/26/08	1	4	5	2	432	25	2	1	3	2	2	5	5	3	5	3	1	
3/26/08	1	4	8	3	862	25	2	1	3	4	3	6	6	4	6	2	6	
3/26/08	1	4	4	4	952	25	2	1	3	4	2	4	4	3	6	4	5	
3/26/08	1	4	3	5	817	25	2	1	3	4	3	5	6	5	6	5	4	
3/26/08	1	4	1	6	842	25	2	1	3	4	2	4	5	4	3	2	3	
3/26/08	1	4	7	7	628	25	2	1	3	4	2	7	6	4	6	6	6	
3/26/08	1	4	2	8	913	25	2	1	3	4	3	5	5	3	5	4	3	
3/26/08	1	4	6	1	894	26	2	2	1	3	5	4	3	7	6	4	1	seems artificially pink and very processed. I water what all has been added besides meat…
3/26/08	1	4	5	2	432	26	2	2	1	4	4	4	5	5	3	5	1	

3/26/08	1	4	8	3	862	26	2	2	1	2	6	4	3	7	2	5	1	rubbery
3/26/08	1	4	4	4	952	26	2	2	1	2	7	2	3	7	1	6	1	very rubbery
3/26/08	1	4	3	5	817	26	2	2	1	1	8	3	3	6	2	4	1	
3/26/08	1	4	1	6	842	26	2	2	1	5	3	5	4	4	2	4	3	favorite so far, seemed a little more natural
3/26/08	1	4	7	7	628	26	2	2	1	4	6	6	6	4	2	5	3	half of casing white, other half pink
3/26/08	1	4	2	8	913	26	2	2	1	2	5	3	5	5	1	4	1	purple tine in color?
3/26/08	1	4	6	1	894	27	2	1	1	7	6	7	7	8	7	2	8	
3/26/08	1	4	5	2	432	27	2	1	1	6	3	7	7	3	8	7	7	
3/26/08	1	4	8	3	862	27	2	1	1	7	4	7	7	2	8	3	7	
3/26/08	1	4	4	4	952	27	2	1	1	8	4	7	6	5	7	6	7	
3/26/08	1	4	3	5	817	27	2	1	1	8	6	4	6	5	6	5	7	particles in hotdoge weren't expected
3/26/08	1	4	1	6	842	27	2	1	1	4	3	5	4	4	6	3	5	
3/26/08	1	4	7	7	628	27	2	1	1	7	6	6	6	5	7	6	7	
3/26/08	1	4	2	8	913	27	2	1	1	8	7	7	7	6	7	6	7	
3/26/08	1	4	6	1	894	28	2	2	1	8	4	8	8	6	4	5	8	
3/26/08	1	4	5	2	432	28	2	2	1	7	4	7	8	5	3	3	3	
3/26/08	1	4	8	3	862	28	2	2	1	6	5	8	8	6	7	4	7	
3/26/08	1	4	4	4	952	28	2	2	1	7	3	5	4	2	8	6	4	
3/26/08	1	4	3	5	817	28	2	2	1	6	7	8	8	6	9	6	8	
3/26/08	1	4	1	6	842	28	2	2	1	3	3	4	6	4	2	3	3	
3/26/08	1	4	7	7	628	28	2	2	1	7	3	9	8	6	9	7	9	
3/26/08	1	4	2	8	913	28	2	2	1	7	4	7	8	5	6	4	7	
3/26/08	1	4	6	1	894	29	1	2	1	5	5	6	7	6	3	4	5	
3/26/08	1	4	5	2	432	29	1	2	1	4	4	4	4	6	4	4	3	
3/26/08	1	4	8	3	862	29	1	2	1	4	4	4	4	5	4	4	3	
3/26/08	1	4	4	4	952	29	1	2	1	3	3	4	4	3	6	4	5	
3/26/08	1	4	3	5	817	29	1	2	1	5	5	5	4	3	4	4	3	
3/26/08	1	4	1	6	842	29	1	2	1	3	3	4	4	3	6	4	4	
3/26/08	1	4	7	7	628	29	1	2	1	2	4	4	6	6	6	5	5	the color on this one was dark in some areas and

																		almost white in others
3/26/08	1	4	2	8	913	29	1	2	1	5	4	4	3	6	4	5	4	
3/26/08	1	4	6	1	894	30	2	2	4	7	5	4	6	5	3	5	3	
3/26/08	1	4	5	2	432	30	2	2	4	3	3	4	4	6	7	5	5	
3/26/08	1	4	8	3	862	30	2	2	4	2	6	3	4	5	6	5	3	
3/26/08	1	4	4	4	952	30	2	2	4	3	4	7	6	6	3	4	6	
3/26/08	1	4	3	5	817	30	2	2	4	7	6	2	4	5	3	3	3	
3/26/08	1	4	1	6	842	30	2	2	4	2	4	3	3	3	4	4	2	
3/26/08	1	4	7	7	628	30	2	2	4	4	6	7	7	6	8	7	8	
3/26/08	1	4	2	8	913	30	2	2	4	3	7	3	3	5	5	6	3	
3/26/08	1	4	6	1	894	31	2	2	1	8	6	7	7	7	5	8	7	
3/26/08	1	4	5	2	432	31	2	2	1	1	2	1	1	8	1	7	1	
3/26/08	1	4	8	3	862	31	2	2	1	2	2	3	3	4	1	5	1	
3/26/08	1	4	4	4	952	31	2	2	1	5	3	5	7	7	3	9	1	
3/26/08	1	4	3	5	817	31	2	2	1	4	5	5	7	6	3	8	3	
3/26/08	1	4	1	6	842	31	2	2	1	1	2	3	2	6	4	7	1	
3/26/08	1	4	7	7	628	31	2	2	1	5	3	5	5	6	3	8	3	
3/26/08	1	4	2	8	913	31	2	2	1	2	1	2	2	6	3	6	3	
3/26/08	1	4	6	1	894	32	1	2	1	4	4	6	6	6	3	6	7	it was slightly chewy. The skin was kind of tuff
3/26/08	1	4	5	2	432	32	1	2	1	2	2	3	5	7	3	5	2	
3/26/08	1	4	8	3	862	32	1	2	1	6	4	3	5	5	3	6	4	kind of spongy
3/26/08	1	4	4	4	952	32	1	2	1	3	3	2	3	3	3	3	3	
3/26/08	1	4	3	5	817	32	1	2	1	3	4	3	4	4	2	3	4	
3/26/08	1	4	1	6	842	32	1	2	1	3	3	3	2	2	5	7	5	
3/26/08	1	4	7	7	628	32	1	2	1	7	5	8	8	7	8	8	9	
3/26/08	1	4	2	8	913	32	1	2	1	2	3	5	3	3	6	8	6	
3/27/08	2	1	1	1	73	51	1	1	1	8	6	6	5	3	6	8	3	
3/27/08	2	1	4	2	60	51	1	1	1	7	5	7	7	5	6	7	6	
3/27/08	2	1	8	3	612	51	1	1	1	6	6	6	6	6	6	6	6	it tasted a lot like the first two samples
3/27/08	2	1	7	4	709	51	1	1	1	6	6	7	7	6	6	6	6	

3/27/08	2	1	6	5	903	51	1	1	1	6	4	6	6	6	6	6	6	
3/27/08	2	1	3	6	608	51	1	1	1	6	6	7	7	6	6	6	6	
3/27/08	2	1	5	7	219	51	1	1	1	6	4	4	3	4	5	6	5	
3/27/08	2	1	2	8	45	51	1	1	1	6	4	7	7	6	6	7	7	all the samples tasted very similar. Color as nothing to do in my preference of a hotdog. Taste has everything.
3/27/08	2	1	1	1	73	52	2	2	2	9	6	6	6	4	3	2	4	the sample was too rubbery. It looked great just didn't taste as good.
3/27/08	2	1	4	2	60	52	2	2	2	9	5	9	8	8	8	8	9	much better I enjoyed the juiceness and pop of the outside casing
3/27/08	2	1	8	3	612	52	2	2	2	6	6	7	8	9	7	7	7	I didn't like that the meat looked pinker but I enjoyed the salty flavor
3/27/08	2	1	7	4	709	52	2	2	2	8	6	7	7	5	8	5	4	I like the texture a lot but everything else seemed medicore
3/27/08	2	1	6	5	903	52	2	2	2	6	8	7	9	8	8	6	6	I liked the texture and also the flavor
3/27/08	2	1	3	6	608	52	2	2	2	7	5	2	1	9	1	6	1	too tough
3/27/08	2	1	5	7	219	52	2	2	2	9	5	9	9	3	8	6	7	very agreeable all around
3/27/08	2	1	2	8	45	52	2	2	2	2	9	6	7	6	9	7	5	I'm in the middle because unless I knew what it tasted like I would pass it up
3/27/08	2	1	1	1	73	53	3	2	1	6	6	5	5	7	3	6	5	a little bit of a crunch when you bite into it, slightly chewy
3/27/08	2	1	4	2	60	53	3	2	1	5	5	7	7	5	5	6	6	
3/27/08	2	1	8	3	612	53	3	2	1	3	5	5	5	5	5	6	5	

3/27/08	2	1	7	4	709	53	3	2	1	5	5	4	4	5	3	7	6	smell is lighter than the others
3/27/08	2	1	6	5	903	53	3	2	1	5	5	5	5	7	5	5	4	chewy
3/27/08	2	1	3	6	608	53	3	2	1	4	6	3	3	6	3	6	6	
3/27/08	2	1	5	7	219	53	3	2	1	4	7	5	5	6	3	5	4	
3/27/08	2	1	2	8	45	53	3	2	1	4	6	5	5	5	6	6	6	
3/27/08	2	1	1	1	73	54	1	2	1	4	4	6	6	5	7	4	6	the texure was a bit chewy, rubbery
3/27/08	2	1	4	2	60	54	1	2	1	7	3	7	7	4	7	3	8	Tough to the bite and rubbery texture
3/27/08	2	1	8	3	612	54	1	2	1	7	4	6	6	4	5	4	6	less chewy
3/27/08	2	1	7	4	709	54	1	2	1	6	4	7	7	2	7	3	7	very bland flavor
3/27/08	2	1	6	5	903	54	1	2	1	7	4	6	6	5	5	4	6	stronger flavor, less rubbery, chewy texture
3/27/08	2	1	3	6	608	54	1	2	1	6	5	6	6	4	6	3	6	
3/27/08	2	1	5	7	219	54	1	2	1	6	4	5	5	4	6	3	6	
3/27/08	2	1	2	8	45	54	1	2	1	7	4	6	6	4	6	3	6	bland flavor
3/27/08	2	1	1	1	73	55	2	2	1	8	5	4	3	4	4	7	1	
3/27/08	2	1	4	2	60	55	2	2	1	7	5	6	6	3	7	6	5	
3/27/08	2	1	8	3	612	55	2	2	1	6	6	3	4	7	7	7	4	
3/27/08	2	1	7	4	709	55	2	2	1	8	7	7	6	6	8	4	6	
3/27/08	2	1	6	5	903	55	2	2	1	8	6	8	8	5	7	5	7	
3/27/08	2	1	3	6	608	55	2	2	1	7	7	7	6	6	5	5	7	
3/27/08	2	1	5	7	219	55	2	2	1	4	4	9	8	7	6	6	9	
3/27/08	2	1	2	8	45	55	2	2	1	8	7	8	8	5	7	8	9	
3/27/08	2	1	1	1	73	56	2	2	1	7	6	6	6	6	2	3	3	
3/27/08	2	1	4	2	60	56	2	2	1	7	5	3	3	5	3	4	3	
3/27/08	2	1	8	3	612	56	2	2	1	3	7	6	7	7	4	7	7	
3/27/08	2	1	7	4	709	56	2	2	1	6	5	5	3	7	6	8	5	
3/27/08	2	1	6	5	903	56	2	2	1	2	8	7	7	6	8	9	7	
3/27/08	2	1	3	6	608	56	2	2	1	6	6	3	3	5	7	4	2	
3/27/08	2	1	5	7	219	56	2	2	1	7	3	8	8	8	3	8	6	
3/27/08	2	1	2	8	45	56	2	2	1	3	7	7	8	7	8	9	7	
3/27/08	2	1	1	1	73	57	2	2	1	7	5	5	4	5	3	5	4	

3/27/08	2	1	4	2	60	57	2	2	1	8	6	7	7	5	6	7	7	
3/27/08	2	1	8	3	612	57	2	2	1	6	4	3	5	7	3	8	4	
3/27/08	2	1	7	4	709	57	2	2	1	7	7	.	5	7	5	7	5	
3/27/08	2	1	6	5	903	57	2	2	1	5	8	4	6	6	4	5	3	
3/27/08	2	1	3	6	608	57	2	2	1	8	5	8	7	3	6	5	8	
3/27/08	2	1	5	7	219	57	2	2	1	4	2	4	4	3	6	4	2	
3/27/08	2	1	2	8	45	57	2	2	1	5	4	8	7	7	7	6	8	
3/27/08	2	1	1	1	73	58	2	2	1	8	5	7	7	5	8	6	8	
3/27/08	2	1	4	2	60	58	2	2	1	8	5	5	4	4	8	6	3	
3/27/08	2	1	8	3	612	58	2	2	1	8	5	3	3	5	8	6	4	
3/27/08	2	1	7	4	709	58	2	2	1	8	5	6	7	6	8	6	7	
3/27/08	2	1	6	5	903	58	2	2	1	8	5	3	2	7	8	6	2	tasted an off-flavor
3/27/08	2	1	3	6	608	58	2	2	1	9	6	3	4	3	8	6	4	bland-not much flavor
3/27/08	2	1	5	7	219	58	2	2	1	8	5	7	7	6	8	5	7	
3/27/08	2	1	2	8	45	58	2	2	1	8	5	6	6	6	8	5	7	
3/27/08	2	2	8	1	612	59	1	2	1	4	3	7	6	4	3	4	3	
3/27/08	2	2	1	2	73	59	1	2	1	3	3	3	3	3	2	4	1	really disliked this one, had something white in it. Visually unappealing
3/27/08	2	2	5	3	219	59	1	2	1	5	3	6	7	6	6	7	7	
3/27/08	2	2	3	4	608	59	1	2	1	6	6	3	3	6	3	7	5	
3/27/08	2	2	7	5	709	59	1	2	1	5	6	7	7	7	7	7	8	really liked this one-great flavor
3/27/08	2	2	2	6	45	59	1	2	1	5	4	5	5	5	4	4	3	
3/27/08	2	2	6	7	903	59	1	2	1	1	6	2	5	6	5	6	4	there was a white streak running along the side, surly from preparation but it really turned me off!
3/27/08	2	2	4	8	60	59	1	2	1	.	6	6	6	5	5	6	5	
3/27/08	2	2	8	1	612	60	1	1	1	6	6	4	7	6	6	6	6	
3/27/08	2	2	1	2	73	60	1	1	1	6	4	7	7	3	6	7	7	maybe a little grainy
3/27/08	2	2	5	3	219	60	1	1	1	4	4	4	4	3	5	6	4	

3/27/08	2	2	3	4	608	60	1	1	1	6	3	6	7	3	6	6	6	
3/27/08	2	2	7	5	709	60	1	1	1	6	5	6	6	4	5	6	5	a little gummy
3/27/08	2	2	2	6	45	60	1	1	1	6	5	5	5	4	6	6	5	
3/27/08	2	2	6	7	903	60	1	1	1	6	6	6	5	4	6	5	5	
3/27/08	2	2	4	8	60	60	1	1	1	5	4	4	4	3	5	6	4	
3/27/08	2	2	8	1	612	61	2	1	1	7	4	7	7	6	6	7	6	
3/27/08	2	2	1	2	73	61	2	1	1	6	4	6	7	4	6	6	5	
3/27/08	2	2	5	3	219	61	2	1	1	7	4	6	7	5	5	6	6	
3/27/08	2	2	3	4	608	61	2	1	1	7	4	7	7	6	6	6	6	
3/27/08	2	2	7	5	709	61	2	1	1	6	5	6	6	6	7	6	6	
3/27/08	2	2	2	6	45	61	2	1	1	6	4	7	8	7	7	7	7	slight aftertaste
3/27/08	2	2	6	7	903	61	2	1	1	6	6	6	7	4	6	6	6	
3/27/08	2	2	4	8	60	61	2	1	1	6	5	6	6	5	6	6	6	
3/27/08	2	2	8	1	612	62	2	1	1	3	3	6	7	5	4	7	6	skin a little rubbery
3/27/08	2	2	1	2	73	62	2	1	1	6	4	6	7	6	7	8	6	skin a little rubbery, very similar to 612, smells great
3/27/08	2	2	5	3	219	62	2	1	1	6	4	5	4	3	4	7	3	
3/27/08	2	2	3	4	608	62	2	1	1	6	6	.	4	7	6	8	6	
3/27/08	2	2	7	5	709	62	2	1	1	6	7	3	4	3	4	7	3	
3/27/08	2	2	2	6	45	62	2	1	1	7	5	6	7	6	7	7	6	
3/27/08	2	2	6	7	903	62	2	1	1	6	6	6	6	6	6	8	5	
3/27/08	2	2	4	8	60	62	2	1	1	6	4	6	6	6	6	6	5	
3/27/08	2	2	8	1	612	63	3	2	2	8	5	.	2	7	2	6	3	hotdog casing was chewy-has strong aftertaste
3/27/08	2	2	1	2	73	63	3	2	2	8	7	3	6	3	7	7	7	a little bland-casing still a little tough-very dense
3/27/08	2	2	5	3	219	63	3	2	2	8	8	9	8	5	8	7	8	
3/27/08	2	2	3	4	608	63	3	2	2	8	8	8	5	3	3	3	5	very dense-chewy-tough exterior
3/27/08	2	2	7	5	709	63	3	2	2	8	8	8	8	4	7	7	8	
3/27/08	2	2	2	6	45	63	3	2	2	8	6	7	3	7	7	7	5	flavor was off some

3/27/08	2	2	6	7	903	63	3	2	2	7	7	7	8	5	6	7	7	chewy
3/27/08	2	2	4	8	60	63	3	2	2	8	8	7	7	3	4	3	5	dense and chewy
3/27/08	2	2	8	1	612	64	2	2	1	7	5	6	6	6	5	4	6	
3/27/08	2	2	1	2	73	64	2	2	1	6	5	4	4	5	5	5	4	
3/27/08	2	2	5	3	219	64	2	2	1	7	5	7	7	7	5	3	7	the casing seemed tougher on this one
3/27/08	2	2	3	4	608	64	2	2	1	7	6	3	4	4	5	6	3	so, far, I've liked this least
3/27/08	2	2	7	5	709	64	2	2	1	7	5	5	7	4	4	5	6	
3/27/08	2	2	2	6	45	64	2	2	1	7	5	5	4	5	3	5	6	very "chewy" texture
3/27/08	2	2	6	7	903	64	2	2	1	8	5	7	7	7	6	6	8	
3/27/08	2	2	4	8	60	64	2	2	1	8	7	7	8	6	6	6	7	
3/27/08	2	2	8	1	612	65	2	1	1	6	5	5	5	5	3	7	4	
3/27/08	2	2	1	2	73	65	2	1	1	7	7	6	6	6	7	4	7	
3/27/08	2	2	5	3	219	65	2	1	1	4	4	7	8	7	8	7	7	
3/27/08	2	2	3	4	608	65	2	1	1	5	7	5	6	6	7	5	2	
3/27/08	2	2	7	5	709	65	2	1	1	8	7	5	7	7	8	7	8	
3/27/08	2	2	2	6	45	65	2	1	1	6	4	5	7	8	7	7	6	
3/27/08	2	2	6	7	903	65	2	1	1	7	6	5	7	7	7	6	6	
3/27/08	2	2	4	8	60	65	2	1	1	5	6	5	4	5	7	5	6	
3/27/08	2	2	8	1	612	66	3	1	2	7	5	6	7	5	8	8	4	
3/27/08	2	2	1	2	73	66	3	1	2	4	3	4	5	5	2	4	2	tougher, hard to chew
3/27/08	2	2	5	3	219	66	3	1	2	7	4	7	8	8	5	4	5	
3/27/08	2	2	3	4	608	66	3	1	2	7	2	8	6	6	5	4	6	
3/27/08	2	2	7	5	709	66	3	1	2	7	6	5	8	8	7	8	7	
3/27/08	2	2	2	6	45	66	3	1	2	6	5	6	8	7	8	6	6	
3/27/08	2	2	6	7	903	66	3	1	2	8	7	8	8	9	7	6	6	
3/27/08	2	2	4	8	60	66	3	1	2	8	8	8	8	8	5	4	5	
3/27/08	2	3	6	1	903	67	1	2	2	4	5	6	6	5	5	7	6	it's good!
3/27/08	2	3	4	2	60	67	1	2	2	4	6	3	3	5	5	5	2	taste funny, needs more flavoring
3/27/08	2	3	3	3	608	67	1	2	2	6	5	6	6	6	6	6	5	good but a lot of salt flavor
3/27/08	2	3	5	4	219	67	1	2	2	6	5	5	4	5	5	4	5	very salty

3/27/08	2	3	7	5	709	67	1	2	2	4	6	5	6	5	6	4	5	
3/27/08	2	3	2	6	45	67	1	2	2	5	5	5	4	5	5	6	5	don’t really like the flavor but the juiceness makes it good
3/27/08	2	3	8	7	612	67	1	2	2	4	6	5	4	5	5	6	5	
3/27/08	2	3	1	8	73	67	1	2	2	5	5	5	6	5	5	5	5	wasn't as salty as the others which is good to me, but still salty
3/27/08	2	3	6	1	903	68	1	1	3	9	5	8	8	7	4	6	7	
3/27/08	2	3	4	2	60	68	1	1	3	7	5	7	8	7	7	7	7	
3/27/08	2	3	3	3	608	68	1	1	3	8	5	8	5	5	1	7	5	
3/27/08	2	3	5	4	219	68	1	1	3	9	5	9	6	6	5	5	5	
3/27/08	2	3	7	5	709	68	1	1	3	2	6	4	6	6	7	6	2	
3/27/08	2	3	2	6	45	68	1	1	3	9	5	9	7	6	9	6	9	
3/27/08	2	3	8	7	612	68	1	1	3	4	6	5	5	6	2	6	1	
3/27/08	2	3	1	8	73	68	1	1	3	8	5	9	5	5	5	3	4	
3/27/08	2	3	6	1	903	69	2	1	1	4	5	5	4	8	4	7	4	
3/27/08	2	3	4	2	60	69	2	1	1	5	6	5	6	3	4	5	6	
3/27/08	2	3	3	3	608	69	2	1	1	8	6	8	8	3	6	6	7	
3/27/08	2	3	5	4	219	69	2	1	1	7	5	7	5	5	8	3	6	
3/27/08	2	3	7	5	709	69	2	1	1	2	4	3	5	5	5	4	4	
3/27/08	2	3	2	6	45	69	2	1	1	4	5	5	5	5	5	3	5	
3/27/08	2	3	8	7	612	69	2	1	1	5	5	5	5	2	5	6	5	
3/27/08	2	3	1	8	73	69	2	1	1	6	4	6	4	5	5	8	7	
3/27/08	2	3	6	1	903	70	2	2	1	9	6	7	3	4	3	3	5	
3/27/08	2	3	4	2	60	70	2	2	1	9	7	7	7	4	6	5	5	
3/27/08	2	3	3	3	608	70	2	2	1	7	6	7	7	3	7	5	7	
3/27/08	2	3	5	4	219	70	2	2	1	7	6	7	8	5	6	6	7	
3/27/08	2	3	7	5	709	70	2	2	1	7	7	7	7	5	8	7	8	
3/27/08	2	3	2	6	45	70	2	2	1	8	7	7	2	2	5	7	5	
3/27/08	2	3	8	7	612	70	2	2	1	7	7	7	7	6	5	7	6	
3/27/08	2	3	1	8	73	70	2	2	1	7	5	6	5	3	6	7	6	
3/27/08	2	3	6	1	903	71	1	1	1	7	4	5	8	3	2	5	3	it has a werid chewy texture

3/27/08	2	3	4	2	60	71	1	1	1	7	5	5	5	4	2	5	2	chewy werid!
3/27/08	2	3	3	3	608	71	1	1	1	5	5	5	4	5	5	5	4	
3/27/08	2	3	5	4	219	71	1	1	1	4	4	5	3	3	2	5	2	
3/27/08	2	3	7	5	709	71	1	1	1	4	5	5	3	3	3	5	3	
3/27/08	2	3	2	6	45	71	1	1	1	3	5	5	1	5	5	5	1	flavor was off!
3/27/08	2	3	8	7	612	71	1	1	1	4	4	5	5	4	5	5	4	
3/27/08	2	3	1	8	73	71	1	1	1	4	4	5	2	5	2	5	2	
3/27/08	2	3	6	1	903	72	2	2	1	8	5	8	8	6	8	8	8	surprisinly tastey and juicy
3/27/08	2	3	4	2	60	72	2	2	1	8	5	7	8	6	6	5	7	texture was a little more rubbery and not as juicy
3/27/08	2	3	3	3	608	72	2	2	1	8	5	7	7	4	7	5	6	
3/27/08	2	3	5	4	219	72	2	2	1	7	4	8	8	6	8	7	8	overall quality seemed better for some reason
3/27/08	2	3	7	5	709	72	2	2	1	9	6	9	8	6	8	8	9	
3/27/08	2	3	2	6	45	72	2	2	1	8	7	8	6	3	5	5	6	the casing around hotdog was too chewy and it made product less juiicy
3/27/08	2	3	8	7	612	72	2	2	1	7	4	7	7	5	6	6	7	still pretty chewy
3/27/08	2	3	1	8	73	72	2	2	1	7	5	7	8	5	7	3	7	
3/27/08	2	3	6	1	903	73	1	2	1	9	7	9	9	7	3	5	3	
3/27/08	2	3	4	2	60	73	1	2	1	8	6	4	3	2	5	4	4	
3/27/08	2	3	3	3	608	73	1	2	1	7	4	4	4	3	6	6	5	
3/27/08	2	3	5	4	219	73	1	2	1	8	8	2	7	8	8	7	8	
3/27/08	2	3	7	5	709	73	1	2	1	4	6	6	9	8	8	8	8	
3/27/08	2	3	2	6	45	73	1	2	1	3	8	4	1	1	2	3	1	
3/27/08	2	3	8	7	612	73	1	2	1	1	1	1	5	6	6	6	5	spo on the piece of hotdog was unappealing
3/27/08	2	3	1	8	73	73	1	2	1	3	9	3	1	7	1	1	1	
3/27/08	2	3	6	1	903	74	2	1	2	5	6	5	6	3	5	6	3	buying this hotdog would depend on the price
3/27/08	2	3	4	2	60	74	2	1	2	4	4	4	6	5	6	4	5	

3/27/08	2	3	3	3	608	74	2	1	2	6	6	5	7	7	6	3	6	
3/27/08	2	3	5	4	219	74	2	1	2	7	4	7	5	6	6	4	3	
3/27/08	2	3	7	5	709	74	2	1	2	7	5	7	7	6	7	6	7	
3/27/08	2	3	2	6	45	74	2	1	2	6	5	6	6	6	6	3	5	
3/27/08	2	3	8	7	612	74	2	1	2	4	3	4	6	6	5	3	4	
3/27/08	2	3	1	8	73	74	2	1	2	5	4	5	6	5	4	3	3	
3/27/08	2	4	8	1	612	75	2	2	1	8	5	8	8	6	7	7	6	
3/27/08	2	4	6	2	903	75	2	2	1	4	4	3	4	4	2	6	3	
3/27/08	2	4	5	3	219	75	2	2	1	3	5	3	6	6	2	5	3	
3/27/08	2	4	7	4	709	75	2	2	1	5	5	7	6	3	6	4	6	
3/27/08	2	4	3	5	608	75	2	2	1	6	5	5	6	5	2	4	3	
3/27/08	2	4	4	6	60	75	2	2	1	5	6	3	3	3	2	4	2	
3/27/08	2	4	2	7	45	75	2	2	1	5	5	4	3	6	6	5	6	
3/27/08	2	4	1	8	73	75	2	2	1	6	4	6	7	6	2	5	4	
3/27/08	2	4	8	1	612	76	2	1	1	5	4	5	4	6	4	6	6	
3/27/08	2	4	6	2	903	76	2	1	1	5	4	5	5	3	4	6	6	
3/27/08	2	4	5	3	219	76	2	1	1	5	4	5	6	7	4	6	5	
3/27/08	2	4	7	4	709	76	2	1	1	5	4	5	4	6	4	5	6	
3/27/08	2	4	3	5	608	76	2	1	1	5	4	5	4	6	3	6	7	
3/27/08	2	4	4	6	60	76	2	1	1	5	4	5	4	6	4	5	7	
3/27/08	2	4	2	7	45	76	2	1	1	5	4	5	6	5	3	6	6	
3/27/08	2	4	1	8	73	76	2	1	1	5	4	5	6	4	5	6	5	
3/27/08	2	4	8	1	612	77	2	2	1	8	4	5	4	6	2	3	4	the outside was a bit tough
3/27/08	2	4	6	2	903	77	2	2	1	8	2	3	3	6	3	7	4	
3/27/08	2	4	5	3	219	77	2	2	1	7	3	5	6	4	2	2	3	outside is tough
3/27/08	2	4	7	4	709	77	2	2	1	8	2	7	7	7	5	3	6	
3/27/08	2	4	3	5	608	77	2	2	1	9	1	8	8	7	8	8	8	
3/27/08	2	4	4	6	60	77	2	2	1	6	4	6	6	5	6	5	5	
3/27/08	2	4	2	7	45	77	2	2	1	7	3	7	7	3	7	6	7	outside is tough
3/27/08	2	4	1	8	73	77	2	2	1	7	3	3	3	7	3	3	3	had a soapy taste to it
3/27/08	2	4	8	1	612	79	2	2	1	4	4	5	5	7	5	4	5	
3/27/08	2	4	6	2	903	79	2	2	1	5	5	6	6	6	5	4	5	

3/27/08	2	4	5	3	219	79	2	2	1	6	4	7	4	3	5	4	6	
3/27/08	2	4	7	4	709	79	2	2	1	5	5	6	6	4	5	3	6	
3/27/08	2	4	3	5	608	79	2	2	1	4	5	3	3	6	3	6	3	
3/27/08	2	4	4	6	60	79	2	2	1	5	5	4	4	2	3	3	3	
3/27/08	2	4	2	7	45	79	2	2	1	4	3	7	7	7	5	4	7	
3/27/08	2	4	1	8	73	79	2	2	1	4	3	2	2	2	2	1	1	
3/27/08	2	4	8	1	612	80	5	2	1	5	4	5	6	3	5	5	2	
3/27/08	2	4	6	2	903	80	5	2	1	6	4	5	5	4	4	5	4	
3/27/08	2	4	5	3	219	80	5	2	1	7	4	7	7	3	5	3	4	
3/27/08	2	4	7	4	709	80	5	2	1	5	3	5	5	2	5	4	3	
3/27/08	2	4	3	5	608	80	5	2	1	8	3	5	5	4	5	4	5	
3/27/08	2	4	4	6	60	80	5	2	1	5	3	4	5	4	5	5	3	
3/27/08	2	4	2	7	45	80	5	2	1	6	4	5	6	4	7	4	4	
3/27/08	2	4	1	8	73	80	5	2	1	7	3	8	5	8	4	5	3	
3/27/08	2	4	8	1	612	81	2	2	1	6	5	7	6	6	5	6	7	
3/27/08	2	4	6	2	903	81	2	2	1	5	6	3	3	4	5	5	4	
3/27/08	2	4	5	3	219	81	2	2	1	5	6	3	3	6	3	5	3	
3/27/08	2	4	7	4	709	81	2	2	1	5	6	5	6	6	5	5	6	
3/27/08	2	4	3	5	608	81	2	2	1	5	7	4	4	5	5	5	4	
3/27/08	2	4	4	6	60	81	2	2	1	5	6	4	5	5	3	4	3	
3/27/08	2	4	2	7	45	81	2	2	1	5	5	6	6	6	5	4	5	
3/27/08	2	4	1	8	73	81	2	2	1	5	5	4	4	4	5	5	5	
3/28/08	3	1	4	1	151	102	3	1	4	8	8	7	7	7	8	4	3	
3/28/08	3	1	7	2	444	102	3	1	4	7	7	7	6	3	8	6	7	
3/28/08	3	1	3	3	480	102	3	1	4	8	6	8	8	4	9	6	7	
3/28/08	3	1	8	4	653	102	3	1	4	8	6	8	5	7	7	7	5	
3/28/08	3	1	6	5	658	102	3	1	4	7	5	8	5	6	6	5	4	
3/28/08	3	1	2	6	51	102	3	1	4	7	5	8	6	6	7	7	8	
3/28/08	3	1	5	7	581	102	3	1	4	6	3	6	5	5	6	5	3	
3/28/08	3	1	1	8	199	102	3	1	4	7	6	6	6	4	4	4	3	
3/28/08	3	1	4	1	151	103	1	1	1	7	3	6	8	6	2	2	3	
3/28/08	3	1	7	2	444	103	1	1	1	1	2	1	1	3	2	3	1	seemed hard and chunky unpalatable

3/28/08	3	1	3	3	480	103	1	1	1	2	2	5	3	4	3	3	3	
3/28/08	3	1	8	4	653	103	1	1	1	2	3	4	6	4	2	3	2	
3/28/08	3	1	6	5	658	103	1	1	1	5	4	7	7	6	5	5	4	
3/28/08	3	1	2	6	51	103	1	1	1	5	3	4	3	2	4	1	4	skin/covering undesirable
3/28/08	3	1	5	7	581	103	1	1	1	5	2	6	4	2	1	2	3	
3/28/08	3	1	1	8	199	103	1	1	1	4	3	6	5	2	1	2	4	
3/28/08	3	1	4	1	151	104	1	1	1	7	6	4	8	7	3	4	3	the outer layer was too hard, it was an unpleasant texture
3/28/08	3	1	7	2	444	104	1	1	1	7	6	4	7	6	2	6	4	a little too tough
3/28/08	3	1	3	3	480	104	1	1	1	5	3	3	5	5	1	4	4	
3/28/08	3	1	8	4	653	104	1	1	1	5	5	6	8	6	6	6	6	
3/28/08	3	1	6	5	658	104	1	1	1	6	6	7	7	8	3	6	6	the texture of the skin is too hard
3/28/08	3	1	2	6	51	104	1	1	1	5	5	7	7	8	4	7	7	
3/28/08	3	1	5	7	581	104	1	1	1	5	5	6	6	6	3	6	6	
3/28/08	3	1	1	8	199	104	1	1	1	5	5	4	6	7	1	8	4	the texture again is unpleasant because of the skin toughness
3/28/08	3	1	4	1	151	105	1	1	2	9	4	8	9	7	7	7	9	a bity chewy and chunky
3/28/08	3	1	7	2	444	105	1	1	2	8	7	3	8	6	4	3	3	chunkier than the first
3/28/08	3	1	3	3	480	105	1	1	2	7	7	8	7	7	7	6	6	harder than preferred outside
3/28/08	3	1	8	4	653	105	1	1	2	7	5	5	8	5	5	4	4	too solid of meat. Breaks before I bite down all the way
3/28/08	3	1	6	5	658	105	1	1	2	8	3	5	4	2	3	1	1	very chewy and dry
3/28/08	3	1	2	6	51	105	1	1	2	5	4	5	6	3	6	3	6	good chewyness on center but tough skin
3/28/08	3	1	5	7	581	105	1	1	2	5	3	5	8	6	5	4	4	too solid on the center and skin
3/28/08	3	1	1	8	199	105	1	1	2	3	4	2	2	1	2	2	1	horrible dog

3/28/08	3	1	4	1	151	106	2	2	1	8	5	7	8	4	3	5	5	
3/28/08	3	1	7	2	444	106	2	2	1	6	6	4	4	4	7	7	6	
3/28/08	3	1	3	3	480	106	2	2	1	8	5	7	7	6	8	7	6	
3/28/08	3	1	8	4	653	106	2	2	1	7	6	5	5	3	5	4	3	
3/28/08	3	1	6	5	658	106	2	2	1	6	4	4	3	5	4	6	1	
3/28/08	3	1	2	6	51	106	2	2	1	7	7	6	6	5	2	3	3	
3/28/08	3	1	5	7	581	106	2	2	1	3	3	2	2	2	1	3	1	
3/28/08	3	1	1	8	199	106	2	2	1	7	5	6	6	4	5	6	5	
3/28/08	3	1	4	1	151	107	1	2	1	6	5	7	7	4	8	6	8	
3/28/08	3	1	7	2	444	107	1	2	1	5	6	3	3	7	2	7	2	chewy
3/28/08	3	1	3	3	480	107	1	2	1	5	5	5	5	5	7	5	6	
3/28/08	3	1	8	4	653	107	1	2	1	5	5	5	4	3	8	4	6	
3/28/08	3	1	6	5	658	107	1	2	1	5	5	8	8	7	7	5	8	
3/28/08	3	1	2	6	51	107	1	2	1	5	5	6	6	4	5	7	7	
3/28/08	3	1	5	7	581	107	1	2	1	5	3	7	7	5	7	4	6	
3/28/08	3	1	1	8	199	107	1	2	1	8	3	7	8	6	7	7	7	
3/28/08	3	1	4	1	151	108	2	2	1	7	5	6	6	4	6	6	6	
3/28/08	3	1	7	2	444	108	2	2	1	5	3	5	5	4	5	7	6	
3/28/08	3	1	3	3	480	108	2	2	1	4	3	4	4	3	5	4	4	
3/28/08	3	1	8	4	653	108	2	2	1	7	5	3	3	3	3	3	3	
3/28/08	3	1	6	5	658	108	2	2	1	5	3	4	4	3	5	3	2	
3/28/08	3	1	2	6	51	108	2	2	1	5	4	7	7	5	6	5	5	
3/28/08	3	1	5	7	581	108	2	2	1	4	3	4	4	4	4	4	4	
3/28/08	3	1	1	8	199	108	2	2	1	6	6	5	5	5	5	5	5	
3/28/08	3	3	5	1	581	117	3	2	3	7	6	7	7	7	1	2	1	outside skin to coarse
3/28/08	3	3	1	2	199	117	3	2	3	7	7	7	5	5	6	5	5	outside skin to coarse
3/28/08	3	3	3	3	480	117	3	2	3	9	5	7	4	4	9	7	5	outside skin to coarse
3/28/08	3	3	6	4	658	117	3	2	3	9	5	5	4	4	9	9	5	outside skin to coarse
3/28/08	3	3	4	5	151	117	3	2	3	6	5	6	6	5	8	6	6	outside skin to coarse
3/28/08	3	3	2	6	51	117	3	2	3	9	6	9	8	7	9	9	9	outside skin to coarse
3/28/08	3	3	7	7	444	117	3	2	3	7	5	5	4	5	2	4	5	outside skin to coarse, has a

																		funny taste to it
3/28/08	3	3	8	8	653	117	3	2	3	7	5	5	5	4	4	1	.	outside skin to coarse
3/28/08	3	3	5	1	581	118	2	2	2	7	4	8	8	7	6	5	7	kinda chewey, but good
3/28/08	3	3	1	2	199	118	2	2	2	7	6	6	6	9	5	4	6	not good aftertaste
3/28/08	3	3	3	3	480	118	2	2	2	8	7	8	8	7	7	7	8	little flavor and taste
3/28/08	3	3	6	4	658	118	2	2	2	8	7	6	7	7	4	7	4	tasted werid, texture=uhh?
3/28/08	3	3	4	5	151	118	2	2	2	7	6	8	8	7	7	7	7	
3/28/08	3	3	2	6	51	118	2	2	2	5	4	8	8	8	7	8	7	
3/28/08	3	3	7	7	444	118	2	2	2	6	6	7	6	8	1	8	6	tough to chew! Skin is tough
3/28/08	3	3	8	8	653	118	2	2	2	3	7	7	8	9	8	6	7	
3/28/08	3	3	5	1	581	119	2	1	1	9	5	7	7	6	4	4	6	
3/28/08	3	3	1	2	199	119	2	1	1	7	4	6	6	8	3	7	6	rubbery
3/28/08	3	3	3	3	480	119	2	1	1	7	5	8	9	7	8	7	8	good flavor
3/28/08	3	3	6	4	658	119	2	1	1	7	5	7	7	7	4	7	6	
3/28/08	3	3	4	5	151	119	2	1	1	5	5	7	6	6	6	6	5	
3/28/08	3	3	2	6	51	119	2	1	1	7	6	7	8	7	6	7	6	
3/28/08	3	3	7	7	444	119	2	1	1	5	7	6	6	6	3	5	5	rubbery, off-flavor
3/28/08	3	3	8	8	653	119	2	1	1	4	4	2	2	8	3	3	2	bad flavor, rubbery and dry
3/28/08	3	3	5	1	581	120	2	2	1	4	4	3	3	4	2	3	1	
3/28/08	3	3	1	2	199	120	2	2	1	5	4	4	4	2	3	4	2	
3/28/08	3	3	3	3	480	120	2	2	1	5	5	6	6	6	6	6	4	
3/28/08	3	3	6	4	658	120	2	2	1	6	5	6	7	6	3	5	3	
3/28/08	3	3	4	5	151	120	2	2	1	3	6	3	3	7	5	6	3	
3/28/08	3	3	2	6	51	120	2	2	1	7	5	7	7	6	6	3	5	
3/28/08	3	3	7	7	444	120	2	2	1	5	4	6	6	7	5	6	5	
3/28/08	3	3	8	8	653	120	2	2	1	5	6	3	4	6	6	4	3	
3/28/08	3	3	5	1	581	121	1	2	1	7	6	8	8	8	6	7	6	
3/28/08	3	3	1	2	199	121	1	2	1	7	7	6	6	8	3	6	4	
3/28/08	3	3	3	3	480	121	1	2	1	7	7	8	8	7	7	8	7	
3/28/08	3	3	6	4	658	121	1	2	1	7	8	.	6	6	7	8	6	
3/28/08	3	3	4	5	151	121	1	2	1	7	7	7	7	8	6	6	6	

3/28/08	3	3	2	6	51	121	1	2	1	8	9	6	5	5	7	7	6	
3/28/08	3	3	7	7	444	121	1	2	1	4	8	.	7	7	6	7	6	
3/28/08	3	3	8	8	653	121	1	2	1	6	7	.	7	6	6	6	6	
3/28/08	3	3	5	1	581	122	1	2	1	7	4	2	6	4	1	2	3	
3/28/08	3	3	1	2	199	122	1	2	1	6	4	4	7	7	3	6	4	
3/28/08	3	3	3	3	480	122	1	2	1	7	3	4	8	7	3	4	4	
3/28/08	3	3	6	4	658	122	1	2	1	5	5	6	7	8	3	4	6	
3/28/08	3	3	4	5	151	122	1	2	1	5	4	4	4	6	1	4	3	
3/28/08	3	3	2	6	51	122	1	2	1	6	6	5	4	8	6	7	6	
3/28/08	3	3	7	7	444	122	1	2	1	3	6	3	3	5	2	3	3	
3/28/08	3	3	8	8	653	122	1	2	1	6	4	6	6	7	5	6	6	
3/28/08	3	3	5	1	581	123	5	2	1	8	5	3	5	5	2	3	2	rubbery
3/28/08	3	3	1	2	199	123	5	2	1	7	7	4	3	3	2	4	2	
3/28/08	3	3	3	3	480	123	5	2	1	4	7	3	2	6	7	3	2	
3/28/08	3	3	6	4	658	123	5	2	1	7	7	5	4	7	3	4	5	
3/28/08	3	3	4	5	151	123	5	2	1	4	4	.	4	5	4	3	4	
3/28/08	3	3	2	6	51	123	5	2	1	7	7	7	7	7	5	7	7	
3/28/08	3	3	7	7	444	123	5	2	1	7	7	3	5	7	3	2	3	
3/28/08	3	3	8	8	653	123	5	2	1	8	7	3	5	6	3	2	2	
3/28/08	3	3	5	1	581	124	5	2	2	6	6	6	6	6	4	4	5	the skin is so hard to break out
3/28/08	3	3	1	2	199	124	5	2	2	7	7	7	7	7	5	7	6	the skin is so hard to break out
3/28/08	3	3	3	3	480	124	5	2	2	6	7	4	5	5	3	8	3	
3/28/08	3	3	6	4	658	124	5	2	2	4	7	6	6	3	4	7	5	
3/28/08	3	3	4	5	151	124	5	2	2	3	4	3	4	4	3	7	3	
3/28/08	3	3	2	6	51	124	5	2	2	7	6	.	7	7	6	6	7	
3/28/08	3	3	7	7	444	124	5	2	2	6	7	6	7	7	7	7	7	
3/28/08	3	3	8	8	653	124	5	2	2	7	7	7	7	7	7	7	7	
3/28/08	3	4	4	1	151	125	2	1	2	5	3	6	8	2	3	7	7	not much flavor, a little tough around he outside
3/28/08	3	4	8	2	653	125	2	1	2	7	5	5	6	6	7	7	6	

3/28/08	3	4	1	3	199	125	2	1	2	4	3	3	3	2	3	7	2	very bland, not good texture
3/28/08	3	4	7	4	444	125	2	1	2	7	7	8	8	7	3	7	8	taste was very good, not great texture
3/28/08	3	4	5	5	581	125	2	1	2	3	3	7	.	5	7	6	6	
3/28/08	3	4	2	6	51	125	2	1	2	5	5	6	6	6	3	7	5	
3/28/08	3	4	6	7	658	125	2	1	2	4	6	6	6	6	4	7	3	
3/28/08	3	4	3	8	480	125	2	1	2	4	3	6	8	6	3	6	5	
3/28/08	3	4	4	1	151	126	3	2	3	6	4	5	5	3	3	3	3	kind of hard to bite thru because of firm texture
3/28/08	3	4	8	2	653	126	3	2	3	5	5	6	5	4	4	4	5	skin is kind tough to bite into
3/28/08	3	4	1	3	199	126	3	2	3	6	5	3	3	3	3	4	3	almost too firm
3/28/08	3	4	7	4	444	126	3	2	3	7	6	8	8	7	7	7	7	I'm not really a texture person with foods
3/28/08	3	4	5	5	581	126	3	2	3	6	4	2	2	6	6	5	3	has a twang aftertaste that's strange
3/28/08	3	4	2	6	51	126	3	2	3	6	5	8	8	7	6	7	8	skin is kind of tough to bite through
3/28/08	3	4	6	7	658	126	3	2	3	6	5	6	7	5	5	6	6	this tastes like the others - is it the same product?
3/28/08	3	4	3	8	480	126	3	2	3	7	5	6	6	5	6	6	6	
3/28/08	3	4	4	1	151	127	2	2	2	7	5	8	8	6	7	6	8	
3/28/08	3	4	8	2	653	127	2	2	2	8	6	7	8	6	6	7	6	
3/28/08	3	4	1	3	199	127	2	2	2	7	6	8	8	6	8	6	8	I really liked the texture that's not too juicy or to dry
3/28/08	3	4	7	4	444	127	2	2	2	8	7	8	8	7	9	5	9	the best so far. Nice color, texture and flavor!
3/28/08	3	4	5	5	581	127	2	2	2	6	4	7	7	6	7	7	7	
3/28/08	3	4	2	6	51	127	2	2	2	7	7	6	7	6	7	6	8	
3/28/08	3	4	6	7	658	127	2	2	2	8	8	7	7	6	6	6	8	
3/28/08	3	4	3	8	480	127	2	2	2	7	8	8	8	6	8	6	8	

3/28/08	3	4	4	1	151	128	2	1	2	5	3	5	8	3	7	2	8	
3/28/08	3	4	8	2	653	128	2	1	2	8	3	8	8	3	8	2	8	
3/28/08	3	4	1	3	199	128	2	1	2	7	2	6	8	4	6	2	6	
3/28/08	3	4	7	4	444	128	2	1	2	6	4	8	9	4	7	4	9	
3/28/08	3	4	5	5	581	128	2	1	2	5	2	8	8	3	8	4	8	
3/28/08	3	4	2	6	51	128	2	1	2	8	2	9	9	1	9	1	9	
3/28/08	3	4	6	7	658	128	2	1	2	7	3	8	8	3	9	1	9	
3/28/08	3	4	3	8	480	128	2	1	2	7	3	8	9	1	9	1	9	
3/28/08	3	4	4	1	151	129	1	2	1	6	6	5	4	4	3	6	4	rubbery texture
3/28/08	3	4	8	2	653	129	1	2	1	6	4	6	6	6	6	6	7	I liked the casing
3/28/08	3	4	1	3	199	129	1	2	1	6	3	5	5	3	6	4	5	
3/28/08	3	4	7	4	444	129	1	2	1	6	6	6	7	6	6	7	7	
3/28/08	3	4	5	5	581	129	1	2	1	7	2	6	3	5	3	6	3	didn't like the aftertaste
3/28/08	3	4	2	6	51	129	1	2	1	6	6	4	4	6	5	4	4	
3/28/08	3	4	6	7	658	129	1	2	1	7	5	6	7	4	7	3	6	
3/28/08	3	4	3	8	480	129	1	2	1	6	6	4	4	7	4	4	4	
3/28/08	3	4	4	1	151	130	2	2	1	7	6	7	7	4	8	3	7	that was good for a a hotdog
3/28/08	3	4	8	2	653	130	2	2	1	5	6	3	3	6	3	7	1	
3/28/08	3	4	1	3	199	130	2	2	1	4	4	2	1	7	2	3	1	real rubbery, gross
3/28/08	3	4	7	4	444	130	2	2	1	5	4	2	2	4	3	3	1	this had a little more juice than the last, still gross
3/28/08	3	4	5	5	581	130	2	2	1	3	5	1	1	5	1	1	1	again, gross! Slightly too porky
3/28/08	3	4	2	6	51	130	2	2	1	5	4	4	4	4	4	4	1	little better, still kinda gross
3/28/08	3	4	6	7	658	130	2	2	1	5	5	1	1	6	1	1	1	really gross
3/28/08	3	4	3	8	480	130	2	2	1	2	6	3	3	6	3	3	1	nope, gross
3/28/08	3	4	4	1	151	131	2	1	1	3	3	5	6	3	4	5	2	
3/28/08	3	4	8	2	653	131	2	1	1	4	4	4	4	4	5	5	3	tastes and looks like the last one
3/28/08	3	4	1	3	199	131	2	1	1	4	4	5	5	5	5	5	3	
3/28/08	3	4	7	4	444	131	2	1	1	5	4	5	5	5	4	5	4	the texture was similar to a sponge, you probably aren't

																		cooking it the same as I would, they all taste the same
3/28/08	3	4	5	5	581	131	2	1	1	5	3	4	5	5	6	5	4	
3/28/08	3	4	2	6	51	131	2	1	1	5	4	5	4	5	6	5	3	
3/28/08	3	4	6	7	658	131	2	1	1	5	4	5	5	6	5	5	4	
3/28/08	3	4	3	8	480	131	2	1	1	5	4	5	4	6	6	5	3	
3/28/08	3	4	4	1	151	132	2	1	1	4	3	4	5	4	4	2	2	
3/28/08	3	4	8	2	653	132	2	1	1	4	3	6	7	5	5	4	4	
3/28/08	3	4	1	3	199	132	2	1	1	2	2	4	3	3	2	2	2	
3/28/08	3	4	7	4	444	132	2	1	1	4	3	4	4	3	3	3	2	
3/28/08	3	4	5	5	581	132	2	1	1	2	2	3	3	2	2	3	2	
3/28/08	3	4	2	6	51	132	2	1	1	5	5	4	4	4	4	3	4	
3/28/08	3	4	6	7	658	132	2	1	1	3	4	4	4	4	4	4	3	
3/28/08	3	4	3	8	480	132	2	1	1	4	3	3	3	4	4	4	3	
3/28/08	3	5	6	1	658	133	2	1	1	7	5	3	7	5	2	3	3	
3/28/08	3	5	4	2	151	133	2	1	1	7	5	3	6	4	3	5	3	
3/28/08	3	5	5	3	581	133	2	1	1	5	3	6	7	5	3	5	4	
3/28/08	3	5	7	4	444	133	2	1	1	7	4	5	6	5	5	4	4	
3/28/08	3	5	3	5	480	133	2	1	1	7	6	4	6	3	3	5	3	
3/28/08	3	5	1	6	199	133	2	1	1	4	4	4	5	5	3	3	3	
3/28/08	3	5	2	7	51	133	2	1	1	6	6	4	5	4	4	4	3	
3/28/08	3	5	8	8	653	133	2	1	1	7	6	5	7	4	4	5	5	
3/28/08	3	5	6	1	658	134	5	2	1	8	6	6	5	3	3	5	5	
3/28/08	3	5	4	2	151	134	5	2	1	8	6	5	4	5	5	4	4	rubbery texture
3/28/08	3	5	5	3	581	134	5	2	1	1	2	2	2	2	3	2	1	
3/28/08	3	5	7	4	444	134	5	2	1	8	6	4	5	4	2	4	3	rubbery texture
3/28/08	3	5	3	5	480	134	5	2	1	8	7	3	3	3	3	4	5	
3/28/08	3	5	1	6	199	134	5	2	1	7	5	2	3	3	2	8	2	
3/28/08	3	5	2	7	51	134	5	2	1	8	8	7	6	6	6	5	4	
3/28/08	3	5	8	8	653	134	5	2	1	7	6	4	4	5	4	5	8	too much outside skin
3/28/08	3	5	6	1	658	135	3	1	4	8	5	8	9	8	9	8	9	
3/28/08	3	5	4	2	151	135	3	1	4	8	7	9	9	1	8	8	9	

3/28/08	3	5	5	3	581	135	3	1	4	7	2	8	7	4	7	5	5	
3/28/08	3	5	7	4	444	135	3	1	4	8	1	9	5	6	6	5	6	
3/28/08	3	5	3	5	480	135	3	1	4	9	4	5	5	6	6	7	5	
3/28/08	3	5	1	6	199	135	3	1	4	9	2	8	8	1	8	7	7	
3/28/08	3	5	2	7	51	135	3	1	4	7	4	5	5	5	6	6	4	
3/28/08	3	5	8	8	653	135	3	1	4	7	1	7	7	3	6	6	6	
3/28/08	3	5	6	1	658	136	2	1	1	7	5	5	5	3	4	3	7	
3/28/08	3	5	4	2	151	136	2	1	1	5	4	6	6	4	5	5	5	
3/28/08	3	5	5	3	581	136	2	1	1	6	5	7	7	5	7	6	7	
3/28/08	3	5	7	4	444	136	2	1	1	3	3	4	4	4	4	4	3	
3/28/08	3	5	3	5	480	136	2	1	1	5	4	7	7	6	6	6	7	
3/28/08	3	5	1	6	199	136	2	1	1	5	4	7	7	5	5	4	6	
3/28/08	3	5	2	7	51	136	2	1	1	4	4	6	6	5	5	4	5	
3/28/08	3	5	8	8	653	136	2	1	1	6	4	6	7	5	6	5	6	
3/28/08	3	5	6	1	658	137	2	1	2	7	5	7	6	4	5	8	4	
3/28/08	3	5	4	2	151	137	2	1	2	3	6	4	7	4	8	9	4	very juicy hotdog
3/28/08	3	5	5	3	581	137	2	1	2	7	2	7	8	3	9	7	9	very good hotdog - very palatable
3/28/08	3	5	7	4	444	137	2	1	2	5	6	5	3	7	4	8	4	tougher texture than the rest (tougher)
3/28/08	3	5	3	5	480	137	2	1	2	7	8	7	7	4	8	9	7	
3/28/08	3	5	1	6	199	137	2	1	2	6	7	7	8	4	7	7	8	casing has a good snap while retaining very soft/juicy center
3/28/08	3	5	2	7	51	137	2	1	2	7	3	7	7	4	6	8	6	was tougher than expected but flavor was spicier
3/28/08	3	5	8	8	653	137	2	1	2	7	4	7	8	3	9	6	9	red casing lighter center
3/28/08	3	5	6	1	658	138	2	1	1	7	4	4	6	6	2	3	4	chewy
3/28/08	3	5	4	2	151	138	2	1	1	8	4	5	6	6	3	5	5	still chewy
3/28/08	3	5	5	3	581	138	2	1	1	5	3	4	3	7	4	6	3	tasted off
3/28/08	3	5	7	4	444	138	2	1	1	7	6	7	7	5	6	6	7	chewy but good
3/28/08	3	5	3	5	480	138	2	1	1	6	4	4	4	6	3	4	4	chewy

3/28/08	3	5	1	6	199	138	2	1	1	6	5	7	7	5	4	6	6	chewy
3/28/08	3	5	2	7	51	138	2	1	1	6	4	4	6	5	3	5	4	chewy
3/28/08	3	5	8	8	653	138	2	1	1	5	4	3	4	4	3	5	3	chewy
3/28/08	3	5	6	1	658	139	2	2	2	7	4	7	8	6	6	7	4	there was a crispy crunch when biting into the hotdog - this was enjoyable. Great aroma
3/28/08	3	5	4	2	151	139	2	2	2	7	7	6	5	4	3	5	3	the product was very tender
3/28/08	3	5	5	3	581	139	2	2	2	3	3	6	4	3	3	6	5	there seemed to be a lot of fat in the product
3/28/08	3	5	7	4	444	139	2	2	2	7	5	3	3	6	3	6	3	extremely chewy
3/28/08	3	5	3	5	480	139	2	2	2	6	6	6	6	7	7	8	4	this product has a nice tenderness to it
3/28/08	3	5	1	6	199	139	2	2	2	5	4	4	2	2	2	4	2	very tough product
3/28/08	3	5	2	7	51	139	2	2	2	6	7	3	3	3	4	4	3	very bland in flavor and chewy
3/28/08	3	5	8	8	653	139	2	2	2	7	6	7	7	7	4	3	6	slight saltyness to the product
3/28/08	3	5	6	1	658	140	2	2	1	8	6	6	7	7	5	6	4	
3/28/08	3	5	4	2	151	140	2	2	1	3	7	6	6	7	6	6	3	
3/28/08	3	5	5	3	581	140	2	2	1	5	4	6	6	4	5	6	5	
3/28/08	3	5	7	4	444	140	2	2	1	8	7	7	7	7	6	7	7	
3/28/08	3	5	3	5	480	140	2	2	1	7	6	6	4	5	5	6	5	
3/28/08	3	5	1	6	199	140	2	2	1	7	5	7	5	4	5	5	4	
3/28/08	3	5	2	7	51	140	2	2	1	7	5	7	7	6	5	6	7	
3/28/08	3	5	8	8	653	140	2	2	1	6	6	7	7	6	6	5	6	
3/28/08	3	6	7	1	444	141	2	1	1	7	6	4	7	7	3	8	3	
3/28/08	3	6	3	2	480	141	2	1	1	4	3	3	2	2	5	3	3	
3/28/08	3	6	2	3	51	141	2	1	1	5	4	4	4	3	3	5	4	
3/28/08	3	6	8	4	653	141	2	1	1	6	6	6	7	7	5	5	6	
3/28/08	3	6	1	5	199	141	2	1	1	5	4	4	4	4	3	5	4	
3/28/08	3	6	4	6	151	141	2	1	1	5	5	3	3	6	2	3	3	
3/28/08	3	6	5	7	581	141	2	1	1	5	5	5	5	6	3	3	4	

3/28/08	3	6	6	8	658	141	2	1	1	5	4	4	5	6	2	4	4

H-4. P2S5: Raw data for trained descriptive texture sensory evaluation for frankfurters.

Date	Rep	Meat	Trt	Order	Sample	Panelist	Spring	Fract	Hard	Cohes	Juice
04/22/08	1	PSE	4	1	845	Higgins	6	6	6	6	6
04/22/08	1	Normal	3	2	019	Higgins	9	6	6	7	5
04/22/08	1	Normal	4	3	299	Higgins	8	5	7	7	6
04/22/08	1	PSE	2	4	447	Higgins	9	6	7	7	7
04/22/08	1	Normal	2	5	086	Higgins	10	6	8	7	7
04/22/08	1	Normal	1	6	245	Higgins	10	6	7	7	6
04/22/08	1	PSE	1	7	563	Higgins	11	7	8	7	6
04/22/08	1	PSE	3	8	912	Higgins	9	6	6	7	6
04/22/08	1	PSE	4	1	845	Kohel	10	7	7	5	6
04/22/08	1	Normal	3	2	019	Kohel	11	7	7	5	6
04/22/08	1	Normal	4	3	299	Kohel	10	7	7	6	5
04/22/08	1	PSE	2	4	447	Kohel	10	7	7	6	6
04/22/08	1	Normal	2	5	086	Kohel	11	7	7	6	7
04/22/08	1	Normal	1	6	245	Kohel	11	7	7	6	7
04/22/08	1	PSE	1	7	563	Kohel	11	7	7	6	7
04/22/08	1	PSE	3	8	912	Kohel	11	7	7	6	7
04/22/08	1	PSE	4	1	845	Gray	12	7	8	10	5
04/22/08	1	Normal	3	2	019	Gray	11	6	8	10	4
04/22/08	1	Normal	4	3	299	Gray	12	6	7	10	5
04/22/08	1	PSE	2	4	447	Gray	13	7	8	11	4
04/22/08	1	Normal	2	5	086	Gray	12	7	8	11	4
04/22/08	1	Normal	1	6	245	Gray	11	7	8	11	5
04/22/08	1	PSE	1	7	563	Gray	12	8	8	11	4
04/22/08	1	PSE	3	8	912	Gray	13	7	7	11	5
04/22/08	1	PSE	4	1	845	Inglis	13	6	7	10	5
04/22/08	1	Normal	3	2	019	Inglis	13	6	7	10	5
04/22/08	1	Normal	4	3	299	Inglis	13	6	7	10	5
04/22/08	1	PSE	2	4	447	Inglis	13	6	7	10	5
04/22/08	1	Normal	2	5	086	Inglis	13	6	7	10	5
04/22/08	1	Normal	1	6	245	Inglis	13	6	7	10	5

04/22/08	1	PSE	1	7	563	Inglis	13	6	7	10	5
04/22/08	1	PSE	3	8	912	Inglis	13	6	7	10	5
04/22/08	1	PSE	4	1	845	Runyon	13	7	8	5	2
04/22/08	1	Normal	3	2	019	Runyon	12	6	7	5	3
04/22/08	1	Normal	4	3	299	Runyon	13	7	8	5	2
04/22/08	1	PSE	2	4	447	Runyon	13	6	7	5	2
04/22/08	1	Normal	2	5	086	Runyon	12	6	7	5	2
04/22/08	1	Normal	1	6	245	Runyon	13	6	7	5	3
04/22/08	1	PSE	1	7	563	Runyon	12	6	7	5	3
04/22/08	1	PSE	3	8	912	Runyon	13	7	7	5	2
04/23/08	2	Normal	2	1	839	Higgins	10	5	6	6	6
04/23/08	2	Normal	4	2	377	Higgins	9	5	7	7	6
04/23/08	2	PSE	1	3	893	Higgins	11	6	7	7	6
04/23/08	2	Normal	1	4	773	Higgins	10	6	8	8	6
04/23/08	2	PSE	4	5	108	Higgins	9	5	8	7	5
04/23/08	2	PSE	3	6	458	Higgins	10	6	8	7	6
04/23/08	2	Normal	3	7	848	Higgins	11	6	7	8	6
04/23/08	2	PSE	2	8	490	Higgins	10	5	7	7	6
04/23/08	2	Normal	2	1	839	Kohel	12	6	7	5	5
04/23/08	2	Normal	4	2	377	Kohel	12	6	7	6	5
04/23/08	2	PSE	1	3	893	Kohel	12	6	7	6	4
04/23/08	2	Normal	1	4	773	Kohel	13	6	7	6	5
04/23/08	2	PSE	4	5	108	Kohel	13	6	7	6	5
04/23/08	2	PSE	3	6	458	Kohel	13	6	7	6	6
04/23/08	2	Normal	3	7	848	Kohel	12	6	6	6	6
04/23/08	2	PSE	2	8	490	Kohel	13	6	7	6	6
04/23/08	2	Normal	2	1	839	Gray	11	6	7	9	6
04/23/08	2	Normal	4	2	377	Gray	12	7	7	10	6
04/23/08	2	PSE	1	3	893	Gray	11	8	9	10	6
04/23/08	2	Normal	1	4	773	Gray	12	8	8	10	7
04/23/08	2	PSE	4	5	108	Gray	13	7	8	10	7
04/23/08	2	PSE	3	6	458	Gray	13	6	7	10	7
04/23/08	2	Normal	3	7	848	Gray	12	6	8	10	7

04/23/08	2	PSE	2	8	490	Gray	13	6	8	10	6
04/23/08	2	Normal	2	1	839	Inglis	13	6	7	8	3
04/23/08	2	Normal	4	2	377	Inglis	13	6	7	8	3
04/23/08	2	PSE	1	3	893	Inglis	13	6	7	8	3
04/23/08	2	Normal	1	4	773	Inglis	13	6	7	8	3
04/23/08	2	PSE	4	5	108	Inglis	13	6	7	8	3
04/23/08	2	PSE	3	6	458	Inglis	13	6	7	8	3
04/23/08	2	Normal	3	7	848	Inglis	13	6	7	8	3
04/23/08	2	PSE	2	8	490	Inglis	13	6	7	8	3
04/23/08	2	Normal	2	1	839	Runyon	12	6	6	5	2
04/23/08	2	Normal	4	2	377	Runyon	12	6	6	5	2
04/23/08	2	PSE	1	3	893	Runyon	12	6	6	5	2
04/23/08	2	Normal	1	4	773	Runyon	12	6	6	5	2
04/23/08	2	PSE	4	5	108	Runyon	13	5	6	5	2
04/23/08	2	PSE	3	6	458	Runyon	13	5	6	5	3
04/23/08	2	Normal	3	7	848	Runyon	12	6	7	5	2
04/23/08	2	PSE	2	8	490	Runyon	13	6	6	5	2
04/24/08	3	PSE	2	1	960	Higgins	11	6	7	6	5
04/24/08	3	Normal	1	2	876	Higgins	12	6	7	6	6
04/24/08	3	PSE	4	3	569	Higgins	12	7	6	7	6
04/24/08	3	PSE	3	4	626	Higgins	9	6	6	6	5
04/24/08	3	Normal	3	5	390	Higgins	12	6	7	6	6
04/24/08	3	Normal	2	6	975	Higgins	13	6	7	7	5
04/24/08	3	PSE	1	7	456	Higgins	11	7	6	6	6
04/24/08	3	Normal	4	8	921	Higgins	13	7	7	6	5
04/24/08	3	PSE	2	1	960	Kohel	12	6	7	5	6
04/24/08	3	Normal	1	2	876	Kohel	13	7	8	5	4
04/24/08	3	PSE	4	3	569	Kohel	13	7	7	5	5
04/24/08	3	PSE	3	4	626	Kohel	12	6	7	5	5
04/24/08	3	Normal	3	5	390	Kohel	13	6	6	5	5
04/24/08	3	Normal	2	6	975	Kohel	12	6	6	5	4
04/24/08	3	PSE	1	7	456	Kohel	14	7	8	5	4
04/24/08	3	Normal	4	8	921	Kohel	13	7	6	5	5

04/24/08	3	PSE	2	1	960	Gray	13	6	7	6	4
04/24/08	3	Normal	1	2	876	Gray	12	7	6	6	4
04/24/08	3	PSE	4	3	569	Gray	13	6	7	8	3
04/24/08	3	PSE	3	4	626	Gray	14	6	8	9	4
04/24/08	3	Normal	3	5	390	Gray	12	6	7	6	4
04/24/08	3	Normal	2	6	975	Gray	11	6	6	6	3
04/24/08	3	PSE	1	7	456	Gray	12	7	7	7	4
04/24/08	3	Normal	4	8	921	Gray	12	6	7	7	4
04/24/08	3	PSE	2	1	960	Inglis	13	6	7	8	5
04/24/08	3	Normal	1	2	876	Inglis	13	6	7	8	5
04/24/08	3	PSE	4	3	569	Inglis	13	6	7	8	5
04/24/08	3	PSE	3	4	626	Inglis	13	6	7	8	5
04/24/08	3	Normal	3	5	390	Inglis	13	6	7	8	5
04/24/08	3	Normal	2	6	975	Inglis	13	6	7	8	5
04/24/08	3	PSE	1	7	456	Inglis	13	6	7	8	5
04/24/08	3	Normal	4	8	921	Inglis	13	6	7	8	5
04/24/08	3	PSE	2	1	960	Runyon	13	6	6	5	2
04/24/08	3	Normal	1	2	876	Runyon	12	6	7	5	2
04/24/08	3	PSE	4	3	569	Runyon	13	6	6	5	2
04/24/08	3	PSE	3	4	626	Runyon	13	5	6	5	2
04/24/08	3	Normal	3	5	390	Runyon	13	5	6	5	2
04/24/08	3	Normal	2	6	975	Runyon	13	5	6	5	2
04/24/08	3	PSE	1	7	456	Runyon	12	6	7	5	2
04/24/08	3	Normal	4	8	921	Runyon	12	6	7	5	2

H-5. P2S4: Raw ANOVA data for consumer sensory evaluation of frankfurters.

Dependent Variable: Ocolor

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	203.128167	8.831659	2.96	<.0001
Error	726	2164.599833	2.981542		
Corrected Total	749	2367.728000			

R-Square	Coeff Var	Root MSE	Ocolor Mean
0.085790	30.10311	1.726714	5.736000

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	106.3234381	53.1617191	17.83	<.0001
Trt	7	51.4509165	7.3501309	2.47	0.0167
Rep*Trt	14	44.2952805	3.1639486	1.06	0.3900

Tests of Hypotheses Using the Type III MS for Rep*Trt as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Trt	7	51.45091647	7.35013092	2.32	0.0851

Dependent Variable: lcolor

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	185.192465	8.051846	3.84	<.0001
Error	728	1528.008333	2.098913		
Corrected Total	751	1713.200798			

R-Square	Coeff Var	Root MSE	lcolor Mean

0.108097	29.84030	1.448762	4.855053

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	25.7049645	12.8524823	6.12	0.0023
Trt	7	116.6668478	16.6666925	7.94	<.0001
Rep*Trt	14	41.4037234	2.9574088	1.41	0.1425

Tests of Hypotheses Using the Type III MS for Rep*Trt as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Trt	7	116.6668478	16.6666925	5.64	0.0030

Dependent Variable: Otexture

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	196.723094	8.553178	2.29	0.0006
Error	728	2724.647917	3.742648		
Corrected Total	751	2921.371011			

R-Square	Coeff Var	Root MSE	Otexture Mean
0.067339	38.33501	1.934593	5.046543

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	29.64470855	14.82235428	3.96	0.0195
Trt	7	88.87857224	12.69693889	3.39	0.0014
Rep*Trt	14	78.90950244	5.63639303	1.51	0.1028

Tests of Hypotheses Using the Type III MS for Rep*Trt as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Trt	7	88.87857224	12.69693889	2.25	0.0928

The GLM Procedure

Dependent Variable: Juice

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	95.508688	4.152552	1.57	0.0438
Error	728	1925.670833	2.645152		
Corrected Total	751	2021.179521			

R-Square	Coeff Var	Root MSE	Juice Mean
0.047254	30.53800	1.626392	5.325798

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	27.75400044	13.87700022	5.25	0.0055
Trt	7	41.74891304	5.96413043	2.25	0.0283
Rep*Trt	14	26.24537899	1.87466993	0.71	0.7668

Tests of Hypotheses Using the Type III MS for Rep*Trt as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Trt	7	41.74891304	5.96413043	3.18	0.0311

Dependent Variable: Osample

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	64.630408	2.810018	0.90	0.6001
Error	715	2234.021825	3.124506		
Corrected Total	738	2298.652233			

R-Square	Coeff Var	Root MSE	Osample Mean

0.028117	32.20603	1.767627	5.488498

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	13.39059433	6.69529716	2.14	0.1181
Trt	7	28.14267226	4.02038175	1.29	0.2539
Rep*Trt	14	23.13607136	1.65257653	0.53	0.9169

Tests of Hypotheses Using the Type III MS for Rep*Trt as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Trt	7	28.14267226	4.02038175	2.43	0.0743

Dependent Variable: Oflavor

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	104.153016	4.528392	1.29	0.1637
Error	727	2550.012097	3.507582		
Corrected Total	750	2654.165113			

R-Square	Coeff Var	Root MSE	Oflavor Mean
0.039241	33.76983	1.872854	5.545939

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	24.05231133	12.02615566	3.43	0.0330
Trt	7	42.64779122	6.09254160	1.74	0.0973
Rep*Trt	14	37.74238311	2.69588451	0.77	0.7041

Tests of Hypotheses Using the Type III MS for Rep*Trt as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Trt	7	42.64779122	6.09254160	2.26	0.0920

Dependent Variable: Iflavor

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	92.666719	4.028988	1.55	0.0479
Error	727	1886.606250	2.595057		
Corrected Total	750	1979.272969			

R-Square	Coeff Var	Root MSE	Iflavor Mean
0.046819	31.06829	1.610918	5.185087

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	2.31856354	1.15928177	0.45	0.6399
Trt	7	61.14207027	8.73458147	3.37	0.0015
Rep*Trt	14	28.97908737	2.06993481	0.80	0.6724

Tests of Hypotheses Using the Type III MS for Rep*Trt as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Trt	7	61.14207027	8.73458147	4.22	0.0106

Dependent Variable: Purchase

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	173.916188	7.561573	1.83	0.0104
Error	727	3004.091801	4.132176		
Corrected Total	750	3178.007989			

R-Square	Coeff Var	Root MSE	Purchase Mean
0.054725	42.19498	2.032775	4.817577

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	56.71812950	28.35906475	6.86	0.0011
Trt	7	81.75109106	11.67872729	2.83	0.0065
Rep*Trt	14	35.80773383	2.55769527	0.62	0.8507

Tests of Hypotheses Using the Type III MS for Rep*Trt as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Trt	7	81.75109106	11.67872729	4.57	0.0076

H-6. P2S5: Raw texture ANOVA data for frankfurters.

Dependent Variable: Stress

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	4411.93322	401.08484	4.79	<.0001
Error	107	8966.01111	83.79450		
Corrected Total	118	13377.94433			

R-Square	Coeff Var	Root MSE	Stress Mean
0.329792	24.13488	9.153933	37.92824

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	2130.424943	1065.212472	12.71	<.0001
Meat	1	5.454530	5.454530	0.07	0.7991
Meat*Rep	2	215.760516	107.880258	1.29	0.2802
Trt	3	1607.022101	535.674034	6.39	0.0005
Meat*Trt	3	420.353263	140.117754	1.67	0.1774

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	5.45453032	5.45453032	0.05	0.8430

Dependent Variable: Strain

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	1.02373885	0.09306717	1.67	0.0894
Error	107	5.95261914	0.05563195		
Corrected Total	118	6.97635798			

R-Square	Coeff Var	Root MSE	Strain Mean
0.146744	13.09562	0.235864	1.801092

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	0.20248377	0.10124189	1.82	0.1670
Meat	1	0.00919334	0.00919334	0.17	0.6852
Meat*Rep	2	0.36518644	0.18259322	3.28	0.0414
Trt	3	0.13080705	0.04360235	0.78	0.5055
Meat*Trt	3	0.31558831	0.10519610	1.89	0.1355

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.00919334	0.00919334	0.05	0.8433

Dependent Variable: Hard1

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	1074.588183	97.689835	4.52	<.0001
Error	108	2335.983683	21.629479		
Corrected Total	119	3410.571867			

R-Square	Coeff Var	Root MSE	Hard1 Mean
0.315076	12.40310	4.650750	37.49667

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	282.8716617	141.4358308	6.54	0.0021
Meat	1	37.3190533	37.3190533	1.73	0.1918
Meat*Rep	2	2.5471217	1.2735608	0.06	0.9428
Trt	3	561.6493000	187.2164333	8.66	<.0001
Meat*Trt	3	190.2010467	63.4003489	2.93	0.0369

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	37.31905333	37.31905333	29.30	0.0325

Dependent Variable: Hard2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	580.150133	52.740921	1.75	0.0716
Error	108	3251.491900	30.106406		
Corrected Total	119	3831.642033			

R-Square	Coeff Var	Root MSE	Hard2 Mean
0.151410	18.72880	5.486931	29.29675

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	342.2637600	171.1318800	5.68	0.0045
Meat	1	67.4250208	67.4250208	2.24	0.1374
Meat*Rep	2	26.5308867	13.2654433	0.44	0.6448
Trt	3	21.8858892	7.2952964	0.24	0.8666
Meat*Trt	3	122.0445758	40.6815253	1.35	0.2617

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	67.42502083	67.42502083	5.08	0.1529

Dependent Variable: Cohesive

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	0.02595250	0.00235932	1.36	0.2002
Error	108	0.18674667	0.00172914		

Source	DF	Sum of Squares
Corrected Total	119	0.21269917

R-Square	Coeff Var	Root MSE	Cohesive Mean
0.122015	19.12589	0.041583	0.217417

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	0.00293167	0.00146583	0.85	0.4312
Meat	1	0.01474083	0.01474083	8.52	0.0043
Meat*Rep	2	0.00216167	0.00108083	0.63	0.5371
Trt	3	0.00204917	0.00068306	0.40	0.7568
Meat*Trt	3	0.00406917	0.00135639	0.78	0.5051

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.01474083	0.01474083	13.64	0.0661

Dependent Variable: Gummy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	144.0946167	13.0995106	2.52	0.0072
Error	108	560.7507033	5.1921361		
Corrected Total	119	704.8453200			

R-Square	Coeff Var	Root MSE	Gummy Mean
0.204434	27.57625	2.278626	8.263000

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	35.52075500	17.76037750	3.42	0.0363
Meat	1	39.05643000	39.05643000	7.52	0.0071
Meat*Rep	2	3.68995500	1.84497750	0.36	0.7018
Trt	3	38.15164667	12.71721556	2.45	0.0675
Meat*Trt	3	27.67583000	9.22527667	1.78	0.1559

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	39.05643000	39.05643000	21.17	0.0441

H-7. P2S5: Raw cook ANOVA data for frankfurters.

Dependent Variable: xph

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	0.19102083	0.01736553	0.27	0.9811
Error	12	0.77292500	0.06441042		
Corrected Total	23	0.96394583			

R-Square	Coeff Var	Root MSE	xph Mean
0.198166	4.125303	0.253792	6.152083

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	0.04627708	0.02313854	0.36	0.7055
Meat	1	0.01706667	0.01706667	0.26	0.6161
Meat*Rep	2	0.02356458	0.01178229	0.18	0.8351
Trt	3	0.08608750	0.02869583	0.45	0.7249
Meat*Trt	3	0.01802500	0.00600833	0.09	0.9623

The GLM Procedure

Dependent Variable: xIL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F

Model	11	26.29507546	2.39046141	2.34	0.0802
Error	12	12.27806852	1.02317238		
Corrected Total	23	38.57314398			

R-Square	Coeff Var	Root MSE	xIL Mean
0.681694	1.771975	1.011520	57.08431

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	4.50603981	2.25301991	2.20	0.1532
Meat	1	5.53280046	5.53280046	5.41	0.0384
Meat*Rep	2	0.14961759	0.07480880	0.07	0.9299
Trt	3	14.04928287	4.68309429	4.58	0.0233
Meat*Trt	3	2.05733472	0.68577824	0.67	0.5865

The GLM Procedure

Dependent Variable: xIa

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	10.90557963	0.99141633	4.93	0.0053
Error	12	2.41359630	0.20113302		
Corrected Total	23	13.31917593			

R-Square Coeff Var Root MSE xIa Mean

0.818788	2.731341	0.448479	16.41972

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	5.64605926	2.82302963	14.04	0.0007
Meat	1	1.01133519	1.01133519	5.03	0.0446
Meat*Rep	2	0.13615926	0.06807963	0.34	0.7194
Trt	3	2.62088333	0.87362778	4.34	0.0273
Meat*Trt	3	1.49114259	0.49704753	2.47	0.1118

The GLM Procedure

Dependent Variable: xIb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	3.03784769	0.27616797	2.63	0.0559
Error	12	1.26244815	0.10520401		
Corrected Total	23	4.30029583			

R-Square	Coeff Var	Root MSE	xIb Mean
0.706428	3.684245	0.324352	8.803750

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	2.21088611	1.10544306	10.51	0.0023
Meat	1	0.03202269	0.03202269	0.30	0.5913
Meat*Rep	2	0.00409537	0.00204769	0.02	0.9808
Trt	3	0.56737176	0.18912392	1.80	0.2012

Meat*Trt	3	0.22347176	0.07449059	0.71	0.5655

The GLM Procedure

Dependent Variable: xEL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	133.7791514	12.1617410	8.52	0.0004
Error	12	17.1350037	1.4279170		
Corrected Total	23	150.9141551			

R-Square	Coeff Var	Root MSE	xEL Mean
0.886459	2.315922	1.194955	51.59736

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	115.5906676	57.7953338	40.48	<.0001
Meat	1	0.3416116	0.3416116	0.24	0.6336
Meat*Rep	2	0.3124843	0.1562421	0.11	0.8972
Trt	3	6.3567458	2.1189153	1.48	0.2686
Meat*Trt	3	11.1776421	3.7258807	2.61	0.0997

The GLM Procedure

Dependent Variable: xEa

Sum of

Source	DF	Squares	Mean Square	F Value	Pr > F
Model	11	72.0243481	6.5476680	2.70	0.0511
Error	12	29.1110667	2.4259222		
Corrected Total	23	101.1354148			

R-Square	Coeff Var	Root MSE	xEa Mean
0.712158	9.090095	1.557537	17.13444

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	24.82371204	12.41185602	5.12	0.0247
Meat	1	8.35440000	8.35440000	3.44	0.0882
Meat*Rep	2	6.74330278	3.37165139	1.39	0.2865
Trt	3	24.77994815	8.25998272	3.40	0.0533
Meat*Trt	3	7.32298519	2.44099506	1.01	0.4237

The GLM Procedure

Dependent Variable: xEb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	139.9359222	12.7214475	7.52	0.0008
Error	12	20.3052167	1.6921014		
Corrected Total	23	160.2411389			

R-Square	Coeff Var	Root MSE	xEb Mean
0.873283	6.299058	1.300808	20.65083

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	84.43620278	42.21810139	24.95	<.0001
Meat	1	4.93831296	4.93831296	2.92	0.1133
Meat*Rep	2	3.21375093	1.60687546	0.95	0.4141
Trt	3	30.47655741	10.15885247	6.00	0.0097
Meat*Trt	3	16.87109815	5.62369938	3.32	0.0567

The GLM Procedure

Dependent Variable: xMoist

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	478.7364870	43.5214988	41.96	<.0001
Error	12	12.4470889	1.0372574		
Corrected Total	23	491.1835759			

R-Square	Coeff Var	Root MSE	xMoist Mean
0.974659	1.495869	1.018458	68.08472

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	171.2294787	85.6147394	82.54	<.0001
Meat	1	101.7640167	101.7640167	98.11	<.0001

Meat*Rep	2	197.3581361	98.6790681	95.13	<.0001
Trt	3	7.3196907	2.4398969	2.35	0.1236
Meat*Trt	3	1.0651648	0.3550549	0.34	0.7953

The GLM Procedure

Dependent Variable: xFat

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	9.54822387	0.86802035	4.69	0.0065
Error	12	2.21944656	0.18495388		
Corrected Total	23	11.76767044			

R-Square	Coeff Var	Root MSE	xFat Mean
0.811395	4.397437	0.430063	9.779849

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	5.43900266	2.71950133	14.70	0.0006
Meat	1	0.17332883	0.17332883	0.94	0.3521
Meat*Rep	2	0.71273229	0.35636615	1.93	0.1881
Trt	3	2.42150945	0.80716982	4.36	0.0269
Meat*Trt	3	0.80165063	0.26721688	1.44	0.2786

Dependent Variable: xph

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.01706667	0.01706667	1.45	0.3519

The GLM Procedure

Dependent Variable: xIL

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	5.53280046	5.53280046	73.96	0.0133

The GLM Procedure

Dependent Variable: xIa

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	1.01133519	1.01133519	14.86	0.0612

The GLM Procedure

Dependent Variable: xIb

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Meat	1	0.03202269	0.03202269	15.64	0.0584

The GLM Procedure

Dependent Variable: xEL

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.34161157	0.34161157	2.19	0.2773

The GLM Procedure

Dependent Variable: xEa

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	8.35440000	8.35440000	2.48	0.2561

The GLM Procedure

Dependent Variable: xEb

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	4.93831296	4.93831296	3.07	0.2217

The GLM Procedure

Dependent Variable: xMoist

Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	101.7640167	101.7640167	1.03	0.4167

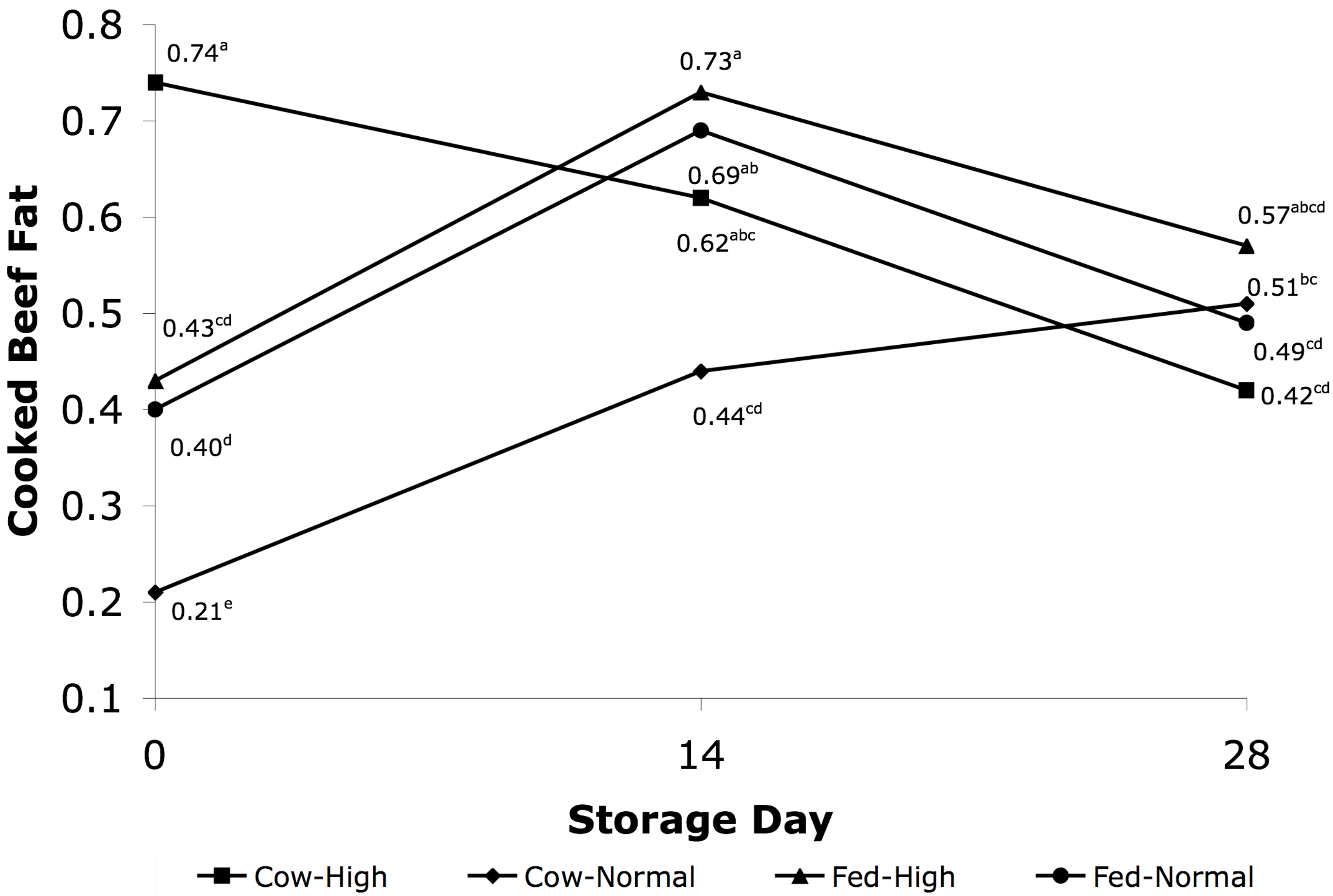
The GLM Procedure

Dependent Variable: xFat

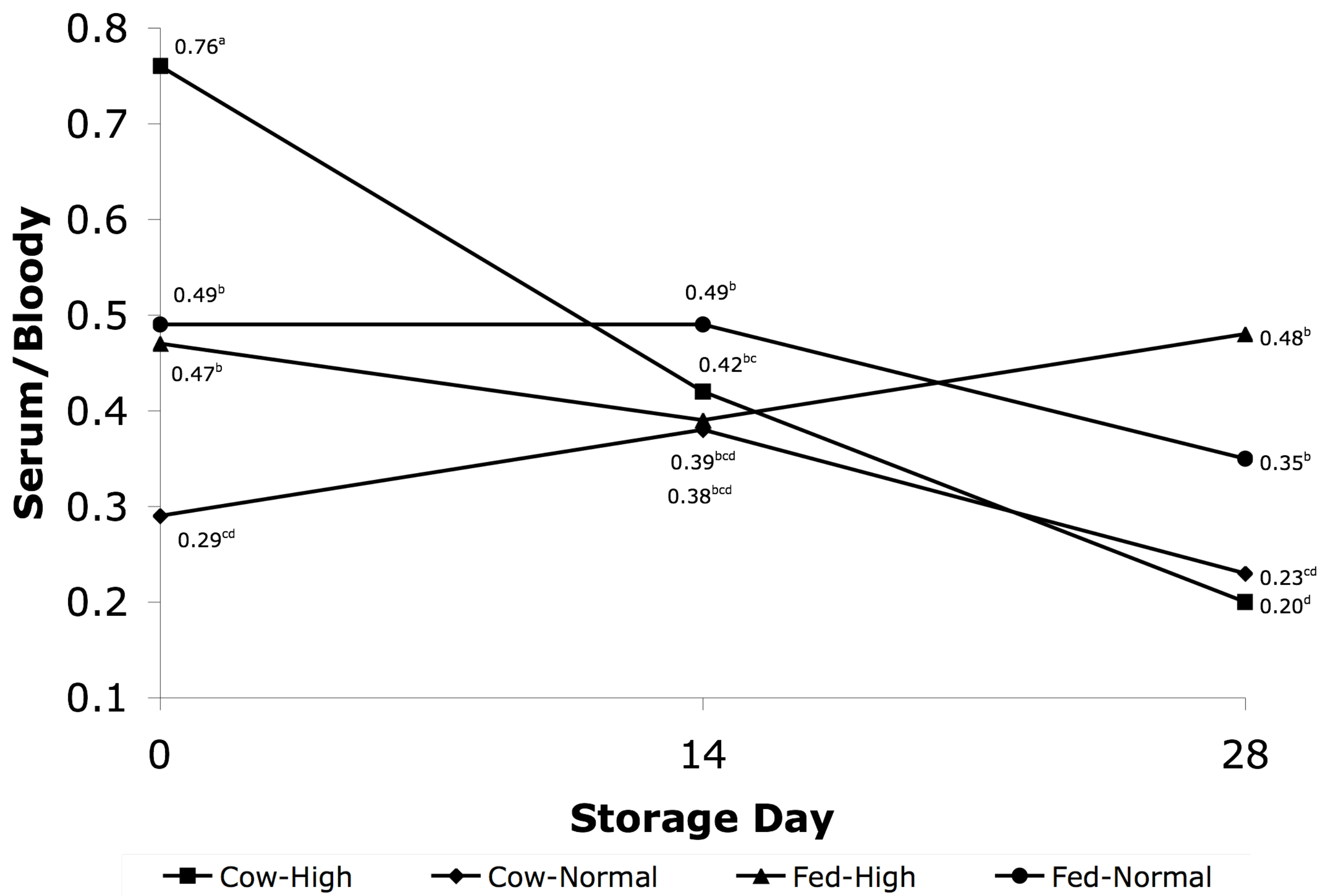
Tests of Hypotheses Using the Type III MS for Meat*Rep as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Meat	1	0.17332883	0.17332883	0.49	0.5577

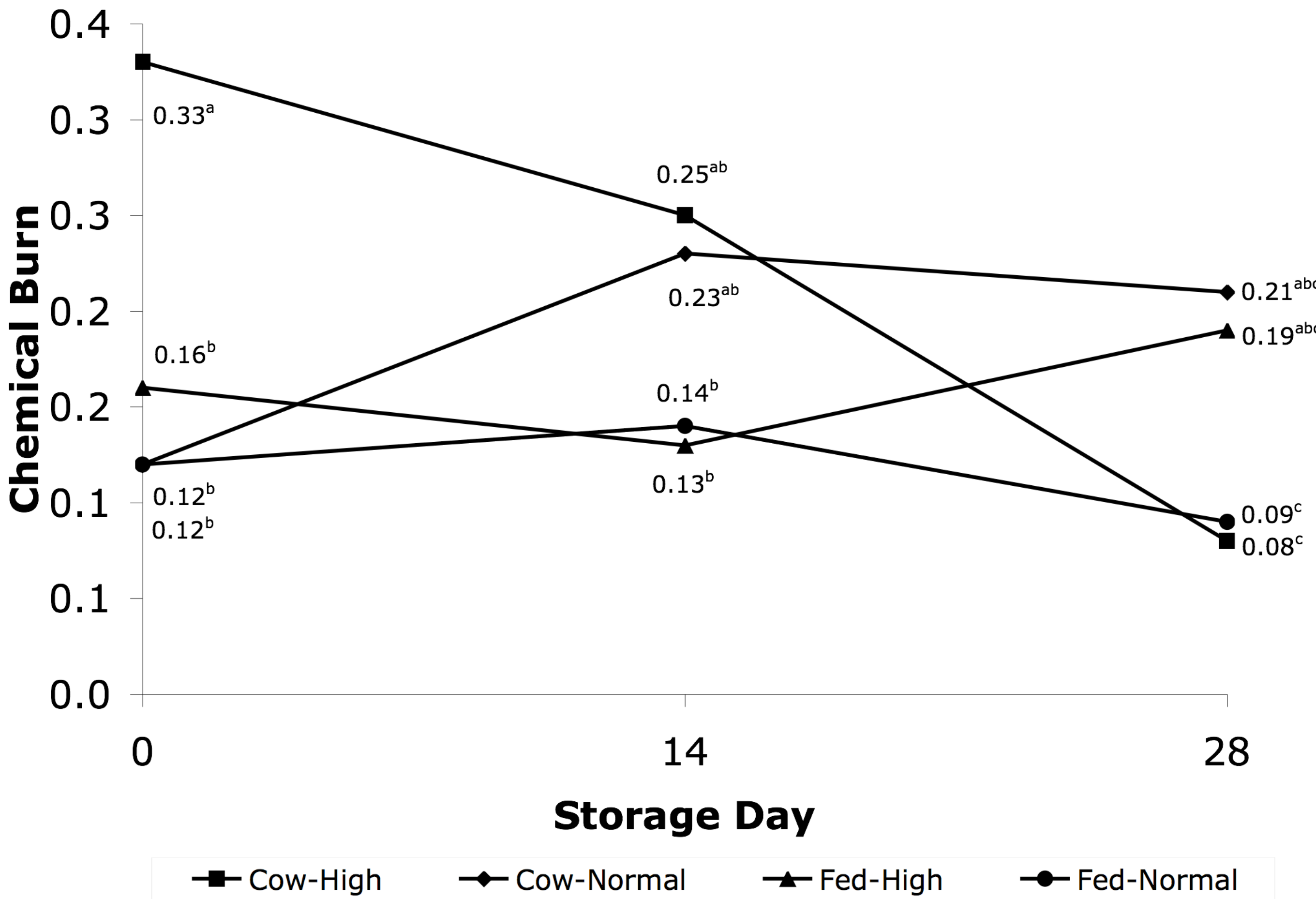
APPENDIX I



I-1. Least squares means for cooked beef roasts of the interaction Animal Type x Storage Day for trained sensory descriptive attribute beef fat (P<0.00015).



I-2. Least squares means for cooked beef roasts of the interaction Animal Type x Storage Day for trained sensory descriptive attribute serum/bloody ($P<0.0013$).



I-3. Least squares means for cooked beef roasts of the interaction Animal Type x Storage Day for trained sensory descriptive attribute chemical burn (P<0.0254).

I-2. Raw data for beef bottom rounds.

Date	Day	Age	pH	carcass	#	Trt	pH-1	pH-2	iwt	ijtwt	Pump	cWt.	cYield	L1	a1	b1	L2	a2	b2	L3	a3	b3
04/01/07	1	y	h	4	600	A	5.8	5.7	5.45	.	.	4.00	73.39	44.41	29.09	14.05	43.50	26.20	12.73	40.20	23.44	9.92
04/01/07	1	y	h	6	601	A	5.7	5.7	5.95	.	.	4.51	75.80	40.23	26.58	11.73	39.42	24.54	10.19	47.57	32.71	15.92
04/01/07	1	y	n	3	602	A	5.7	5.6	6.55	.	.	4.63	70.69	42.46	28.74	12.92	43.72	30.03	14.44	49.75	33.61	17.52
04/01/07	1	y	n	5	603	A	5.7	5.5	4.98	.	.	3.96	79.52	46.99	32.16	16.13	44.97	31.39	14.46	39.38	26.92	12.37
04/01/07	1	c	n	23	604	A	5.7	5.9	5.49	.	.	3.81	69.40	41.49	25.86	8.47	38.40	29.22	12.76	39.47	27.43	11.18
04/01/07	1	c	n	11	605	A	5.6	5.6	3.70	.	.	2.56	69.19	36.71	28.13	13.43	39.18	26.18	10.69	36.35	23.43	10.37
04/01/07	1	c	n	15	606	A	5.8	5.6	5.00	.	.	3.73	74.60	35.56	26.64	11.80	36.66	27.67	12.24	38.12	31.20	14.57
04/01/07	1	c	n	13	607	A	5.6	5.6	3.39	.	.	2.25	66.37	43.35	29.50	14.27	37.20	25.82	11.09	39.38	29.07	13.32
04/01/07	1	y	h	4	600	B	5.8	5.8	5.61	6.59	14.87	3.69	55.99	46.67	31.85	16.05	42.59	28.68	13.18	39.73	24.65	10.99
04/01/07	1	y	h	6	601	B	5.8	5.6	4.90	5.45	10.09	3.30	60.55	49.28	32.36	15.67	41.50	26.10	11.05	41.33	26.51	11.90
04/01/07	1	y	n	3	602	B	5.7	5.4	4.81	5.44	11.58	3.21	59.01	49.93	31.79	16.21	39.89	26.16	11.34	46.76	29.57	14.49
04/01/07	1	y	n	5	603	B	5.7	5.8	5.65	6.39	11.58	3.67	57.43	47.41	32.64	16.56	38.29	26.97	12.52	41.33	30.24	14.19
04/01/07	1	c	n	23	604	B	5.7	5.7	2.94	3.2	8.13	1.81	56.56	37.49	27.73	11.82	36.92	27.01	10.61	37.32	27.75	10.91
04/01/07	1	c	n	11	605	B	5.6	5.6	3.89	4.56	14.69	2.58	56.58	39.39	26.11	11.59	37.03	23.98	10.65	35.84	25.26	10.76
04/01/07	1	c	n	15	606	B	5.8	5.7	4.48	5.01	10.58	3.22	64.27	36.60	21.03	8.74	37.95	27.47	12.70	35.55	23.93	9.88
04/01/07	1	c	n	13	607	B	5.3	5.6	4.23	5.15	17.86	2.55	49.51	38.87	25.45	11.23	38.95	25.39	10.89	40.24	28.71	14.18
04/01/07	1	y	h	4	600	C	5.8	5.8	5.65	6.36	11.16	4.04	63.52	48.36	29.48	14.08	41.92	25.60	11.28	39.83	25.28	11.29
04/01/07	1	y	h	6	601	C	5.7	5.6	4.96	5.59	11.27	3.51	62.79	46.24	30.16	13.91	48.84	29.59	14.43	41.16	26.30	11.82
04/01/07	1	y	n	3	602	C	5.7	5.6	6.12	6.94	11.82	4.51	64.99	49.68	29.26	14.95	41.45	23.72	10.55	44.33	22.78	10.11
04/01/07	1	y	n	5	603	C	5.6	5.7	5.60	6.3	11.11	4.19	66.51	45.10	32.51	15.24	38.45	25.16	11.06	42.91	30.27	14.82
04/01/07	1	c	n	23	604	C	5.6	5.6	4.65	5.2	10.58	3.35	64.42	38.29	29.59	12.29	39.23	31.22	14.32	42.58	31.39	14.14
04/01/07	1	c	n	11	605	C	5.6	5.6	3.75	4.38	14.38	2.54	57.99	33.95	22.01	9.01	33.80	22.93	9.59	34.15	24.69	10.52
04/01/07	1	c	n	15	606	C	5.6	5.7	5.68	6.34	10.41	4.13	65.14	35.35	25.51	11.21	33.72	24.08	10.40	40.14	28.45	13.52
04/01/07	1	c	n	13	607	C	5.6	5.5	4.58	5.19	11.75	3.19	61.46	36.98	23.51	8.88	42.04	25.45	11.21	35.09	22.53	7.38
04/01/07	1	y	h	4	600	D	5.6	5.7	5.70	6.66	14.41	3.81	57.21	48.25	28.87	13.71	43.28	28.36	13.32	42.87	26.77	12.14
04/01/07	1	y	h	6	601	D	5.6	5.8	5.65	6.65	15.04	3.91	58.80	40.06	26.28	11.59	44.62	27.53	12.11	47.37	29.37	13.88
04/01/07	1	y	n	3	602	D	5.8	5.7	6.05	6.78	10.77	4.87	71.83	40.62	24.29	11.39	39.44	25.25	10.93	48.83	32.39	16.27
04/01/07	1	y	n	5	603	D	5.6	5.7	5.20	5.86	11.26	3.83	65.36	46.63	33.10	16.06	43.63	29.97	14.30	40.28	26.60	11.63
04/01/07	1	c	n	23	604	D	5.7	5.6	3.46	3.88	10.82	2.21	56.96	39.92	28.52	12.00	38.99	28.44	11.57	40.24	26.39	11.38

04/01/07	1	c	n	11	605	D	5.6	5.6	3.76	4.2	10.48	2.52	60.00	34.96	23.73	10.22	35.70	25.96	11.30	34.29	21.41	8.56
04/01/07	1	c	n	15	606	D	5.8	5.6	5.56	6.59	15.63	3.88	58.88	35.36	25.40	11.25	35.91	25.82	11.18	39.36	29.32	13.43
04/01/07	1	c	n	13	607	D	5.6	5.6	4.91	5.74	14.46	3.25	56.62	41.80	24.13	11.08	37.88	24.92	10.45	36.70	24.58	10.84
04/02/07	2	y	h	2	608	A	5.9	6.0	6.88	.	.	5.89	85.61	48.95	29.03	14.51	43.18	25.58	11.81	.	.	.
04/02/07	2	y	h	3	609	A	6.2	6.3	4.97	.	.	3.97	79.88	36.07	24.24	9.40	32.04	19.71	6.76	.	.	.
04/02/07	2	y	n	6	610	A	5.6	5.3	6.99	.	.	5.19	74.25	45.71	28.02	12.87	56.95	29.12	15.83	.	.	.
04/02/07	2	y	n	2	611	A	5.7	5.7	4.09	.	.	3.52	86.06	42.77	25.77	11.70	51.17	29.70	15.44	.	.	.
04/02/07	2	c	h	105	612	A	6.9	6.7	2.83	.	.	2.02	71.38	30.40	17.04	3.94	31.32	18.45	4.30	.	.	.
04/02/07	2	c	n	16	613	A	5.7	5.6	3.60	.	.	2.53	70.28	43.24	27.80	12.15	41.37	25.24	10.84	.	.	.
04/02/07	2	c	n	14	614	A	5.1	5.6	4.15	.	.	3.31	79.76	39.19	28.30	12.86	37.77	27.03	12.03	.	.	.
04/02/07	2	c	n	12	615	A	5.9	5.7	3.57	.	.	3.07	85.99	42.16	24.86	10.79	36.23	30.30	14.31	.	.	.
04/02/07	2	y	h	2	608	B	5.6	6.4	6.10	6.83	10.69	5.48	80.23	43.95	26.16	11.92	30.47	16.04	3.55	.	.	.
04/02/07	2	y	h	3	609	B	6.4	6.1	4.68	5.24	10.69	3.75	71.56	34.72	19.12	6.62	45.90	20.63	9.11	.	.	.
04/02/07	2	y	n	6	610	B	5.5	5.6	7.20	8.06	10.67	5.09	63.15	54.22	29.37	15.77	52.91	29.10	15.32	.	.	.
04/02/07	2	y	n	2	611	B	5.6	5.7	4.28	4.79	10.65	2.61	54.49	45.33	24.40	11.48	47.91	27.28	12.99	.	.	.
04/02/07	2	c	h	105	612	B	6.7	6.7	2.77	3.1	10.65	1.86	60.00	33.64	16.38	2.45	30.94	16.36	3.38	.	.	.
04/02/07	2	c	n	16	613	B	5.6	5.6	3.59	4.02	10.70	2.40	59.70	43.31	29.33	13.26	38.83	27.47	10.68	.	.	.
04/02/07	2	c	n	14	614	B	5.7	5.7	4.15	4.65	10.75	2.75	59.14	37.62	24.72	9.33	39.51	26.06	10.90	.	.	.
04/02/07	2	c	n	12	615	B	5.3	5.8	4.00	4.48	10.71	2.59	57.81	43.81	25.55	12.43	42.11	28.33	13.17	.	.	.
04/02/07	2	y	h	2	608	C	5.9	5.7	6.31	7.09	11.00	5.17	72.92	49.50	27.45	13.29	45.43	23.76	9.62	43.51	23.21	10.13
04/02/07	2	y	h	3	609	C	5.9	6.3	4.15	4.68	11.32	2.93	62.61	34.07	19.62	6.42	32.75	19.33	6.25	35.55	18.74	6.38
04/02/07	2	y	n	6	610	C	5.3	5.6	5.41	6.03	10.28	3.78	62.69	52.63	27.22	13.71	46.30	24.06	9.38	47.93	25.39	11.75
04/02/07	2	y	n	2	611	C	5.7	5.6	4.22	4.7	10.21	2.70	57.45	43.75	23.13	10.30	52.21	25.71	12.96	49.22	23.66	11.13
04/02/07	2	c	h	105	612	C	7.0	7.2	2.68	3	10.67	1.86	62.00	33.31	18.68	4.79	32.30	19.45	5.39	29.69	18.41	5.57
04/02/07	2	c	n	16	613	C	5.6	5.7	4.25	4.76	10.71	2.87	60.29	40.36	24.43	9.22	42.25	21.68	8.56	40.16	21.34	7.56
04/02/07	2	c	n	14	614	C	5.5	5.5	2.75	3.08	10.71	1.64	53.25	37.76	26.16	9.74	34.42	22.36	8.29	43.09	25.07	10.94
04/02/07	2	c	n	12	615	C	5.5	5.4	3.47	3.91	11.25	2.47	63.17	36.55	24.44	8.71	37.56	23.29	8.63	44.19	24.65	10.66
04/02/07	2	y	h	2	608	D	5.6	5.7	7.09	7.96	10.93	5.09	63.94	47.95	26.96	13.06	49.15	28.44	13.36	.	.	.
04/02/07	2	y	h	3	609	D	6.3	6.5	4.36	5.02	13.15	3.30	65.74	32.11	18.27	5.20	35.29	15.96	5.21	.	.	.
04/02/07	2	y	n	6	610	D	5.6	5.7	6.10	6.92	11.85	4.19	60.55	53.13	29.73	15.97	49.55	29.81	14.90	.	.	.
04/02/07	2	y	n	2	611	D	5.8	5.6	4.71	5.32	11.47	3.11	58.46	46.66	25.80	12.74	53.93	30.57	16.33	.	.	.
04/02/07	2	c	h	105	612	D	6.9	6.8	2.60	2.9	10.34	1.77	61.03	33.26	16.68	3.77	35.37	21.72	6.53	.	.	.
04/02/07	2	c	n	16	613	D	5.7	5.3	3.45	3.85	10.39	2.25	58.44	40.81	28.53	12.53	42.01	26.47	11.78	.	.	.

04/02/07	2	c	n	14	614	D	5.6	5.7	4.19	4.85	13.61	2.71	55.88	40.52	26.62	11.92	38.79	31.03	15.07	.	.	.
04/02/07	2	c	n	12	615	D	5.6	5.4	3.49	3.91	10.74	2.37	60.61	37.71	26.41	12.05	39.66	23.89	10.91	.	.	.
04/03/07	3	y	h	1	616	A	5.7	5.6	3.85	.	.	2.83	73.51	36.27	25.40	10.88	46.28	27.68	13.61	40.30	26.64	12.35
04/03/07	3	y	h	5	617	A	5.8	5.7	4.73	.	.	3.74	79.07	45.88	28.18	13.46	51.91	30.27	15.79	42.11	24.48	10.48
04/03/07	3	y	n	4	618	A	5.5	5.7	4.73	.	.	3.60	76.11	44.74	29.39	13.81	44.31	27.27	12.64	39.64	25.01	10.69
04/03/07	3	y	n	1	619	A	5.7	5.7	5.30	.	.	4.09	77.17	42.75	28.06	13.20	47.98	30.03	15.13	41.92	23.98	11.02
04/03/07	3	c	h	24	620	A	5.9	5.9	4.16	.	.	3.01	72.36	37.82	23.05	8.39	38.53	26.45	10.46	37.30	24.35	8.82
04/03/07	3	c	h	101	621	A	6.9	7.0	3.83	.	.	2.71	70.76	35.65	20.08	6.53	35.68	20.01	6.55	35.46	21.46	5.59
04/03/07	3	c	h	102	622	A	6.1	6.1	2.02	.	.	1.36	67.33	36.20	15.61	5.67	45.38	20.70	10.74	38.94	19.23	8.38
04/03/07	3	c	h	103	623	A	6.5	6.6	1.98	.	.	1.36	68.69	34.71	20.91	7.80	34.29	22.56	10.01	38.69	21.72	8.75
04/03/07	3	y	h	1	616	B	6.0	5.8	4.70	5.35	12.15	3.46	64.67	41.64	25.18	10.77	37.94	23.08	9.76	41.50	26.59	12.01
04/03/07	3	y	h	5	617	B	5.8	5.7	3.46	3.93	11.96	2.31	58.78	42.36	25.58	11.49	53.12	28.06	14.09	41.75	26.13	11.55
04/03/07	3	y	n	4	618	B	5.7	5.7	3.69	4.12	10.44	2.68	65.05	50.32	25.87	12.53	47.07	29.13	13.69	39.95	26.35	11.38
04/03/07	3	y	n	1	619	B	5.8	5.7	4.16	4.64	10.34	3.19	68.75	52.09	30.46	15.63	41.44	29.36	13.17	47.17	21.19	9.32
04/03/07	3	c	h	24	620	B	5.8	5.9	4.20	4.79	12.32	2.93	61.17	37.36	22.96	8.84	39.75	25.25	9.89	38.53	26.59	10.75
04/03/07	3	c	h	101	621	B	6.9	7.0	3.80	4.25	10.59	2.81	66.12	33.11	20.12	6.53	37.25	18.36	5.02	38.54	20.54	5.71
04/03/07	3	c	h	102	622	B	6.0	6.2	2.63	2.94	10.54	1.70	57.82	36.40	18.79	7.02	38.21	23.25	9.95	36.38	19.57	7.23
04/03/07	3	c	h	103	623	B	6.3	7.0	2.43	2.75	11.64	1.65	60.00	34.77	21.37	8.15	42.07	17.36	4.02	32.97	21.66	8.29
04/03/07	3	y	h	1	616	C	5.7	5.8	5.09	5.64	9.75	4.10	72.70	39.87	27.07	12.60	41.61	25.75	11.00	42.01	30.62	14.32
04/03/07	3	y	h	5	617	C	5.7	5.7	5.11	5.67	9.88	4.06	71.60	43.97	26.37	12.20	47.79	28.30	13.34	44.41	24.81	11.14
04/03/07	3	y	n	4	618	C	5.8	5.7	4.05	4.73	14.38	2.97	62.79	43.78	30.86	14.93	48.20	30.65	15.25	39.76	26.23	12.08
04/03/07	3	y	n	1	619	C	5.7	5.7	5.03	6.06	17.00	3.72	61.39	52.12	28.55	14.75	etsy	23.77	10.52	42.13	23.34	10.06
04/03/07	3	c	h	24	620	C	6.0	5.9	3.70	4.13	10.41	2.61	63.20	39.91	27.57	11.80	41.06	24.81	9.52	36.45	25.57	10.63
04/03/07	3	c	h	101	621	C	7.0	7.0	2.91	3.23	9.91	1.94	60.06	32.72	18.48	4.80	33.11	19.97	5.65	36.43	18.33	3.68
04/03/07	3	c	h	102	622	C	6.1	6.0	2.01	2.29	12.23	1.25	54.59	39.08	20.10	8.66	43.12	25.19	13.21	44.42	20.92	10.80
04/03/07	3	c	h	103	623	C	6.5	6.7	2.34	2.62	10.69	1.58	60.31	34.28	21.23	7.41	36.92	23.86	9.45	36.10	20.96	7.35
04/03/07	3	y	h	1	616	D	5.6	5.9	4.30	4.83	10.97	3.20	66.25	39.77	23.66	10.04	42.20	28.15	12.98	41.93	28.78	13.63
04/03/07	3	y	h	5	617	D	5.7	5.7	3.53	3.94	10.41	2.45	62.18	44.51	25.12	11.10	50.16	31.60	16.24	41.68	28.04	13.15
04/03/07	3	y	n	4	618	D	5.7	5.7	3.61	4.09	11.74	2.65	64.79	41.63	26.37	11.81	43.25	24.08	11.04	40.96	28.00	12.40
04/03/07	3	y	n	1	619	D	5.7	5.8	3.82	4.28	10.75	2.82	65.89	41.12	25.25	11.31	49.39	29.62	15.01	41.24	26.78	11.96
04/03/07	3	c	h	24	620	D	5.9	5.6	4.37	4.93	11.36	3.21	65.11	37.94	25.84	10.34	38.50	24.38	9.21	34.63	24.24	9.61
04/03/07	3	c	h	101	621	D	6.8	6.8	4.80	5.36	10.45	3.77	70.34	33.45	20.88	6.61	32.92	18.12	5.56	34.97	17.59	4.90
04/03/07	3	c	h	102	622	D	6.0	6.0	2.40	2.69	10.78	1.48	55.02	38.66	19.72	6.36	38.41	21.71	8.75	37.10	19.74	8.18

04/03/07	3	c	h	103	623	D	6.5	6.3	2.70	3.01	10.30	1.87	62.13	35.14	21.32	8.91	34.58	19.20	6.94	34.27	16.51	3.90

I-3. Raw data for chemical analysis beef bottom rounds.

Date	PD	SD	#	trt	pH1	pH2	L1	a1	b1	L2	a2	b2	L3	a3	b3	Shear1	Shear2	Shear3	Shear4	Shear5	Shear6
4/3/07	1	0	600	A	6.50	6.10	53.54	13.75	13.28	50.92	14.26	11.77	54.85	11.02	11.43	2.8623	2.8494	2.8318	2.1864	2.5116	3.0324
4/3/07	1	0	601	A	6.80	6.70	54.62	12.03	11.31	61.71	13.57	12.53	52.53	13.53	10.80	2.5078	2.9396	2.8554	1.9077	2.0769	2.0016
4/3/07	1	0	602	A	6.00	6.00	56.25	11.66	10.97	54.75	14.07	11.78	59.89	12.63	11.22	2.9552	2.2500	2.7412	2.3934	3.1747	2.3610
4/3/07	1	0	603	A	6.00	6.00	53.39	11.49	11.26	52.33	15.10	10.94	54.31	13.19	10.78	1.6261	2.0182	1.9390	2.9791	1.6381	3.4331
4/3/07	1	0	604	A	6.10	6.20	51.82	14.63	11.30	50.49	15.10	12.50	49.12	15.53	12.46	5.0007	4.5284	4.1637	3.5081	7.4712	5.4756
4/3/07	1	0	605	A	6.00	6.00	49.44	10.44	10.51	50.89	10.78	10.69	52.98	10.27	10.53	5.4144	8.1765	3.9381	4.2209	3.6097	2.4777
4/3/07	1	0	606	A	6.10	6.00	48.60	12.35	10.98	49.24	18.44	12.43	52.18	15.99	11.92	4.3664	1.8561	4.0551	3.6095	2.7362	2.4121
4/3/07	1	0	607	A	5.70	6.20	53.58	9.15	11.41	51.17	9.93	10.53	47.67	9.72	10.21	3.4016	2.8145	4.6423	.	.	.
4/3/07	1	0	600	B	5.50	5.70	55.63	8.36	10.55	59.67	8.76	10.55	54.56	9.44	11.20	3.6366	3.1060	2.0427	2.8761	3.7545	2.0070
4/3/07	1	0	601	B	5.80	5.90	50.33	10.99	10.64	62.23	8.57	9.30	55.49	10.31	10.87	0.9046	2.0071	1.6205	2.5119	2.4567	1.1006
4/3/07	1	0	602	B	5.70	5.80	55.15	9.50	9.88	56.31	9.62	9.86	53.73	10.05	10.33	2.1639	2.6445	2.4698	2.4645	3.9771	3.3703
4/3/07	1	0	603	B	5.80	5.70	55.19	8.88	10.71	54.44	10.93	10.83	53.15	9.49	10.37	2.8104	3.5962	3.2157	2.3996	3.3279	3.7711
4/3/07	1	0	604	B	5.90	6.10	49.94	9.89	10.65	47.79	10.00	9.91	47.25	9.03	10.54	4.4760	1.5778	6.6932	6.9367	.	.
4/3/07	1	0	605	B	5.50	5.80	47.44	8.97	10.73	57.34	8.66	11.33	56.72	8.27	10.82	5.4343	3.4053	6.2746	1.8113	3.4734	4.0365
4/3/07	1	0	606	B	6.00	6.00	44.06	11.03	10.69	47.61	12.44	11.15	47.26	11.06	10.96	3.1079	1.9098	4.9584	1.7054	2.2528	4.3602
4/3/07	1	0	607	B	5.40	5.40	62.24	7.36	11.66	55.35	7.87	10.33	53.77	7.51	9.73	5.1632	4.6420	5.2939	5.5289	5.7189	4.9558
4/3/07	1	0	600	C	5.90	5.90	54.12	13.49	12.91	54.32	13.26	10.41	53.09	10.24	11.32	1.8758	1.1622	2.1230	1.9451	1.6223	2.4738
4/3/07	1	0	601	C	5.80	5.80	58.90	10.78	11.78	58.15	11.53	11.42	54.48	11.33	11.69	2.3569	1.5689	0.9667	1.0715	1.7440	.
4/3/07	1	0	602	C	5.90	5.90	53.83	12.53	11.33	55.07	16.20	12.67	58.20	10.97	11.20	1.7523	2.3698	3.1256	2.8754	2.1331	1.7346
4/3/07	1	0	603	C	5.70	5.80	55.84	11.29	13.08	54.36	11.03	11.79	54.28	11.10	13.38	4.6902	5.1358	5.9299	4.2475	4.5706	5.4894
4/3/07	1	0	604	C	6.30	5.90	55.53	11.96	11.82	51.30	11.38	10.83	48.50	9.47	9.90	5.0792	6.1115	7.6753	6.5734	5.7991	.
4/3/07	1	0	605	C	5.70	5.50	48.44	9.79	10.92	54.15	9.32	11.12	50.38	10.09	11.28	4.2304	3.9754	3.1880	4.1075	4.2421	.
4/3/07	1	0	606	C	5.80	6.10	58.87	11.11	12.26	55.83	13.15	12.17	53.63	9.68	11.01	4.0475	4.0780	4.1865	2.7905	4.4535	3.1533
4/3/07	1	0	607	C	5.80	5.60	50.52	9.36	10.65	54.86	8.73	10.58	51.74	8.73	10.35	9.3683	7.7164	8.5705	3.1182	5.7242	.
4/3/07	1	0	600	D	5.60	5.40	59.65	9.61	9.40	59.78	10.53	10.17	59.97	9.44	9.57	3.9071	3.6710	2.8421	4.5501	3.1820	2.7318
4/3/07	1	0	601	D	5.80	5.90	65.45	14.08	11.63	62.27	15.43	11.87	55.10	9.80	10.22	3.4790	3.5018	4.6786	2.3209	4.6580	2.5198
4/3/07	1	0	602	D	5.90	5.80	54.59	15.91	11.67	56.90	18.87	11.92	56.31	15.46	9.89	2.2070	1.9634	3.7212	2.8687	1.9685	2.5544
4/3/07	1	0	603	D	5.90	5.60	54.95	12.23	10.57	52.36	13.00	9.97	57.47	10.13	10.45	1.2815	2.1187	1.1181	2.3934	1.6422	2.8678

4/3/07	1	0	604	D	6.30	6.10	48.55	10.67	9.70	51.17	10.58	9.93	50.65	10.56	10.84	6.9219	5.4423	4.1873	4.9162	2.9259	.
4/3/07	1	0	605	D	6.30	5.90	49.65	9.73	10.77	52.95	11.42	11.42	53.31	10.93	11.30	4.3998	4.4559	6.0110	4.8498	6.4077	4.7147
4/3/07	1	0	606	D	6.00	5.70	52.88	10.71	11.13	50.21	10.84	10.19	47.10	10.19	10.53	4.7106	2.2590	3.5027	4.9836	2.6674	.
4/3/07	1	0	607	D	5.80	6.00	61.45	9.36	11.13	59.00	9.92	11.31	53.25	9.66	10.86	3.7421	6.2391	6.0703	5.0943	4.3177	5.4555
4/4/07	2	0	608	A	6.00	6.00	57.20	13.82	10.09	54.92	12.26	9.88	55.93	18.43	10.87	2.8510	1.8682	2.1565	2.0509	3.4389	2.1692
4/4/07	2	0	609	A	6.40	6.80	49.57	16.01	10.24	48.17	16.72	10.70	47.18	14.15	10.08	.	.	.	.	.	.
4/4/07	2	0	610	A	5.80	5.90	56.87	12.82	10.58	57.66	11.47	10.54	56.14	12.57	10.06	1.9973	2.2371	2.3362	1.7977	1.4671	2.0753
4/4/07	2	0	611	A	6.00	6.00	54.39	10.05	10.88	54.61	10.15	10.57	55.90	9.78	10.59	.	.	.	.	.	.
4/4/07	2	0	612	A	7.20	7.20	45.06	12.06	8.98	46.00	12.98	9.72	46.48	12.20	9.69	4.4684	2.1954	3.4510	1.7117	3.4236	3.2236
4/4/07	2	0	613	A	6.40	6.10	51.72	11.62	11.07	55.75	8.10	9.52	50.99	10.40	9.98	3.4473	3.4422	2.9050	3.7939	2.7403	4.2049
4/4/07	2	0	614	A	6.40	6.00	48.99	10.39	9.63	49.77	12.23	9.64	48.14	11.67	10.41	4.2199	5.7261	4.2433	5.6072	.	.
4/4/07	2	0	615	A	6.00	6.10	45.80	10.05	10.08	48.99	10.41	9.74	50.79	9.75	10.24	5.6246	3.8977	3.8600	4.9001	3.2994	3.5353
4/4/07	2	0	608	B	6.30	6.20	66.54	8.79	12.00	68.50	8.61	11.13	62.20	9.96	10.88	2.1797	1.6175	2.3024	2.8766	2.0050	3.0495
4/4/07	2	0	609	B	6.30	6.20	53.12	13.36	10.50	59.15	10.06	9.10	51.93	10.79	9.00	1.6280	2.0805	2.1835	2.1451	1.6196	2.0472
4/4/07	2	0	610	B	5.50	5.70	62.37	7.93	11.35	59.14	8.96	9.58	63.12	8.96	10.09	2.6910	1.9064	2.3584	2.8368	1.8463	3.1018
4/4/07	2	0	611	B	5.40	5.60	58.85	8.49	10.40	62.56	7.85	10.09	61.22	6.69	9.57	2.1925	2.4203	2.5679	2.3667	2.4291	2.0366
4/4/07	2	0	612	B	6.50	6.20	52.93	12.16	11.24	46.43	12.80	9.63	46.46	12.22	9.37	4.2420	2.4621	2.2541	3.9212	3.6328	4.0705
4/4/07	2	0	613	B	5.90	5.60	52.07	8.58	8.55	50.68	8.49	8.86	61.41	7.87	10.54	.	.	.	.	.	.
4/4/07	2	0	614	B	5.60	6.00	48.61	10.33	9.42	54.79	9.69	10.47	47.18	8.37	9.44	4.0758	6.3067	5.3846	4.4213	4.3160	6.0532
4/4/07	2	0	615	B	5.70	5.70	54.30	9.07	10.58	53.72	8.55	9.91	52.64	8.53	10.33	3.7905	2.2083	2.8690	.	.	.
4/4/07	2	0	608	C	5.90	5.90	60.82	9.70	9.97	59.71	11.91	10.10	58.50	11.10	10.72	3.4452	2.4616	2.3469	3.7842	2.8383	2.7777
4/4/07	2	0	609	C	6.40	6.00	54.69	9.75	10.38	54.80	10.44	9.70	49.93	12.06	10.46	2.4891	2.0263	2.8315	4.7681	3.3987	2.6877
4/4/07	2	0	610	C	5.80	5.90	56.98	8.79	9.94	57.76	10.19	9.92	59.52	9.67	9.92	1.2771	1.2199	1.0735	0.9409	1.9247	1.2988
4/4/07	2	0	611	C	6.00	5.90	59.20	9.81	10.20	60.83	9.36	10.32	54.49	9.74	10.05	2.5024	2.3231	3.6293	2.8869	2.4952	.
4/4/07	2	0	612	C	6.90	6.80	52.51	15.11	10.18	55.03	13.72	10.31	56.81	14.56	11.77	6.1140	5.8880	5.3449	8.1739	7.9786	3.5115
4/4/07	2	0	613	C	5.90	6.30	53.08	8.66	8.82	51.21	7.94	9.11	46.89	9.88	9.57	5.1550	5.3441	7.7631	4.9118	4.8366	.
4/4/07	2	0	614	C	5.90	6.10	49.69	9.37	10.03	48.54	9.05	9.60	49.16	9.42	10.38	2.8072	3.7064	5.3271	4.1182	3.1001	.
4/4/07	2	0	615	C	5.90	5.80	51.91	8.59	10.19	50.58	9.35	10.80	47.96	10.16	10.60	3.4097	5.2289	3.9860	.	.	.
4/4/07	2	0	608	D	5.80	6.00	57.53	9.92	9.74	60.07	9.48	9.60	59.81	9.54	9.42	2.0086	1.5992	2.5452	2.7351	1.5315	2.0753
4/4/07	2	0	609	D	6.50	6.80	50.72	11.83	9.79	50.58	11.21	9.63	54.03	10.51	9.72	3.1845	4.4231	3.6383	4.0857	2.7322	.
4/4/07	2	0	610	D	5.60	5.90	60.60	9.82	10.26	59.44	10.05	10.51	59.07	9.50	10.12	2.0993	2.2376	2.5337	2.4178	1.8907	1.4838

4/4/07	2	0	611	D	5.80	6.00	63.94	6.74	11.28	63.22	7.75	10.30	66.09	5.92	9.71	3.8432	2.9764	2.9919	3.7744	3.4282	.
4/4/07	2	0	612	D	6.60	7.20	55.99	-2.59	9.31	55.36	-2.99	9.17	58.83	-1.18	10.44	3.5106	4.9805	4.4536	2.7589	2.0799	.
4/4/07	2	0	613	D	5.90	5.90	56.19	-4.46	9.35	57.41	-4.05	9.28	57.98	-4.32	8.79	4.1447	5.2206	6.2298	5.3127	4.5629	3.9586
4/4/07	2	0	614	D	5.80	6.00	57.28	-4.01	9.84	59.18	-4.20	9.67	57.23	-4.25	9.72	5.1804	5.7294	5.9221	4.2904	4.8171	4.5408
4/4/07	2	0	615	D	5.80	5.90	56.29	-5.12	9.16	55.31	-5.71	9.82	60.14	-3.15	10.08	4.4950	4.5399	3.8295	3.9558	.	.
4/5/07	3	0	616	A	6.20	5.80	56.74	5.93	10.25	57.82	3.23	9.60	56.23	4.93	9.73	1.9149	1.6801	2.0729	.	.	.
4/5/07	3	0	617	A	6.00	6.10	62.06	9.46	10.77	59.67	9.25	10.78	60.17	4.93	10.34	3.4682	1.6924	3.5541	2.1109	1.9983	1.7283
4/5/07	3	0	618	A	6.00	5.70	58.43	5.11	9.59	58.20	7.70	9.75	59.02	3.56	9.20	3.4686	2.7948	3.0264	.	.	.
4/5/07	3	0	619	A	6.20	5.80	52.62	25.21	11.79	54.69	24.07	11.61	52.11	19.33	10.48	.	.	.	.	.	.
4/5/07	3	0	620	A	6.50	5.30	45.95	20.97	10.62	47.57	20.12	10.76	48.17	19.69	10.59	3.2480	6.2043	1.9249	2.9732	2.0017	2.3128
4/5/07	3	0	621	A	5.90	6.00	48.35	17.70	10.10	48.33	16.70	9.52	49.36	17.64	10.08	4.1524	3.7147	4.4538	4.4152	4.0424	.
4/5/07	3	0	622	A	6.40	5.70	48.99	15.14	10.46	51.12	15.20	11.52	49.78	14.97	11.31	.	.	.	.	.	.
4/5/07	3	0	623	A	6.80	6.40	44.57	16.71	10.56	45.37	19.49	11.45	45.24	18.53	10.59	5.6777	6.8968	6.2514	5.2630	.	.
4/5/07	3	0	616	B	5.80	5.90	51.97	16.90	9.80	54.08	16.53	9.79	51.41	20.70	10.64	3.3336	3.0035	2.2936	5.5027	3.6352	2.5157
4/5/07	3	0	617	B	5.60	4.60	58.01	11.54	9.34	56.87	11.22	9.16	59.08	11.83	9.18	3.6705	2.9953	2.8647	4.4773	5.0098	2.4620
4/5/07	3	0	618	B	5.80	5.60	49.64	14.56	9.37	51.96	13.08	8.81	49.10	13.10	8.99	.	.	.	.	.	.
4/5/07	3	0	619	B	5.50	5.70	53.71	18.76	10.21	53.96	23.83	10.80	53.24	18.10	10.12	5.0319	3.8575	4.4296	4.0393	4.5637	.
4/5/07	3	0	620	B	5.80	6.40	51.72	12.25	8.34	49.01	14.00	8.51	51.89	19.65	10.06	4.3453	4.7998	5.2399	3.6850	4.5129	5.0411
4/5/07	3	0	621	B	6.50	6.20	54.51	22.60	10.78	51.00	27.30	11.14	56.04	19.59	10.94	4.5435	8.6329	5.5662	3.8781	3.8807	.
4/5/07	3	0	622	B	6.20	6.10	49.50	13.11	10.50	46.89	11.64	8.87	50.52	12.57	10.34	5.8055	7.6168	.	.	.	.
4/5/07	3	0	623	B	6.70	6.50	59.19	23.22	11.26	62.67	22.82	11.04	58.96	21.60	11.09	1.6805	1.8197	1.6619	2.2135	1.5891	1.6440
4/5/07	3	0	616	C	6.10	5.90	52.74	22.06	10.43	51.35	23.52	11.14	52.58	17.22	9.74	2.1306	2.5505	2.9197	4.0992	1.4733	1.6286
4/5/07	3	0	617	C	5.90	6.00	55.29	15.20	9.16	55.76	23.45	10.67	54.28	20.95	10.78	2.3735	2.6865	3.5560	4.1062	3.0338	2.9142
4/5/07	3	0	618	C	5.80	5.80	57.53	13.67	9.41	57.32	15.09	9.63	56.09	14.77	9.37	2.8843	2.2168	3.1540	2.3837	3.2138	2.3216
4/5/07	3	0	619	C	5.80	5.70	57.84	14.72	9.85	56.87	14.99	9.63	57.79	15.26	9.75	3.3127	4.6516	4.1005	2.2768	2.9647	2.5178
4/5/07	3	0	620	C	6.10	6.00	48.60	16.92	9.53	47.94	17.74	9.52	48.89	17.02	9.84	4.8978	1.5833	4.1357	.	.	.
4/5/07	3	0	621	C	6.90	6.80	48.63	18.59	10.78	48.62	20.57	12.25	52.66	19.83	11.62	4.0565	2.6725	5.3268	7.9258	.	.
4/5/07	3	0	622	C	6.80	6.70	52.94	13.59	11.17	54.53	13.80	11.42	49.62	14.49	11.78	5.0249	6.0040	3.7623	.	.	.
4/5/07	3	0	623	C	6.60	6.80	43.72	16.74	12.18	43.07	15.98	11.38	42.44	15.93	10.51	4.0735	2.4696	.	.	.	.
4/5/07	3	0	616	D	6.10	6.00	54.36	16.65	9.64	47.91	19.73	9.97	54.66	16.40	9.88	3.5519	3.2588	4.2468	6.1025	3.9399	4.5260
4/5/07	3	0	617	D	5.90	5.90	58.03	16.99	9.82	55.38	15.91	9.58	56.75	15.60	8.32	2.3736	2.7143	1.9659	2.0353	.	.

4/5/07	3	0	618	D	5.90	6.00	51.21	14.13	8.54	51.72	14.99	8.96	51.47	16.65	9.50	1.4313	2.0035	1.5291	2.6268	1.6948	.
4/5/07	3	0	619	D	5.90	5.90	52.21	16.67	9.34	52.78	14.67	8.87	55.22	18.10	10.22	2.3508	1.4412	1.8979	2.3227	2.6163	.
4/5/07	3	0	620	D	6.20	5.70	50.28	20.20	10.05	48.60	20.03	9.20	50.27	15.06	9.22	2.1852	3.3606	3.5941	3.3632	3.0594	7.3576
4/5/07	3	0	621	D	6.80	6.80	55.76	26.04	11.45	54.91	26.66	11.85	54.91	20.97	10.63	8.2474	3.9407	6.9626	3.1470	4.3064	.
4/5/07	3	0	622	D	6.30	5.30	50.12	14.68	10.29	49.98	13.91	9.86	51.87	12.17	11.76	8.3993	5.0908	.	.	.	.
4/5/07	3	0	623	D	6.50	6.70	49.82	18.62	11.23	53.57	19.28	11.52	52.07	18.50	11.69	4.3087	6.3233	4.5485	2.5341	2.4762	.
4/17/07	1	14	600	A	6.10	6.10	62.78	12.45	10.36	51.87	16.03	10.94	53.48	13.32	10.81	2.3376	2.6800	2.3572	2.0171	3.1030	1.7783
4/17/07	1	14	601	A	6.10	6.10	54.45	13.87	10.92	49.81	13.67	10.57	50.39	13.32	11.02	1.9006	1.4507	2.4375	2.3113	5.2154	2.9830
4/17/07	1	14	602	A	6.00	6.10	51.47	14.27	11.04	56.15	12.62	10.70	55.66	12.73	11.68	2.7678	2.5360	1.8902	2.2352	2.1355	2.0667
4/17/07	1	14	603	A	5.10	6.00	54.60	13.34	10.27	53.98	14.00	9.79	52.58	13.05	10.39	2.1863	3.0812	2.2219	3.2753	3.0153	2.1184
4/17/07	1	14	604	A	6.20	6.40	52.00	13.88	10.54	48.85	11.77	9.92	46.80	11.15	9.87	4.2632	2.8698	3.1209	4.7750	3.9943	4.1979
4/17/07	1	14	605	A	5.30	6.10	49.85	12.74	10.42	51.99	12.20	10.01	53.97	10.41	9.84	.	.	.	.	.	.
4/17/07	1	14	606	A	6.10	5.60	50.23	12.24	11.66	49.76	16.61	11.10	50.53	13.70	10.89	2.7208	3.9901	1.6549	2.0120	2.9612	2.8753
4/17/07	1	14	607	A	6.30	5.90	55.17	10.56	11.27	53.96	11.26	12.15	53.68	10.25	10.12	.	.	.	.	.	.
4/17/07	1	14	600	B	5.70	5.50	58.01	8.23	9.23	60.94	7.86	10.17	53.70	8.68	10.34	3.4652	3.0776	1.3816	3.5113	2.6912	2.3933
4/17/07	1	14	601	B	5.70	5.60	55.09	12.46	10.24	56.22	11.04	9.80	55.10	12.48	9.18	3.4221	2.4527	3.3953	5.2520	5.1200	4.0015
4/17/07	1	14	602	B	4.90	5.70	56.51	7.25	10.37	57.30	8.07	10.13	52.52	8.93	9.88	1.2277	1.3806	0.9235	.	.	.
4/17/07	1	14	603	B	5.80	5.70	62.19	8.48	9.53	61.64	8.26	9.89	63.17	7.90	10.39	2.0674	2.0987	5.7155	.	.	.
4/17/07	1	14	604	B	6.20	6.10	50.65	9.53	10.71	52.04	9.46	11.37	49.27	11.03	11.19	.	.	.	.	.	.
4/17/07	1	14	605	B	5.00	4.90	54.15	8.64	10.39	50.59	8.77	9.10	49.26	8.79	9.65	.	.	.	.	.	.
4/17/07	1	14	606	B	5.40	5.90	48.64	10.23	10.47	51.83	12.42	10.04	49.18	12.56	10.47	2.9659	3.2648	5.4389	4.5565	1.6198	4.4171
4/17/07	1	14	607	B	5.30	5.50	51.80	8.45	9.23	51.18	8.26	9.69	47.42	7.77	9.00	2.4741	3.3562	2.8185	.	.	.
4/17/07	1	14	600	C	5.40	4.60	54.98	14.20	11.97	57.98	13.36	10.78	59.04	9.16	10.27	5.4419	2.4469	2.9251	3.0153	3.0940	2.2018
4/17/07	1	14	601	C	6.00	5.90	56.44	12.05	10.13	57.87	12.70	11.02	58.77	11.10	9.38	4.0932	6.5776	7.6073	2.8580	2.7620	5.4840
4/17/07	1	14	602	C	5.10	5.80	52.74	11.50	10.47	56.93	9.64	10.50	54.36	11.93	10.08	2.3827	1.6841	1.6121	1.6924	2.2622	2.3331
4/17/07	1	14	603	C	5.80	5.90	59.83	10.66	9.97	57.15	13.06	10.86	52.60	12.33	9.47	4.6145	4.6647	3.2471	2.6835	3.0377	2.5166
4/17/07	1	14	604	C	6.10	6.00	50.31	11.65	9.92	49.86	12.16	9.82	54.20	14.69	10.97	.	.	.	.	.	.
4/17/07	1	14	605	C	5.80	5.80	52.53	9.44	10.11	52.92	9.29	10.28	51.33	8.95	10.01	5.6618	4.2272	7.5042	3.1759	4.2636	5.0118
4/17/07	1	14	606	C	6.10	6.10	51.19	11.88	10.31	49.20	16.94	11.11	58.11	12.13	11.13	2.8216	2.5521	2.6087	3.7950	1.8191	2.7780
4/17/07	1	14	607	C	5.80	5.80	55.33	9.20	11.13	51.72	9.66	9.73	51.47	9.04	9.34	3.5166	5.7865	3.6485	4.9930	4.4374	3.9279
4/17/07	1	14	600	D	4.80	5.00	53.74	10.02	11.36	57.57	8.06	10.13	54.93	7.38	9.71	2.1300	1.0293	1.8909	1.7781	2.1141	3.0879

4/17/07	1	14	601	D	4.90	5.80	51.61	10.94	9.47	53.87	11.11	9.26	53.70	9.96	.	2.5692	2.0364	2.0347	2.1334	2.5389	2.2298
4/17/07	1	14	602	D	5.20	5.80	55.80	14.53	10.43	54.54	12.57	10.93	56.73	15.01	11.06	2.1516	1.4967	2.1293	1.7886	2.4873	2.5600
4/17/07	1	14	603	D	5.90	6.00	51.76	14.00	11.28	56.38	12.59	10.52	54.37	15.25	11.38	3.0165	2.6136	2.9617	1.9300	2.3625	3.5529
4/17/07	1	14	604	D	5.20	5.90	47.12	10.68	9.52	48.07	10.86	9.26	51.14	10.57	10.99	4.8893	4.4112	3.5095	4.7568	5.9716	5.2616
4/17/07	1	14	605	D	5.30	6.00	47.20	8.87	9.61	49.67	9.16	10.08	48.95	9.74	10.36	6.0977	3.5668	2.8987	3.2753	4.1520	3.9191
4/17/07	1	14	606	D	5.00	4.70	50.88	8.89	9.91	51.57	8.94	10.26	50.31	9.65	9.69	3.7979	3.2081	4.1741	3.3644	4.3322	3.5546
4/17/07	1	14	607	D	5.70	5.80	51.10	9.25	9.41	52.82	10.18	10.06	50.47	10.37	9.88	4.0396	8.4253	2.5237	2.5640	2.5263	2.7129
4/18/07	2	14	608	A	6.40	6.70	61.88	11.68	11.66	56.65	9.34	10.57	62.06	16.12	11.37	1.6263	2.8704	2.8593	2.7914	1.8024	2.1876
4/18/07	2	14	609	A	6.40	6.40	51.44	13.22	10.69	56.69	10.80	10.01	49.38	14.38	11.00	2.1551	1.8824	2.9506	3.9366	4.0467	3.4511
4/18/07	2	14	610	A	5.90	5.40	67.76	6.37	10.05	58.82	9.96	10.52	59.45	11.56	10.73	1.5808	2.0707	2.2085	1.2841	2.3521	2.2623
4/18/07	2	14	611	A	6.00	5.20	60.34	8.52	9.80	58.99	9.59	10.27	55.55	10.56	10.81	3.0497	3.0979	2.6003	3.0500	2.7317	.
4/18/07	2	14	612	A	7.20	7.20	41.11	12.04	8.15	39.40	14.21	10.03	44.96	15.03	10.80	.	.	.	.	.	.
4/18/07	2	14	613	A	5.10	5.80	53.73	8.43	10.03	47.97	9.86	9.09	47.95	9.74	10.63	4.2206	3.3627	3.5897	5.2929	4.8053	5.1369
4/18/07	2	14	614	A	5.70	6.00	55.57	10.34	12.03	45.31	12.33	10.70	46.79	10.62	10.58	2.1586	6.5835	5.1895	3.5274	6.0263	1.5932
4/18/07	2	14	615	A	6.00	5.90	51.74	9.25	10.11	49.04	9.74	9.62	48.02	9.67	9.97	.	.	.	.	.	.
4/18/07	2	14	608	B	5.70	5.90	56.38	10.37	10.63	61.42	6.27	10.80	59.32	9.01	13.08	2.5267	1.5833	2.0111	2.4155	1.9188	3.6991
4/18/07	2	14	609	B	5.90	5.80	54.89	7.64	9.49	55.88	9.75	10.27	56.78	9.43	9.39	2.6908	3.0983	2.2600	2.1625	3.1044	2.1936
4/18/07	2	14	610	B	5.50	5.30	60.56	7.03	10.27	57.24	8.13	8.54	63.90	7.96	10.43	3.1208	2.8435	2.5098	2.5048	2.1656	1.6478
4/18/07	2	14	611	B	5.60	5.70	61.86	6.01	10.77	62.90	5.69	11.75	59.67	5.98	10.63	1.9134	1.4593	1.7213	1.9991	1.5078	1.6931
4/18/07	2	14	612	B	6.20	6.80	55.89	9.50	10.82	45.68	12.12	9.87	49.74	11.83	10.23	.	.	.	.	.	.
4/18/07	2	14	613	B	5.60	5.90	52.42	7.46	9.41	53.90	7.14	9.08	55.51	6.14	10.73	.	.	.	.	.	.
4/18/07	2	14	614	B	5.70	4.90	51.15	8.39	10.63	49.55	10.21	10.12	51.64	8.06	10.88	4.3586	2.1433	3.3219	4.7570	2.6839	3.8779
4/18/07	2	14	615	B	5.70	5.70	53.33	8.05	10.48	54.24	6.48	12.04	54.10	8.25	10.73	.	.	.	.	.	.
4/18/07	2	14	608	C	5.00	5.70	51.27	10.50	9.77	60.80	7.44	10.48	58.35	10.24	9.83	1.9812	1.2632	1.5941	0.7203	1.1698	1.7048
4/18/07	2	14	609	C	6.20	6.30	57.51	8.68	10.01	52.32	10.94	10.28	56.17	9.53	10.61	.	.	.	.	.	.
4/18/07	2	14	610	C	5.50	5.70	56.40	10.61	10.84	61.79	7.84	10.47	59.33	9.83	10.53	1.3607	1.7049	1.7425	1.0615	1.4564	1.6764
4/18/07	2	14	611	C	5.90	5.80	58.80	8.07	10.57	58.98	9.14	10.63	59.85	8.35	10.62	1.2278	1.5632	1.1830	1.9584	1.6239	1.5365
4/18/07	2	14	612	C	6.80	6.50	53.53	12.99	11.58	53.11	12.35	10.89	52.88	12.72	10.83	.	.	.	.	.	.
4/18/07	2	14	613	C	5.90	5.90	51.02	9.44	10.31	50.48	9.94	9.15	47.80	10.30	9.08	2.3927	1.4680	3.0174	3.4208	1.8498	1.7167
4/18/07	2	14	614	C	5.90	5.90	56.31	8.46	11.12	57.90	7.96	11.18	55.47	7.26	11.20	.	.	.	.	.	.
4/18/07	2	14	615	C	5.80	5.70	51.76	8.34	11.53	50.34	9.27	10.62	51.60	9.30	11.14	5.0109	2.6766	5.5448	3.9938	.	.

4/18/07	2	14	608	D	5.90	5.80	65.16	7.54	10.77	61.88	8.76	11.28	59.51	9.55	10.45	1.7618	3.3048	2.5104	1.9557	3.0761	2.0949
4/18/07	2	14	609	D	6.80	6.10	51.53	11.05	10.76	54.94	12.29	10.85	59.42	11.33	11.19	1.3499	1.6295	1.5233	1.4498	1.4054	1.5078
4/18/07	2	14	610	D	6.00	5.70	60.15	7.67	10.83	61.42	8.94	10.77	60.47	7.87	10.71	0.9433	1.7825	1.0234	1.2819	1.5411	1.3612
4/18/07	2	14	611	D	5.80	5.70	58.87	8.95	11.05	62.30	8.10	10.93	59.48	8.74	10.19	1.9147	1.6403	1.8073	2.1918	2.8094	2.6270
4/18/07	2	14	612	D	6.20	6.30	44.90	12.11	8.80	48.93	12.87	10.28	47.83	14.27	10.50	3.2320	2.1169	3.3940	2.0812	2.2529	2.0353
4/18/07	2	14	613	D	6.30	5.40	57.66	8.89	9.90	52.77	10.11	10.23	54.36	9.18	10.53	4.8252	3.1928	2.5866	4.0861	3.4482	.
4/18/07	2	14	614	D	5.10	5.80	61.40	7.99	11.24	51.01	9.09	10.88	53.33	9.06	10.34	4.7239	4.3219	4.8775	3.2010	5.0678	3.9112
4/18/07	2	14	615	D	5.80	5.90	55.24	8.50	10.81	51.73	8.72	10.07	47.88	9.61	10.78	3.7784	3.9142	3.8687	3.8753	4.4054	5.2983
4/19/07	3	14	616	A	5.49	5.45	56.49	16.71	12.23	52.12	18.22	11.80	57.28	16.20	12.18	1.8452	3.3886	3.1279	3.7869	3.0746	2.3944
4/19/07	3	14	617	A	6.15	5.75	57.46	17.41	12.60	57.71	16.72	12.86	59.40	15.78	12.19	2.4100	3.3121	2.5274	2.7240	2.6255	2.5937
4/19/07	3	14	618	A	5.67	5.94	53.11	19.32	12.13	54.19	13.36	10.93	55.08	18.48	12.33	1.8427	3.1474	3.5672	2.8069	2.6471	2.7680
4/19/07	3	14	619	A	5.97	5.98	57.55	19.98	13.26	57.15	19.27	12.73	57.48	20.30	13.12	2.6398	3.4462	2.4553	2.1988	2.3850	2.0133
4/19/07	3	14	620	A	6.37	6.40	53.84	18.31	12.38	54.59	19.72	12.63	54.61	20.48	12.76	4.3141	2.9777	4.5364	3.2329	4.0140	2.8621
4/19/07	3	14	621	A	6.71	6.94	53.56	22.17	12.58	53.84	19.64	12.41	53.68	22.62	12.61	3.6800	2.8496	2.5540	2.9256	2.9694	.
4/19/07	3	14	622	A	5.95	5.93	52.48	12.32	12.57	55.36	13.32	13.12	53.46	13.08	12.31	.	.	.	.	.	.
4/19/07	3	14	623	A	6.68	6.34	48.54	15.71	12.05	48.93	15.14	12.18	47.73	13.56	11.04	3.1485	2.6542	2.9896	3.6158	1.7482	.
4/19/07	3	14	616	B	5.61	5.62	62.72	13.77	12.25	60.67	15.79	11.89	57.67	11.43	11.31	2.1524	2.3732	2.4491	2.2257	2.4917	2.2400
4/19/07	3	14	617	B	5.55	5.12	55.14	9.85	10.53	55.11	10.93	10.55	58.75	9.93	11.17	2.1859	2.4236	1.8271	.	.	.
4/19/07	3	14	618	B	5.89	5.81	53.73	10.28	11.34	52.62	10.40	10.75	53.66	12.60	11.16	1.2411	1.9542	2.0025	2.3654	3.2397	2.2372
4/19/07	3	14	619	B	5.83	5.84	57.73	21.65	13.66	59.32	16.79	13.46	57.18	18.72	12.54	3.2613	1.2853	1.1442	0.8533	1.3739	1.4605
4/19/07	3	14	620	B	5.51	5.73	56.45	12.89	12.31	51.72	12.07	10.74	53.50	12.03	11.41	5.8251	3.4454	4.1200	6.8593	7.9585	5.9786
4/19/07	3	14	621	B	5.60	5.83	65.42	9.58	11.68	56.84	16.71	12.57	55.73	16.49	12.43	5.6872	5.7122	6.1057	5.5870	5.0140	4.1721
4/19/07	3	14	622	B	6.22	6.06	54.28	12.20	12.00	53.18	11.22	11.90	50.28	11.13	11.45	.	.	.	.	.	.
4/19/07	3	14	623	B	6.75	6.52	60.08	10.02	14.81	60.39	10.08	14.86	60.43	10.14	14.92	.	.	.	.	.	.
4/19/07	3	14	616	C	6.21	6.86	62.07	21.13	13.43	58.57	24.09	13.74	62.59	19.78	13.36	1.6778	1.7264	1.7795	2.2137	2.0519	1.9902
4/19/07	3	14	617	C	6.53	6.35	61.48	21.33	13.47	62.00	21.55	15.14	66.07	18.35	13.15	2.3044	4.0024	2.4991	1.9693	1.6345	3.3197
4/19/07	3	14	618	C	5.67	5.65	54.54	11.71	11.66	56.44	12.80	11.74	59.16	9.61	11.27	2.9413	3.5258	3.2182	2.1812	2.5012	3.4582
4/19/07	3	14	619	C	5.65	5.66	60.64	10.62	11.75	56.52	10.37	12.35	58.29	10.93	12.15	1.5674	1.7980	1.2965	2.2405	1.5963	2.3632
4/19/07	3	14	620	C	6.27	5.69	53.75	10.39	12.00	52.05	10.05	13.14	56.45	10.35	12.90	2.6781	3.0625	.	.	.	.
4/19/07	3	14	621	C	6.05	5.87	54.22	12.15	11.64	52.45	12.42	10.86	53.39	11.81	12.07	2.5317	2.8533	2.8302	3.2417	3.6970	.
4/19/07	3	14	622	C	5.78	5.76	53.54	8.99	12.38	53.24	9.09	11.67	53.21	8.97	12.18	7.8262	7.8433	7.9064	.	.	.

4/19/07	3	14	623	C	6.72	6.35	51.97	15.30	12.40	51.22	15.38	12.82	53.73	14.31	13.48	9.3654	9.1797	9.2966	7.5969	7.4515	7.1999
4/19/07	3	14	616	D	5.99	5.62	53.79	17.11	11.97	58.54	16.01	11.99	49.98	12.79	11.12	2.9374	2.1233	2.2908	3.2667	1.8123	2.2908
4/19/07	3	14	617	D	5.51	5.45	59.22	10.66	12.27	56.53	11.13	11.58	57.12	11.30	12.03	2.4219	2.1545	.	.	.	.
4/19/07	3	14	618	D	5.56	5.95	55.98	10.87	10.81	53.67	11.17	11.72	56.93	11.62	11.55	3.7462	3.6717	3.5186	4.0171	4.6094	5.2921
4/19/07	3	14	619	D	5.96	5.96	56.03	12.72	11.59	59.25	12.20	11.69	56.35	15.35	12.07	3.6247	2.9384	3.9652	3.9363	3.0735	.
4/19/07	3	14	620	D	6.18	5.25	49.72	10.61	10.95	49.43	13.46	10.07	48.96	12.31	10.61	6.6504	4.4516	5.6031	6.4117	7.1969	5.1255
4/19/07	3	14	621	D	6.67	6.56	58.80	17.41	13.29	55.94	16.37	12.55	57.54	17.85	13.74	2.7392	2.5718	4.1011	2.3286	2.4889	.
4/19/07	3	14	622	D	6.25	6.31	54.69	10.62	12.93	51.75	12.49	12.85	54.71	11.69	13.38	.	.	.	.	.	.
4/19/07	3	14	623	D	6.94	5.99	52.38	16.58	13.57	52.16	15.83	12.70	54.57	15.49	13.28	1.8452	3.3886	3.1279	3.7869	3.0746	2.3944
5/1/07	1	28	600	A	5.74	6.34	56.06	11.13	11.52	62.21	15.04	11.75	55.74	11.30	12.40	2.2210	2.1118	2.1793	1.7139	2.5743	2.4065
5/1/07	1	28	601	A	6.19	6.11	62.41	16.08	12.00	55.54	21.95	12.25	54.85	12.71	12.16	.	.	.	.	.	.
5/1/07	1	28	602	A	5.54	6.01	59.52	9.87	11.75	58.09	11.01	11.99	53.85	14.14	12.27	3.6480	3.9834	3.7115	3.5795	3.4664	3.3999
5/1/07	1	28	603	A	6.32	6.04	55.93	13.29	11.93	57.35	15.09	11.48	50.86	14.05	11.27	2.3133	3.0129	3.1608	2.5633	2.6298	2.7608
5/1/07	1	28	604	A	6.31	6.31	52.96	11.57	12.23	53.94	16.60	12.51	52.71	14.64	11.57	3.2540	3.6966	2.5207	2.0840	5.0711	3.1578
5/1/07	1	28	605	A	5.45	5.43	49.54	11.48	11.24	51.38	11.71	11.54	48.25	10.86	11.00	6.1677	5.1674	6.6827	3.9050	2.6169	.
5/1/07	1	28	606	A	6.04	6.04	48.83	15.44	12.78	52.42	14.12	11.66	50.72	13.88	12.11	4.1135	3.7612	5.0969	2.7420	3.3106	5.2398
5/1/07	1	28	607	A	6.09	6.06	58.38	8.70	11.62	52.51	10.88	11.50	53.38	9.95	10.99	.	.	.	.	.	.
5/1/07	1	28	600	B	5.92	5.64	56.56	8.53	10.40	58.69	8.17	11.56	59.83	8.76	11.03	1.4628	1.5481	1.6424	1.6672	3.5131	1.4658
5/1/07	1	28	601	B	5.92	5.80	59.28	8.24	11.73	54.50	11.60	10.50	55.64	9.88	10.06	3.1141	1.5283	2.1118	1.6444	1.6057	2.7211
5/1/07	1	28	602	B	5.70	5.69	57.53	9.11	11.28	59.25	10.37	11.47	54.43	9.68	10.69	0.8267	2.2795	1.8925	1.3407	1.5729	1.5203
5/1/07	1	28	603	B	5.84	5.80	55.35	10.49	12.13	52.73	9.38	11.18	57.58	8.47	12.13	3.4674	3.9348	3.1756	3.4098	3.4742	3.5031
5/1/07	1	28	604	B	5.87	6.05	46.53	10.38	10.77	48.38	10.81	10.94	49.25	10.26	10.91	.	.	.	.	.	.
5/1/07	1	28	605	B	5.97	5.92	52.21	8.19	11.64	54.69	8.15	11.40	49.74	10.26	11.10	4.8577	5.0959	4.9292	3.7105	2.9762	3.2759
5/1/07	1	28	606	B	5.87	5.82	51.28	9.31	11.35	48.88	10.53	10.44	49.83	10.64	11.27	5.6685	3.9120	4.5620	3.0258	.	.
5/1/07	1	28	607	B	5.81	5.51	60.35	6.31	11.04	52.25	7.58	11.07	54.20	6.75	11.84	4.5590	5.3658	3.3533	2.4194	.	.
5/1/07	1	28	600	C	5.78	5.84	58.20	11.17	11.64	56.50	13.71	11.79	57.19	9.33	10.82	5.0473	3.1072	3.5835	2.8303	1.1740	4.1343
5/1/07	1	28	601	C	5.84	5.79	52.87	13.02	11.63	62.03	12.62	10.99	56.55	9.46	10.92	1.9431	1.1393	2.7043	1.4787	0.7324	1.1115
5/1/07	1	28	602	C	5.80	5.80	57.29	10.86	11.97	58.05	11.11	10.97	53.51	11.10	10.89	4.0351	3.6282	3.5607	3.9070	3.0258	3.4535
5/1/07	1	28	603	C	5.66	5.89	60.23	9.88	11.81	58.21	11.86	11.82	58.22	11.49	12.18	1.9242	2.1465	3.1369	2.6249	2.3401	3.5250
5/1/07	1	28	604	C	6.09	6.01	54.56	11.27	11.54	52.24	11.12	11.13	52.26	10.18	10.98	2.8640	2.7876	2.8055	3.5944	3.2600	3.0675
5/1/07	1	28	605	C	5.77	5.84	53.97	10.16	11.95	53.27	7.22	11.50	48.95	8.80	11.44	.	.	.	.	.	.

5/1/07	1	28	606	C	5.92	5.95	51.06	11.61	11.64	48.24	13.10	11.45	50.24	12.71	11.16	3.1935	3.6093	3.7026	4.3477	4.1770	3.5081
5/1/07	1	28	607	C	5.74	5.83	53.62	9.56	10.54	62.06	8.73	11.72	53.53	8.78	11.68	3.2789	4.5253	2.8124	3.0169	4.5531	3.2392
5/1/07	1	28	600	D	6.04	5.72	59.13	8.20	11.03	57.79	9.31	11.58	58.48	8.30	11.15	1.5313	0.8812	1.0609	1.2325	1.5253	1.1045
5/1/07	1	28	601	D	5.88	6.30	56.91	10.44	11.01	63.61	15.38	13.10	63.54	10.44	11.83	1.3050	2.3182	2.5703	1.9570	1.6424	2.5147
5/1/07	1	28	602	D	5.81	5.83	55.61	11.36	11.93	55.88	13.46	11.84	58.48	12.91	11.69	1.1363	0.8624	1.1353	1.0093	1.3963	1.0807
5/1/07	1	28	603	D	5.78	5.88	52.98	14.03	11.08	57.01	13.22	11.63	52.93	11.13	11.01	3.9609	2.7182	3.4227	2.8918	4.1571	3.0774
5/1/07	1	28	604	D	5.96	6.04	46.98	11.95	11.82	57.52	10.53	11.98	51.67	11.35	11.43	.	.	.	.	.	.
5/1/07	1	28	605	D	5.77	5.74	46.93	.	11.16	47.38	10.63	11.83	47.82	9.76	11.10	2.5633	5.4125	4.0301	5.7062	4.7714	3.1985
5/1/07	1	28	606	D	5.87	5.96	57.34	9.59	11.79	56.68	10.75	12.54	57.47	10.78	12.86	4.0033	3.1737	3.9497	3.0109	3.1151	4.2921
5/1/07	1	28	607	D	5.64	5.79	58.15	9.42	12.04	50.90	9.62	10.94	55.28	8.29	11.37	.	.	.	.	.	.
5/2/07	2	28	608	A	6.72	6.98	60.08	20.19	12.90	58.79	13.95	11.90	55.19	12.49	11.25	1.9193	2.1416	2.1783	2.1188	2.0523	2.2497
5/2/07	2	28	609	A	7.27	7.36	54.46	14.83	11.87	54.68	15.11	11.17	53.39	15.01	11.25	2.8045	3.1330	2.9801	2.5673	3.2481	2.9395
5/2/07	2	28	610	A	6.21	6.10	66.29	8.14	13.45	63.09	11.29	12.50	58.58	11.34	11.64	0.9676	1.1581	1.2742	1.5220	1.4211	1.3695
5/2/07	2	28	611	A	6.18	6.13	56.99	9.08	10.89	57.94	10.11	11.74	59.71	9.47	10.65	2.0066	1.7714	1.8488	1.7674	2.0394	1.8181
5/2/07	2	28	612	A	7.28	7.40	42.97	14.26	10.48	43.28	12.25	8.88	40.26	15.31	10.11	3.9755	1.4380	2.5356	2.5901	1.7754	1.3109
5/2/07	2	28	613	A	6.70	6.87	52.34	12.51	12.05	53.14	14.30	12.34	50.50	11.37	11.39	4.7297	4.3933	3.4168	.	.	.
5/2/07	2	28	614	A	6.18	6.18	46.32	11.93	10.99	49.35	13.39	11.34	47.65	13.42	10.97	4.3457	7.6622	3.3262	2.6378	2.9325	4.3635
5/2/07	2	28	615	A	6.18	6.21	52.29	10.04	11.20	55.91	9.36	11.46	58.79	8.55	11.89	.	.	.	.	.	.
5/2/07	2	28	608	B	5.91	6.08	62.70	7.50	11.69	58.04	9.98	11.94	61.86	8.67	11.45	1.9241	2.3311	2.2180	2.0533	2.0463	2.5236
5/2/07	2	28	609	B	6.21	6.29	55.33	11.22	10.94	46.92	17.07	14.04	55.75	9.05	10.19	4.0718	4.7109	3.1409	4.6086	4.1690	3.7056
5/2/07	2	28	610	B	5.72	5.76	61.00	9.09	11.11	61.56	8.77	11.08	58.55	8.19	11.51	1.1889	2.2468	1.7684	1.5293	1.7655	1.8806
5/2/07	2	28	611	B	5.68	5.78	62.77	6.83	11.58	59.95	6.58	11.95	66.26	6.37	13.39	.	.	.	.	.	.
5/2/07	2	28	612	B	6.98	7.06	56.01	11.96	12.83	49.32	12.55	11.25	46.68	12.87	10.57	.	.	.	.	.	.
5/2/07	2	28	613	B	5.91	5.91	53.67	7.98	10.74	48.82	7.82	10.58	49.06	8.30	10.59	.	.	.	.	.	.
5/2/07	2	28	614	B	5.97	5.95	51.71	9.39	11.69	52.34	9.87	11.78	51.48	8.58	12.24	2.5445	1.5819	3.5458	1.8627	.	.
5/2/07	2	28	615	B	5.98	5.94	53.33	8.78	11.58	54.67	9.09	11.68	55.59	6.69	11.87	3.3056	3.9567	3.3731	2.5614	1.7228	4.0162
5/2/07	2	28	608	C	6.01	5.96	60.32	8.00	12.26	60.57	10.34	11.98	57.40	9.58	11.77	2.1128	.	.	.	.	.
5/2/07	2	28	609	C	6.29	6.24	54.29	9.34	11.35	53.53	11.53	11.22	49.30	12.55	11.34	2.0483	2.3798	2.0691	1.9620	2.0165	1.8736
5/2/07	2	28	610	C	6.02	6.01	55.89	10.46	11.25	55.86	9.79	11.52	59.76	10.01	10.99	2.1059	2.3748	2.8968	1.9957	2.1346	.
5/2/07	2	28	611	C	6.01	6.03	59.73	9.41	11.63	60.05	9.61	12.21	63.85	7.17	11.53	4.2077	2.5584	2.7837	2.9603	3.4476	2.6656
5/2/07	2	28	612	C	7.07	7.01	49.24	14.07	10.43	53.46	13.62	11.92	50.43	14.49	11.77	.	.	.	.	.	.

5/2/07	2	28	613	C	6.07	6.02	52.30	10.25	10.27	49.00	10.11	10.64	55.75	8.35	10.64	.	.	.	.	.	.
5/2/07	2	28	614	C	6.17	6.18	51.08	9.25	11.34	49.92	9.35	10.83	46.79	9.19	10.63	5.7420	5.2051	5.1664	4.4270	4.5213	4.9143
5/2/07	2	28	615	C	6.06	6.07	53.03	9.97	10.90	55.36	8.77	11.76	50.47	10.42	11.75	.	.	.	.	.	.
5/2/07	2	28	608	D	5.80	5.94	58.46	9.56	11.48	57.44	9.68	11.72	60.69	9.21	11.85	1.7208	2.5852	1.9600	2.3966	1.2445	1.7258
5/2/07	2	28	609	D	6.38	6.32	54.57	11.63	11.43	54.44	12.11	11.66	51.70	12.22	11.81	2.1227	2.1009	1.8171	1.7794	2.5623	3.1260
5/2/07	2	28	610	D	5.70	5.77	57.32	9.57	10.58	63.72	8.78	11.28	63.05	7.34	11.59	3.0109	1.4558	2.0086	2.9891	2.4522	3.4476
5/2/07	2	28	611	D	5.89	5.90	61.27	7.61	12.17	61.97	7.91	12.00	56.66	9.84	12.31	2.3291	2.7003	2.1882	2.1545	2.5028	2.0175
5/2/07	2	28	612	D	7.13	7.14	50.01	15.35	11.11	51.55	14.78	11.28	50.23	14.30	11.49	.	.	.	.	.	.
5/2/07	2	28	613	D	6.16	6.27	51.92	10.86	11.27	55.72	7.79	10.61	52.87	10.92	11.50	2.2550	2.9712	6.4475	4.2425	2.8710	2.8154
5/2/07	2	28	614	D	5.92	5.97	47.75	8.61	10.76	48.13	8.62	11.72	46.67	9.11	10.89	2.7579	4.0231	4.3943	3.1121	3.8991	5.8055
5/2/07	2	28	615	D	5.97	6.00	63.30	6.79	12.49	52.05	10.01	12.42	49.78	10.00	11.38	4.5828	2.5623	3.2957	5.1733	4.1194	.
5/3/07	3	28	616	A	6.20	6.30	56.37	17.57	12.21	56.64	16.93	11.69	56.63	16.89	11.93	.	.	.	.	.	.
5/3/07	3	28	617	A	7.00	6.70	62.68	17.07	12.29	61.80	19.54	12.25	57.02	18.60	11.79	1.7769	1.7806	1.9881	2.0180	1.5461	.
5/3/07	3	28	618	A	6.20	6.10	58.25	12.42	10.63	58.95	16.57	12.57	57.99	15.11	11.11	2.8645	3.9940	3.2446	2.9657	3.2957	3.4296
5/3/07	3	28	619	A	6.10	6.10	57.90	13.95	11.68	59.03	15.80	11.57	62.57	12.32	12.70	2.8639	2.6255	3.6574	2.5968	2.8704	1.9874
5/3/07	3	28	620	A	5.90	6.10	52.33	18.24	11.61	53.97	19.30	12.33	52.10	18.35	11.40	2.6515	4.9319	9.1117	3.6225	5.2747	.
5/3/07	3	28	621	A	6.80	6.50	53.41	21.68	12.02	53.47	21.31	11.37	54.89	19.34	12.07	2.4440	6.2864	2.3379	3.6208	2.9511	.
5/3/07	3	28	622	A	6.50	6.60	54.52	14.46	11.31	52.82	13.83	12.36	54.08	14.94	13.35	.	.	.	.	.	.
5/3/07	3	28	623	A	7.10	7.10	44.52	14.13	11.75	46.09	14.54	12.25	46.51	15.82	13.53	.	.	.	.	.	.
5/3/07	3	28	616	B	6.70	7.00	51.74	13.99	12.40	53.33	14.41	12.55	49.09	14.70	11.83	.	.	.	.	.	.
5/3/07	3	28	617	B	5.50	5.50	59.14	10.30	11.14	59.62	11.68	10.90	57.06	10.63	11.22	.	.	.	.	.	.
5/3/07	3	28	618	B	5.80	5.90	53.59	11.75	10.55	54.95	15.33	11.17	56.55	12.18	9.86	.	.	.	.	.	.
5/3/07	3	28	619	B	6.00	6.00	56.73	12.98	10.80	59.64	14.37	11.52	58.35	15.91	11.60	1.7379	2.0040	1.9789	1.4917	.	.
5/3/07	3	28	620	B	6.10	5.60	56.02	14.48	12.17	54.02	14.51	11.66	53.96	11.40	10.10	3.2149	3.8812	5.0934	4.4810	5.3255	.
5/3/07	3	28	621	B	6.20	5.90	57.46	16.01	11.82	56.29	20.54	12.36	56.91	20.45	12.76	.	.	.	.	.	.
5/3/07	3	28	622	B	5.60	6.30	60.18	11.82	13.53	53.26	11.95	11.68	56.15	10.94	13.15	5.1072	.	.	.	.	.
5/3/07	3	28	623	B	6.10	6.50	51.40	12.89	12.26	50.85	15.44	12.60	49.68	13.77	11.01	.	.	.	.	.	.
5/3/07	3	28	616	C	6.00	6.10	57.63	19.11	12.49	56.96	20.28	12.75	57.15	14.91	11.73	3.1679	4.0316	2.8496	2.6744	4.6002	6.7648
5/3/07	3	28	617	C	5.70	6.00	58.23	15.25	11.76	58.72	16.14	11.65	56.22	15.41	11.05	3.4895	2.9337	2.9789	2.1993	3.1783	2.9663
5/3/07	3	28	618	C	5.90	5.90	57.28	11.53	10.25	57.87	12.74	11.08	61.02	11.21	11.39	3.7661	2.3878	2.3692	2.3719	3.4355	.
5/3/07	3	28	619	C	5.90	5.80	54.58	10.21	11.02	57.42	11.19	11.57	62.34	9.66	12.39	3.9609	4.1173	4.0977	4.1684	.	.

5/3/07	3	28	620	C	6.20	6.30	52.53	14.82	11.83	53.31	16.30	11.32	54.99	17.23	12.50	4.8196	6.3974	6.0501	3.3075	3.9264	3.5831
5/3/07	3	28	621	C	5.80	5.80	56.64	16.67	11.63	56.34	16.13	12.23	56.18	14.04	12.24	3.0651	4.3096	2.4655	3.0980	.	.
5/3/07	3	28	622	C	6.70	6.40	56.88	11.76	12.79	58.52	10.93	12.68	60.09	10.00	13.59	.	.	.	.	.	.
5/3/07	3	28	623	C	6.80	6.50	50.32	16.65	12.94	50.54	15.86	13.13	50.30	14.66	13.68	.	.	.	.	.	.
5/3/07	3	28	616	D	6.10	5.80	58.12	12.68	13.13	57.35	14.00	12.30	59.33	13.96	11.79	2.1485	2.0024	2.4935	2.0004	.	.
5/3/07	3	28	617	D	6.00	6.00	60.71	11.44	11.60	60.33	14.20	11.72	58.31	14.24	11.31	5.7168	1.7889	4.1053	3.1901	.	.
5/3/07	3	28	618	D	5.30	5.50	55.90	10.56	11.14	56.43	10.99	11.34	56.84	10.41	12.11	2.8568	6.0918	.	.	.	.
5/3/07	3	28	619	D	6.00	5.40	59.12	13.59	12.10	55.91	14.93	11.56	53.62	13.25	11.53	.	.	.	.	.	.
5/3/07	3	28	620	D	5.90	6.50	52.74	17.23	11.02	54.27	18.30	11.27	56.21	16.30	11.36	6.7687	3.8704	3.4418	9.0829	.	.
5/3/07	3	28	621	D	6.70	6.30	58.25	19.09	12.45	59.01	18.88	12.09	59.01	17.70	11.85	3.0618	5.6255	4.2631	2.9128	.	.
5/3/07	3	28	622	D	6.00	5.40	50.11	11.47	13.81	52.75	12.14	14.97	53.26	10.91	14.45	.	.	.	.	.	.
5/3/07	3	28	623	D	6.60	6.80	55.93	12.20	13.14	54.04	14.49	13.00	54.48	12.80	13.84	.	.	.	.	.	.

I-4. Raw data for trained descriptive sensory analysis cooked beef bottom rounds.

Date	PD	SD	Panel	#	Trt	Code	Order	Session	Panelists	Juicy	MFTend	CT	Otend	oflavint	CBLean	CBFat	serum	liver	cowy	salt	sour	bitter	metallic
4/3/07	1	0	1	600	D	71	1	1	Cunningham	4	7	6	6	4	4	0	0	0	0	0	0	1	0
4/3/07	1	0	1	600	A	15	2	1	Cunningham	5	6	6	6	5	4	1	0	0	0	1	1	0	1
4/3/07	1	0	1	603	C	499	3	1	Cunningham	5	5	4	4	5	4	1	0	0	1	0	2	0	0
4/3/07	1	0	1	605	D	313	4	1	Cunningham	5	5	5	5	5	4	1	0	0	0	0	1	0	0
4/3/07	1	0	1	603	D	793	5	1	Cunningham	6	6	6	6	5	5	0	0	0	0	1	2	1	0
4/3/07	1	0	1	601	B	641	6	1	Cunningham	5	7	7	7	5	5	2	0	0	2	0	1	0	0
4/3/07	1	0	1	607	C	11	7	1	Cunningham	5	6	5	5	6	5	0	0	0	1	2	1	1	1
4/3/07	1	0	1	606	C	119	8	1	Cunningham	6	5	5	5	6	5	0	1	0	0	0	2	2	2
4/3/07	1	0	1	603	A	19	9	2	Cunningham	6	6	5	5	5	5	1	0	0	0	0	0	0	1
4/3/07	1	0	1	605	A	931	10	2	Cunningham	6	5	5	5	6	5	0	0	0	0	2	2	1	2
4/3/07	1	0	1	604	B	826	11	2	Cunningham	5	6	6	6	5	4	0	0	0	2	0	0	0	0
4/3/07	1	0	1	606	D	214	12	2	Cunningham	6	6	5	5	6	5	0	0	0	0	0	3	2	0
4/3/07	1	0	1	602	B	346	13	2	Cunningham	5	7	5	5	5	5	0	0	0	0	0	2	2	1
4/3/07	1	0	1	606	A	322	14	2	Cunningham	6	6	5	5	6	5	0	0	0	3	1	2	2	2
4/3/07	1	0	1	605	B	450	15	2	Cunningham	5	6	6	6	5	5	0	0	0	0	0	2	0	1
4/3/07	1	0	1	600	C	759	16	2	Cunningham	5	7	7	7	5	5	1	0	0	0	1	0	0	0
4/3/07	1	0	1	600	D	71	1	1	Amen	4	6	8	6	3	3	0	0	0	0	0	0	0	2
4/3/07	1	0	1	600	A	15	2	1	Amen	5	6	7	6	4	3	1	0	0	0	0	0	0	2
4/3/07	1	0	1	603	C	499	3	1	Amen	4	3	5	3	5	4	0	0	0	0	0	1	1	1
4/3/07	1	0	1	605	D	313	4	1	Amen	4	4	4	4	6	4	0	0	0	2	0	1	1	1
4/3/07	1	0	1	603	D	793	5	1	Amen	5	5	6	5	5	4	2	0	0	0	0	1	1	2
4/3/07	1	0	1	601	B	641	6	1	Amen	6	6	7	6	5	3	0	0	0	0	0	1	1	1
4/3/07	1	0	1	607	C	11	7	1	Amen	4	6	5	5	5	3	1	0	2	0	0	0	0	2
4/3/07	1	0	1	606	C	119	8	1	Amen	5	5	5	4	6	4	1	0	0	3	0	0	2	2

4/3/07	1	0	1	603	A	19	9	2	Amen	5	6	6	6	5	5	0	1	0	0	0	2	1	2
4/3/07	1	0	1	605	A	931	10	2	Amen	5	5	6	5	5	4	0	0	0	2	0	1	1	1
4/3/07	1	0	1	604	B	826	11	2	Amen	4	6	6	6	4	4	1	0	0	0	0	0	0	2
4/3/07	1	0	1	606	D	214	12	2	Amen	5	5	6	5	7	4	1	0	0	4	0	1	2	2
4/3/07	1	0	1	602	B	346	13	2	Amen	5	6	7	6	6	5	0	0	0	0	0	1	2	1
4/3/07	1	0	1	606	A	322	14	2	Amen	6	7	7	7	6	4	1	0	0	2	0	2	1	2
4/3/07	1	0	1	605	B	450	15	2	Amen	4	6	6	6	5	4	0	0	0	1	0	1	1	1
4/3/07	1	0	1	600	C	759	16	2	Amen	4	6	7	6	5	4	0	0	0	0	0	1	2	2
4/3/07	1	0	1	600	D	71	1	1	Davis	3	6	5	6	4	5	0	0	0	0	0	1	1	1
4/3/07	1	0	1	600	A	15	2	1	Davis	4	5	6	5	3	4	0	0	0	0	1	0	0	3
4/3/07	1	0	1	603	C	499	3	1	Davis	3	4	5	4	4	4	0	1	0	0	0	1	0	2
4/3/07	1	0	1	605	D	313	4	1	Davis	5	3	2	2	5	5	0	1	0	0	0	1	2	1
4/3/07	1	0	1	603	D	793	5	1	Davis	4	6	7	6	6	5	0	0	0	1	0	2	2	2
4/3/07	1	0	1	601	B	641	6	1	Davis	4	6	7	6	5	5	0	0	0	0	1	0	1	2
4/3/07	1	0	1	607	C	11	7	1	Davis	3	3	2	3	6	6	0	1	0	3	0	0	1	2
4/3/07	1	0	1	606	C	119	8	1	Davis	5	3	1	2	6	6	0	0	0	1	2	1	2	1
4/3/07	1	0	1	603	A	19	9	2	Davis	5	5	6	5	6	6	0	1	0	0	1	2	1	2
4/3/07	1	0	1	605	A	931	10	2	Davis	4	6	6	6	5	5	0	0	0	2	0	0	2	1
4/3/07	1	0	1	604	B	826	11	2	Davis	3	5	5	5	4	5	0	0	0	0	0	1	1	1
4/3/07	1	0	1	606	D	214	12	2	Davis	5	3	1	2	7	5	0	0	0	3	0	2	2	0
4/3/07	1	0	1	602	B	346	13	2	Davis	3	6	5	6	5	5	0	0	0	1	0	0	0	3
4/3/07	1	0	1	606	A	322	14	2	Davis	6	6	4	5	6	6	0	0	0	2	0	1	1	2
4/3/07	1	0	1	605	B	450	15	2	Davis	4	6	6	6	4	4	0	0	0	1	0	1	0	3
4/3/07	1	0	1	600	C	759	16	2	Davis	5	6	6	6	5	5	0	0	0	0	1	2	1	2
4/3/07	1	0	1	600	D	71	1	1	Inglis	3	7	7	7	5	4	3	0	0	0	2	4	3	3
4/3/07	1	0	1	600	A	15	2	1	Inglis	3	7	7	7	5	4	3	0	0	0	1	2	4	3
4/3/07	1	0	1	603	C	499	3	1	Inglis	2	5	6	5	5	4	2	0	1	0	1	2	3	3
4/3/07	1	0	1	605	D	313	4	1	Inglis	2	5	5	5	4	3	0	0	0	0	1	2	3	3
4/3/07	1	0	1	603	D	793	5	1	Inglis	2	6	6	6	5	4	2	0	0	0	1	2	2	3
4/3/07	1	0	1	601	B	641	6	1	Inglis	2	6	6	6	5	4	1	0	1	0	1	2	2	3
4/3/07	1	0	1	607	C	11	7	1	Inglis	2	5	5	5	4	3	0	0	1	0	1	2	2	3

4/3/07	1	0	1	606	C	119	8	1	Inglis	2	4	4	4	4	3	0	0	0	0	1	1	1	3
4/3/07	1	0	1	603	A	19	9	2	Inglis	2	6	6	6	5	4	1	0	1	0	1	2	2	3
4/3/07	1	0	1	605	A	931	10	2	Inglis	2	7	6	7	5	4	1	0	1	0	1	2	3	3
4/3/07	1	0	1	604	B	826	11	2	Inglis	2	7	6	7	5	4	1	0	1	0	1	2	2	3
4/3/07	1	0	1	606	D	214	12	2	Inglis	2	7	6	7	5	4	1	1	0	0	1	2	3	3
4/3/07	1	0	1	602	B	346	13	2	Inglis	2	7	6	7	5	4	1	0	0	0	1	3	3	3
4/3/07	1	0	1	606	A	322	14	2	Inglis	2	5	4	5	4	3	0	0	0	0	1	3	3	3
4/3/07	1	0	1	605	B	450	15	2	Inglis	2	7	6	7	4	3	0	0	0	0	1	3	3	3
4/3/07	1	0	1	600	C	759	16	2	Inglis	2	6	5	6	4	3	0	0	0	0	1	3	3	3
4/3/07	1	0	1	600	D	71	1	1	Edwards	4	6	6	6	5	5	1	0	1	0	1	3	2	2
4/3/07	1	0	1	600	A	15	2	1	Edwards	5	7	7	7	5	5	0	0	0	0	1	2	1	1
4/3/07	1	0	1	603	C	499	3	1	Edwards	4	4	7	4	4	4	0	0	0	0	0	3	3	0
4/3/07	1	0	1	605	D	313	4	1	Edwards	6	5	5	5	6	5	0	0	0	2	1	1	1	0
4/3/07	1	0	1	603	D	793	5	1	Edwards	6	7	6	7	6	6	1	0	0	0	2	2	1	2
4/3/07	1	0	1	601	B	641	6	1	Edwards	5	7	7	7	5	5	0	0	0	0	0	1	2	0
4/3/07	1	0	1	607	C	11	7	1	Edwards	5	5	6	5	6	6	0	0	1	2	1	2	0	1
4/3/07	1	0	1	606	C	119	8	1	Edwards	7	5	6	5	6	6	2	0	2	3	2	3	3	2
4/3/07	1	0	1	603	A	19	9	2	Edwards	5	6	7	6	4	3	0	0	0	1	1	0	2	2
4/3/07	1	0	1	605	A	931	10	2	Edwards	6	6	6	6	5	4	0	0	0	2	0	2	3	0
4/3/07	1	0	1	604	B	826	11	2	Edwards	3	3	5	3	3	3	0	0	0	0	0	0	1	2
4/3/07	1	0	1	606	D	214	12	2	Edwards	6	2	4	2	5	4	0	0	0	0	2	3	3	0
4/3/07	1	0	1	602	B	346	13	2	Edwards	6	8	8	8	5	5	1	0	0	0	1	3	2	1
4/3/07	1	0	1	606	A	322	14	2	Edwards	6	6	6	6	5	5	0	0	0	3	1	1	3	0
4/3/07	1	0	1	605	B	450	15	2	Edwards	5	6	7	6	6	5	0	0	1	0	0	3	0	0
4/3/07	1	0	1	600	C	759	16	2	Edwards	5	7	7	7	6	6	0	0	0	0	1	2	2	0
4/3/07	1	0	2	607	D	154	1	1	Bailey	5	5	3	4	5	5	0	0	1	0	0	2	1	2
4/3/07	1	0	2	602	D	262	2	1	Bailey	6	6	6	6	5	5	1	0	0	0	1	2	1	2
4/3/07	1	0	2	607	A	993	3	1	Bailey	2	5	6	5	5	5	0	0	2	0	0	1	1	1
4/3/07	1	0	2	601	C	704	4	1	Bailey	3	7	7	7	4	4	0	0	0	0	0	0	1	0
4/3/07	1	0	2	607	B	709	5	1	Bailey	4	6	4	5	7	4	0	0	1	0	0	5	2	2
4/3/07	1	0	2	604	D	33	6	1	Bailey	5	6	5	6	5	5	0	0	0	0	1	1	1	0

4/3/07	1	0	2	603	B	12	7	1	Bailey	4	5	4	5	5	5	0	0	0	0	1	1	1	1
4/3/07	1	0	2	604	A	557	8	1	Bailey	7	7	4	6	6	5	0	0	1	0	0	3	2	1
4/3/07	1	0	2	606	B	25	9	2	Bailey	6	6	4	5	6	5	0	0	0	0	1	4	2	1
4/3/07	1	0	2	602	C	531	10	2	Bailey	6	6	7	6	5	5	0	0	0	0	1	1	1	0
4/3/07	1	0	2	604	C	917	11	2	Bailey	5	5	3	4	5	6	0	0	0	0	1	1	1	0
4/3/07	1	0	2	600	B	18	12	2	Bailey	2	7	7	7	5	5	0	0	0	0	1	1	1	0
4/3/07	1	0	2	601	D	610	13	2	Bailey	6	6	6	6	4	4	0	0	0	0	1	0	1	0
4/3/07	1	0	2	605	C	385	14	2	Bailey	4	6	4	5	5	5	0	0	1	0	0	1	2	2
4/3/07	1	0	2	602	A	644	15	2	Bailey	5	7	6	6	6	6	0	0	0	0	1	3	1	1
4/3/07	1	0	2	601	A	365	16	2	Bailey	5	7	6	7	5	5	1	0	0	0	1	2	1	1
4/3/07	1	0	2	607	D	154	1	1	Philip	5	5	6	5	6	5	0	1	0	0	1	2	1	2
4/3/07	1	0	2	602	D	262	2	1	Philip	5	7	7	7	6	5	0	1	0	0	2	2	1	2
4/3/07	1	0	2	607	A	993	3	1	Philip	4	6	7	6	5	5	0	0	0	1	1	2	2	0
4/3/07	1	0	2	601	C	704	4	1	Philip	6	8	8	8	6	5	0	1	0	0	1	1	0	3
4/3/07	1	0	2	607	B	709	5	1	Philip	6	6	6	6	7	6	0	0	0	0	2	2	1	2
4/3/07	1	0	2	604	D	33	6	1	Philip	5	6	6	6	5	5	0	0	0	0	1	2	1	2
4/3/07	1	0	2	603	B	12	7	1	Philip	5	7	8	7	5	5	1	0	0	0	1	2	1	2
4/3/07	1	0	2	604	A	557	8	1	Philip	6	6	7	6	7	5	0	0	0	0	1	2	2	2
4/3/07	1	0	2	606	B	25	9	2	Philip	6	7	7	7	7	6	0	1	0	0	1	2	1	2
4/3/07	1	0	2	602	C	531	10	2	Philip	6	7	8	7	6	5	1	0	0	0	2	2	3	2
4/3/07	1	0	2	604	C	917	11	2	Philip	5	6	5	6	6	5	0	0	0	0	0	1	2	3
4/3/07	1	0	2	600	B	18	12	2	Philip	5	8	8	8	7	6	0	0	0	0	0	1	3	3
4/3/07	1	0	2	601	D	610	13	2	Philip	7	7	8	7	5	5	0	0	0	0	0	1	1	1
4/3/07	1	0	2	605	C	385	14	2	Philip	6	6	6	6	6	5	0	0	0	0	2	1	1	2
4/3/07	1	0	2	602	A	644	15	2	Philip	7	7	7	7	6	5	1	0	0	0	1	2	1	2
4/3/07	1	0	2	601	A	365	16	2	Philip	6	7	8	7	7	5	0	0	0	0	1	0	3	3
4/3/07	1	0	2	607	D	154	1	1	Johnson	5	6	6	6	6	4	0	0	0	2	2	2	2	2
4/3/07	1	0	2	602	D	262	2	1	Johnson	6	7	6	7	6	4	0	0	0	1	2	2	1	2
4/3/07	1	0	2	607	A	993	3	1	Johnson	4	6	7	6	6	4	1	0	0	0	3	3	2	2
4/3/07	1	0	2	601	C	704	4	1	Johnson	5	7	7	7	6	5	0	0	0	1	2	2	1	2
4/3/07	1	0	2	607	B	709	5	1	Johnson	5	6	5	6	7	5	0	0	0	0	2	4	2	3

4/3/07	1	0	2	604	D	33	6	1	Johnson	4	5	5	5	6	4	0	0	0	2	2	4	2	2
4/3/07	1	0	2	603	B	12	7	1	Johnson	4	5	6	5	5	4	0	0	0	0	2	3	1	2
4/3/07	1	0	2	604	A	557	8	1	Johnson	5	6	6	6	6	4	0	0	0	2	1	2	2	2
4/3/07	1	0	2	606	B	25	9	2	Johnson	5	6	6	6	7	5	0	0	0	1	2	3	2	3
4/3/07	1	0	2	602	C	531	10	2	Johnson	6	7	7	7	7	5	1	0	0	1	2	2	1	3
4/3/07	1	0	2	604	C	917	11	2	Johnson	5	6	5	5	6	4	0	0	0	0	1	2	2	2
4/3/07	1	0	2	600	B	18	12	2	Johnson	4	7	7	7	5	4	1	0	0	0	2	4	1	2
4/3/07	1	0	2	601	D	610	13	2	Johnson	6	6	6	6	5	4	0	0	0	0	1	1	1	1
4/3/07	1	0	2	605	C	385	14	2	Johnson	6	7	6	7	6	5	0	0	0	0	2	1	1	2
4/3/07	1	0	2	602	A	644	15	2	Johnson	6	8	7	8	7	4	1	1	0	0	2	1	2	2
4/3/07	1	0	2	601	A	365	16	2	Johnson	6	7	7	7	5	0	0	0	0	1	2	2	2	2
4/3/07	1	0	2	607	D	154	1	1	Thurman	6	4	4	4	6	0	0	2	0	2	1	0	2	0
4/3/07	1	0	2	602	D	262	2	1	Thurman	6	7	6	7	5	4	0	0	0	0	0	2	3	0
4/3/07	1	0	2	607	A	993	3	1	Thurman	4	2	1	2	3	3	0	0	0	0	0	0	0	0
4/3/07	1	0	2	601	C	704	4	1	Thurman	5	6	6	6	5	4	0	0	0	1	0	0	2	2
4/3/07	1	0	2	607	B	709	5	1	Thurman	3	3	1	2	6	4	1	3	0	0	0	0	3	1
4/3/07	1	0	2	604	D	33	6	1	Thurman	3	3	2	3	5	3	0	2	0	2	0	0	1	0
4/3/07	1	0	2	603	B	12	7	1	Thurman	4	4	4	4	5	3	0	2	1	1	0	0	1	1
4/3/07	1	0	2	604	A	557	8	1	Thurman	6	5	5	5	6	5	2	2	0	0	2	0	2	0
4/3/07	1	0	2	606	B	25	9	2	Thurman	4	5	5	5	6	5	0	1	0	0	1	0	3	2
4/3/07	1	0	2	602	C	531	10	2	Thurman	5	6	5	6	5	4	1	0	0	0	3	0	0	0
4/3/07	1	0	2	604	C	917	11	2	Thurman	4	5	4	5	4	4	0	1	0	0	0	0	2	1
4/3/07	1	0	2	600	B	18	12	2	Thurman	2	5	5	5	2	2	0	0	0	0	0	0	1	0
4/3/07	1	0	2	601	D	610	13	2	Thurman	7	6	7	7	6	5	1	0	0	0	1	2	2	0
4/3/07	1	0	2	605	C	385	14	2	Thurman	5	4	3	4	5	5	0	1	0	2	1	1	0	1
4/3/07	1	0	2	602	A	644	15	2	Thurman	5	5	5	5	6	4	0	0	0	0	0	0	0	2
4/3/07	1	0	2	601	A	365	16	2	Thurman	5	5	5	5	5	4	0	1	0	0	0	0	2	0
4/3/07	1	0	2	607	D	154	1	1	Benli	5	7	5	5	5	5	0	0	0	0	1	1	0	1
4/3/07	1	0	2	602	D	262	2	1	Benli	6	7	6	6	6	6	0	1	0	0	2	2	0	1
4/3/07	1	0	2	607	A	993	3	1	Benli	4	7	5	6	6	5	1	1	0	0	1	1	0	2
4/3/07	1	0	2	601	C	704	4	1	Benli	4	8	7	7	6	6	0	0	0	0	1	0	0	1

4/3/07	1	0	2	607	B	709	5	1	Benli	3	7	5	5	6	5	0	0	0	0	0	2	2	1
4/3/07	1	0	2	604	D	33	6	1	Benli	3	6	4	5	6	4	0	0	0	0	0	1	1	1
4/3/07	1	0	2	603	B	12	7	1	Benli	5	7	7	7	6	6	0	0	0	0	2	1	0	1
4/3/07	1	0	2	604	A	557	8	1	Benli	6	7	5	6	6	6	1	1	0	0	1	1	0	1
4/3/07	1	0	2	606	B	25	9	2	Benli	7	7	5	6	7	6	0	1	0	0	1	2	1	2
4/3/07	1	0	2	602	C	531	10	2	Benli	7	7	6	6	6	6	0	1	0	0	2	2	1	2
4/3/07	1	0	2	604	C	917	11	2	Benli	6	7	6	6	6	6	0	1	0	0	1	1	0	2
4/3/07	1	0	2	600	B	18	12	2	Benli	3	7	8	7	6	6	0	0	0	0	1	2	2	0
4/3/07	1	0	2	601	D	610	13	2	Benli	7	6	6	6	5	5	0	0	0	0	1	0	0	1
4/3/07	1	0	2	605	C	385	14	2	Benli	6	6	5	5	6	5	0	1	0	0	2	1	1	2
4/3/07	1	0	2	602	A	644	15	2	Benli	5	7	6	6	7	6	1	2	0	0	1	2	0	2
4/3/07	1	0	2	601	A	365	16	2	Benli	6	7	8	7	6	5	0	0	0	0	1	2	3	1
4/4/07	2	0	1	612	A	521	1	1	Thurman	5	3	2	3	4	4	1	0	0	0	0	0	0	0
4/4/07	2	0	1	609	C	607	2	1	Thurman	3	3	3	3	5	4	0	0	2	1	0	0	1	0
4/4/07	2	0	1	608	B	725	3	1	Thurman	5	4	4	4	5	3	0	0	0	1	0	0	3	2
4/4/07	2	0	1	612	D	31	4	1	Thurman	3	3	2	3	4	3	0	0	0	0	0	0	1	0
4/4/07	2	0	1	615	A	739	5	1	Thurman	3	3	3	3	5	4	0	1	3	0	0	1	2	0
4/4/07	2	0	1	615	C	190	6	1	Thurman	2	2	3	3	4	4	0	0	0	0	0	2	0	0
4/4/07	2	0	1	611	D	654	7	1	Thurman	4	5	4	4	4	4	0	0	0	0	0	0	0	0
4/4/07	2	0	1	615	D	37	8	1	Thurman	4	5	4	5	6	4	0	0	2	0	0	0	3	2
4/4/07	2	0	1	612	C	120	9	1	Thurman	6	5	3	4	5	4	2	1	0	2	0	0	0	0
4/4/07	2	0	1	611	A	124	10	1	Thurman	5	5	4	5	7	5	0	1	2	3	0	0	3	1
4/4/07	2	0	1	609	D	499	11	1	Thurman	4	5	5	5	6	5	0	0	0	1	1	0	2	2
4/4/07	2	0	1	613	B	472	12	1	Thurman	3	3	2	3	5	4	0	0	4	0	0	2	2	1
4/4/07	2	0	1	614	B	920	13	1	Thurman	4	3	3	3	6	5	1	0	0	3	1	0	1	1
4/4/07	2	0	1	609	A	96	14	1	Thurman	5	6	6	6	5	4	0	0	0	1	1	2	0	0
4/4/07	2	0	1	611	C	811	15	1	Thurman	5	6	5	6	6	4	0	0	3	0	0	1	2	1
4/4/07	2	0	1	611	B	12	16	1	Thurman	2	4	4	4	5	3	0	0	0	2	0	0	2	2
4/4/07	2	0	1	612	A	521	1	1	Bradley	4	5	4	4	4	4	0	1	1	1	0	0	1	0
4/4/07	2	0	1	609	C	607	2	1	Bradley	3	6	5	5	5	5	1	1	0	0	1	0	1	0
4/4/07	2	0	1	608	B	725	3	1	Bradley	3	6	6	6	6	5	1	2	0	0	1	0	1	0

4/4/07	2	0	1	612	D	31	4	1	Bradley	4	5	3	3	5	5	0	1	0	0	0	2	2	0
4/4/07	2	0	1	615	A	739	5	1	Bradley	5	6	4	5	7	5	0	0	0	0	3	2	0	0
4/4/07	2	0	1	615	C	190	6	1	Bradley	3	6	4	5	5	5	0	0	0	0	1	2	1	0
4/4/07	2	0	1	611	D	654	7	1	Bradley	3	6	6	6	4	4	0	0	0	0	1	1	0	0
4/4/07	2	0	1	615	D	37	8	1	Bradley	4	7	6	6	6	5	0	1	0	0	2	3	1	0
4/4/07	2	0	1	612	C	120	9	1	Bradley	6	4	3	3	5	5	1	1	0	0	1	1	1	0
4/4/07	2	0	1	611	A	124	10	1	Bradley	4	6	6	6	5	5	0	1	0	0	2	2	1	1
4/4/07	2	0	1	609	D	499	11	1	Bradley	5	7	6	7	4	4	0	1	1	2	0	0	2	0
4/4/07	2	0	1	613	B	472	12	1	Bradley	6	6	3	4	5	4	1	0	0	0	1	1	1	0
4/4/07	2	0	1	614	B	920	13	1	Bradley	5	7	5	6	7	5	0	0	0	0	1	3	2	0
4/4/07	2	0	1	609	A	96	14	1	Bradley	6	7	6	7	6	5	0	2	0	1	0	2	3	0
4/4/07	2	0	1	611	C	811	15	1	Bradley	3	6	6	6	5	5	0	0	0	0	2	1	0	0
4/4/07	2	0	1	611	B	12	16	1	Bradley	4	6	7	6	6	5	1	0	0	0	2	3	0	0
4/4/07	2	0	1	612	A	521	1	1	Bailey	5	6	5	6	5	4	2	0	0	1	1	0	1	0
4/4/07	2	0	1	609	C	607	2	1	Bailey	5	6	4	5	5	5	1	0	1	0	1	2	1	0
4/4/07	2	0	1	608	B	725	3	1	Bailey	5	6	7	6	5	5	0	0	2	0	1	0	1	0
4/4/07	2	0	1	612	D	31	4	1	Bailey	6	6	4	5	5	5	1	0	0	1	0	0	1	0
4/4/07	2	0	1	615	A	739	5	1	Bailey	5	5	6	5	6	5	0	0	2	0	0	2	2	0
4/4/07	2	0	1	615	C	190	6	1	Bailey	4	6	6	6	5	4	0	0	1	0	0	1	2	0
4/4/07	2	0	1	611	D	654	7	1	Bailey	3	6	7	6	5	4	0	0	0	1	0	1	1	0
4/4/07	2	0	1	615	D	37	8	1	Bailey	4	6	6	6	6	5	0	0	2	0	0	1	2	0
4/4/07	2	0	1	612	C	120	9	1	Bailey	7	5	2	3	5	4	2	0	0	1	1	0	0	0
4/4/07	2	0	1	611	A	124	10	1	Bailey	5	6	5	6	5	5	1	0	0	1	1	0	1	0
4/4/07	2	0	1	609	D	499	11	1	Bailey	5	6	7	6	5	5	1	0	1	0	0	0	0	0
4/4/07	2	0	1	613	B	472	12	1	Bailey	4	4	1	2	5	5	1	0	0	1	1	0	1	0
4/4/07	2	0	1	614	B	920	13	1	Bailey	5	6	5	5	6	5	0	0	2	0	0	1	2	0
4/4/07	2	0	1	609	A	96	14	1	Bailey	5	6	7	6	5	4	2	0	1	0	1	0	1	0
4/4/07	2	0	1	611	C	811	15	1	Bailey	5	6	7	6	5	5	1	0	0	1	0	0	1	0
4/4/07	2	0	1	611	B	12	16	1	Bailey	5	6	7	6	6	5	0	0	1	0	0	2	2	0
4/4/07	2	0	1	612	A	521	1	1	Davis	5	5	4	5	3	4	0	0	0	0	1	0	3	0
4/4/07	2	0	1	609	C	607	2	1	Davis	4	5	6	5	4	5	0	0	0	0	0	1	1	1

4/4/07	2	0	1	608	B	725	3	1	Davis	5	6	7	6	5	6	0	0	0	0	1	0	0	2
4/4/07	2	0	1	612	D	31	4	1	Davis	5	5	3	4	5	5	0	0	0	2	0	2	2	0
4/4/07	2	0	1	615	A	739	5	1	Davis	4	4	4	4	6	5	0	0	1	4	0	0	1	0
4/4/07	2	0	1	615	C	190	6	1	Davis	3	5	4	4	6	5	0	0	0	2	2	0	0	3
4/4/07	2	0	1	611	D	654	7	1	Davis	4	6	8	6	5	6	0	0	0	0	1	1	0	1
4/4/07	2	0	1	615	D	37	8	1	Davis	2	6	6	6	6	5	0	0	0	0	1	2	2	3
4/4/07	2	0	1	612	C	120	9	1	Davis	6	2	1	1	6	5	1	0	0	3	0	0	1	0
4/4/07	2	0	1	611	A	124	10	1	Davis	6	6	7	6	5	5	0	0	0	0	0	1	0	2
4/4/07	2	0	1	609	D	499	11	1	Davis	4	6	7	6	5	6	0	0	2	2	0	1	1	2
4/4/07	2	0	1	613	B	472	12	1	Davis	4	2	2	2	5	5	0	0	0	1	1	1	1	1
4/4/07	2	0	1	614	B	920	13	1	Davis	4	4	5	4	5	5	0	0	1	0	1	1	0	0
4/4/07	2	0	1	609	A	96	14	1	Davis	7	6	6	6	6	6	0	0	0	2	0	1	0	2
4/4/07	2	0	1	611	C	811	15	1	Davis	3	6	6	6	5	5	0	0	0	2	1	1	0	3
4/4/07	2	0	1	611	B	12	16	1	Davis	3	5	7	5	6	5	0	0	0	3	0	0	1	3
4/4/07	2	0	1	612	A	521	1	1	Cunningham	4	6	5	5	5	5	0	0	0	2	0	2	1	0
4/4/07	2	0	1	609	C	607	2	1	Cunningham	5	6	6	6	6	6	1	0	0	0	1	0	0	1
4/4/07	2	0	1	608	B	725	3	1	Cunningham	5	6	5	5	5	5	0	0	0	0	0	1	1	2
4/4/07	2	0	1	612	D	31	4	1	Cunningham	4	5	5	5	5	4	2	0	0	1	0	1	0	0
4/4/07	2	0	1	615	A	739	5	1	Cunningham	5	6	4	5	6	5	0	0	0	0	2	4	1	0
4/4/07	2	0	1	615	C	190	6	1	Cunningham	5	6	6	6	6	5	0	0	0	0	0	3	2	1
4/4/07	2	0	1	611	D	654	7	1	Cunningham	4	6	6	6	4	4	0	0	0	1	0	0	0	0
4/4/07	2	0	1	615	D	37	8	1	Cunningham	5	6	6	6	5	4	0	0	0	0	0	2	2	0
4/4/07	2	0	1	612	C	120	9	1	Cunningham	5	5	2	0	6	5	0	0	2	0	0	2	3	3
4/4/07	2	0	1	611	A	124	10	1	Cunningham	5	6	6	6	5	5	0	0	0	0	1	1	1	0
4/4/07	2	0	1	609	D	499	11	1	Cunningham	5	6	7	6	5	5	1	0	0	0	0	0	0	0
4/4/07	2	0	1	613	B	472	12	1	Cunningham	5	5	3	0	4	4	0	0	0	0	0	0	2	0
4/4/07	2	0	1	614	B	920	13	1	Cunningham	4	5	5	5	5	4	0	0	0	0	0	2	2	0
4/4/07	2	0	1	609	A	96	14	1	Cunningham	5	6	6	6	6	5	0	0	0	2	1	2	1	1

4/4/07	2	0	1	611	C	811	15	1	Cunningham	4	6	7	6	5	5	1	0	0	0	0	1	1	0
4/4/07	2	0	1	611	B	12	16	1	Cunningham	5	6	6	6	5	5	0	0	0	0	1	1	0	0
4/4/07	2	0	2	611	D	331	1	1	Philip	4	6	5	6	6	6	0	0	0	1	1	1	0	2
4/4/07	2	0	2	610	B	489	2	1	Philip	6	7	7	7	7	5	2	1	0	0	2	2	0	2
4/4/07	2	0	2	613	A	598	3	1	Philip	6	7	7	7	5	6	0	0	0	0	1	2	1	1
4/4/07	2	0	2	610	D	212	4	1	Philip	5	8	8	8	6	5	1	0	0	0	2	1	1	2
4/4/07	2	0	2	609	B	298	5	1	Philip	6	7	7	7	7	6	0	0	2	0	1	2	2	2
4/4/07	2	0	2	608	D	748	6	1	Philip	6	7	6	7	6	5	0	0	0	0	1	1	1	2
4/4/07	2	0	2	613	C	524	7	1	Philip	5	5	6	5	6	6	0	0	0	0	1	0	2	3
4/4/07	2	0	2	615	B	178	8	1	Philip	6	6	6	6	7	5	0	0	0	0	0	1	2	2
4/4/07	2	0	2	610	A	742	9	1	Philip	7	7	8	7	5	5	0	0	0	0	2	2	1	2
4/4/07	2	0	2	614	D	687	10	1	Philip	6	6	5	6	6	6	0	0	0	0	2	1	2	3
4/4/07	2	0	2	608	A	418	11	1	Philip	6	6	7	6	6	5	1	0	0	0	1	1	1	2
4/4/07	2	0	2	610	C	798	12	1	Philip	5	8	8	8	5	5	0	0	0	0	1	1	2	3
4/4/07	2	0	2	614	A	730	13	1	Philip	6	6	6	6	5	6	0	0	0	0	1	1	1	2
4/4/07	2	0	2	614	C	834	14	1	Philip	5	6	5	6	5	5	0	0	0	0	1	0	1	2
4/4/07	2	0	2	608	C	151	15	1	Philip	6	7	7	7	5	6	0	0	1	0	0	1	2	2
4/4/07	2	0	2	612	B	914	16	1	Philip	5	6	5	6	6	5	0	0	0	1	0	2	1	2
4/4/07	2	0	2	613	D	331	1	1	Benli	3	7	5	6	6	6	0	1	0	0	2	0	0	1
4/4/07	2	0	2	610	B	489	2	1	Benli	6	7	6	6	6	6	0	0	0	0	2	2	0	1
4/4/07	2	0	2	613	A	598	3	1	Benli	5	6	5	5	6	6	0	1	0	0	1	1	1	2
4/4/07	2	0	2	610	D	212	4	1	Benli	5	7	6	6	6	6	0	0	0	0	1	2	0	2
4/4/07	2	0	2	609	B	298	5	1	Benli	5	7	7	7	6	4	1	2	3	0	1	1	1	0
4/4/07	2	0	2	608	D	748	6	1	Benli	5	7	6	6	7	5	1	1	0	0	1	1	1	2
4/4/07	2	0	2	613	C	524	7	1	Benli	5	6	5	5	5	5	0	2	1	0	1	1	0	0
4/4/07	2	0	2	615	B	178	8	1	Benli	5	7	6	6	7	5	0	2	2	0	1	0	1	2
4/4/07	2	0	2	610	A	742	9	1	Benli	6	7	8	7	7	5	0	0	0	0	2	2	1	2
4/4/07	2	0	2	614	D	687	10	1	Benli	4	7	6	6	6	6	0	0	1	0	1	0	2	1
4/4/07	2	0	2	608	A	418	11	1	Benli	6	7	8	7	6	6	0	1	1	0	1	2	1	2
4/4/07	2	0	2	610	C	798	12	1	Benli	6	8	7	8	6	5	0	2	1	0	1	0	1	2

4/4/07	2	0	2	614	A	730	13	1	Benli	6	6	6	6	6	6	0	1	0	0	1	1	0	1
4/4/07	2	0	2	614	C	834	14	1	Benli	4	7	5	6	6	6	0	1	0	0	0	1	0	2
4/4/07	2	0	2	608	C	151	15	1	Benli	5	7	5	5	6	5	0	1	2	0	1	1	2	1
4/4/07	2	0	2	612	B	914	16	1	Benli	3	6	5	5	7	4	1	2	0	0	0	2	2	2
4/4/07	2	0	2	613	D	331	1	1	Morrow	3	5	4	5	4	5	0	1	0	0	1	1	1	1
4/4/07	2	0	2	610	B	489	2	1	Morrow	4	8	8	8	6	5	0	1	3	0	1	2	1	1
4/4/07	2	0	2	613	A	598	3	1	Morrow	5	6	6	6	5	5	1	1	0	0	1	1	1	1
4/4/07	2	0	2	610	D	212	4	1	Morrow	2	7	8	7	5	5	0	2	0	1	1	2	1	1
4/4/07	2	0	2	609	B	298	5	1	Morrow	3	8	8	8	6	5	0	1	3	0	1	2	1	1
4/4/07	2	0	2	608	D	748	6	1	Morrow	6	8	8	8	6	5	0	2	0	0	1	2	1	1
4/4/07	2	0	2	613	C	524	7	1	Morrow	2	6	1	6	4	4	1	0	0	2	1	1	1	1
4/4/07	2	0	2	615	B	178	8	1	Morrow	2	7	7	7	8	5	0	1	1	3	2	3	3	2
4/4/07	2	0	2	610	A	742	9	1	Morrow	6	8	8	8	6	5	0	1	0	3	1	2	2	1
4/4/07	2	0	2	614	D	687	10	1	Morrow	5	3	7	3	7	5	0	1	3	1	1	2	1	2
4/4/07	2	0	2	608	A	418	11	1	Morrow	5	7	8	7	5	5	1	2	0	0	2	2	1	1
4/4/07	2	0	2	610	C	798	12	1	Morrow	2	8	8	8	4	4	0	1	0	0	1	2	1	1
4/4/07	2	0	2	614	A	730	13	1	Morrow	3	3	2	3	6	5	0	1	3	1	1	2	1	1
4/4/07	2	0	2	614	C	834	14	1	Morrow	2	5	5	5	5	5	0	1	0	1	1	1	1	1
4/4/07	2	0	2	608	C	151	15	1	Morrow	3	7	8	7	5	5	0	1	2	0	1	1	2	1
4/4/07	2	0	2	612	B	914	16	1	Morrow	4	6	6	6	5	5	0	0	0	3	1	1	2	1
4/4/07	2	0	2	613	D	331	1	1	Amen	4	5	4	4	6	5	0	0	0	0	2	1	2	1
4/4/07	2	0	2	610	B	489	2	1	Amen	5	7	8	7	6	4	1	0	0	1	0	1	2	2
4/4/07	2	0	2	613	A	598	3	1	Amen	5	5	6	5	5	5	1	0	0	0	0	0	1	1
4/4/07	2	0	2	610	D	212	4	1	Amen	5	7	7	7	6	5	0	0	0	1	0	2	1	2
4/4/07	2	0	2	609	B	298	5	1	Amen	5	6	7	6	6	5	0	0	2	0	0	1	2	1
4/4/07	2	0	2	608	D	748	6	1	Amen	6	7	7	7	7	4	0	0	0	2	0	2	2	2
4/4/07	2	0	2	613	C	524	7	1	Amen	5	6	2	3	5	5	1	0	0	0	0	0	2	1
4/4/07	2	0	2	615	B	178	8	1	Amen	4	6	7	6	8	4	1	0	0	5	0	2	3	2
4/4/07	2	0	2	610	A	742	9	1	Amen	6	7	7	7	5	4	1	0	0	0	0	1	1	1
4/4/07	2	0	2	614	D	687	10	1	Amen	5	5	6	5	7	4	0	0	0	3	0	0	2	1
4/4/07	2	0	2	608	A	418	11	1	Amen	6	6	7	6	6	4	1	0	2	0	0	1	2	2

4/4/07	2	0	2	610	C	798	12	1	Amen	4	7	8	7	6	5	0	0	0	1	0	1	1	2
4/4/07	2	0	2	614	A	730	13	1	Amen	5	5	5	4	7	4	1	0	0	3	0	1	3	3
4/4/07	2	0	2	614	C	834	14	1	Amen	4	5	6	4	6	4	0	0	0	1	0	0	2	1
4/4/07	2	0	2	608	C	151	15	1	Amen	5	6	7	6	6	5	0	0	1	0	0	0	1	1
4/4/07	2	0	2	612	B	914	16	1	Amen	5	6	3	4	4	3	3	0	0	0	0	0	0	2
4/4/07	2	0	2	613	D	331	1	1	Aldredge	2	3	2	3	6	6	2	0	0	0	0	2	0	1
4/4/07	2	0	2	610	B	489	2	1	Aldredge	5	6	8	6	7	4	0	0	0	0	2	3	1	3
4/4/07	2	0	2	613	A	598	3	1	Aldredge	5	4	3	4	5	4	1	0	0	2	0	1	2	2
4/4/07	2	0	2	610	D	212	4	1	Aldredge	4	7	8	7	6	5	0	0	0	0	1	3	1	3
4/4/07	2	0	2	609	B	298	5	1	Aldredge	4	7	8	7	8	3	0	0	2	6	0	2	3	2
4/4/07	2	0	2	608	D	748	6	1	Aldredge	6	7	7	7	7	6	1	2	1	0	1	2	2	3
4/4/07	2	0	2	613	C	524	7	1	Aldredge	3	3	1	1	6	5	0	0	0	0	2	0	2	2
4/4/07	2	0	2	615	B	178	8	1	Aldredge	3	6	6	6	7	3	0	0	2	0	2	4	2	2
4/4/07	2	0	2	610	A	742	9	1	Aldredge	5	7	7	7	6	5	0	1	0	2	1	1	2	2
4/4/07	2	0	2	614	D	687	10	1	Aldredge	5	5	3	4	6	4	0	1	2	0	1	3	2	3
4/4/07	2	0	2	608	A	418	11	1	Aldredge	7	7	7	7	6	5	0	0	0	3	0	0	3	3
4/4/07	2	0	2	610	C	798	12	1	Aldredge	3	8	8	8	6	6	0	0	0	0	2	0	2	1
4/4/07	2	0	2	614	A	730	13	1	Aldredge	5	5	2	3	7	3	0	0	0	1	0	2	1	2
4/4/07	2	0	2	614	C	834	14	1	Aldredge	4	4	2	3	5	5	0	0	0	2	0	2	2	3
4/4/07	2	0	2	608	C	151	15	1	Aldredge	5	7	6	7	6	5	2	0	0	0	1	3	2	4
4/4/07	2	0	2	612	B	914	16	1	Aldredge	5	6	2	4	5	4	3	0	0	0	0	0	2	2
4/5/07	3	0	1	620	D	18	1	1	Edwards	6	4	6	4	6	5	1	1	0	0	1	1	2	1
4/5/07	3	0	1	621	B	288	2	1	Edwards	4	3	4	3	3	3	0	0	0	3	0	0	1	0
4/5/07	3	0	1	617	A	273	3	1	Edwards	6	7	7	7	6	5	0	1	0	0	1	2	1	2
4/5/07	3	0	1	622	D	951	4	1	Edwards	4	4	5	4	5	4	0	0	0	1	0	0	3	0
4/5/07	3	0	1	617	D	817	5	1	Edwards	6	5	6	5	6	5	0	0	0	0	1	2	2	1
4/5/07	3	0	1	617	C	307	6	1	Edwards	6	5	6	5	7	5	0	0	0	0	1	1	1	3
4/5/07	3	0	1	620	C	584	7	1	Edwards	5	2	6	2	5	4	0	0	0	2	1	1	2	2
4/5/07	3	0	1	622	B	520	8	1	Edwards	6	4	5	4	5	5	0	0	0	1	2	0	3	0
4/5/07	3	0	1	622	C	924	9	1	Edwards	6	5	5	5	6	4	0	0	0	1	1	0	2	0
4/5/07	3	0	1	618	B	8	10	1	Edwards	5	4	6	4	6	5	0	0	1	1	1	2	2	1

4/5/07	3	0	1	618	A	137	11	1	Edwards	6	6	6	6	7	5	0	0	0	0	0	3	2	1
4/5/07	3	0	1	622	A	304	12	1	Edwards	5	5	5	5	5	3	0	0	0	0	0	0	3	3
4/5/07	3	0	1	620	A	795	13	1	Edwards	3	4	6	4	6	5	2	0	0	3	0	0	3	1
4/5/07	3	0	1	619	C	860	14	1	Edwards	3	6	6	6	6	4	0	0	0	0	0	3	2	2
4/5/07	3	0	1	616	B	337	15	1	Edwards	6	6	7	6	7	6	1	0	0	0	2	3	2	0
4/5/07	3	0	1	619	D	80	16	1	Edwards	6	7	7	7	6	5	0	1	0	0	1	3	2	3
4/5/07	3	0	1	620	D	18	1	1	Aldredge	5	5	3	4	5	5	1	1	0	0	0	1	2	2
4/5/07	3	0	1	621	B	288	2	1	Aldredge	6	3	1	2	4	3	0	0	0	1	0	0	1	1
4/5/07	3	0	1	617	A	273	3	1	Aldredge	6	7	7	7	6	5	1	1	0	0	2	1	1	2
4/5/07	3	0	1	622	D	951	4	1	Aldredge	5	4	1	2	4	3	0	0	0	2	0	0	2	1
4/5/07	3	0	1	617	D	817	5	1	Aldredge	4	8	5	6	6	4	0	0	0	0	2	4	1	3
4/5/07	3	0	1	617	C	307	6	1	Aldredge	4	5	6	5	5	4	0	0	0	0	1	2	0	2
4/5/07	3	0	1	620	C	584	7	1	Aldredge	3	4	1	2	5	5	0	0	0	0	0	1	2	1
4/5/07	3	0	1	622	B	520	8	1	Aldredge	3	2	1	1	7	3	0	0	1	6	0	0	3	3
4/5/07	3	0	1	622	C	924	9	1	Aldredge	4	5	3	4	6	3	0	0	3	4	0	0	1	1
4/5/07	3	0	1	618	B	8	10	1	Aldredge	5	7	4	6	7	3	0	1	1	5	1	3	2	3
4/5/07	3	0	1	618	A	137	11	1	Aldredge	7	6	4	5	6	5	0	0	0	0	1	3	2	1
4/5/07	3	0	1	622	A	304	12	1	Aldredge	4	6	2	3	4	3	0	0	0	0	0	0	2	3
4/5/07	3	0	1	620	A	795	13	1	Aldredge	3	3	1	2	5	4	0	0	2	0	0	0	3	4
4/5/07	3	0	1	619	C	860	14	1	Aldredge	6	7	2	4	5	4	0	0	0	0	2	4	2	2
4/5/07	3	0	1	616	B	337	15	1	Aldredge	7	6	6	6	5	3	0	0	0	2	0	4	1	3
4/5/07	3	0	1	619	D	80	16	1	Aldredge	7	7	5	6	6	5	0	0	0	0	2	3	3	3
4/5/07	3	0	1	620	D	18	1	1	Amen	6	4	5	3	5	4	0	1	0	1	0	2	1	1
4/5/07	3	0	1	621	B	288	2	1	Amen	6	5	4	2	5	4	1	1	0	2	0	0	0	1
4/5/07	3	0	1	617	A	273	3	1	Amen	5	7	7	7	6	4	0	1	2	0	0	2	3	0
4/5/07	3	0	1	622	D	951	4	1	Amen	5	5	5	4	6	4	0	1	2	0	0	2	2	0
4/5/07	3	0	1	617	D	817	5	1	Amen	6	7	6	7	5	5	1	1	0	0	0	1	2	2
4/5/07	3	0	1	617	C	307	6	1	Amen	5	6	6	6	6	5	1	1	0	0	0	0	0	2
4/5/07	3	0	1	620	C	584	7	1	Amen	5	5	4	4	5	5	1	0	0	0	1	0	1	1
4/5/07	3	0	1	622	B	520	8	1	Amen	5	5	4	4	6	4	1	0	0	2	0	1	2	0
4/5/07	3	0	1	622	C	924	9	1	Amen	6	6	4	4	5	4	1	0	0	1	0	0	2	3

4/5/07	3	0	1	618	B	8	10	1	Amen	5	6	5	6	5	4	0	0	0	1	0	0	1	1
4/5/07	3	0	1	618	A	137	11	1	Amen	5	6	6	6	5	5	1	0	0	0	0	1	1	1
4/5/07	3	0	1	622	A	304	12	1	Amen	5	5	6	4	5	4	1	0	0	0	0	0	1	2
4/5/07	3	0	1	620	A	795	13	1	Amen	5	5	7	5	4	4	0	0	0	0	0	0	1	1
4/5/07	3	0	1	619	C	860	14	1	Amen	6	6	7	6	5	4	0	0	0	0	0	2	1	2
4/5/07	3	0	1	616	B	337	15	1	Amen	5	5	7	5	6	4	0	0	1	1	0	1	2	0
4/5/07	3	0	1	619	D	80	16	1	Amen	6	7	7	7	5	4	0	1	0	0	0	1	0	2
4/5/07	3	0	1	620	D	18	1	1	Davis	7	4	1	2	5	4	0	2	0	0	1	2	2	1
4/5/07	3	0	1	621	B	288	2	1	Davis	6	3	1	2	5	4	0	2	0	2	0	1	2	1
4/5/07	3	0	1	617	A	273	3	1	Davis	7	6	6	6	6	5	1	2	0	0	1	2	1	0
4/5/07	3	0	1	622	D	951	4	1	Davis	6	3	2	3	5	4	0	1	0	0	0	2	2	1
4/5/07	3	0	1	617	D	817	5	1	Davis	7	6	6	6	6	6	0	1	0	0	1	2	1	2
4/5/07	3	0	1	617	C	307	6	1	Davis	5	6	6	6	6	6	0	2	0	0	0	2	2	2
4/5/07	3	0	1	620	C	584	7	1	Davis	5	2	1	2	5	5	0	1	0	0	0	1	2	1
4/5/07	3	0	1	622	B	520	8	1	Davis	6	3	2	2	6	5	0	2	0	0	0	1	2	1
4/5/07	3	0	1	622	C	924	9	1	Davis	5	4	2	3	6	5	0	0	0	0	0	0	2	1
4/5/07	3	0	1	618	B	8	10	1	Davis	4	5	5	5	4	4	0	0	0	0	0	2	2	2
4/5/07	3	0	1	618	A	137	11	1	Davis	6	6	6	6	6	6	0	2	0	0	2	2	0	1
4/5/07	3	0	1	622	A	304	12	1	Davis	5	4	4	4	5	4	0	0	0	2	0	2	2	1
4/5/07	3	0	1	620	A	795	13	1	Davis	5	4	5	4	5	4	0	0	0	0	2	1	1	1
4/5/07	3	0	1	619	C	860	14	1	Davis	7	7	5	6	6	5	0	2	0	1	2	0	2	2
4/5/07	3	0	1	616	B	337	15	1	Davis	4	5	7	5	4	5	0	0	0	0	1	2	2	2
4/5/07	3	0	1	619	D	80	16	1	Davis	6	6	6	6	6	6	0	2	0	0	1	2	2	3
4/5/07	3	0	1	620	D	18	1	1	Morrow	6	4	4	4	5	5	0	2	0	1	1	1	2	1
4/5/07	3	0	1	621	B	288	2	1	Morrow	6	4	1	4	5	5	0	1	2	1	1	1	2	2
4/5/07	3	0	1	617	A	273	3	1	Morrow	5	7	7	7	6	5	0	2	0	0	2	2	1	2
4/5/07	3	0	1	622	D	951	4	1	Morrow	5	4	2	4	5	5	0	1	1	1	1	1	2	1
4/5/07	3	0	1	617	D	817	5	1	Morrow	4	6	6	6	5	5	0	2	0	1	1	2	2	2
4/5/07	3	0	1	617	C	307	6	1	Morrow	5	7	6	7	5	5	0	2	1	0	1	1	2	1
4/5/07	3	0	1	620	C	584	7	1	Morrow	6	5	3	5	6	5	0	2	0	1	1	1	1	1
4/5/07	3	0	1	622	B	520	8	1	Morrow	5	5	4	5	5	5	0	2	0	2	1	1	2	2

4/5/07	3	0	1	622	C	924	9	1	Morrow	6	5	4	5	5	5	2	0	0	0	1	1	1	1
4/5/07	3	0	1	618	B	8	10	1	Morrow	2	6	6	6	4	4	0	1	0	0	1	1	1	1
4/5/07	3	0	1	618	A	137	11	1	Morrow	6	7	6	7	5	5	1	0	0	1	1	1	1	1
4/5/07	3	0	1	622	A	304	12	1	Morrow	4	5	5	5	5	4	0	0	0	1	0	1	3	1
4/5/07	3	0	1	620	A	795	13	1	Morrow	3	5	8	5	4	4	0	0	0	1	1	1	1	1
4/5/07	3	0	1	619	C	860	14	1	Morrow	6	7	8	7	5	5	1	1	0	0	1	1	1	1
4/5/07	3	0	1	616	B	337	15	1	Morrow	6	6	6	6	5	5	0	2	0	1	0	2	2	1
4/5/07	3	0	1	619	D	80	16	1	Morrow	5	8	7	8	5	5	0	1	0	1	1	2	2	1
4/5/07	3	0	2	621	C	402	1	2	Benli	4	5	4	4	6	5	1	2	1	0	1	1	0	2
4/5/07	3	0	2	616	A	305	2	2	Benli	3	6	5	5	6	6	0	1	1	0	1	0	1	1
4/5/07	3	0	2	619	A	514	3	2	Benli	4	6	5	5	6	5	1	2	0	0	1	2	0	2
4/5/07	3	0	2	620	B	788	4	2	Benli	5	5	4	4	7	5	0	2	1	0	2	3	3	3
4/5/07	3	0	2	623	C	986	5	2	Benli	4	5	5	5	7	4	0	0	0	0	0	3	4	3
4/5/07	3	0	2	623	A	803	6	2	Benli	4	5	3	4	7	4	0	1	0	0	0	1	3	1
4/5/07	3	0	2	618	C	433	7	2	Benli	3	5	4	4	6	4	0	1	0	0	2	2	1	2
4/5/07	3	0	2	623	D	983	8	2	Benli	4	3	1	2	4	3	0	0	0	0	1	1	1	0
4/5/07	3	0	2	621	D	16	9	2	Benli	5	4	3	3	7	3	0	0	0	0	2	4	2	3
4/5/07	3	0	2	623	B	742	10	2	Benli	4	6	5	5	6	4	0	0	0	0	1	2	2	1
4/5/07	3	0	2	619	B	737	11	2	Benli	4	6	5	5	7	4	0	0	0	0	1	3	1	1
4/5/07	3	0	2	616	D	31	12	2	Benli	4	6	4	5	6	5	1	0	0	0	1	1	1	2
4/5/07	3	0	2	618	D	194	13	2	Benli	4	7	5	6	6	5	0	1	2	0	1	0	1	2
4/5/07	3	0	2	616	C	206	14	2	Benli	6	6	5	5	6	6	0	0	0	0	1	1	0	2
4/5/07	3	0	2	621	A	162	15	2	Benli	3	5	4	4	7	4	0	0	0	0	1	3	4	3
4/5/07	3	0	2	617	B	913	16	2	Benli	4	6	4	5	6	5	0	0	0	0	2	1	1	1
4/5/07	3	0	2	621	C	402	1	2	Asif	5	5	4	5	6	4	1	2	0	2	1	2	2	3
4/5/07	3	0	2	616	A	305	2	2	Asif	4	6	5	5	6	5	2	0	0	1	2	1	1	2
4/5/07	3	0	2	619	A	514	3	2	Asif	7	7	5	5	7	6	1	0	1	0	1	1	1	1
4/5/07	3	0	2	620	B	788	4	2	Asif	6	5	4	4	6	5	1	0	0	2	2	2	0	2
4/5/07	3	0	2	623	C	986	5	2	Asif	6	7	6	6	5	3	3	0	0	0	0	0	1	2
4/5/07	3	0	2	623	A	803	6	2	Asif	5	6	5	5	6	4	2	0	0	3	1	0	2	3
4/5/07	3	0	2	618	C	433	7	2	Asif	3	7	6	6	7	5	1	1	1	0	1	3	2	2

4/5/07	3	0	2	623	D	983	8	2	Asif	5	6	2	2	5	3	0	1	0	3	1	1	2	3
4/5/07	3	0	2	621	D	16	9	2	Asif	6	5	3	3	6	3	2	2	2	2	1	2	2	3
4/5/07	3	0	2	623	B	742	10	2	Asif	6	7	5	5	6	3	2	0	0	1	0	0	1	2
4/5/07	3	0	2	619	B	737	11	2	Asif	4	6	5	5	6	5	1	1	1	0	2	2	1	2
4/5/07	3	0	2	616	D	31	12	2	Asif	2	6	5	5	6	5	1	0	0	1	2	2	1	2
4/5/07	3	0	2	618	D	194	13	2	Asif	4	5	4	4	6	4	0	1	0	0	2	2	2	2
4/5/07	3	0	2	616	C	206	14	2	Asif	5	5	3	3	5	4	0	0	0	0	1	3	1	2
4/5/07	3	0	2	621	A	162	15	2	Asif	3	6	5	5	6	5	0	0	2	1	1	1	1	2
4/5/07	3	0	2	617	B	913	16	2	Asif	2	7	5	5	6	5	0	0	1	0	1	3	2	3
4/5/07	3	0	2	621	C	402	1	2	Bradley	6	4	3	3	6	5	1	1	1	0	0	0	2	1
4/5/07	3	0	2	616	A	305	2	2	Bradley	5	7	5	6	4	4	0	1	0	0	1	2	0	1
4/5/07	3	0	2	619	A	514	3	2	Bradley	7	7	6	7	5	5	0	0	0	0	2	1	3	0
4/5/07	3	0	2	620	B	788	4	2	Bradley	4	4	4	4	4	4	0	0	0	0	1	1	1	0
4/5/07	3	0	2	623	C	986	5	2	Bradley	5	7	6	6	4	3	2	0	0	0	0	0	2	0
4/5/07	3	0	2	623	A	803	6	2	Bradley	6	5	4	4	5	5	1	1	0	0	1	1	1	2
4/5/07	3	0	2	618	C	433	7	2	Bradley	4	6	6	6	4	4	0	1	0	0	1	2	1	1
4/5/07	3	0	2	623	D	983	8	2	Bradley	6	5	5	5	4	4	2	0	0	0	1	0	2	0
4/5/07	3	0	2	621	D	16	9	2	Bradley	6	3	2	2	5	5	0	1	0	0	1	1	1	0
4/5/07	3	0	2	623	B	742	10	2	Bradley	6	7	6	6	5	5	0	2	0	0	1	0	2	2
4/5/07	3	0	2	619	B	737	11	2	Bradley	6	7	6	6	6	5	1	0	0	0	2	3	1	0
4/5/07	3	0	2	616	D	31	12	2	Bradley	6	5	4	5	5	5	0	1	0	0	1	2	0	1
4/5/07	3	0	2	618	D	194	13	2	Bradley	5	6	6	6	4	4	0	1	0	0	2	1	0	0
4/5/07	3	0	2	616	C	206	14	2	Bradley	6	6	5	6	6	5	0	1	1	2	1	1	2	0
4/5/07	3	0	2	621	A	162	15	2	Bradley	4	4	4	4	5	5	1	1	1	1	0	0	1	0
4/5/07	3	0	2	617	B	913	16	2	Bradley	5	6	5	6	5	4	0	0	0	0	1	2	0	0
4/5/07	3	0	2	621	C	402	1	2	Inglis	3	2	2	2	5	4	2	3	1	0	1	2	3	3
4/5/07	3	0	2	616	A	305	2	2	Inglis	5	6	6	6	5	4	2	3	3	0	1	2	2	3
4/5/07	3	0	2	619	A	514	3	2	Inglis	6	7	7	7	5	4	2	3	0	0	1	3	3	3
4/5/07	3	0	2	620	B	788	4	2	Inglis	2	2	2	2	5	4	2	3	0	0	1	2	3	3
4/5/07	3	0	2	623	C	986	5	2	Inglis	5	6	6	6	5	4	2	2	1	0	1	2	3	3
4/5/07	3	0	2	623	A	803	6	2	Inglis	5	6	7	6	5	4	2	2	0	0	1	2	3	3

4/5/07	3	0	2	618	C	433	7	2	Inglis	3	6	6	6	5	4	2	2	0	0	1	2	2	3
4/5/07	3	0	2	623	D	983	8	2	Inglis	4	2	2	2	5	4	2	3	0	0	1	2	4	3
4/5/07	3	0	2	621	D	16	9	2	Inglis	5	2	2	2	5	4	2	3	0	0	1	2	3	3
4/5/07	3	0	2	623	B	742	10	2	Inglis	6	7	7	7	4	3	2	4	0	0	1	3	3	3
4/5/07	3	0	2	619	B	737	11	2	Inglis	6	6	7	6	4	3	2	3	0	0	1	3	3	3
4/5/07	3	0	2	616	D	31	12	2	Inglis	5	5	6	5	4	3	2	3	0	0	1	3	2	3
4/5/07	3	0	2	618	D	194	13	2	Inglis	6	6	7	6	5	4	2	3	0	0	1	3	2	3
4/5/07	3	0	2	616	C	206	14	2	Inglis	6	4	6	4	5	4	2	3	0	0	1	3	3	3
4/5/07	3	0	2	621	A	162	15	2	Inglis	2	2	2	2	4	3	2	3	0	0	1	3	4	3
4/5/07	3	0	2	617	C	913	16	2	Inglis	5	6	6	6	5	4	2	3	0	0	1	4	3	3
4/17/07	1	14	1	602	C	656	1	1	Higgins	6	6	7	6	5	5	2	1	0	1	1	2	2	2
4/17/07	1	14	1	606	D	264	2	1	Higgins	5	5	6	5	5	5	1	1	0	2	1	2	3	3
4/17/07	1	14	1	602	D	542	3	1	Higgins	6	7	8	7	5	5	1	0	0	0	1	1	2	2
4/17/07	1	14	1	601	A	997	4	1	Higgins	6	6	7	6	6	5	2	1	0	1	2	1	2	3
4/17/07	1	14	1	605	C	453	5	1	Higgins	5	5	6	5	6	6	1	1	0	3	1	0	2	2
4/17/07	1	14	1	604	A	202	6	1	Higgins	5	5	6	5	5	5	2	0	0	1	1	2	2	3
4/17/07	1	14	1	600	D	85	7	1	Higgins	6	5	5	5	6	5	1	1	0	3	1	2	2	3
4/17/07	1	14	1	607	C	31	8	1	Higgins	5	4	4	4	6	5	1	1	0	2	0	2	2	3
4/17/07	1	14	1	602	B	885	9	1	Higgins	5	5	6	5	6	5	1	0	0	3	1	2	2	3
4/17/07	1	14	1	603	A	141	10	1	Higgins	6	6	7	6	6	6	2	2	6	0	2	2	2	3
4/17/07	1	14	1	606	A	170	11	1	Higgins	6	5	6	5	5	5	1	1	0	3	1	1	2	2
4/17/07	1	14	1	600	C	462	12	1	Higgins	5	6	7	6	5	5	2	1	0	2	1	1	2	3
4/17/07	1	14	1	606	B	437	13	1	Higgins	5	5	6	5	6	5	1	1	0	4	2	2	2	3
4/17/07	1	14	1	604	B	952	14	1	Higgins	5	6	7	6	5	6	2	2	0	0	2	2	2	3
4/17/07	1	14	1	605	D	623	15	1	Higgins	5	5	6	5	6	5	2	1	0	2	1	1	2	2
4/17/07	1	14	1	600	B	283	16	1	Higgins	4	6	7	6	5	5	2	1	0	2	1	2	2	3
4/17/07	1	14	1	602	C	656	1	1	Amen	5	6	7	6	6	5	1	2	0	1	0	2	2	3

4/17/07	1	14	1	606	D	264	2	1	Amen	4	4	5	4	7	4	1	0	1	3	0	2	3	2
4/17/07	1	14	1	602	D	542	3	1	Amen	5	6	7	6	5	4	0	1	0	0	0	1	1	1
4/17/07	1	14	1	601	A	997	4	1	Amen	5	6	7	6	4	4	0	0	0	0	0	0	1	1
4/17/07	1	14	1	605	C	453	5	1	Amen	4	5	6	5	6	5	0	0	0	2	0	2	2	2
4/17/07	1	14	1	604	A	202	6	1	Amen	5	6	4	4	6	5	2	0	0	0	2	2	1	2
4/17/07	1	14	1	600	D	85	7	1	Amen	4	6	6	6	6	5	1	0	0	0	1	2	2	0
4/17/07	1	14	1	607	C	31	8	1	Amen	5	5	5	4	7	6	0	1	0	2	0	2	3	2
4/17/07	1	14	1	602	B	885	9	1	Amen	4	6	7	6	5	4	0	0	0	0	0	1	1	1
4/17/07	1	14	1	603	A	141	10	1	Amen	5	4	5	4	5	5	0	1	0	0	0	2	2	1
4/17/07	1	14	1	606	A	170	11	1	Amen	5	4	5	4	8	5	0	0	2	3	3	2	3	3
4/17/07	1	14	1	600	C	462	12	1	Amen	5	5	6	5	6	5	0	1	0	0	0	2	2	1
4/17/07	1	14	1	606	B	437	13	1	Amen	5	3	3	1	7	4	0	0	0	4	0	2	3	2
4/17/07	1	14	1	604	B	952	14	1	Amen	4	6	6	6	5	4	0	1	0	0	0	1	1	1
4/17/07	1	14	1	605	D	623	15	1	Amen	4	4	5	3	6	4	0	1	0	2	0	2	2	1
4/17/07	1	14	1	600	B	283	16	1	Amen	4	6	6	6	5	5	0	0	0	0	1	2	1	3
4/17/07	1	14	1	602	C	656	1	1	Inglis	4	6	6	6	7	4	1	2	0	0	1	3	4	2
4/17/07	1	14	1	606	D	264	2	1	Inglis	4	5	4	5	7	4	1	1	0	2	1	3	4	3
4/17/07	1	14	1	602	D	542	3	1	Inglis	4	6	4	6	7	4	1	2	0	0	1	3	3	3
4/17/07	1	14	1	601	A	997	4	1	Inglis	4	6	4	6	7	4	1	2	0	0	1	4	3	3
4/17/07	1	14	1	605	C	453	5	1	Inglis	3	2	2	2	5	4	0	1	0	0	1	2	2	2
4/17/07	1	14	1	604	A	202	6	1	Inglis	3	4	3	4	5	4	0	1	2	3	1	3	3	2
4/17/07	1	14	1	600	D	85	7	1	Inglis	3	6	7	6	7	6	1	2	0	0	1	3	3	3
4/17/07	1	14	1	607	C	31	8	1	Inglis	3	3	4	3	5	4	0	1	0	2	1	3	3	3
4/17/07	1	14	1	602	B	885	9	1	Inglis	3	7	7	7	5	4	1	2	0	0	1	3	2	3
4/17/07	1	14	1	603	A	141	10	1	Inglis	3	6	6	6	5	4	1	0	0	0	1	2	2	2

4/17/07	1	14	1	606	A	170	11	1	Inglis	3	6	6	6	5	4	1	0	0	0	1	2	3	2
4/17/07	1	14	1	600	C	462	12	1	Inglis	3	6	6	6	5	4	1	0	0	0	1	2	2	2
4/17/07	1	14	1	606	B	437	13	1	Inglis	4	2	2	2	5	4	1	2	0	2	1	3	3	3
4/17/07	1	14	1	604	B	952	14	1	Inglis	3	6	7	6	5	4	1	1	2	2	1	3	4	3
4/17/07	1	14	1	605	D	623	15	1	Inglis	3	3	3	3	5	4	1	1	0	3	1	2	3	3
4/17/07	1	14	1	600	B	283	16	1	Inglis	3	5	6	5	5	4	1	0	0	2	1	3	4	0
4/17/07	1	14	1	602	C	656	1	1	Runyon	7	7	6	6	5	4	1	0	0	0	1	3	3	3
4/17/07	1	14	1	606	D	264	2	1	Runyon	5	5	3	4	7	3	1	0	0	5	1	4	3	3
4/17/07	1	14	1	602	D	542	3	1	Runyon	5	7	5	6	5	5	2	0	0	0	1	2	2	2
4/17/07	1	14	1	601	A	997	4	1	Runyon	4	7	6	7	5	5	1	0	0	0	1	2	2	2
4/17/07	1	14	1	605	C	453	5	1	Runyon	4	5	2	2	6	4	1	0	0	4	1	3	3	3
4/17/07	1	14	1	604	A	202	6	1	Runyon	4	6	7	6	5	4	1	0	0	0	1	2	2	2
4/17/07	1	14	1	600	D	85	7	1	Runyon	4	8	7	7	6	5	1	0	0	0	1	4	2	3
4/17/07	1	14	1	607	C	31	8	1	Runyon	4	7	3	4	6	4	1	0	2	2	1	3	3	3
4/17/07	1	14	1	602	B	885	9	1	Runyon	2	7	7	7	5	5	1	0	0	0	1	2	2	2
4/17/07	1	14	1	603	A	141	10	1	Runyon	5	6	6	6	5	5	1	0	0	0	1	2	2	2
4/17/07	1	14	1	606	A	170	11	1	Runyon	5	7	5	6	6	3	0	2	0	4	1	3	3	3
4/17/07	1	14	1	600	C	462	12	1	Runyon	3	6	5	6	5	5	0	0	0	0	1	3	3	3
4/17/07	1	14	1	606	B	437	13	1	Runyon	5	6	4	5	6	4	0	0	0	3	1	4	3	3
4/17/07	1	14	1	604	B	952	14	1	Runyon	4	7	7	7	5	5	1	0	0	0	1	2	2	2
4/17/07	1	14	1	605	D	623	15	1	Runyon	3	5	5	5	5	4	1	0	0	0	1	3	2	2
4/17/07	1	14	1	600	B	283	16	1	Runyon	4	7	6	7	6	3	0	0	0	0	1	4	2	2
4/17/07	1	14	2	606	C	726	1	2	Bailey	6	6	6	6	7	5	0	0	0	0	0	4	3	3
4/17/07	1	14	2	604	D	608	2	2	Bailey	5	6	5	5	5	5	0	0	0	0	1	2	3	2
4/17/07	1	14	2	600	A	685	3	2	Bailey	4	7	7	7	5	5	1	0	0	0	1	1	2	1

4/17/07	1	14	2	601	B	878	4	2	Bailey	5	6	5	6	5	5	0	0	0	0	2	1	2	2
4/17/07	1	14	2	603	B	722	5	2	Bailey	3	5	7	5	5	5	0	0	0	0	1	1	3	3
4/17/07	1	14	2	603	C	778	6	2	Bailey	6	6	7	6	6	5	0	0	0	0	1	3	2	3
4/17/07	1	14	2	607	D	950	7	2	Bailey	5	6	6	6	6	5	0	0	1	0	1	2	3	3
4/17/07	1	14	2	601	D	919	8	2	Bailey	6	7	7	7	5	5	0	0	0	0	1	2	2	3
4/17/07	1	14	2	607	B	79	9	2	Bailey	4	5	5	5	7	5	0	0	0	0	1	4	2	3
4/17/07	1	14	2	605	A	601	10	2	Bailey	4	6	5	5	6	5	0	0	0	1	0	3	2	3
4/17/07	1	14	2	601	C	635	11	2	Bailey	6	6	6	6	5	5	2	0	0	0	1	1	2	2
4/17/07	1	14	2	604	C	383	12	2	Bailey	5	7	6	6	6	5	0	0	1	0	1	3	2	2
4/17/07	1	14	2	603	D	405	13	2	Bailey	5	7	7	7	5	5	1	0	0	0	1	1	3	2
4/17/07	1	14	2	602	A	552	14	2	Bailey	5	7	7	7	6	5	1	0	0	0	1	2	2	3
4/17/07	1	14	2	607	A	192	15	2	Bailey	4	4	5	4	5	5	1	0	0	1	1	1	2	2
4/17/07	1	14	2	605	B	146	16	2	Bailey	3	4	5	4	6	5	0	0	0	0	1	3	2	4
4/17/07	1	14	2	606	C	726	1	2	Inglis	4	3	3	3	5	4	0	2	0	2	1	3	3	3
4/17/07	1	14	2	604	D	608	2	2	Inglis	3	4	4	4	5	4	0	2	0	2	1	2	2	2
4/17/07	1	14	2	600	A	685	3	2	Inglis	3	6	6	6	5	4	1	2	0	0	1	2	2	2
4/17/07	1	14	2	601	B	878	4	2	Inglis	3	2	2	2	5	4	0	1	0	2	1	1	1	2
4/17/07	1	14	2	603	B	722	5	2	Inglis	3	2	2	2	5	4	0	1	0	2	1	3	3	3
4/17/07	1	14	2	603	C	778	6	2	Inglis	3	5	6	5	5	4	1	1	0	0	1	3	2	3
4/17/07	1	14	2	607	D	950	7	2	Inglis	3	4	4	4	5	4	0	1	0	0	1	3	3	3
4/17/07	1	14	2	601	D	919	8	2	Inglis	4	6	6	6	5	4	1	2	2	0	1	2	2	2
4/17/07	1	14	2	607	B	79	9	2	Inglis	3	4	5	4	5	4	0	1	0	2	1	2	3	2
4/17/07	1	14	2	605	A	601	10	2	Inglis	3	6	6	6	5	4	0	2	0	0	1	3	4	3
4/17/07	1	14	2	601	C	635	11	2	Inglis	3	5	6	5	5	4	0	2	0	0	1	2	2	2
4/17/07	1	14	2	604	C	383	12	2	Inglis	3	5	6	5	5	4	0	2	0	0	1	2	2	2

4/17/07	1	14	2	603	D	405	13	2	Inglis	3	6	6	6	5	4	1	2	0	0	1	3	3	3
4/17/07	1	14	2	602	A	552	14	2	Inglis	4	6	7	6	6	5	1	2	0	0	1	4	3	3
4/17/07	1	14	2	607	A	192	15	2	Inglis	3	4	5	4	5	4	0	1	0	2	1	2	2	2
4/17/07	1	14	2	605	B	146	16	2	Inglis	3	2	2	2	5	4	0	1	0	2	0	3	3	3
4/17/07	1	14	2	606	C	726	1	2	Davis	4	5	4	5	7	3	0	0	0	0	1	0	1	0
4/17/07	1	14	2	604	D	608	2	2	Davis	4	5	5	5	5	4	0	0	0	0	1	1	2	0
4/17/07	1	14	2	600	A	685	3	2	Davis	4	6	7	6	5	4	0	0	0	0	1	0	1	3
4/17/07	1	14	2	601	B	878	4	2	Davis	4	4	3	4	5	4	0	0	0	0	0	0	1	3
4/17/07	1	14	2	603	B	722	5	2	Davis	3	5	5	5	4	3	0	0	0	0	0	1	0	3
4/17/07	1	14	2	603	C	778	6	2	Davis	4	5	5	5	5	4	0	0	0	0	2	1	2	2
4/17/07	1	14	2	607	D	950	7	2	Davis	3	4	4	4	4	4	0	0	0	0	0	0	2	3
4/17/07	1	14	2	601	D	919	8	2	Davis	5	7	7	7	5	4	0	0	0	0	0	0	2	3
4/17/07	1	14	2	607	B	79	9	2	Davis	4	6	4	5	5	4	0	0	0	0	0	0	1	2
4/17/07	1	14	2	605	A	601	10	2	Davis	4	5	6	5	5	4	0	0	0	0	0	0	2	3
4/17/07	1	14	2	601	C	635	11	2	Davis	3	4	3	4	4	3	0	0	0	0	1	0	0	1
4/17/07	1	14	2	604	C	383	12	2	Davis	5	6	6	6	6	4	0	0	0	0	0	2	0	2
4/17/07	1	14	2	603	D	405	13	2	Davis	5	6	6	6	6	5	0	0	0	0	0	2	2	1
4/17/07	1	14	2	602	A	552	14	2	Davis	5	6	7	6	5	5	1	0	0	0	1	2	0	0
4/17/07	1	14	2	607	A	192	15	2	Davis	2	5	6	5	4	3	0	0	0	0	0	0	1	2
4/17/07	1	14	2	605	B	146	16	2	Davis	2	3	3	3	4	3	0	0	0	0	0	0	2	3
4/17/07	1	14	2	606	C	726	1	2	Thurman	5	6	5	6	7	5	0	2	0	0	1	0	2	1
4/17/07	1	14	2	604	D	608	2	2	Thurman	5	5	5	5	6	5	1	0	0	1	0	0	0	1
4/17/07	1	14	2	600	A	685	3	2	Thurman	4	4	5	5	4	4	0	0	0	1	0	0	1	0
4/17/07	1	14	2	601	B	878	4	2	Thurman	5	5	5	5	5	4	0	1	0	0	1	1	1	0
4/17/07	1	14	2	603	B	722	5	2	Thurman	4	3	3	3	6	5	0	1	0	0	1	2	2	1

4/17/07	1	14	2	603	C	778	6	2	Thurman	4	5	5	5	6	4	0	1	0	0	0	1	2	2
4/17/07	1	14	2	607	D	950	7	2	Thurman	5	4	5	4	6	5	0	2	0	0	1	2	0	2
4/17/07	1	14	2	601	D	919	8	2	Thurman	6	7	7	7	6	4	1	2	0	0	1	1	1	0
4/17/07	1	14	2	607	B	79	9	2	Thurman	4	5	5	5	7	6	0	0	2	2	1	0	0	0
4/17/07	1	14	2	605	A	601	10	2	Thurman	5	5	5	5	6	5	1	1	0	0	0	0	1	1
4/17/07	1	14	2	601	C	635	11	2	Thurman	6	6	6	6	6	4	1	0	2	0	0	1	1	0
4/17/07	1	14	2	604	C	383	12	2	Thurman	6	7	7	7	5	4	0	0	0	0	1	0	2	0
4/17/07	1	14	2	603	D	405	13	2	Thurman	5	6	6	6	6	5	0	1	0	1	0	0	1	0
4/17/07	1	14	2	602	A	552	14	2	Thurman	7	7	6	7	6	5	0	0	0	0	0	2	1	1
4/17/07	1	14	2	607	A	192	15	2	Thurman	4	2	2	2	3	2	0	0	0	0	0	0	1	1
4/17/07	1	14	2	605	B	146	16	2	Thurman	6	6	6	6	7	6	0	1	2	0	1	2	1	1
4/17/07	1	14	2	606	C	726	1	2	Johnson	5	6	6	6	5	4	1	0	0	0	1	1	2	2
4/17/07	1	14	2	604	D	608	2	2	Johnson	5	6	7	6	6	4	1	0	0	0	1	2	2	2
4/17/07	1	14	2	600	A	685	3	2	Johnson	6	7	7	7	5	5	1	0	0	0	2	2	3	3
4/17/07	1	14	2	601	B	878	4	2	Johnson	5	6	5	6	5	5	1	0	0	0	1	2	2	2
4/17/07	1	14	2	603	B	722	5	2	Johnson	3	6	6	6	4	4	0	0	0	0	1	1	2	1
4/17/07	1	14	2	603	C	778	6	2	Johnson	6	6	6	6	6	4	1	0	0	0	1	3	2	2
4/17/07	1	14	2	607	D	950	7	2	Johnson	5	6	6	6	6	4	0	0	0	0	2	3	2	2
4/17/07	1	14	2	601	D	919	8	2	Johnson	6	7	6	7	6	4	0	0	0	0	2	2	2	1
4/17/07	1	14	2	607	B	79	9	2	Johnson	6	6	5	5	6	4	0	0	0	0	2	3	2	1
4/17/07	1	14	2	605	A	601	10	2	Johnson	5	7	5	6	6	5	0	0	0	0	1	2	2	1
4/17/07	1	14	2	601	C	635	11	2	Johnson	6	7	6	7	6	4	0	0	0	0	2	3	2	2
4/17/07	1	14	2	604	C	383	12	2	Johnson	6	7	6	7	7	4	0	0	0	1	1	1	2	1
4/17/07	1	14	2	603	D	405	13	2	Johnson	5	7	6	7	6	5	0	0	0	1	1	2	3	2
4/17/07	1	14	2	602	A	552	14	2	Johnson	5	7	6	7	6	4	0	0	0	0	2	3	2	2

4/17/07	1	14	2	607	A	192	15	2	Johnson	4	6	5	5	5	3	0	0	0	0	1	2	2	1
4/17/07	1	14	2	605	B	146	16	2	Johnson	6	7	6	7	5	4	0	0	0	0	1	3	2	2
4/18/07	2	14	1	612	B	745	1	1	Higgins	3	4	5	4	4	5	2	0	0	2	1	2	2	3
4/18/07	2	14	1	615	B	13	2	1	Higgins	4	5	5	5	5	4	2	1	0	3	1	2	2	3
4/18/07	2	14	1	611	A	318	3	1	Higgins	5	5	6	5	5	5	2	0	0	0	1	2	2	2
4/18/07	2	14	1	612	C	533	4	1	Higgins	4	4	5	4	5	4	1	1	0	2	1	2	2	3
4/18/07	2	14	1	609	B	226	5	1	Higgins	5	6	6	6	6	5	2	1	0	3	2	2	2	2
4/18/07	2	14	1	610	D	63	6	1	Higgins	5	6	7	6	6	4	2	2	0	2	1	1	1	2
4/18/07	2	14	1	609	D	68	7	1	Higgins	5	7	8	7	5	5	2	1	0	0	1	2	2	3
4/18/07	2	14	1	609	C	786	8	1	Higgins	5	7	8	7	6	5	2	1	0	1	2	2	2	2
4/18/07	2	14	1	611	B	845	9	1	Higgins	4	5	5	5	5	4	2	1	0	3	2	2	2	3
4/18/07	2	14	1	613	D	280	10	1	Higgins	4	4	5	4	5	5	2	1	0	2	2	2	3	3
4/18/07	2	14	1	612	A	761	11	1	Higgins	5	5	6	5	6	5	2	2	0	3	2	2	2	3
4/18/07	2	14	1	608	A	392	12	1	Higgins	5	6	6	6	5	5	2	1	0	1	1	2	2	3
4/18/07	2	14	1	614	D	334	13	1	Higgins	4	5	5	5	5	4	2	1	0	3	2	2	3	3
4/18/07	2	14	1	614	C	117	14	1	Higgins	4	5	6	5	6	5	2	2	0	3	2	2	3	3
4/18/07	2	14	1	611	C	597	15	1	Higgins	5	6	6	6	6	5	2	1	0	2	1	2	2	3
4/18/07	2	14	1	615	A	487	16	1	Higgins	4	5	5	5	5	5	2	1	0	3	1	2	2	3
4/18/07	2	14	1	612	B	745	1	1	Amen	5	6	3	4	4	3	3	0	0	0	0	0	1	4
4/18/07	2	14	1	615	B	13	2	1	Amen	3	4	5	4	6	5	0	0	0	2	0	2	3	3
4/18/07	2	14	1	611	A	318	3	1	Amen	5	5	6	5	5	4	2	1	0	0	0	2	2	2
4/18/07	2	14	1	612	C	533	4	1	Amen	4	6	6	6	4	3	2	0	0	0	0	0	1	3
4/18/07	2	14	1	609	B	226	5	1	Amen	5	5	5	4	5	4	1	1	0	0	1	1	2	2
4/18/07	2	14	1	610	D	63	6	1	Amen	5	7	7	7	5	4	1	0	0	0	0	2	2	4
4/18/07	2	14	1	609	D	68	7	1	Amen	4	7	7	7	4	3	2	0	0	0	0	1	0	2

4/18/07	2	14	1	609	C	786	8	1	Amen	4	7	7	7	5	5	1	0	0	0	0	1	2	1
4/18/07	2	14	1	611	B	845	9	1	Amen	5	6	6	6	6	4	1	0	0	0	0	2	3	3
4/18/07	2	14	1	613	D	280	10	1	Amen	5	4	5	4	6	4	3	0	0	0	1	3	2	3
4/18/07	2	14	1	612	A	761	11	1	Amen	5	5	5	5	3	2	1	0	0	0	0	0	1	1
4/18/07	2	14	1	608	A	392	12	1	Amen	6	6	7	6	5	3	2	1	0	0	0	2	3	1
4/18/07	2	14	1	614	D	334	13	1	Amen	4	4	4	3	7	4	2	0	0	3	0	2	3	3
4/18/07	2	14	1	614	C	117	14	1	Amen	4	3	6	3	6	5	0	0	0	2	0	1	2	2
4/18/07	2	14	1	611	C	597	15	1	Amen	4	7	7	7	6	5	1	0	0	0	1	2	2	2
4/18/07	2	14	1	615	A	487	16	1	Amen	4	4	5	3	7	4	0	0	0	3	0	3	4	1
4/18/07	2	14	1	612	B	745	1	1	Johnson	5	6	4	5	5	3	1	0	0	0	1	1	2	2
4/18/07	2	14	1	615	B	13	2	1	Johnson	4	6	5	5	6	4	1	0	0	0	1	2	2	2
4/18/07	2	14	1	611	A	318	3	1	Johnson	5	6	6	6	5	4	1	0	0	0	2	2	2	3
4/18/07	2	14	1	612	C	533	4	1	Johnson	5	6	5	5	6	3	1	0	0	2	2	2	2	2
4/18/07	2	14	1	609	B	226	5	1	Johnson	5	6	6	6	5	4	1	0	0	0	1	2	3	3
4/18/07	2	14	1	610	D	63	6	1	Johnson	6	8	7	8	4	4	1	0	0	0	1	2	1	2
4/18/07	2	14	1	609	D	68	7	1	Johnson	5	7	7	7	5	4	2	0	0	0	1	2	2	2
4/18/07	2	14	1	609	C	786	8	1	Johnson	6	7	6	7	5	4	2	0	0	1	1	2	2	3
4/18/07	2	14	1	611	B	845	9	1	Johnson	4	7	6	7	5	4	1	0	0	1	1	2	3	2
4/18/07	2	14	1	613	D	280	10	1	Johnson	4	5	5	5	4	3	1	0	0	0	2	2	2	2
4/18/07	2	14	1	612	A	761	11	1	Johnson	5	6	5	5	6	4	1	0	0	2	1	2	2	2
4/18/07	2	14	1	608	A	392	12	1	Johnson	4	6	6	6	5	4	1	0	0	0	2	1	2	2
4/18/07	2	14	1	614	D	334	13	1	Johnson	5	6	5	6	6	4	1	0	0	1	2	2	3	2
4/18/07	2	14	1	614	C	117	14	1	Johnson	4	5	5	5	4	4	1	0	0	0	1	1	2	1
4/18/07	2	14	1	611	C	597	15	1	Johnson	5	7	6	7	5	4	2	0	0	0	2	2	2	3
4/18/07	2	14	1	615	A	487	16	1	Johnson	5	6	5	6	5	4	1	0	0	1	2	3	2	1

4/18/07	2	14	1	612	B	745	1	1	Inglis	3	3	4	3	4	3	0	0	0	2	1	2	2	2
4/18/07	2	14	1	615	B	13	2	1	Inglis	4	5	5	5	6	3	0	0	0	2	1	4	3	3
4/18/07	2	14	1	611	A	318	3	1	Inglis	4	5	6	5	5	3	0	0	0	2	1	3	3	3
4/18/07	2	14	1	612	C	533	4	1	Inglis	3	6	6	6	5	4	0	0	1	0	1	2	2	2
4/18/07	2	14	1	609	B	226	5	1	Inglis	4	6	7	6	5	4	2	0	1	0	1	2	2	2
4/18/07	2	14	1	610	D	63	6	1	Inglis	4	7	6	7	5	4	0	0	1	0	1	3	2	2
4/18/07	2	14	1	609	D	68	7	1	Inglis	4	7	6	7	5	4	0	0	2	0	1	2	4	3
4/18/07	2	14	1	609	C	786	8	1	Inglis	4	7	7	7	5	4	2	0	3	0	1	2	2	2
4/18/07	2	14	1	611	B	845	9	1	Inglis	3	5	6	5	5	4	0	0	2	0	1	4	3	3
4/18/07	2	14	1	613	D	280	10	1	Inglis	3	2	3	2	4	3	0	0	0	3	1	2	2	2
4/18/07	2	14	1	612	A	761	11	1	Inglis	3	4	5	4	3	0	0	0	0	5	1	3	5	3
4/18/07	2	14	1	608	A	392	12	1	Inglis	4	7	7	7	5	4	1	3	0	0	1	2	2	2
4/18/07	2	14	1	614	D	334	13	1	Inglis	3	2	3	2	4	3	0	0	0	2	1	2	2	2
4/18/07	2	14	1	614	C	117	14	1	Inglis	2	3	4	3	4	3	0	0	2	2	1	2	3	2
4/18/07	2	14	1	611	C	597	15	1	Inglis	4	6	7	6	5	4	2	0	1	0	1	3	2	2
4/18/07	2	14	1	615	A	487	16	1	Inglis	3	2	3	2	4	3	0	0	0	2	1	2	2	2
4/18/07	2	14	1	612	B	745	1	1	Runyon	3	4	3	3	5	3	1	0	0	3	0	2	2	2
4/18/07	2	14	1	615	B	13	2	1	Runyon	4	6	3	4	7	2	0	0	0	7	0	4	3	3
4/18/07	2	14	1	611	A	318	3	1	Runyon	5	7	7	7	5	4	1	0	0	0	1	2	2	2
4/18/07	2	14	1	612	C	533	4	1	Runyon	4	5	3	4	5	3	0	2	0	2	1	2	3	3
4/18/07	2	14	1	609	B	226	5	1	Runyon	5	7	7	7	5	4	1	0	0	2	1	4	2	3
4/18/07	2	14	1	610	D	63	6	1	Runyon	4	8	8	8	6	4	0	0	0	0	1	4	2	3
4/18/07	2	14	1	609	D	68	7	1	Runyon	4	8	8	8	5	5	1	0	0	0	1	2	2	2
4/18/07	2	14	1	609	C	786	8	1	Runyon	4	8	8	8	5	5	2	0	0	0	1	2	2	2
4/18/07	2	14	1	611	B	845	9	1	Runyon	3	6	6	6	6	3	0	0	0	4	0	4	2	2

4/18/07	2	14	1	613	D	280	10	1	Runyon	4	4	3	3	5	4	1	0	0	0	0	2	2	2
4/18/07	2	14	1	612	A	761	11	1	Runyon	4	5	4	5	5	1	0	0	0	0	0	2	3	4
4/18/07	2	14	1	608	A	392	12	1	Runyon	6	6	6	6	5	4	0	0	0	0	0	3	3	3
4/18/07	2	14	1	614	D	334	13	1	Runyon	4	4	5	4	7	2	0	0	0	6	0	4	3	3
4/18/07	2	14	1	614	C	117	14	1	Runyon	3	5	6	5	5	4	0	0	0	0	0	3	3	3
4/18/07	2	14	1	611	C	597	15	1	Runyon	5	8	7	7	5	4	0	0	0	0	0	3	3	3
4/18/07	2	14	1	615	A	487	16	1	Runyon	2	4	2	3	7	2	0	0	0	7	0	4	3	3
4/18/07	2	14	2	611	D	917	1	1	Benli	5	6	6	6	5	5	0	0	0	0	1	2	1	1
4/18/07	2	14	2	610	C	168	2	1	Benli	5	7	7	7	6	5	1	0	0	0	1	2	1	1
4/18/07	2	14	2	613	C	514	3	1	Benli	5	6	4	4	5	5	0	1	0	0	1	1	0	2
4/18/07	2	14	2	613	B	638	4	1	Benli	4	4	2	3	5	4	0	1	0	0	1	1	2	2
4/18/07	2	14	2	610	B	964	5	1	Benli	5	7	5	6	6	5	0	0	0	0	1	2	2	2
4/18/07	2	14	2	612	D	592	6	1	Benli	3	6	5	5	6	4	0	0	0	1	1	1	2	1
4/18/07	2	14	2	615	C	905	7	1	Benli	4	6	4	5	7	4	0	0	0	0	1	0	1	1
4/18/07	2	14	2	608	C	570	8	1	Benli	5	7	6	6	5	5	0	0	0	0	1	2	1	1
4/18/07	2	14	2	608	D	43	9	2	Benli	5	6	6	6	6	6	0	1	0	0	1	2	1	1
4/18/07	2	14	2	610	A	453	10	2	Benli	4	7	6	6	6	6	0	1	0	0	2	2	1	2
4/18/07	2	14	2	613	A	146	11	2	Benli	4	5	4	4	6	6	0	1	0	0	1	1	2	1
4/18/07	2	14	2	615	D	439	12	2	Benli	4	5	5	5	8	4	0	0	0	0	1	1	2	0
4/18/07	2	14	2	608	B	813	13	2	Benli	5	7	7	7	6	6	0	0	0	0	1	1	1	2
4/18/07	2	14	2	614	A	993	14	2	Benli	5	6	5	5	8	5	0	0	0	0	1	1	1	0
4/18/07	2	14	2	614	B	606	15	2	Benli	5	5	5	5	6	6	0	0	0	0	1	1	0	1
4/18/07	2	14	2	609	A	825	16	2	Benli	5	6	6	6	6	4	1	0	0	1	1	1	2	0
4/18/07	2	14	2	611	D	917	1	1	Bailey	5	6	7	6	5	5	0	0	0	0	1	2	1	2
4/18/07	2	14	2	610	C	168	2	1	Bailey	4	6	6	6	5	5	1	0	0	0	1	2	1	2

4/18/07	2	14	2	613	C	514	3	1	Bailey	4	6	3	4	6	5	0	0	0	0	1	3	2	3
4/18/07	2	14	2	613	B	638	4	1	Bailey	4	4	4	4	6	5	0	0	0	0	1	3	2	4
4/18/07	2	14	2	610	B	964	5	1	Bailey	7	7	7	7	7	5	0	0	0	0	1	4	3	5
4/18/07	2	14	2	612	D	592	6	1	Bailey	6	7	6	7	6	5	1	0	0	0	1	1	1	2
4/18/07	2	14	2	615	C	905	7	1	Bailey	5	6	5	5	7	5	0	0	0	0	1	4	3	4
4/18/07	2	14	2	608	C	570	8	1	Bailey	5	6	7	6	5	5	0	0	0	0	1	1	2	3
4/18/07	2	14	2	608	D	43	9	2	Bailey	6	6	6	6	6	5	0	0	0	0	1	2	2	2
4/18/07	2	14	2	610	A	453	10	2	Bailey	6	6	7	6	6	5	0	0	0	0	1	2	3	3
4/18/07	2	14	2	613	A	146	11	2	Bailey	4	5	4	4	5	5	1	0	0	1	1	1	2	1
4/18/07	2	14	2	615	D	439	12	2	Bailey	4	6	6	6	8	5	0	0	2	0	1	4	3	3
4/18/07	2	14	2	608	B	813	13	2	Bailey	3	6	7	6	7	5	0	0	1	0	1	2	4	4
4/18/07	2	14	2	614	A	993	14	2	Bailey	5	5	6	5	6	5	1	0	0	1	1	3	3	3
4/18/07	2	14	2	614	B	606	15	2	Bailey	5	5	4	4	6	5	0	0	0	1	1	3	3	2
4/18/07	2	14	2	609	A	825	16	2	Bailey	6	7	6	6	5	5	1	0	0	1	1	1	2	2
4/18/07	2	14	2	611	D	917	1	1	Davis	4	6	6	6	4	4	0	0	0	0	0	1	1	2
4/18/07	2	14	2	610	C	168	2	1	Davis	4	6	6	6	5	4	0	0	0	0	1	0	2	3
4/18/07	2	14	2	613	C	514	3	1	Davis	3	5	5	5	4	4	0	0	0	0	0	0	1	3
4/18/07	2	14	2	613	B	638	4	1	Davis	2	3	3	3	3	3	0	0	0	0	0	0	2	4
4/18/07	2	14	2	610	B	964	5	1	Davis	5	7	8	7	5	4	0	0	0	0	0	2	1	1
4/18/07	2	14	2	612	D	592	6	1	Davis	2	5	5	5	5	3	0	0	0	2	0	0	0	1
4/18/07	2	14	2	615	C	905	7	1	Davis	2	5	4	5	6	3	0	0	0	0	0	0	0	4
4/18/07	2	14	2	608	C	570	8	1	Davis	5	8	8	8	5	4	0	0	0	0	0	2	1	3
4/18/07	2	14	2	608	D	43	9	2	Davis	4	7	8	7	5	4	0	0	0	0	0	1	2	2
4/18/07	2	14	2	610	A	453	10	2	Davis	5	6	7	6	4	4	0	0	0	0	0	0	1	2
4/18/07	2	14	2	613	A	146	11	2	Davis	2	2	2	2	3	2	0	0	0	0	0	0	0	2

4/18/07	2	14	2	615	D	439	12	2	Davis	3	4	5	4	6	3	0	0	0	0	0	0	0	4
4/18/07	2	14	2	608	B	813	13	2	Davis	3	7	8	7	4	3	0	0	0	0	0	2	0	3
4/18/07	2	14	2	614	A	993	14	2	Davis	3	5	6	5	6	3	0	0	0	0	0	2	2	0
4/18/07	2	14	2	614	B	606	15	2	Davis	2	5	4	5	6	3	0	0	0	0	0	0	2	2
4/18/07	2	14	2	609	A	825	16	2	Davis	5	4	4	4	5	3	0	0	0	0	0	2	0	2
4/18/07	2	14	2	611	D	917	1	1	Johnson	5	7	6	7	5	5	1	0	0	0	1	1	1	1
4/18/07	2	14	2	610	C	168	2	1	Johnson	6	7	7	7	4	4	0	0	0	0	2	2	2	1
4/18/07	2	14	2	613	C	514	3	1	Johnson	6	6	5	6	6	3	1	0	0	2	1	2	2	2
4/18/07	2	14	2	613	B	638	4	1	Johnson	5	6	6	6	6	4	1	0	0	1	1	2	1	1
4/18/07	2	14	2	610	B	964	5	1	Johnson	5	7	6	7	4	5	0	0	0	0	2	3	1	1
4/18/07	2	14	2	612	D	592	6	1	Johnson	5	6	6	6	5	4	2	0	0	1	1	2	2	2
4/18/07	2	14	2	615	C	905	7	1	Johnson	5	7	6	7	6	5	0	0	0	0	1	2	1	3
4/18/07	2	14	2	608	C	570	8	1	Johnson	6	7	7	7	5	4	1	0	0	0	1	3	2	2
4/18/07	2	14	2	608	D	43	9	2	Johnson	5	6	5	6	5	4	2	0	0	0	2	1	1	2
4/18/07	2	14	2	610	A	453	10	2	Johnson	6	7	6	7	6	5	1	0	0	0	1	2	2	2
4/18/07	2	14	2	613	A	146	11	2	Johnson	5	6	6	6	5	5	1	0	0	1	1	2	1	2
4/18/07	2	14	2	615	D	439	12	2	Johnson	6	7	5	6	6	5	0	0	0	0	2	2	2	3
4/18/07	2	14	2	608	B	813	13	2	Johnson	5	7	7	7	5	4	0	0	0	0	2	2	1	2
4/18/07	2	14	2	614	A	993	14	2	Johnson	6	6	5	6	7	4	0	0	0	2	1	2	3	2
4/18/07	2	14	2	614	B	606	15	2	Johnson	5	7	6	7	6	4	0	0	0	0	1	3	2	2
4/18/07	2	14	2	609	A	825	16	2	Johnson	5	6	6	6	5	5	0	0	0	0	2	2	2	2
4/18/07	2	14	2	611	D	917	1	1	Philip	6	6	6	6	5	5	0	0	0	0	1	2	2	2
4/18/07	2	14	2	610	C	168	2	1	Philip	7	7	7	7	5	5	0	0	0	0	2	2	1	1
4/18/07	2	14	2	613	C	514	3	1	Philip	7	5	5	5	6	5	0	0	0	0	2	1	2	2
4/18/07	2	14	2	613	B	638	4	1	Philip	5	7	7	7	6	5	0	0	0	1	1	2	1	3

4/18/07	2	14	2	610	B	964	5	1	Philip	6	6	7	6	7	5	0	0	0	1	2	1	1	2
4/18/07	2	14	2	612	D	592	6	1	Philip	5	6	6	6	6	6	0	0	0	0	1	1	1	2
4/18/07	2	14	2	615	C	905	7	1	Philip	6	6	6	6	7	5	0	0	0	1	2	2	2	2
4/18/07	2	14	2	608	C	570	8	1	Philip	6	8	7	8	6	5	0	0	0	0	2	1	1	1
4/18/07	2	14	2	608	D	43	9	2	Philip	6	7	8	7	7	5	0	0	0	1	1	2	0	2
4/18/07	2	14	2	610	A	453	10	2	Philip	5	7	7	7	6	5	0	0	0	0	1	2	2	2
4/18/07	2	14	2	613	A	146	11	2	Philip	5	6	7	6	6	5	0	0	0	0	1	1	2	2
4/18/07	2	14	2	615	D	439	12	2	Philip	6	6	6	6	7	5	0	0	0	1	2	1	2	2
4/18/07	2	14	2	608	B	813	13	2	Philip	7	8	8	8	6	4	0	0	0	0	1	2	1	1
4/18/07	2	14	2	614	A	993	14	2	Philip	6	6	7	6	7	5	0	0	0	0	1	2	2	2
4/18/07	2	14	2	614	B	606	15	2	Philip	6	6	6	6	7	5	0	0	0	1	0	1	2	3
4/18/07	2	14	2	609	A	825	16	2	Philip	7	7	6	7	7	5	0	0	2	0	1	1	2	2
4/19/07	3	14	1	616	C	502	1	1	Runyon	4	7	7	7	5	3	1	0	3	0	0	2	3	3
4/19/07	3	14	1	620	D	833	2	1	Runyon	5	5	1	3	5	4	1	0	0	3	1	2	2	2
4/19/07	3	14	1	618	C	265	3	1	Runyon	6	7	7	7	6	3	1	0	0	1	1	3	2	2
4/19/07	3	14	1	616	D	229	4	1	Runyon	4	5	5	5	7	2	0	0	4	0	0	2	3	3
4/19/07	3	14	1	617	A	902	5	1	Runyon	7	8	6	7	6	4	0	0	0	0	1	3	2	2
4/19/07	3	14	1	618	B	725	6	1	Runyon	4	8	8	8	6	2	0	0	0	0	0	4	2	2
4/19/07	3	14	1	616	B	599	7	1	Runyon	3	7	7	7	5	4	0	0	3	2	0	2	3	3
4/19/07	3	14	1	622	A	40	8	1	Runyon	6	2	2	2	7	1	0	0	0	6	0	4	3	3
4/19/07	3	14	1	621	C	760	9	1	Runyon	4	5	6	5	5	3	0	0	2	2	0	2	3	3
4/19/07	3	14	1	618	D	758	10	1	Runyon	5	6	4	4	5	4	0	0	0	0	0	3	2	2
4/19/07	3	14	1	620	B	303	11	1	Runyon	6	5	3	4	6	2	0	0	0	1	0	4	2	2
4/19/07	3	14	1	623	C	528	12	1	Runyon	5	6	6	6	7	1	0	0	0	2	0	2	3	2
4/19/07	3	14	1	622	B	657	13	1	Runyon	4	3	3	3	6	0	0	0	0	5	0	2	3	2

4/19/07	3	14	1	620	A	195	14	1	Runyon	5	5	3	4	5	4	0	2	0	2	0	2	3	3
4/19/07	3	14	1	618	A	475	15	1	Runyon	6	7	6	7	5	3	0	0	0	0	0	3	3	2
4/19/07	3	14	1	622	D	99	16	1	Runyon	5	6	4	5	6	1	0	0	0	0	0	2	3	3
4/19/07	3	14	1	616	C	502	1	1	Inglis	3	6	7	6	5	4	1	1	2	0	1	2	3	2
4/19/07	3	14	1	620	D	833	2	1	Inglis	3	1	1	1	4	3	0	1	0	0	1	1	1	1
4/19/07	3	14	1	618	C	265	3	1	Inglis	4	6	6	6	5	3	1	0	0	0	1	3	2	3
4/19/07	3	14	1	616	D	229	4	1	Inglis	4	6	6	6	5	3	1	1	1	0	1	3	2	3
4/19/07	3	14	1	617	A	902	5	1	Inglis	4	6	6	6	5	4	1	2	0	0	1	3	2	3
4/19/07	3	14	1	618	B	725	6	1	Inglis	4	7	7	7	5	5	2	1	0	0	1	4	2	3
4/19/07	3	14	1	616	B	599	7	1	Inglis	3	6	6	6	5	4	2	0	2	0	1	2	4	2
4/19/07	3	14	1	622	A	40	8	1	Inglis	3	1	1	1	4	3	0	1	0	0	1	1	1	1
4/19/07	3	14	1	621	C	760	9	1	Inglis	4	4	4	4	4	3	0	3	2	0	1	3	4	3
4/19/07	3	14	1	618	D	758	10	1	Inglis	4	5	6	5	5	3	0	0	0	0	1	3	3	3
4/19/07	3	14	1	620	B	303	11	1	Inglis	3	1	1	1	4	3	0	1	0	0	1	1	1	1
4/19/07	3	14	1	623	C	528	12	1	Inglis	3	2	2	2	3	2	0	0	0	0	1	2	2	2
4/19/07	3	14	1	622	B	657	13	1	Inglis	3	1	1	1	4	3	0	1	0	0	1	1	1	1
4/19/07	3	14	1	620	A	195	14	1	Inglis	3	2	2	2	3	2	0	0	0	0	1	2	2	2
4/19/07	3	14	1	618	A	475	15	1	Inglis	3	5	6	5	5	4	0	1	0	0	1	3	4	3
4/19/07	3	14	1	622	D	99	16	1	Inglis	3	3	3	3	4	3	0	1	0	0	1	2	5	3
4/19/07	3	14	1	616	C	502	1	1	Unknown	5	6	6	6	6	5	0	0	0	2	1	2	2	2
4/19/07	3	14	1	620	D	833	2	1	Unknown	4	6	5	5	5	5	0	1	0	0	1	2	2	3
4/19/07	3	14	1	618	C	265	3	1	Unknown	5	7	7	7	5	5	1	2	0	0	1	2	2	3
4/19/07	3	14	1	616	D	229	4	1	Unknown	5	6	5	5	5	5	0	1	0	1	1	1	2	3
4/19/07	3	14	1	617	A	902	5	1	Unknown	5	6	5	5	5	5	1	0	0	0	1	1	1	2
4/19/07	3	14	1	618	B	725	6	1	Unknown	4	7	6	6	6	5	0	1	0	0	1	1	1	2

4/19/07	3	14	1	616	B	599	7	1	Unknown	4	7	6	6	6	5	0	0	0	1	1	2	2	2
4/19/07	3	14	1	622	A	40	8	1	Unknown	5	3	2	2	4	4	0	0	0	2	1	2	2	3
4/19/07	3	14	1	621	C	760	9	1	Unknown	3	2	3	2	6	4	0	1	0	1	1	2	3	3
4/19/07	3	14	1	618	D	758	10	1	Unknown	4	6	5	5	5	5	0	0	0	0	1	2	2	2
4/19/07	3	14	1	620	B	303	11	1	Unknown	3	2	2	2	6	4	0	0	0	1	1	2	2	3
4/19/07	3	14	1	623	C	528	12	1	Unknown	4	3	3	3	6	4	0	0	0	1	1	2	3	3
4/19/07	3	14	1	622	B	657	13	1	Unknown	4	3	2	2	5	5	0	1	0	0	1	2	2	3
4/19/07	3	14	1	620	A	195	14	1	Unknown	5	3	2	2	5	4	0	0	0	1	1	2	2	2
4/19/07	3	14	1	618	A	475	15	1	Unknown	5	7	6	6	5	5	0	0	0	0	1	2	2	2
4/19/07	3	14	1	622	D	99	16	1	Unknown	5	4	4	4	5	5	0	1	0	1	1	2	3	2
4/19/07	3	14	1	616	C	502	1	1	Amen	6	7	6	7	5	3	1	0	0	0	0	1	2	3
4/19/07	3	14	1	620	D	833	2	1	Amen	5	4	4	3	5	5	1	0	0	0	1	2	2	1
4/19/07	3	14	1	618	C	265	3	1	Amen	7	7	7	7	6	5	1	0	0	0	1	3	3	2
4/19/07	3	14	1	616	D	229	4	1	Amen	6	6	7	6	6	5	1	0	2	0	0	2	3	3
4/19/07	3	14	1	617	A	902	5	1	Amen	5	7	6	7	5	4	1	0	0	0	1	2	2	2
4/19/07	3	14	1	618	B	725	6	1	Amen	5	7	7	7	5	5	1	0	0	0	1	2	3	2
4/19/07	3	14	1	616	B	599	7	1	Amen	5	6	6	6	4	3	3	0	0	0	0	1	1	1
4/19/07	3	14	1	622	A	40	8	1	Amen	5	3	4	2	6	4	1	0	0	0	2	3	3	2
4/19/07	3	14	1	621	C	760	9	1	Amen	4	4	6	4	7	6	1	0	0	0	3	2	1	1
4/19/07	3	14	1	618	D	758	10	1	Amen	6	4	4	3	6	5	2	1	0	0	1	2	3	2
4/19/07	3	14	1	620	B	303	11	1	Amen	6	3	3	2	5	4	2	1	0	0	1	1	2	1
4/19/07	3	14	1	623	C	528	12	1	Amen	5	6	7	6	7	4	1	0	0	1	1	2	3	2
4/19/07	3	14	1	622	B	657	13	1	Amen	6	4	4	3	7	6	1	0	0	3	1	2	2	2
4/19/07	3	14	1	620	A	195	14	1	Amen	5	2	3	1	5	4	2	0	0	0	1	1	1	1
4/19/07	3	14	1	618	A	475	15	1	Amen	6	6	7	6	7	5	2	0	0	0	1	3	3	2

4/19/07	3	14	1	622	D	99	16	1	Amen	5	5	6	5	7	4	1	0	0	4	2	2	3	2
4/19/07	3	14	1	616	C	502	1	1	Higgins	5	6	6	6	5	5	1	1	0	1	2	2	2	3
4/19/07	3	14	1	620	D	833	2	1	Higgins	5	4	5	4	4	4	1	0	0	2	2	2	2	2
4/19/07	3	14	1	618	C	265	3	1	Higgins	5	6	6	6	5	4	2	2	0	3	2	2	3	3
4/19/07	3	14	1	616	D	229	4	1	Higgins	4	4	5	4	4	3	1	0	0	0	2	2	2	3
4/19/07	3	14	1	617	A	902	5	1	Higgins	6	5	4	5	4	4	1	0	0	2	2	2	2	2
4/19/07	3	14	1	618	B	725	6	1	Higgins	5	6	7	6	5	5	2	1	0	0	1	2	2	2
4/19/07	3	14	1	616	B	599	7	1	Higgins	4	5	6	5	4	5	1	0	0	0	1	1	2	2
4/19/07	3	14	1	622	A	40	8	1	Higgins	3	3	3	3	4	5	1	0	0	3	0	1	2	3
4/19/07	3	14	1	621	C	760	9	1	Higgins	5	5	6	5	5	5	2	1	0	2	1	2	2	3
4/19/07	3	14	1	618	D	758	10	1	Higgins	6	6	7	6	5	4	2	1	0	2	2	2	2	2
4/19/07	3	14	1	620	B	303	11	1	Higgins	4	4	4	4	5	5	2	0	0	3	1	3	3	3
4/19/07	3	14	1	623	C	528	12	1	Higgins	3	3	2	3	4	5	1	0	0	2	1	2	2	4
4/19/07	3	14	1	622	B	657	13	1	Higgins	4	4	4	4	4	5	1	0	0	2	1	2	2	3
4/19/07	3	14	1	620	A	195	14	1	Higgins	3	3	2	3	3	5	1	0	0	1	1	1	2	4
4/19/07	3	14	1	618	A	475	15	1	Higgins	5	5	5	5	5	5	1	1	0	2	2	2	2	2
4/19/07	3	14	1	622	D	99	16	1	Higgins	4	4	5	4	4	4	2	1	0	1	2	2	2	3
4/19/07	3	14	2	616	A	551	1	2	Johnson	5	6	6	6	5	4	2	1	0	0	1	1	1	2
4/19/07	3	14	2	617	B	188	2	2	Johnson	5	7	6	7	6	4	2	0	0	0	2	2	1	3
4/19/07	3	14	2	622	C	273	3	2	Johnson	5	6	6	6	4	3	1	0	0	1	1	1	1	2
4/19/07	3	14	2	620	C	497	4	2	Johnson	5	6	6	6	6	5	1	0	0	1	1	2	2	1
4/19/07	3	14	2	621	D	544	5	2	Johnson	6	7	5	6	6	4	1	0	0	1	1	2	1	2
4/19/07	3	14	2	623	D	505	6	2	Johnson	5	6	5	6	5	4	2	0	0	2	1	1	2	2
4/19/07	3	14	2	621	A	230	7	2	Johnson	5	7	6	7	5	5	1	0	0	0	2	1	2	2
4/19/07	3	14	2	619	D	554	8	2	Johnson	6	7	7	7	6	5	1	0	0	0	3	1	2	2

4/19/07	3	14	2	619	A	125	9	2	Johnson	6	7	7	7	6	4	1	0	0	0	2	3	1	2
4/19/07	3	14	2	617	C	521	10	2	Johnson	6	7	6	7	6	5	1	0	0	0	2	1	1	3
4/19/07	3	14	2	619	C	884	11	2	Johnson	6	7	7	7	6	4	1	0	0	0	2	3	1	2
4/19/07	3	14	2	623	B	776	12	2	Johnson	5	6	6	6	5	4	1	0	0	0	2	1	2	1
4/19/07	3	14	2	619	B	801	13	2	Johnson	6	7	6	7	6	5	1	0	0	1	3	2	1	2
4/19/07	3	14	2	621	B	337	14	2	Johnson	6	6	6	6	7	5	1	0	0	2	2	3	2	2
4/19/07	3	14	2	623	A	433	15	2	Johnson	6	6	6	6	6	4	0	0	0	1	2	1	2	2
4/19/07	3	14	2	617	D	643	16	2	Johnson	5	7	6	7	5	4	1	0	0	0	2	2	1	2
4/19/07	3	14	2	616	A	551	1	2	Cunningham	5	6	6	6	4	4	1	0	0	0	1	1	1	0
4/19/07	3	14	2	617	B	188	2	2	Cunningham	5	7	7	7	5	4	0	0	0	0	0	0	2	1
4/19/07	3	14	2	622	C	273	3	2	Cunningham	5	6	5	5	5	4	0	0	0	1	0	2	1	0
4/19/07	3	14	2	620	C	497	4	2	Cunningham	5	6	6	6	4	4	0	0	0	0	0	1	0	0
4/19/07	3	14	2	621	D	544	5	2	Cunningham	5	6	4	5	6	5	0	1	0	0	1	2	2	2
4/19/07	3	14	2	623	D	505	6	2	Cunningham	6	5	5	5	6	5	0	1	0	1	0	1	1	1
4/19/07	3	14	2	621	A	230	7	2	Cunningham	5	6	6	6	6	6	1	0	0	1	0	2	2	0
4/19/07	3	14	2	619	D	554	8	2	Cunningham	5	7	7	7	5	5	0	0	0	0	1	1	0	0
4/19/07	3	14	2	619	A	125	9	2	Cunningham	7	8	8	8	6	5	0	1	0	0	2	2	3	2
4/19/07	3	14	2	617	C	521	10	2	Cunningham	7	7	7	7	5	5	1	0	0	0	0	0	0	1
4/19/07	3	14	2	619	C	884	11	2	Cunningham	6	7	7	7	5	4	0	0	0	0	0	2	1	0
4/19/07	3	14	2	623	B	776	12	2	Cunningham	5	6	3	4	5	5	0	0	0	0	1	0	0	0
4/19/07	3	14	2	619	B	801	13	2	Cunningham	6	6	6	6	6	5	1	0	0	0	2	1	0	1
4/19/07	3	14	2	621	B	337	14	2	Cunningham	5	6	5	5	5	0	4	0	0	0	0	0	1	0
4/19/07	3	14	2	623	A	433	15	2	Cunningham	5	6	6	6	5	4	0	0	0	2	0	4	2	0
4/19/07	3	14	2	617	D	643	16	2	Cunningham	5	7	7	7	5	5	1	0	0	0	0	0	1	0
4/19/07	3	14	2	616	A	551	1	2	Thurman	5	5	5	5	5	4	0	0	0	0	0	1	2	0

4/19/07	3	14	2	617	B	188	2	2	Thurman	4	6	5	6	4	4	0	0	0	0	0	1	1	0
4/19/07	3	14	2	622	C	273	3	2	Thurman	3	2	2	2	4	3	1	0	0	0	0	0	0	0
4/19/07	3	14	2	620	C	497	4	2	Thurman	4	4	3	4	5	4	0	0	0	0	0	1	1	0
4/19/07	3	14	2	621	D	544	5	2	Thurman	7	6	5	6	6	5	1	3	0	0	0	0	0	0
4/19/07	3	14	2	623	D	505	6	2	Thurman	6	5	4	5	5	4	1	1	0	0	0	1	1	0
4/19/07	3	14	2	621	A	230	7	2	Thurman	7	6	5	6	6	5	1	3	0	0	0	2	2	1
4/19/07	3	14	2	619	D	554	8	2	Thurman	6	7	7	7	7	6	0	1	0	0	1	1	1	0
4/19/07	3	14	2	619	A	125	9	2	Thurman	7	7	7	7	6	5	0	2	0	1	0	0	1	0
4/19/07	3	14	2	617	C	521	10	2	Thurman	7	7	7	7	5	5	0	1	0	0	0	0	0	0
4/19/07	3	14	2	619	C	884	11	2	Thurman	7	8	8	8	6	5	1	1	0	0	0	1	2	0
4/19/07	3	14	2	623	B	776	12	2	Thurman	5	5	4	5	6	5	2	0	0	0	0	1	1	0
4/19/07	3	14	2	619	B	801	13	2	Thurman	7	7	7	7	7	5	1	3	2	0	0	2	2	1
4/19/07	3	14	2	621	B	337	14	2	Thurman	6	4	3	4	6	5	1	2	0	0	0	0	2	0
4/19/07	3	14	2	623	A	433	15	2	Thurman	5	5	5	5	6	6	1	0	0	0	1	1	0	0
4/19/07	3	14	2	617	D	643	16	2	Thurman	4	6	6	6	6	5	0	0	1	0	0	1	1	1
4/19/07	3	14	2	616	A	551	1	2	Inglis	4	3	4	3	6	3	0	3	0	0	1	4	3	3
4/19/07	3	14	2	617	B	188	2	2	Inglis	4	4	5	4	6	3	0	0	0	0	1	4	3	3
4/19/07	3	14	2	622	C	273	3	2	Inglis	3	1	1	1	4	2	0	0	0	0	1	2	2	2
4/19/07	3	14	2	620	C	497	4	2	Inglis	3	2	2	2	4	3	0	0	3	0	1	2	3	2
4/19/07	3	14	2	621	D	544	5	2	Inglis	4	1	1	1	3	2	0	3	0	0	1	2	2	2
4/19/07	3	14	2	623	D	505	6	2	Inglis	3	1	1	1	4	2	0	0	0	0	1	2	3	3
4/19/07	3	14	2	621	A	230	7	2	Inglis	3	1	1	1	4	2	0	3	0	0	1	2	3	3
4/19/07	3	14	2	619	D	554	8	2	Inglis	4	3	4	3	5	3	0	3	0	0	1	4	3	3
4/19/07	3	14	2	619	A	125	9	2	Inglis	4	5	5	5	5	3	1	0	0	0	1	4	3	3
4/19/07	3	14	2	617	C	521	10	2	Inglis	4	6	7	6	5	3	1	2	0	0	1	4	3	3

4/19/07	3	14	2	619	C	884	11	2	Inglis	4	6	6	6	5	3	1	2	0	0	1	4	3	3
4/19/07	3	14	2	623	B	776	12	2	Inglis	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4/19/07	3	14	2	619	B	801	13	2	Inglis	4	6	6	6	6	5	3	2	0	0	1	5	3	3
4/19/07	3	14	2	621	B	337	14	2	Inglis	4	2	3	2	4	2	0	1	0	0	1	3	2	3
4/19/07	3	14	2	623	A	433	15	2	Inglis	3	1	2	1	4	2	0	0	0	0	1	2	2	2
4/19/07	3	14	2	617	D	643	16	2	Inglis	3	6	7	6	4	3	0	1	0	0	1	3	2	2
4/19/07	3	14	2	616	A	551	1	2	Davis	5	3	4	3	4	4	0	1	0	0	0	2	1	1
4/19/07	3	14	2	617	B	188	2	2	Davis	5	5	7	5	4	4	0	0	0	0	0	1	2	2
4/19/07	3	14	2	622	C	273	3	2	Davis	4	2	2	2	5	4	0	0	0	2	0	0	2	1
4/19/07	3	14	2	620	C	497	4	2	Davis	3	4	4	4	4	3	0	0	0	0	0	1	2	2
4/19/07	3	14	2	621	D	544	5	2	Davis	6	2	2	2	6	3	0	0	0	3	0	1	0	0
4/19/07	3	14	2	623	D	505	6	2	Davis	4	2	2	2	2	2	0	0	0	0	0	0	1	0
4/19/07	3	14	2	621	A	230	7	2	Davis	5	3	2	3	4	3	0	0	0	2	0	2	1	1
4/19/07	3	14	2	619	D	554	8	2	Davis	5	5	6	5	5	5	1	0	0	0	0	2	1	3
4/19/07	3	14	2	619	A	125	9	2	Davis	6	7	7	7	6	5	0	0	0	0	0	0	3	0
4/19/07	3	14	2	617	C	521	10	2	Davis	7	7	7	7	5	5	0	1	0	1	0	2	2	2
4/19/07	3	14	2	619	C	884	11	2	Davis	7	7	7	7	6	5	0	1	0	2	0	2	1	2
4/19/07	3	14	2	623	B	776	12	2	Davis	5	2	2	2	3	2	0	1	0	0	0	0	1	0
4/19/07	3	14	2	619	B	801	13	2	Davis	7	6	7	6	6	3	0	0	0	2	0	2	2	2
4/19/07	3	14	2	621	B	337	14	2	Davis	5	5	4	5	5	3	0	1	0	3	0	1	1	0
4/19/07	3	14	2	623	A	433	15	2	Davis	4	6	6	6	6	3	0	0	0	3	0	0	2	0
4/19/07	3	14	2	617	D	643	16	2	Davis	4	6	6	6	6	3	0	0	0	2	0	0	2	3
5/1/07	1	28	1	605	A	368	1	1	Runyon	4	4	2	3	5	4	1	0	0	3	0	4	2	2
5/1/07	1	28	1	600	B	589	2	1	Runyon	5	6	7	6	5	4	0	0	0	0	0	3	2	2
5/1/07	1	28	1	606	D	606	3	1	Runyon	4	4	6	4	6	3	0	0	0	4	0	3	2	2
5/1/07	1	28	1	605	B	952	4	1	Runyon	4	5	6	5	5	4	0	0	0	2	0	3	2	2

5/1/07	1	28	1	601	A	544	5	1	Runyon	5	6	7	6	5	4	0	0	0	0	0	1	2	3
5/1/07	1	28	1	603	A	917	6	1	Runyon	5	6	5	5	5	4	0	0	0	0	0	3	2	2
5/1/07	1	28	1	602	D	248	7	1	Runyon	4	8	7	7	5	4	0	0	0	0	0	3	2	2
5/1/07	1	28	1	604	C	120	8	1	Runyon	4	6	6	6	5	4	0	0	0	2	0	3	2	2
5/1/07	1	28	1	601	C	175	9	2	Runyon	5	6	6	6	6	3	0	0	0	0	0	4	2	2
5/1/07	1	28	1	607	C	633	10	2	Runyon	3	6	4	4	6	3	0	0	0	4	0	3	3	3
5/1/07	1	28	1	607	D	783	11	2	Runyon	5	6	2	4	5	3	0	0	0	2	0	4	2	3
5/1/07	1	28	1	604	A	127	12	2	Runyon	4	5	2	4	5	2	1	0	0	5	0	1	3	3
5/1/07	1	28	1	603	C	79	13	2	Runyon	3	6	7	6	5	4	0	0	0	0	0	2	3	3
5/1/07	1	28	1	607	B	12	14	2	Runyon	3	5	2	3	6	3	0	0	0	3	0	4	2	3
5/1/07	1	28	1	603	B	278	15	2	Runyon	4	6	6	6	5	4	0	0	0	0	0	3	2	3
5/1/07	1	28	1	605	A	368	1	1	Inglis	4	4	5	4	5	4	1	0	2	0	1	2	3	2
5/1/07	1	28	1	600	B	589	2	1	Inglis	3	6	6	6	5	4	1	0	2	0	1	4	2	3
5/1/07	1	28	1	606	D	606	3	1	Inglis	4	2	2	2	3	2	0	0	0	0	1	4	2	3
5/1/07	1	28	1	605	B	952	4	1	Inglis	3	3	3	3	4	3	0	0	2	0	1	3	3	3
5/1/07	1	28	1	601	A	544	5	1	Inglis	3	6	6	6	5	4	1	1	3	0	1	2	3	2
5/1/07	1	28	1	603	A	917	6	1	Inglis	4	4	5	4	5	4	0	0	2	0	1	3	3	3
5/1/07	1	28	1	602	D	248	7	1	Inglis	3	6	7	6	5	4	1	0	0	0	1	4	2	3
5/1/07	1	28	1	604	C	120	8	1	Inglis	3	5	6	5	5	4	1	0	3	0	1	2	2	2
5/1/07	1	28	1	601	C	175	9	2	Inglis	3	3	3	3	3	3	0	0	2	0	1	2	4	2
5/1/07	1	28	1	607	C	633	10	2	Inglis	3	3	3	3	4	3	0	0	2	0	1	2	2	2
5/1/07	1	28	1	607	D	783	11	2	Inglis	3	1	2	1	2	1	0	0	0	0	1	2	2	2
5/1/07	1	28	1	604	A	127	12	2	Inglis	3	3	3	3	3	3	0	0	2	0	1	2	3	2
5/1/07	1	28	1	603	C	79	13	2	Inglis	3	6	6	6	5	4	0	0	2	0	1	4	2	3
5/1/07	1	28	1	607	B	12	14	2	Inglis	3	1	2	1	2	1	0	0	0	0	1	2	2	2
5/1/07	1	28	1	603	B	278	15	2	Inglis	3	4	5	4	4	3	0	0	2	0	1	3	4	3
5/1/07	1	28	1	605	A	368	1	1	Amen	5	5	5	4	6	4	0	0	0	2	0	2	2	2
5/1/07	1	28	1	600	B	589	2	1	Amen	5	6	7	6	6	3	0	0	0	0	0	1	3	1
5/1/07	1	28	1	606	D	606	3	1	Amen	4	5	6	5	5	3	0	0	0	1	0	2	2	0
5/1/07	1	28	1	605	B	952	4	1	Amen	4	3	6	3	6	4	1	0	0	2	0	2	2	1
5/1/07	1	28	1	601	A	544	5	1	Amen	6	6	7	6	5	4	1	2	0	0	0	3	2	2

5/1/07	1	28	1	603	A	917	6	1	Amen	6	7	6	7	6	3	1	3	0	0	0	2	3	3
5/1/07	1	28	1	602	D	248	7	1	Amen	5	8	7	8	6	4	1	1	0	0	0	2	3	3
5/1/07	1	28	1	604	C	120	8	1	Amen	5	5	6	5	6	5	1	0	0	0	1	2	2	2
5/1/07	1	28	1	601	C	175	9	2	Amen	5	6	7	6	5	3	1	1	0	0	0	2	3	2
5/1/07	1	28	1	607	C	633	10	2	Amen	4	5	5	4	6	5	0	0	0	3	0	1	3	1
5/1/07	1	28	1	607	D	783	11	2	Amen	5	4	4	3	7	4	0	1	0	2	0	4	3	3
5/1/07	1	28	1	604	A	127	12	2	Amen	6	6	6	6	6	5	2	1	0	0	0	2	2	3
5/1/07	1	28	1	603	C	79	13	2	Amen	5	7	7	7	5	5	1	0	0	0	0	2	3	3
5/1/07	1	28	1	607	B	12	14	2	Amen	4	3	6	3	6	4	0	0	0	3	0	3	4	3
5/1/07	1	28	1	603	B	278	15	2	Amen	6	4	6	4	5	4	0	1	0	0	0	2	3	2
5/1/07	1	28	1	605	A	368	1	1	Higgins	5	5	6	5	4	4	2	1	0	1	1	2	2	3
5/1/07	1	28	1	600	B	589	2	1	Higgins	6	6	7	6	5	5	2	1	0	0	1	2	2	2
5/1/07	1	28	1	606	D	606	3	1	Higgins	5	5	6	5	4	5	2	1	0	1	1	2	2	2
5/1/07	1	28	1	605	B	952	4	1	Higgins	5	4	5	4	5	4	2	0	0	2	1	2	3	3
5/1/07	1	28	1	601	A	544	5	1	Higgins	6	6	7	6	5	5	3	2	0	1	1	2	2	2
5/1/07	1	28	1	603	A	917	6	1	Higgins	6	6	7	6	5	5	2	2	0	1	1	2	2	2
5/1/07	1	28	1	602	D	248	7	1	Higgins	6	7	8	7	6	5	2	1	0	3	1	2	2	3
5/1/07	1	28	1	604	C	120	8	1	Higgins	6	5	6	5	5	6	2	1	0	1	1	2	2	2
5/1/07	1	28	1	601	C	175	9	2	Higgins	6	6	7	6	5	5	1	1	0	0	1	1	2	2
5/1/07	1	28	1	607	C	633	10	2	Higgins	5	5	6	5	6	5	1	1	0	2	1	2	2	3
5/1/07	1	28	1	607	D	783	11	2	Higgins	5	5	5	5	6	5	2	2	0	2	1	2	3	3
5/1/07	1	28	1	604	A	127	12	2	Higgins	6	6	6	6	6	5	2	1	0	1	2	2	2	3
5/1/07	1	28	1	603	C	79	13	2	Higgins	6	7	8	7	6	5	2	2	0	1	1	2	2	3
5/1/07	1	28	1	607	B	12	14	2	Higgins	5	4	5	4	5	5	2	1	0	2	2	2	3	3
5/1/07	1	28	1	603	B	278	15	2	Higgins	5	5	6	5	5	5	2	0	0	0	1	1	2	3
5/1/07	1	28	2	604	D	299	1	1	Bailey	5	7	7	7	6	5	1	0	0	0	1	2	2	2
5/1/07	1	28	2	600	A	357	2	1	Bailey	5	6	7	6	6	5	0	0	0	0	1	2	1	2
5/1/07	1	28	2	607	A	610	3	1	Bailey	5	5	6	5	6	5	1	0	0	1	2	2	2	3
5/1/07	1	28	2	600	C	289	4	1	Bailey	6	7	6	7	6	5	0	0	0	0	1	3	2	2
5/1/07	1	28	2	603	D	137	5	1	Bailey	6	6	6	6	6	5	0	0	0	0	1	2	3	3
5/1/07	1	28	2	602	C	169	6	1	Bailey	6	7	7	7	6	5	0	0	0	0	1	2	2	3

5/1/07	1	28	2	602	A	58	7	1	Bailey	6	7	7	7	5	5	1	0	0	0	1	1	2	2
5/1/07	1	28	2	602	B	293	8	1	Bailey	7	7	7	7	7	5	0	0	0	0	1	4	3	4
5/1/07	1	28	2	606	C	690	9	2	Bailey	7	6	5	6	6	5	1	0	0	1	1	2	3	3
5/1/07	1	28	2	605	C	955	10	2	Bailey	5	4	5	4	6	5	1	0	0	1	1	2	2	2
5/1/07	1	28	2	605	D	255	11	2	Bailey	6	5	6	5	6	5	1	0	0	0	1	2	1	3
5/1/07	1	28	2	601	D	679	12	2	Bailey	7	7	7	7	6	5	1	0	0	0	1	2	3	2
5/1/07	1	28	2	606	A	419	13	2	Bailey	6	6	7	6	7	5	0	0	0	0	1	4	3	3
5/1/07	1	28	2	604	B	301	14	2	Bailey	5	7	7	7	7	5	1	0	0	1	1	1	2	2
5/1/07	1	28	2	601	B	372	15	2	Bailey	6	6	6	6	6	5	1	0	0	0	1	3	2	3
5/1/07	1	28	2	606	B	868	16	2	Bailey	5	5	5	5	7	5	0	0	0	1	1	3	2	3
5/1/07	1	28	2	604	D	299	1	1	Thurman	5	6	6	6	6	4	1	0	0	0	0	3	2	1
5/1/07	1	28	2	600	A	357	2	1	Thurman	4	5	7	6	5	4	0	0	1	0	0	2	1	0
5/1/07	1	28	2	607	A	610	3	1	Thurman	4	4	3	4	7	5	0	0	0	3	0	2	2	2
5/1/07	1	28	2	600	C	289	4	1	Thurman	6	6	5	6	7	5	1	0	2	3	0	2	2	1
5/1/07	1	28	2	603	D	137	5	1	Thurman	5	3	4	4	6	5	0	0	0	0	0	1	3	0
5/1/07	1	28	2	602	C	169	6	1	Thurman	7	6	7	6	6	4	1	0	0	0	1	2	1	2
5/1/07	1	28	2	602	A	58	7	1	Thurman	6	6	7	6	7	6	2	0	2	0	0	2	2	0
5/1/07	1	28	2	602	B	293	8	1	Thurman	6	6	7	6	6	5	1	1	0	0	0	1	1	0
5/1/07	1	28	2	606	C	690	9	2	Thurman	6	6	6	6	7	5	0	1	1	0	2	1	2	0
5/1/07	1	28	2	605	C	955	10	2	Thurman	5	5	4	5	6	5	1	1	0	1	0	1	1	0
5/1/07	1	28	2	605	D	255	11	2	Thurman	5	5	5	5	6	5	0	1	0	0	1	0	1	1
5/1/07	1	28	2	601	D	679	12	2	Thurman	7	7	7	7	6	5	1	2	0	0	0	2	2	0
5/1/07	1	28	2	606	A	419	13	2	Thurman	6	6	6	6	7	5	1	1	1	0	1	2	2	0
5/1/07	1	28	2	604	B	301	14	2	Thurman	4	5	6	6	5	4	1	0	0	0	0	1	1	1
5/1/07	1	28	2	601	B	372	15	2	Thurman	4	4	4	4	5	4	0	0	0	0	1	2	0	1
5/1/07	1	28	2	606	B	868	16	2	Thurman	5	6	2	6	7	5	0	0	1	0	1	3	2	0
5/1/07	1	28	2	604	D	299	1	1	Davis	2	6	7	6	4	4	0	0	0	1	1	0	0	2
5/1/07	1	28	2	600	A	357	2	1	Davis	2	5	7	5	4	4	0	0	0	1	1	0	1	3
5/1/07	1	28	2	607	A	610	3	1	Davis	1	3	5	3	4	3	0	0	0	1	0	0	1	3
5/1/07	1	28	2	600	C	289	4	1	Davis	4	8	8	8	5	4	0	0	0	0	1	1	1	3
5/1/07	1	28	2	603	D	137	5	1	Davis	2	7	7	7	3	4	0	0	0	0	0	1	0	2

5/1/07	1	28	2	602	C	169	6	1	Davis	3	6	7	6	4	4	0	0	0	0	1	2	0	2
5/1/07	1	28	2	602	A	58	7	1	Davis	4	5	6	5	5	5	0	0	0	0	0	0	1	3
5/1/07	1	28	2	602	B	293	8	1	Davis	2	7	7	7	5	3	0	0	0	0	0	0	2	3
5/1/07	1	28	2	606	C	690	9	2	Davis	6	4	4	4	6	4	0	0	0	3	0	0	1	2
5/1/07	1	28	2	605	C	955	10	2	Davis	2	4	2	3	5	3	0	0	0	1	0	1	1	3
5/1/07	1	28	2	605	D	255	11	2	Davis	2	3	2	3	6	3	0	0	0	3	0	1	1	3
5/1/07	1	28	2	601	D	679	12	2	Davis	6	8	7	8	6	5	0	2	0	0	0	2	1	2
5/1/07	1	28	2	606	A	419	13	2	Davis	5	5	6	5	6	5	0	0	0	0	0	1	0	2
5/1/07	1	28	2	604	B	301	14	2	Davis	5	6	5	6	4	3	0	0	0	0	0	0	2	1
5/1/07	1	28	2	601	B	372	15	2	Davis	3	5	5	5	4	3	0	0	0	0	1	1	1	3
5/1/07	1	28	2	606	B	868	16	2	Davis	1	3	2	3	4	2	0	0	0	3	0	0	2	2
5/1/07	1	28	2	604	D	299	1	1	Unknown	5	7	6	6	5	5	1	1	0	0	1	1	0	1
5/1/07	1	28	2	600	A	357	2	1	Unknown	4	7	7	7	7	6	0	2	0	0	1	2	2	2
5/1/07	1	28	2	607	A	610	3	1	Unknown	4	6	5	5	6	5	0	0	0	0	1	1	1	1
5/1/07	1	28	2	600	C	289	4	1	Unknown	5	7	7	7	6	5	0	0	0	0	1	2	1	1
5/1/07	1	28	2	603	D	137	5	1	Unknown	4	6	6	6	6	5	0	0	0	0	1	2	1	2
5/1/07	1	28	2	602	C	169	6	1	Unknown	6	6	7	6	6	6	0	1	0	0	1	2	1	2
5/1/07	1	28	2	602	A	58	7	1	Unknown	5	7	7	7	6	5	0	1	0	0	1	1	1	1
5/1/07	1	28	2	602	B	293	8	1	Unknown	6	7	7	7	7	5	0	0	0	0	1	2	2	2
5/1/07	1	28	2	606	C	690	9	2	Unknown	5	6	5	5	6	6	0	0	0	0	1	2	1	1
5/1/07	1	28	2	605	C	955	10	2	Unknown	4	6	5	5	5	5	0	1	0	0	1	1	1	1
5/1/07	1	28	2	605	D	255	11	2	Unknown	5	6	6	6	6	5	0	1	0	0	1	2	1	2
5/1/07	1	28	2	601	D	679	12	2	Unknown	5	7	7	7	6	5	1	1	0	0	2	3	2	3
5/1/07	1	28	2	606	A	419	13	2	Unknown	5	6	6	6	7	5	0	0	0	0	1	0	0	1
5/1/07	1	28	2	604	B	301	14	2	Unknown	4	6	6	6	5	4	0	0	0	0	1	1	0	1
5/1/07	1	28	2	601	B	372	15	2	Unknown	4	7	6	6	6	5	0	1	0	0	1	2	1	1
5/1/07	1	28	2	606	B	868	16	2	Unknown	4	5	5	5	7	4	0	0	0	0	1	0	1	1
5/1/07	1	28	2	604	D	299	1	1	Edwards	5	5	6	5	6	5	0	0	0	0	2	3	2	2
5/1/07	1	28	2	600	A	357	2	1	Edwards	4	6	7	6	6	6	0	0	0	0	1	2	3	0
5/1/07	1	28	2	607	A	610	3	1	Edwards	4	4	5	4	5	4	0	0	2	1	2	1	2	3
5/1/07	1	28	2	600	C	289	4	1	Edwards	6	6	6	6	6	6	0	1	0	0	1	3	1	1

5/1/07	1	28	2	603	D	137	5	1	Edwards	5	5	6	5	6	5	0	0	1	0	1	2	2	0
5/1/07	1	28	2	602	C	169	6	1	Edwards	6	6	7	6	6	5	0	0	0	0	2	3	1	0
5/1/07	1	28	2	602	A	58	7	1	Edwards	5	6	6	6	5	5	0	0	0	0	1	2	1	2
5/1/07	1	28	2	602	B	293	8	1	Edwards	6	6	6	6	6	4	0	0	0	3	1	2	1	1
5/1/07	1	28	2	606	C	690	9	2	Edwards	6	5	6	5	7	4	0	0	0	3	2	1	2	0
5/1/07	1	28	2	605	C	955	10	2	Edwards	5	6	5	5	6	5	0	0	1	2	1	3	1	0
5/1/07	1	28	2	605	D	255	11	2	Edwards	5	4	5	4	6	5	0	0	0	1	0	2	2	2
5/1/07	1	28	2	601	D	679	12	2	Edwards	6	6	6	6	6	5	0	1	0	1	0	0	2	0
5/1/07	1	28	2	606	A	419	13	2	Edwards	6	6	6	6	7	5	0	0	0	0	0	0	3	0
5/1/07	1	28	2	604	B	301	14	2	Edwards	6	6	6	6	6	5	0	0	0	2	1	0	0	0
5/1/07	1	28	2	601	B	372	15	2	Edwards	6	6	6	6	6	4	0	1	1	2	2	1	3	1
5/1/07	1	28	2	606	B	868	16	2	Edwards	5	4	5	4	7	4	0	0	0	1	0	2	2	0
5/2/07	2	28	1	615	C	161	1	1	Runyon	3	7	5	3	6	3	1	0	0	5	0	2	2	2
5/2/07	2	28	1	611	B	585	2	1	Runyon	3	7	8	7	5	4	0	0	2	0	0	2	2	2
5/2/07	2	28	1	615	D	681	3	1	Runyon	4	6	5	5	5	4	1	0	0	0	0	3	2	2
5/2/07	2	28	1	613	A	708	4	1	Runyon	4	5	4	4	5	4	0	0	0	0	0	2	3	3
5/2/07	2	28	1	613	D	666	5	1	Runyon	3	5	3	4	5	4	1	0	0	0	0	2	2	2
5/2/07	2	28	1	610	C	555	6	1	Runyon	3	6	6	6	5	4	0	0	0	0	0	3	2	2
5/2/07	2	28	1	613	B	577	7	1	Runyon	2	5	5	5	5	4	0	0	0	0	0	3	3	3
5/2/07	2	28	1	615	A	257	8	1	Runyon	5	5	4	4	6	2	0	0	0	3	0	3	3	3
5/2/07	2	28	1	610	D	202	9	1	Runyon	5	8	7	7	5	4	0	0	0	0	0	3	2	2
5/2/07	2	28	1	609	D	375	10	1	Runyon	6	6	6	6	5	4	0	0	0	4	0	2	3	2
5/2/07	2	28	1	609	B	777	11	1	Runyon	5	5	5	5	5	4	0	0	2	2	0	2	3	2
5/2/07	2	28	1	613	C	593	12	1	Runyon	4	6	1	2	5	5	0	0	0	0	0	2	2	2
5/2/07	2	28	1	608	C	671	13	1	Runyon	4	7	8	7	6	3	0	0	2	0	0	2	3	3
5/2/07	2	28	1	610	A	714	14	1	Runyon	4	6	7	6	5	5	0	0	0	0	0	2	2	2
5/2/07	2	28	1	614	B	989	15	1	Runyon	4	6	6	6	6	3	0	0	0	5	0	3	3	3
5/2/07	2	28	1	608	A	646	16	1	Runyon	5	8	8	8	6	1	0	0	0	0	0	2	2	2
5/2/07	2	28	1	615	C	161	1	1	Inglis	2	1	1	1	2	1	0	0	2	0	1	3	4	2
5/2/07	2	28	1	611	B	585	2	1	Inglis	3	5	6	5	4	3	0	2	0	0	1	3	3	3
5/2/07	2	28	1	615	D	681	3	1	Inglis	1	2	2	2	4	3	0	1	0	0	1	3	3	3

5/2/07	2	28	1	613	A	708	4	1	Inglis	3	4	4	4	3	2	0	1	2	0	1	2	3	2
5/2/07	2	28	1	613	D	666	5	1	Inglis	1	2	2	2	3	2	0	0	2	0	1	3	4	3
5/2/07	2	28	1	610	C	555	6	1	Inglis	2	5	5	5	5	3	0	0	0	0	1	3	3	3
5/2/07	2	28	1	613	B	577	7	1	Inglis	1	2	2	2	3	2	0	0	2	0	1	2	3	2
5/2/07	2	28	1	615	A	257	8	1	Inglis	1	2	2	2	2	2	0	0	1	0	1	3	4	2
5/2/07	2	28	1	610	D	202	9	1	Inglis	5	6	6	6	5	4	0	2	0	0	1	3	2	3
5/2/07	2	28	1	609	D	375	10	1	Inglis	3	5	5	5	4	3	0	1	0	0	1	2	2	2
5/2/07	2	28	1	609	B	777	11	1	Inglis	3	5	5	5	4	3	0	2	2	0	1	2	2	2
5/2/07	2	28	1	613	C	593	12	1	Inglis	2	1	1	1	2	1	0	0	0	0	0	3	2	2
5/2/07	2	28	1	608	C	671	13	1	Inglis	2	5	5	5	5	3	0	1	2	0	1	4	3	3
5/2/07	2	28	1	610	A	714	14	1	Inglis	2	5	6	5	4	3	0	1	1	0	1	2	2	2
5/2/07	2	28	1	614	B	989	15	1	Inglis	2	1	1	1	2	1	0	0	0	0	1	3	4	3
5/2/07	2	28	1	608	A	646	16	1	Inglis	6	6	6	6	5	4	0	3	0	0	1	3	2	3
5/2/07	2	28	1	615	C	161	1	1	Bailey	5	5	5	5	7	5	0	0	0	2	0	3	2	2
5/2/07	2	28	1	611	B	585	2	1	Bailey	4	6	7	6	6	5	0	0	0	0	1	2	2	2
5/2/07	2	28	1	615	D	681	3	1	Bailey	5	6	6	6	5	5	0	0	0	0	1	2	3	2
5/2/07	2	28	1	613	A	708	4	1	Bailey	6	6	6	6	5	5	2	1	0	0	1	1	2	2
5/2/07	2	28	1	613	D	666	5	1	Bailey	5	5	6	5	6	5	1	0	0	1	1	2	2	2
5/2/07	2	28	1	610	C	555	6	1	Bailey	5	6	6	6	6	5	0	0	0	0	1	3	2	3
5/2/07	2	28	1	613	B	577	7	1	Bailey	4	5	6	5	5	5	1	0	0	1	1	2	2	2
5/2/07	2	28	1	615	A	257	8	1	Bailey	6	6	6	6	5	5	1	1	0	0	1	2	3	2
5/2/07	2	28	1	610	D	202	9	1	Bailey	5	7	7	7	5	5	0	0	0	0	0	2	2	2
5/2/07	2	28	1	609	D	375	10	1	Bailey	5	6	6	6	5	5	1	0	1	0	1	1	2	1
5/2/07	2	28	1	609	B	777	11	1	Bailey	5	5	6	5	5	4	2	0	0	1	1	1	2	1
5/2/07	2	28	1	613	C	593	12	1	Bailey	5	6	5	5	5	5	1	0	0	1	1	1	2	2
5/2/07	2	28	1	608	C	671	13	1	Bailey	6	7	7	7	6	5	1	0	1	0	0	2	2	2
5/2/07	2	28	1	610	A	714	14	1	Bailey	5	6	7	6	4	4	1	0	0	0	1	0	2	1
5/2/07	2	28	1	614	B	989	15	1	Bailey	5	6	6	6	6	5	1	0	0	2	0	2	2	2
5/2/07	2	28	1	608	A	646	16	1	Bailey	6	7	7	7	5	4	2	0	0	0	1	0	2	2
5/2/07	2	28	1	615	C	161	1	1	Thurman	4	3	3	3	6	4	1	0	0	0	1	3	2	0
5/2/07	2	28	1	611	B	585	2	1	Thurman	4	5	7	5	5	4	0	0	0	0	0	1	2	1

5/2/07	2	28	1	615	D	681	3	1	Thurman	5	5	5	5	5	4	1	0	0	0	1	1	2	0
5/2/07	2	28	1	613	A	708	4	1	Thurman	5	4	5	4	5	3	2	0	0	2	0	0	2	1
5/2/07	2	28	1	613	D	666	5	1	Thurman	6	6	5	6	6	5	1	1	0	0	0	2	3	0
5/2/07	2	28	1	610	C	555	6	1	Thurman	5	6	6	6	6	4	1	0	0	2	1	1	3	1
5/2/07	2	28	1	613	B	577	7	1	Thurman	4	4	5	4	5	4	0	0	0	0	1	3	1	0
5/2/07	2	28	1	615	A	257	8	1	Thurman	5	5	5	5	6	5	0	0	0	0	0	2	2	1
5/2/07	2	28	1	610	D	202	9	1	Thurman	6	7	7	7	6	5	1	0	0	0	1	1	2	1
5/2/07	2	28	1	609	D	375	10	1	Thurman	7	6	7	6	6	5	0	2	0	0	0	1	2	0
5/2/07	2	28	1	609	B	777	11	1	Thurman	6	5	7	6	5	5	0	0	0	0	0	2	1	0
5/2/07	2	28	1	613	C	593	12	1	Thurman	5	3	2	3	6	5	1	0	0	0	0	2	2	0
5/2/07	2	28	1	608	C	671	13	1	Thurman	6	8	8	8	5	5	0	0	0	0	0	1	2	1
5/2/07	2	28	1	610	A	714	14	1	Thurman	5	7	8	7	6	5	1	0	0	0	2	1	2	0
5/2/07	2	28	1	614	B	989	15	1	Thurman	6	5	6	5	7	5	2	1	0	0	2	1	3	0
5/2/07	2	28	1	608	A	646	16	1	Thurman	6	6	7	6	6	4	2	1	0	0	0	2	2	1
5/2/07	2	28	1	615	C	161	1	1	Higgins	5	5	5	5	5	5	1	1	1	2	1	2	3	3
5/2/07	2	28	1	611	B	585	2	1	Higgins	4	6	7	6	6	6	2	2	0	0	1	2	2	2
5/2/07	2	28	1	615	D	681	3	1	Higgins	5	5	6	5	6	5	2	1	0	1	1	1	2	2
5/2/07	2	28	1	613	A	708	4	1	Higgins	4	5	5	5	5	5	2	1	0	0	1	1	2	3
5/2/07	2	28	1	613	D	666	5	1	Higgins	5	6	6	6	6	6	1	1	0	0	1	1	2	2
5/2/07	2	28	1	610	C	555	6	1	Higgins	6	6	7	6	5	6	2	1	0	1	1	2	2	3
5/2/07	2	28	1	613	B	577	7	1	Higgins	4	4	4	4	5	5	1	0	1	2	2	2	3	3
5/2/07	2	28	1	615	A	257	8	1	Higgins	5	5	6	5	5	5	2	1	1	1	1	1	2	2
5/2/07	2	28	1	610	D	202	9	1	Higgins	6	7	8	7	6	5	3	2	0	0	1	1	2	2
5/2/07	2	28	1	609	D	375	10	1	Higgins	6	6	7	6	5	5	2	0	0	0	1	1	1	2
5/2/07	2	28	1	609	B	777	11	1	Higgins	5	5	5	5	5	5	2	1	0	1	1	1	2	3
5/2/07	2	28	1	613	C	593	12	1	Higgins	5	4	4	4	5	5	1	0	0	0	1	1	2	3
5/2/07	2	28	1	608	C	671	13	1	Higgins	6	7	8	7	6	6	2	1	0	2	1	2	2	2
5/2/07	2	28	1	610	A	714	14	1	Higgins	6	6	7	6	6	5	2	1	0	1	2	2	2	2
5/2/07	2	28	1	614	B	989	15	1	Higgins	5	5	6	5	5	5	1	1	1	1	1	2	2	3
5/2/07	2	28	1	608	A	646	16	1	Higgins	6	8	8	8	6	6	2	1	0	0	1	2	2	3
5/2/07	2	28	2	611	C	461	1	2	Davis	4	6	7	6	5	5	0	0	0	0	0	1	1	2

5/2/07	2	28	2	612	B	124	2	2	Davis	6	7	4	6	6	4	0	0	0	2	0	0	2	1
5/2/07	2	28	2	614	C	440	3	2	Davis	2	4	4	4	5	3	0	0	0	2	0	0	2	3
5/2/07	2	28	2	612	C	718	4	2	Davis	6	4	2	3	5	3	0	0	0	2	0	1	1	0
5/2/07	2	28	2	608	D	53	5	2	Davis	5	7	7	7	6	4	0	0	0	2	0	0	2	3
5/2/07	2	28	2	612	A	850	6	2	Davis	6	3	2	2	5	3	0	0	0	2	0	1	2	1
5/2/07	2	28	2	611	D	132	7	2	Davis	6	7	5	6	6	4	0	0	0	0	0	2	1	2
5/2/07	2	28	2	609	A	735	8	2	Davis	6	8	7	8	6	4	0	0	0	3	0	1	2	1
5/2/07	2	28	2	610	B	806	9	2	Davis	4	8	7	8	6	4	0	0	0	0	0	3	0	3
5/2/07	2	28	2	611	A	851	10	2	Davis	3	6	7	6	5	5	0	0	0	0	1	2	1	3
5/2/07	2	28	2	608	B	693	11	2	Davis	4	7	7	7	4	4	0	0	0	0	0	1	2	2
5/2/07	2	28	2	614	A	414	12	2	Davis	6	5	4	5	6	3	0	0	0	3	0	2	0	1
5/2/07	2	28	2	615	B	198	13	2	Davis	3	6	6	6	4	2	0	0	0	1	0	0	2	4
5/2/07	2	28	2	609	C	868	14	2	Davis	5	4	5	4	6	3	0	0	0	2	0	2	2	2
5/2/07	2	28	2	614	D	222	15	2	Davis	5	5	4	5	5	3	0	0	0	0	0	0	1	2
5/2/07	2	28	2	612	D	22	16	2	Davis	5	7	7	7	5	4	0	0	0	0	0	0	2	1
5/2/07	2	28	2	611	C	461	1	2	Amen	4	6	7	6	5	4	1	0	0	0	0	0	1	1
5/2/07	2	28	2	612	B	124	2	2	Amen	4	5	6	5	3	2	1	0	0	0	0	0	0	0
5/2/07	2	28	2	614	C	440	3	2	Amen	3	4	6	4	5	4	0	0	0	2	0	1	3	1
5/2/07	2	28	2	612	C	718	4	2	Amen	6	5	3	4	3	3	1	0	0	0	0	0	0	1
5/2/07	2	28	2	608	D	53	5	2	Amen	4	7	8	7	6	4	0	0	0	0	0	2	1	1
5/2/07	2	28	2	612	A	850	6	2	Amen	5	5	6	5	3	3	1	0	0	0	0	0	0	2
5/2/07	2	28	2	611	D	132	7	2	Amen	4	6	7	6	5	5	0	0	0	0	0	2	1	1
5/2/07	2	28	2	609	A	735	8	2	Amen	5	8	8	8	5	4	3	0	0	0	0	1	2	2
5/2/07	2	28	2	610	B	806	9	2	Amen	4	7	7	7	6	4	0	0	0	0	0	3	3	2
5/2/07	2	28	2	611	A	851	10	2	Amen	4	6	7	6	5	5	0	0	0	0	0	1	2	1
5/2/07	2	28	2	608	B	693	11	2	Amen	4	6	6	6	6	5	1	0	0	0	0	2	1	1
5/2/07	2	28	2	614	A	414	12	2	Amen	6	4	6	4	7	5	0	1	0	3	0	2	1	2
5/2/07	2	28	2	615	B	198	13	2	Amen	4	5	6	5	8	4	2	0	0	3	0	2	4	3
5/2/07	2	28	2	609	C	868	14	2	Amen	5	6	7	6	5	4	2	0	0	0	0	0	1	1
5/2/07	2	28	2	614	D	222	15	2	Amen	6	4	5	3	6	4	0	0	0	2	0	2	3	0
5/2/07	2	28	2	612	D	22	16	2	Amen	5	6	6	6	4	3	1	0	0	0	0	1	1	0

5/2/07	2	28	2	611	C	461	1	2	Benli	4	7	6	6	6	5	0	0	0	0	1	1	1	1
5/2/07	2	28	2	612	B	124	2	2	Benli	4	6	6	6	6	4	0	0	0	0	2	2	2	1
5/2/07	2	28	2	614	C	440	3	2	Benli	4	6	6	6	7	4	0	0	0	0	1	0	1	1
5/2/07	2	28	2	612	C	718	4	2	Benli	5	6	5	5	6	5	1	0	0	0	1	2	1	2
5/2/07	2	28	2	608	D	53	5	2	Benli	4	7	7	7	6	6	0	1	1	0	1	2	2	2
5/2/07	2	28	2	612	A	850	6	2	Benli	5	5	6	5	6	4	0	0	0	0	1	1	2	2
5/2/07	2	28	2	611	D	132	7	2	Benli	4	7	6	6	6	6	0	0	0	0	1	1	2	2
5/2/07	2	28	2	609	A	735	8	2	Benli	5	6	7	6	6	4	0	0	0	0	1	3	2	1
5/2/07	2	28	2	610	B	806	9	2	Benli	5	7	7	7	6	5	0	0	0	0	2	2	1	2
5/2/07	2	28	2	611	A	851	10	2	Benli	4	7	6	6	6	6	0	0	0	0	1	2	1	1
5/2/07	2	28	2	608	B	693	11	2	Benli	5	6	7	6	6	5	0	0	0	0	1	1	2	1
5/2/07	2	28	2	614	A	414	12	2	Benli	6	6	5	5	6	4	0	0	0	0	1	1	2	1
5/2/07	2	28	2	615	B	198	13	2	Benli	4	6	6	6	8	4	0	0	0	0	1	1	2	0
5/2/07	2	28	2	609	C	868	14	2	Benli	5	6	6	6	6	5	1	0	0	0	1	1	1	2
5/2/07	2	28	2	614	D	222	15	2	Benli	6	6	6	6	7	5	0	0	0	0	1	1	1	1
5/2/07	2	28	2	612	D	22	16	2	Benli	4	6	5	5	6	5	0	0	0	0	1	2	2	1
5/2/07	2	28	2	611	C	461	1	2	Philip	5	7	8	7	6	5	1	0	0	0	1	2	1	1
5/2/07	2	28	2	612	B	124	2	2	Philip	6	6	6	6	4	6	0	0	0	0	1	0	1	2
5/2/07	2	28	2	614	C	440	3	2	Philip	6	6	7	6	5	5	0	0	0	0	1	0	2	2
5/2/07	2	28	2	612	C	718	4	2	Philip	6	6	5	6	6	5	1	0	0	0	0	1	1	2
5/2/07	2	28	2	608	D	53	5	2	Philip	6	7	8	7	7	5	0	0	0	0	0	2	2	2
5/2/07	2	28	2	612	A	850	6	2	Philip	6	6	7	6	5	5	1	0	0	0	1	1	1	0
5/2/07	2	28	2	611	D	132	7	2	Philip	5	8	7	8	6	5	0	0	0	0	1	2	1	2
5/2/07	2	28	2	609	A	735	8	2	Philip	6	7	8	7	6	5	0	0	1	0	1	1	1	2
5/2/07	2	28	2	610	B	806	9	2	Philip	5	7	8	7	6	5	1	0	0	0	2	2	1	2
5/2/07	2	28	2	611	A	851	10	2	Philip	6	6	5	6	7	5	2	0	0	0	1	1	0	2
5/2/07	2	28	2	608	B	693	11	2	Philip	7	6	7	6	6	6	0	1	0	0	1	2	2	3
5/2/07	2	28	2	614	A	414	12	2	Philip	6	6	5	6	6	6	0	0	0	0	1	1	0	2
5/2/07	2	28	2	615	B	198	13	2	Philip	5	6	6	6	6	5	0	0	0	0	1	1	2	2
5/2/07	2	28	2	609	C	868	14	2	Philip	6	7	7	7	6	5	0	0	0	0	1	2	2	2
5/2/07	2	28	2	614	D	222	15	2	Philip	7	6	6	6	6	5	0	0	0	0	1	2	1	2

5/2/07	2	28	2	612	D	22	16	2	Philip	6	6	6	6	5	5	0	0	0	0	1	1	1	2
5/2/07	2	28	2	611	C	461	1	2	Edwards	4	6	7	6	6	5	0	0	0	0	0	3	2	0
5/2/07	2	28	2	612	B	124	2	2	Edwards	4	5	6	5	5	3	0	0	0	1	1	0	2	0
5/2/07	2	28	2	614	C	440	3	2	Edwards	4	5	6	5	6	5	0	0	0	0	0	2	1	2
5/2/07	2	28	2	612	C	718	4	2	Edwards	6	5	5	5	5	3	0	0	0	3	1	0	3	1
5/2/07	2	28	2	608	D	53	5	2	Edwards	6	6	6	6	6	5	1	0	0	0	0	3	2	2
5/2/07	2	28	2	612	A	850	6	2	Edwards	5	5	6	5	5	4	0	0	0	2	0	0	3	1
5/2/07	2	28	2	611	D	132	7	2	Edwards	6	6	6	6	7	5	0	0	0	1	1	3	2	3
5/2/07	2	28	2	609	A	735	8	2	Edwards	5	7	8	7	5	4	0	0	0	3	1	0	3	2
5/2/07	2	28	2	610	B	806	9	2	Edwards	6	6	6	6	7	5	0	0	0	0	1	3	2	4
5/2/07	2	28	2	611	A	851	10	2	Edwards	5	6	7	6	6	5	0	0	0	1	1	2	2	0
5/2/07	2	28	2	608	B	693	11	2	Edwards	6	6	5	6	6	5	0	1	0	2	2	1	1	2
5/2/07	2	28	2	614	A	414	12	2	Edwards	6	5	5	5	6	4	0	0	0	0	0	3	2	3
5/2/07	2	28	2	615	B	198	13	2	Edwards	6	5	6	5	6	5	0	0	0	0	1	3	1	1
5/2/07	2	28	2	609	C	868	14	2	Edwards	6	6	7	6	6	4	0	0	0	3	0	0	2	0
5/2/07	2	28	2	614	D	222	15	2	Edwards	6	5	6	5	6	4	0	0	0	0	0	2	2	2
5/2/07	2	28	2	612	D	22	16	2	Edwards	6	5	6	5	5	3	0	0	1	1	0	0	2	0
5/3/07	3	28	1	617	D	932	1	1	Amen	4	6	6	6	5	5	1	0	0	0	1	1	2	2
5/3/07	3	28	1	619	A	23	2	1	Amen	5	6	7	6	6	5	0	0	0	0	1	2	1	1
5/3/07	3	28	1	618	B	691	3	1	Amen	5	6	6	6	6	4	1	0	0	0	0	2	2	3
5/3/07	3	28	1	619	D	138	4	1	Amen	4	5	7	6	5	4	2	0	0	0	0	2	1	0
5/3/07	3	28	1	617	B	699	5	1	Amen	3	6	7	6	5	4	0	0	0	0	0	1	2	1
5/3/07	3	28	1	622	D	267	6	1	Amen	5	3	6	3	6	4	0	0	0	3	1	1	1	1
5/3/07	3	28	1	616	C	574	7	1	Amen	5	5	6	5	5	4	1	2	0	0	0	1	1	2
5/3/07	3	28	1	618	C	424	8	1	Amen	4	5	7	5	4	4	0	0	0	0	0	1	1	1
5/3/07	3	28	1	621	A	799	9	1	Amen	5	3	4	3	5	4	2	0	0	0	1	1	1	1
5/3/07	3	28	1	623	C	928	10	1	Amen	6	5	6	5	6	4	0	0	0	1	1	1	2	1
5/3/07	3	28	1	622	A	509	11	1	Amen	5	4	6	4	6	4	1	0	0	2	1	2	1	1
5/3/07	3	28	1	616	A	770	12	1	Amen	4	6	6	6	5	5	1	0	0	0	0	2	2	2
5/3/07	3	28	1	622	B	492	13	1	Amen	5	5	4	4	5	5	0	0	0	0	2	1	1	1
5/3/07	3	28	1	621	B	269	14	1	Amen	6	5	3	4	5	4	0	1	0	0	2	2	1	1

5/3/07	3	28	1	621	D	11	15	1	Amen	6	6	6	6	5	4	0	0	0	0	2	1	1	1
5/3/07	3	28	1	620	C	505	16	1	Amen	5	6	6	6	5	4	0	0	0	0	1	2	2	0
5/3/07	3	28	1	617	D	932	1	1	Runyon	4	6	6	6	4	4	1	0	0	0	1	2	2	2
5/3/07	3	28	1	619	A	23	2	1	Runyon	4	6	6	6	5	5	1	0	0	0	1	2	2	2
5/3/07	3	28	1	618	B	691	3	1	Runyon	5	6	5	4	5	4	0	0	0	0	0	3	2	2
5/3/07	3	28	1	619	D	138	4	1	Runyon	5	7	7	7	5	4	2	0	0	2	1	2	2	2
5/3/07	3	28	1	617	B	699	5	1	Runyon	3	7	7	7	4	3	0	0	0	0	1	3	2	2
5/3/07	3	28	1	622	D	267	6	1	Runyon	3	4	7	4	4	2	2	0	0	0	0	1	3	2
5/3/07	3	28	1	616	C	574	7	1	Runyon	5	6	5	5	5	4	0	2	0	0	1	2	3	3
5/3/07	3	28	1	618	C	424	8	1	Runyon	4	6	6	6	5	5	1	0	0	0	0	2	2	2
5/3/07	3	28	1	621	A	799	9	1	Runyon	6	5	3	3	6	2	0	0	2	3	0	1	3	2
5/3/07	3	28	1	623	C	928	10	1	Runyon	5	6	7	6	6	2	0	2	0	3	0	3	3	3
5/3/07	3	28	1	622	A	509	11	1	Runyon	4	6	4	4	6	2	0	0	0	0	0	1	3	3
5/3/07	3	28	1	616	A	770	12	1	Runyon	3	5	2	4	5	4	0	0	0	0	1	2	2	2
5/3/07	3	28	1	622	B	492	13	1	Runyon	5	4	2	2	4	1	0	0	0	3	0	2	3	2
5/3/07	3	28	1	621	B	269	14	1	Runyon	6	4	1	1	6	2	0	3	0	0	0	2	3	3
5/3/07	3	28	1	621	D	11	15	1	Runyon	5	6	2	3	6	2	0	0	4	0	0	1	3	3
5/3/07	3	28	1	620	C	505	16	1	Runyon	5	5	4	4	5	3	1	2	0	0	0	1	2	2
5/3/07	3	28	1	617	D	932	1	1	Cunningham	5	6	6	6	4	4	0	0	0	0	1	2	1	1
5/3/07	3	28	1	619	A	23	2	1	Cunningham	6	6	6	6	5	5	1	0	0	0	2	1	1	0
5/3/07	3	28	1	618	B	691	3	1	Cunningham	6	6	5	5	5	5	1	0	0	2	1	2	2	2
5/3/07	3	28	1	619	D	138	4	1	Cunningham	5	7	7	7	4	4	0	0	0	0	0	0	1	2
5/3/07	3	28	1	617	B	699	5	1	Cunningham	5	7	7	7	5	4	1	0	0	1	1	2	1	0
5/3/07	3	28	1	622	D	267	6	1	Cunningham	4	5	4	4	6	5	1	0	0	2	1	2	2	1
5/3/07	3	28	1	616	C	574	7	1	Cunningham	6	6	6	6	6	6	2	1	0	0	2	1	1	2
5/3/07	3	28	1	618	C	424	8	1	Cunningham	5	6	6	6	5	5	1	0	0	1	1	2	1	1
5/3/07	3	28	1	621	A	799	9	1	Cunningham	6	6	6	6	6	5	1	0	0	2	0	3	1	1
5/3/07	3	28	1	623	C	928	10	1	Cunningham	5	7	6	6	7	5	0	1	0	1	1	2	2	2
5/3/07	3	28	1	622	A	509	11	1	Cunningha	6	6	4	4	4	4	1	0	0	0	0	0	0	1

									m														
5/3/07	3	28	1	616	A	770	12	1	Cunningham	5	6	6	6	6	6	1	0	0	0	1	1	0	0
5/3/07	3	28	1	622	B	492	13	1	Cunningham	6	7	6	6	6	5	1	0	0	0	2	3	2	2
5/3/07	3	28	1	621	B	269	14	1	Cunningham	6	6	5	5	5	4	0	1	0	0	0	1	1	2
5/3/07	3	28	1	621	D	11	15	1	Cunningham	6	6	6	6	5	5	0	2	0	0	0	1	1	2
5/3/07	3	28	1	620	C	505	16	1	Cunningham	6	6	5	5	6	6	1	1	0	0	0	1	1	1
5/3/07	3	28	1	617	D	932	1	1	Higgins	5	5	6	5	5	4	2	0	0	0	1	1	1	2
5/3/07	3	28	1	619	A	23	2	1	Higgins	4	5	5	5	4	5	2	0	0	1	1	2	2	3
5/3/07	3	28	1	618	B	691	3	1	Higgins	5	5	6	5	5	5	2	1	0	1	1	1	2	2
5/3/07	3	28	1	619	D	138	4	1	Higgins	6	6	6	6	4	5	2	1	0	2	1	1	1	2
5/3/07	3	28	1	617	B	699	5	1	Higgins	5	5	5	5	4	4	2	1	0	0	1	2	2	3
5/3/07	3	28	1	622	D	267	6	1	Higgins	3	3	3	3	4	4	1	0	0	0	1	1	1	2
5/3/07	3	28	1	616	C	574	7	1	Higgins	6	5	6	5	5	5	2	1	0	1	1	1	1	2
5/3/07	3	28	1	618	C	424	8	1	Higgins	5	5	6	5	5	5	2	1	0	2	1	2	2	3
5/3/07	3	28	1	621	A	799	9	1	Higgins	4	3	3	3	4	5	2	0	0	1	1	1	1	3
5/3/07	3	28	1	623	C	928	10	1	Higgins	5	4	4	4	4	5	2	0	0	0	1	1	1	3
5/3/07	3	28	1	622	A	509	11	1	Higgins	3	3	3	3	4	5	2	0	0	2	2	2	2	3
5/3/07	3	28	1	616	A	770	12	1	Higgins	4	4	4	4	5	5	2	0	0	1	1	1	2	3
5/3/07	3	28	1	622	B	492	13	1	Higgins	5	5	5	5	5	5	2	1	0	2	1	2	2	2
5/3/07	3	28	1	621	B	269	14	1	Higgins	6	5	5	5	4	5	1	0	0	1	1	1	1	3
5/3/07	3	28	1	621	D	11	15	1	Higgins	5	5	5	5	4	5	2	0	0	0	1	2	2	3
5/3/07	3	28	1	620	C	505	16	1	Higgins	5	5	5	5	5	5	2	0	0	1	1	1	2	3
5/3/07	3	28	1	617	D	932	1	1	Inglis	3	4	5	4	5	4	0	2	2	0	1	2	2	2
5/3/07	3	28	1	619	A	23	2	1	Inglis	3	5	7	5	5	4	0	2	2	0	1	2	2	2
5/3/07	3	28	1	618	B	691	3	1	Inglis	3	4	5	4	4	3	0	0	0	0	1	3	2	3
5/3/07	3	28	1	619	D	138	4	1	Inglis	3	5	7	5	5	4	0	2	2	0	1	3	3	3
5/3/07	3	28	1	617	B	699	5	1	Inglis	3	6	6	6	5	4	0	2	0	0	1	4	3	3
5/3/07	3	28	1	622	D	267	6	1	Inglis	1	1	1	1	1	1	0	0	0	0	1	1	1	1
5/3/07	3	28	1	616	C	574	7	1	Inglis	4	5	6	5	5	4	0	2	0	0	1	2	2	2
5/3/07	3	28	1	618	C	424	8	1	Inglis	3	5	6	5	4	3	0	2	0	0	1	3	3	3

5/3/07	3	28	1	621	A	799	9	1	Inglis	3	1	2	1	3	2	0	0	3	0	1	2	5	2
5/3/07	3	28	1	623	C	928	10	1	Inglis	3	5	6	5	3	2	0	0	0	0	1	3	4	2
5/3/07	3	28	1	622	A	509	11	1	Inglis	3	2	3	2	3	2	0	0	0	0	1	3	4	2
5/3/07	3	28	1	616	A	770	12	1	Inglis	3	5	5	5	3	2	0	0	0	0	1	3	3	2
5/3/07	3	28	1	622	B	492	13	1	Inglis	3	1	1	1	2	1	0	0	0	0	1	2	2	2
5/3/07	3	28	1	621	B	269	14	1	Inglis	3	1	1	1	3	1	0	0	0	0	1	3	3	3
5/3/07	3	28	1	621	D	11	15	1	Inglis	3	4	5	4	3	2	0	2	0	0	1	3	4	0
5/3/07	3	28	1	620	C	505	16	1	Inglis	3	2	3	2	3	2	0	1	0	0	1	3	4	3
5/3/07	3	28	2	617	C	928	1	2	Edwards	6	7	6	7	5	3	0	0	0	0	0	3	2	3
5/3/07	3	28	2	620	D	264	2	2	Edwards	5	4	5	4	4	3	0	0	0	1	0	0	3	0
5/3/07	3	28	2	620	A	951	3	2	Edwards	5	4	5	4	5	4	0	0	0	3	1	0	2	2
5/3/07	3	28	2	622	C	992	4	2	Edwards	4	5	5	5	3	3	0	0	0	1	0	0	0	0
5/3/07	3	28	2	621	C	929	5	2	Edwards	5	6	6	6	4	4	0	0	0	3	0	0	0	2
5/3/07	3	28	2	617	A	592	6	2	Edwards	6	7	6	7	5	3	0	0	0	0	1	0	1	0
5/3/07	3	28	2	623	B	767	7	2	Edwards	5	5	5	5	5	2	0	0	0	0	0	0	3	0
5/3/07	3	28	2	618	A	567	8	2	Edwards	6	7	7	7	6	5	1	1	0	0	1	2	1	1
5/3/07	3	28	2	620	B	551	9	2	Edwards	5	6	6	6	5	4	0	0	0	2	1	0	3	2
5/3/07	3	28	2	623	A	386	10	2	Edwards	7	7	7	7	5	4	0	0	0	0	1	0	2	2
5/3/07	3	28	2	623	D	234	11	2	Edwards	5	5	5	5	4	3	0	0	0	1	0	0	2	4
5/3/07	3	28	2	619	C	402	12	2	Edwards	5	7	7	7	6	5	0	0	0	0	0	3	2	2
5/3/07	3	28	2	616	B	621	13	2	Edwards	4	2	3	2	4	3	0	0	0	1	0	0	2	0
5/3/07	3	28	2	619	B	179	14	2	Edwards	6	7	7	7	7	4	0	1	0	0	1	5	4	3
5/3/07	3	28	2	618	D	315	15	2	Edwards	6	5	5	5	6	5	0	0	0	0	1	2	1	2
5/3/07	3	28	2	616	D	523	16	2	Edwards	6	7	7	7	5	5	0	0	0	2	0	1	1	2
5/3/07	3	28	2	617	C	928	1	2	Benli	6	7	6	6	6	5	1	1	0	0	1	2	1	2
5/3/07	3	28	2	620	D	264	2	2	Benli	5	5	5	5	5	4	0	0	0	0	1	1	2	2
5/3/07	3	28	2	620	A	951	3	2	Benli	5	3	4	3	5	4	0	0	0	0	1	2	2	2
5/3/07	3	28	2	622	C	992	4	2	Benli	4	4	6	4	6	4	0	1	0	0	1	1	2	1
5/3/07	3	28	2	621	C	929	5	2	Benli	5	4	6	4	6	5	0	0	0	0	1	1	1	2
5/3/07	3	28	2	617	A	592	6	2	Benli	4	7	6	7	6	6	0	0	0	0	1	2	2	2
5/3/07	3	28	2	623	B	767	7	2	Benli	5	3	5	3	5	4	0	0	0	0	1	1	1	3

5/3/07	3	28	2	618	A	567	8	2	Benli	6	6	6	6	6	5	0	1	0	0	2	1	1	2
5/3/07	3	28	2	620	B	551	9	2	Benli	5	6	6	6	6	4	0	0	0	0	1	1	2	2
5/3/07	3	28	2	623	A	386	10	2	Benli	5	5	6	5	7	5	0	0	0	0	1	2	2	1
5/3/07	3	28	2	623	D	234	11	2	Benli	5	5	5	5	6	5	0	1	0	0	1	1	1	1
5/3/07	3	28	2	619	C	402	12	2	Benli	5	6	6	6	6	5	0	0	0	0	2	2	1	2
5/3/07	3	28	2	616	B	621	13	2	Benli	4	2	4	2	4	3	0	2	0	0	0	1	0	1
5/3/07	3	28	2	619	B	179	14	2	Benli	6	7	7	7	6	6	0	0	0	0	2	2	1	2
5/3/07	3	28	2	618	D	315	15	2	Benli	5	7	5	6	6	4	0	0	0	0	2	1	2	2
5/3/07	3	28	2	616	D	523	16	2	Benli	6	7	6	6	6	5	0	0	0	0	1	2	1	1
5/3/07	3	28	2	617	C	928	1	2	Bradley	6	6	4	5	6	5	1	1	0	0	1	3	1	1
5/3/07	3	28	2	620	D	264	2	2	Bradley	4	4	2	3	4	3	0	0	0	0	0	0	1	0
5/3/07	3	28	2	620	A	951	3	2	Bradley	4	3	1	2	4	3	0	0	0	0	0	0	2	1
5/3/07	3	28	2	622	C	992	4	2	Bradley	3	2	1	2	4	3	0	0	0	0	0	0	1	0
5/3/07	3	28	2	621	C	929	5	2	Bradley	4	2	2	2	4	4	0	0	0	0	0	0	2	1
5/3/07	3	28	2	617	A	592	6	2	Bradley	5	7	6	7	5	4	1	0	0	0	0	0	1	1
5/3/07	3	28	2	623	B	767	7	2	Bradley	6	4	2	3	5	4	1	0	0	0	1	0	1	0
5/3/07	3	28	2	618	A	567	8	2	Bradley	3	6	5	5	6	5	0	0	0	0	1	2	1	1
5/3/07	3	28	2	620	B	551	9	2	Bradley	3	5	4	4	5	4	0	0	0	0	0	0	1	0
5/3/07	3	28	2	623	A	386	10	2	Bradley	5	6	6	6	6	5	1	1	0	0	0	0	2	0
5/3/07	3	28	2	623	D	234	11	2	Bradley	6	5	5	5	5	4	1	0	0	0	2	0	2	1
5/3/07	3	28	2	619	C	402	12	2	Bradley	5	6	7	6	6	5	0	1	0	0	1	1	2	0
5/3/07	3	28	2	616	B	621	13	2	Bradley	5	3	2	2	4	4	0	0	0	0	0	0	1	0
5/3/07	3	28	2	619	B	179	14	2	Bradley	6	7	7	7	7	5	0	0	0	0	2	2	2	0
5/3/07	3	28	2	618	D	315	15	2	Bradley	4	7	7	7	7	5	0	1	0	0	1	3	2	0
5/3/07	3	28	2	616	D	523	16	2	Bradley	5	7	7	7	6	5	2	0	1	0	2	0	0	1
5/3/07	3	28	2	617	C	928	1	2	Davis	7	7	5	6	6	5	1	0	0	0	1	2	1	2
5/3/07	3	28	2	620	D	264	2	2	Davis	6	5	4	5	5	5	0	0	0	2	0	1	2	1
5/3/07	3	28	2	620	A	951	3	2	Davis	5	2	2	2	5	3	0	0	0	1	0	0	1	2
5/3/07	3	28	2	622	C	992	4	2	Davis	5	4	4	4	5	3	0	0	0	0	1	0	1	1
5/3/07	3	28	2	621	C	929	5	2	Davis	6	3	3	3	6	4	0	0	0	2	0	0	3	1
5/3/07	3	28	2	617	A	592	6	2	Davis	6	7	8	7	6	4	0	0	0	2	0	0	2	2

5/3/07	3	28	2	623	B	767	7	2	Davis	7	2	2	2	6	3	0	0	0	2	0	2	1	1
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5/3/07	3	28	2	620	B	551	9	2	Davis	6	4	4	4	5	5	0	0	0	0	0	0	2	2
5/3/07	3	28	2	623	A	386	10	2	Davis	7	7	5	6	5	4	0	0	0	2	1	0	2	0
5/3/07	3	28	2	623	D	234	11	2	Davis	6	2	1	2	4	2	0	0	0	1	0	0	1	1
5/3/07	3	28	2	619	C	402	12	2	Davis	3	6	6	6	5	3	0	0	0	0	0	2	0	3
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5/3/07	3	28	2	616	D	523	16	2	Davis	6	8	8	8	5	4	0	0	0	0	0	2	1	1
5/3/07	3	28	2	617	C	928	1	2	Aldredge	6	8	6	7	6	4	0	1	0	0	2	1	2	1
5/3/07	3	28	2	620	D	264	2	2	Aldredge	5	5	3	4	4	2	1	0	0	0	0	1	2	0
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5/3/07	3	28	2	622	C	992	4	2	Aldredge	5	7	6	7	5	2	2	0	0	2	0	1	3	5
5/3/07	3	28	2	621	C	929	5	2	Aldredge	3	5	4	5	5	4	1	0	0	0	1	1	2	2
5/3/07	3	28	2	617	A	592	6	2	Aldredge	4	7	8	7	6	3	0	0	0	0	1	2	4	4
5/3/07	3	28	2	623	B	767	7	2	Aldredge	4	6	3	5	5	2	1	0	0	1	0	0	3	3
5/3/07	3	28	2	618	A	567	8	2	Aldredge	3	7	7	7	6	5	1	1	0	0	2	2	2	1
5/3/07	3	28	2	620	B	551	9	2	Aldredge	3	5	4	5	5	4	0	0	0	0	1	3	3	3
5/3/07	3	28	2	623	A	386	10	2	Aldredge	3	8	7	8	5	2	1	0	0	0	2	0	3	4
5/3/07	3	28	2	623	D	234	11	2	Aldredge	4	7	5	6	4	2	1	0	0	1	1	2	2	1
5/3/07	3	28	2	619	C	402	12	2	Aldredge	1	7	7	7	5	5	1	0	0	0	2	2	2	2
5/3/07	3	28	2	616	B	621	13	2	Aldredge	6	5	1	2	5	3	0	1	0	0	1	0	1	2
5/3/07	3	28	2	619	B	179	14	2	Aldredge	6	8	8	8	6	4	0	0	0	0	2	3	3	3
5/3/07	3	28	2	618	D	315	15	2	Aldredge	6	7	8	7	6	4	0	0	0	0	2	3	4	2
5/3/07	3	28	2	616	D	523	16	2	Aldredge	6	7	7	7	6	4	0	0	2	0	0	1	2	2

chemburn	ofacid	ofbitter	ofmetal	ofgrassy	ofbrown	ofsoured	ofsweet	ofmilky	ofliver	ofcrdbd	ofpainty	ofnutty	oFishy
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I-5. Raw cook ANOVA data for bottom rounds and roast beef.

Dependent Variable: xchemph

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	35.84249948	0.36951030	6.17	<.0001
Error	190	11.38568802	0.05992467		
Corrected Total	287	47.22818750			

R-Square	Coeff Var	Root MSE	xchemph Mean
0.758922	4.082046	0.244795	5.996875

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	10.57562569	0.52878128	8.82	<.0001
Sample(Animal*trt)	69	4.93889097	0.07157813	1.19	0.1749
Animal	3	13.13318264	4.37772755	73.05	<.0001
trt	3	4.42015486	1.47338495	24.59	<.0001
Sday	2	2.77464531	1.38732266	23.15	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	13.13318264	4.37772755	8.28	0.0009

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F

trt	3	4.42015486	1.47338495	20.58	<.0001

Dependent Variable: xchemL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	3696.807277	35.891333	6.09	<.0001
Error	184	1083.830114	5.890381		
Corrected Total	287	4780.637391			

R-Square	Coeff Var	Root MSE	xchemL Mean
0.773288	4.451075	2.427011	54.52640

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	875.914893	43.795745	7.44	<.0001
Sample(Animal*trt)	69	699.011104	10.130596	1.72	0.0022
Animal	3	1833.767210	611.255737	103.77	<.0001
trt	3	132.993414	44.331138	7.53	<.0001
Sday	2	75.289432	37.644716	6.39	0.0021
trt*Sday	6	79.831225	13.305204	2.26	0.0397

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1833.767210	611.255737	13.96	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	132.9934137	44.3311379	4.38	0.0070

Dependent Variable: xchema

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	109	3464.625490	31.785555	5.06	<.0001
Error	178	1117.162906	6.276196		
Corrected Total	287	4581.788396			

R-Square	Coeff Var	Root MSE	xchema Mean
0.756173	20.93230	2.505234	11.96827

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	1265.877659	63.293883	10.08	<.0001
Sample(Animal*trt)	69	652.478448	9.456209	1.51	0.0168
Animal	3	1031.171788	343.723929	54.77	<.0001
trt	3	304.279925	101.426642	16.16	<.0001
Sday	2	17.446752	8.723376	1.39	0.2518
Animal*Sday	6	117.917636	19.652939	3.13	0.0061
trt*Sday	6	82.693840	13.782307	2.20	0.0454

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1031.171788	343.723929	5.43	0.0067

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	304.2799251	101.4266417	10.73	<.0001

Dependent Variable: xchemb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	198.5369829	1.9275435	3.76	<.0001
Error	184	94.3123886	0.5125673		
Corrected Total	287	292.8493715			

R-Square	Coeff Var	Root MSE	xchemb Mean
0.677949	6.481946	0.715938	11.04511

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	50.59204769	2.52960238	4.94	<.0001
Sample(Animal*trt)	69	32.58371525	0.47222776	0.92	0.6469
Animal	3	22.48718424	7.49572808	14.62	<.0001
trt	3	5.20003730	1.73334577	3.38	0.0194
Sday	2	74.28805042	37.14402521	72.47	<.0001
Animal*Sday	6	15.45932640	2.57655440	5.03	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	22.48718424	7.49572808	2.96	0.0568

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	5.20003730	1.73334577	3.67	0.0163

Dependent Variable: xrawph

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	35	14.63415774	0.41811879	53.96	<.0001
Error	60	0.46490476	0.00774841		
Corrected Total	95	15.09906250			

R-Square	Coeff Var	Root MSE	xrawph Mean
0.969210	1.503899	0.088025	5.853125

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	4.66347619	0.23317381	30.09	<.0001
Animal	3	9.81058631	3.27019544	422.05	<.0001
trt	3	0.01941449	0.00647150	0.84	0.4798
Animal*trt	9	0.14228274	0.01580919	2.04	0.0500

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	9.81058631	3.27019544	14.02	<.0001

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The GLM Procedure

Dependent Variable: xrawL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	35	1953.851552	55.824330	17.07	<.0001
Error	60	196.231791	3.270530		
Corrected Total	95	2150.083343			

R-Square	Coeff Var	Root MSE	xrawL Mean
0.908733	4.422103	1.808461	40.89594

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	682.104013	34.105201	10.43	<.0001
Animal	3	1254.175971	418.058657	127.83	<.0001
trt	3	0.813992	0.271331	0.08	0.9691
Animal*trt	9	16.567236	1.840804	0.56	0.8219

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Animal	3	1254.175971	418.058657	12.26	<.0001

The GLM Procedure

Dependent Variable: xrawa

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	35	1016.701602	29.048617	12.28	<.0001
Error	60	141.905162	2.365086		
Corrected Total	95	1158.606764			

R-Square	Coeff Var	Root MSE	xrawa Mean
0.877521	6.066095	1.537884	25.35212

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	374.1880362	18.7094018	7.91	<.0001
Animal	3	594.9003220	198.3001073	83.84	<.0001
trt	3	15.4096665	5.1365555	2.17	0.1007
Animal*trt	9	28.3962810	3.1551423	1.33	0.2390

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	594.9003220	198.3001073	10.60	0.0002

The GLM Procedure

Dependent Variable: xrawb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	35	653.7027239	18.6772207	12.85	<.0001
Error	60	87.1750133	1.4529169		
Corrected Total	95	740.8777372			

R-Square	Coeff Var	Root MSE	xrawb Mean
0.882335	10.95744	1.205370	11.00047

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	202.7374518	10.1368726	6.98	<.0001
Animal	3	422.8419459	140.9473153	97.01	<.0001
trt	3	9.4171870	3.1390623	2.16	0.1020
Animal*trt	9	16.6251171	1.8472352	1.27	0.2712

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	422.8419459	140.9473153	13.90	<.0001

Dependent Variable: Juicy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	85.2151134	0.8785063	2.77	<.0001
Error	189	60.0261874	0.3175989		
Corrected Total	286	145.2413008			

R-Square	Coeff Var	Root MSE	Juicy Mean
0.586714	12.05736	0.563559	4.673984

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	28.57388221	1.42869411	4.50	<.0001
Sample(Animal*trt)	69	38.77001188	0.56188423	1.77	0.0013
Animal	3	11.39713982	3.79904661	11.96	<.0001
trt	3	4.75983743	1.58661248	5.00	0.0023
Sday	2	1.35821077	0.67910538	2.14	0.1207

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	11.39713982	3.79904661	2.66	0.0761

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	4.75983743	1.58661248	2.82	0.0450

Dependent Variable: MFTend

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	231.3618619	2.3851738	5.13	<.0001
Error	189	87.8849789	0.4649999		
Corrected Total	286	319.2468409			

R-Square	Coeff Var	Root MSE	MFTend Mean
0.724712	12.38697	0.681909	5.505052

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	50.0467625	2.5023381	5.38	<.0001
Sample(Animal*trt)	69	24.9642600	0.3618009	0.78	0.8855
Animal	3	151.6461402	50.5487134	108.71	<.0001
trt	3	1.1385024	0.3795008	0.82	0.4864
Sday	2	3.3818266	1.6909133	3.64	0.0282

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	151.6461402	50.5487134	20.20	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	1.13850242	0.37950081	1.05	0.3766

Dependent Variable: CT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	350.1756032	3.6100578	6.11	<.0001
Error	189	111.6361776	0.5906676		
Corrected Total	286	461.8117809			

R-Square	Coeff Var	Root MSE	CT Mean
0.758265	14.32280	0.768549	5.365912

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	52.7982714	2.6399136	4.47	<.0001
Sample(Animal*trt)	69	35.6676464	0.5169224	0.88	0.7360
Animal	3	256.9198638	85.6399546	144.99	<.0001
trt	3	1.8102694	0.6034231	1.02	0.3843
Sday	2	3.1324798	1.5662399	2.65	0.0732

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	256.9198638	85.6399546	32.44	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F

trt	3	1.81026936	0.60342312	1.17	0.3286

Dependent Variable: Otend

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	306.5373734	3.1601791	5.35	<.0001
Error	189	111.5842894	0.5903931		
Corrected Total	286	418.1216628			

R-Square	Coeff Var	Root MSE	Otend Mean
0.733130	14.65524	0.768370	5.242973

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	58.7990187	2.9399509	4.98	<.0001
Sample(Animal*trt)	69	30.3584283	0.4399772	0.75	0.9207
Animal	3	215.3681038	71.7893679	121.60	<.0001
trt	3	1.6574034	0.5524678	0.94	0.4245
Sday	2	0.0257106	0.0128553	0.02	0.9785

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	215.3681038	71.7893679	24.42	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F

trt	3	1.65740335	0.55246778	1.26	0.2964

Dependent Variable: oflavint

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	49.63941542	0.51174655	2.53	<.0001
Error	189	38.29115949	0.20259873		
Corrected Total	286	87.93057491			

R-Square	Coeff Var	Root MSE	oflavint Mean
0.564530	8.403141	0.450110	5.356446

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	15.53657931	0.77682897	3.83	<.0001
Sample(Animal*trt)	69	19.66379110	0.28498248	1.41	0.0371
Animal	3	13.03751874	4.34583958	21.45	<.0001
trt	3	0.04201165	0.01400388	0.07	0.9763
Sday	2	1.38786828	0.69393414	3.43	0.0346

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	13.03751874	4.34583958	5.59	0.0059

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.04201165	0.01400388	0.05	0.9855

Dependent Variable: CBLean

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	51.09783226	0.52678178	3.68	<.0001
Error	189	27.04575853	0.14309925		
Corrected Total	286	78.14359079			

R-Square	Coeff Var	Root MSE	CBLean Mean
0.653897	8.789008	0.378285	4.304065

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	5.69685879	0.28484294	1.99	0.0094
Sample(Animal*trt)	69	11.25750017	0.16315218	1.14	0.2434
Animal	3	22.26030784	7.42010261	51.85	<.0001
trt	3	1.46183587	0.48727862	3.41	0.0188
Sday	2	10.37493592	5.18746796	36.25	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	22.26030784	7.42010261	26.05	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	1.46183587	0.48727862	2.99	0.0370

Dependent Variable: CBFat

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	18.55943374	0.18018868	1.47	0.0121
Error	183	22.44774396	0.12266527		
Corrected Total	286	41.00717770			

R-Square	Coeff Var	Root MSE	CBFat Mean
0.452590	68.63621	0.350236	0.510279

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	3.97742113	0.19887106	1.62	0.0515
Sample(Animal*trt)	69	7.55799050	0.10953609	0.89	0.7021
Animal	3	1.98087062	0.66029021	5.38	0.0014
trt	3	0.52017055	0.17339018	1.41	0.2403
Sday	2	1.56432307	0.78216153	6.38	0.0021
Animal*Sday	6	2.76576481	0.46096080	3.76	0.0015

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1.98087062	0.66029021	3.32	0.0407

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.52017055	0.17339018	1.58	0.2014

Dependent Variable: CBFat

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	18.55943374	0.18018868	1.47	0.0121
Error	183	22.44774396	0.12266527		
Corrected Total	286	41.00717770			

R-Square	Coeff Var	Root MSE	CBFat Mean
0.452590	68.63621	0.350236	0.510279

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	3.97742113	0.19887106	1.62	0.0515
Sample(Animal*trt)	69	7.55799050	0.10953609	0.89	0.7021
Animal	3	1.98087062	0.66029021	5.38	0.0014
trt	3	0.52017055	0.17339018	1.41	0.2403
Sday	2	1.56432307	0.78216153	6.38	0.0021
Animal*Sday	6	2.76576481	0.46096080	3.76	0.0015

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Animal	3	1.98087062	0.66029021	3.32	0.0407

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.52017055	0.17339018	1.58	0.2014

Dependent Variable: liver

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	11.96095963	0.12330886	1.34	0.0451
Error	189	17.39900940	0.09205825		
Corrected Total	286	29.35996903			

R-Square	Coeff Var	Root MSE	liver Mean
0.407390	142.6355	0.303411	0.212718

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	4.16356745	0.20817837	2.26	0.0024
Sample(Animal*trt)	69	5.35683413	0.07763528	0.84	0.7917
Animal	3	1.15118275	0.38372758	4.17	0.0069
trt	3	0.21161263	0.07053754	0.77	0.5143
Sday	2	1.03858320	0.51929160	5.64	0.0042

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1.15118275	0.38372758	1.84	0.1718

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.21161263	0.07053754	0.91	0.4415

Dependent Variable: cowy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	63.4546337	0.6160644	2.49	<.0001
Error	183	45.2410631	0.2472189		
Corrected Total	286	108.6956969			

R-Square	Coeff Var	Root MSE	cowy Mean
0.583782	81.33348	0.497211	0.611324

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	16.18025793	0.80901290	3.27	<.0001
Sample(Animal*trt)	69	15.76740338	0.22851309	0.92	0.6407
Animal	3	24.89545363	8.29848454	33.57	<.0001
trt	3	0.84116126	0.28038709	1.13	0.3366
Sday	2	2.00783806	1.00391903	4.06	0.0188
Animal*Sday	6	3.50281199	0.58380200	2.36	0.0320

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	24.89545363	8.29848454	10.26	0.0003

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.84116126	0.28038709	1.23	0.3065

Dependent Variable: salt

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	12.27102758	0.12650544	1.75	0.0005
Error	189	13.63690893	0.07215296		
Corrected Total	286	25.90793651			

R-Square	Coeff Var	Root MSE	salt Mean
0.473640	34.50076	0.268613	0.778571

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	2.94809620	0.14740481	2.04	0.0072
Sample(Animal*trt)	69	5.43768128	0.07880698	1.09	0.3169
Animal	3	2.11149251	0.70383084	9.75	<.0001
trt	3	0.06575204	0.02191735	0.30	0.8227
Sday	2	1.70735033	0.85367516	11.83	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	2.11149251	0.70383084	4.77	0.0114

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.06575204	0.02191735	0.28	0.8410

Dependent Variable: sour

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	63.7562661	0.6572811	2.89	<.0001
Error	189	43.0523750	0.2277903		
Corrected Total	286	106.8086411			

R-Square	Coeff Var	Root MSE	sour Mean
0.596920	29.20424	0.477274	1.634262

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	10.29978310	0.51498916	2.26	0.0024
Sample(Animal*trt)	69	21.29269781	0.30858982	1.35	0.0561

Animal	3	18.30615803	6.10205268	26.79	<.0001
trt	3	1.61802534	0.53934178	2.37	0.0722
Sday	2	12.38702313	6.19351157	27.19	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	18.30615803	6.10205268	11.85	0.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	1.61802534	0.53934178	1.75	0.1653

Dependent Variable: bitter

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	43.84577679	0.42568715	2.13	<.0001
Error	183	36.60512720	0.20002802		
Corrected Total	286	80.45090399			

R-Square	Coeff Var	Root MSE	bitter Mean
0.545000	25.35242	0.447245	1.764111

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	6.80182555	0.34009128	1.70	0.0365

Sample(Animal*trt)	69	14.74773458	0.21373528	1.07	0.3584
Animal	3	2.64854331	0.88284777	4.41	0.0050
trt	3	0.35066477	0.11688826	0.58	0.6260
Sday	2	13.67603030	6.83801515	34.19	<.0001
Animal*Sday	6	3.85261392	0.64210232	3.21	0.0051

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	2.64854331	0.88284777	2.60	0.0809

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.35066477	0.11688826	0.55	0.6519

Dependent Variable: metallic

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	44.64982973	0.46030752	1.71	0.0009
Error	189	51.00469214	0.26986610		
Corrected Total	286	95.65452187			

R-Square	Coeff Var	Root MSE	metallic Mean
0.466782	29.46785	0.519486	1.762892

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	6.27289693	0.31364485	1.16	0.2914
Sample(Animal*trt)	69	16.26315857	0.23569795	0.87	0.7392
Animal	3	2.91356497	0.97118832	3.60	0.0146
trt	3	0.59454963	0.19818321	0.73	0.5327
Sday	2	18.59137267	9.29568633	34.45	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	2.91356497	0.97118832	3.10	0.0501

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.59454963	0.19818321	0.84	0.4761

Dependent Variable: chemburn

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	6.79765662	0.06599667	1.18	0.1630
Error	183	10.21619162	0.05582618		
Corrected Total	286	17.01384824			

R-Square	Coeff Var	Root MSE	chemburn Mean
0.399537	139.7207	0.236276	0.169106

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	1.42179838	0.07108992	1.27	0.2017
Sample(Animal*trt)	69	3.78191912	0.05481042	0.98	0.5245
Animal	3	0.39203236	0.13067745	2.34	0.0748
trt	3	0.29191555	0.09730518	1.74	0.1598
Sday	2	0.11149940	0.05574970	1.00	0.3704
Animal*Sday	6	0.82768352	0.13794725	2.47	0.0254

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	0.39203236	0.13067745	1.84	0.1727

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.29191555	0.09730518	1.78	0.1600

Dependent Variable: ofacid

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	55.7321857	0.5745586	1.51	0.0085
Error	189	71.9812618	0.3808532		
Corrected Total	286	127.7134475			

R-Square	Coeff Var	Root MSE	ofacid Mean
0.436385	92.01690	0.617133	0.670674

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	6.85202367	0.34260118	0.90	0.5881
Sample(Animal*trt)	69	24.53773443	0.35561934	0.93	0.6222
Animal	3	2.56710203	0.85570068	2.25	0.0843
trt	3	0.24831281	0.08277094	0.22	0.8843
Sday	2	22.02059002	11.01029501	28.91	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	2.56710203	0.85570068	2.50	0.0890

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.24831281	0.08277094	0.23	0.8733

Dependent Variable: ofcrdbrd

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	4.04957402	0.04174819	1.23	0.1161
Error	189	6.42185455	0.03397807		
Corrected Total	286	10.47142857			

R-Square	Coeff Var	Root MSE	ofcrdbrd Mean
0.386726	180.0446	0.184331	0.102381

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	0.53869286	0.02693464	0.79	0.7205
Sample(Animal*trt)	69	2.41052030	0.03493508	1.03	0.4323
Animal	3	0.57892147	0.19297382	5.68	0.0010
trt	3	0.22016081	0.07338694	2.16	0.0942
Sday	2	0.30018249	0.15009124	4.42	0.0133

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	0.57892147	0.19297382	7.16	0.0019

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.22016081	0.07338694	2.10	0.1081

Dependent Variable: oFishy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	28.06854262	0.28936642	2.14	<.0001
Error	189	25.53356926	0.13509825		

Corrected Total	286	53.60211189

R-Square	Coeff Var	Root MSE	oFishy Mean
0.523646	178.1406	0.367557	0.206330

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	13.75258368	0.68762918	5.09	<.0001
Sample(Animal*trt)	69	5.44578029	0.07892435	0.58	0.9946
Animal	3	4.43016914	1.47672305	10.93	<.0001
trt	3	0.30270010	0.10090003	0.75	0.5254
Sday	2	4.05328259	2.02664130	15.00	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	4.43016914	1.47672305	2.15	0.1261

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.30270010	0.10090003	1.28	0.2887

APPENDIX J

J-1. Raw data for beef strip loins.

Date	PD	Age	pH	#	Code	Trt	pH1	pH2	iWt	ijWt	Pump	L1	a1	b1	L2	a2	b2	L3	a3	b3
03/26/07	1	y	h	4	500	A	6.7	6.7	.	.	.	30.80	14.21	4.04	29.50	12.09	2.70	29.89	12.94	2.89
03/26/07	1	y	h	6	501	A	6.7	6.9	.	.	.	28.34	13.83	3.61	28.96	11.79	2.56	30.02	12.10	2.72
03/26/07	1	y	n	3	502	A	5.7	6.0	.	.	.	36.06	23.60	10.66	41.31	28.25	13.41	39.19	24.02	11.04
03/26/07	1	y	n	5	503	A	5.7	5.7	.	.	.	40.76	25.09	11.64	39.87	27.67	12.81	39.12	26.20	11.64
03/26/07	1	c	n	23	504	A	6.0	5.8	.	.	.	31.65	17.24	3.41	32.84	22.72	8.26	34.65	21.06	6.87
03/26/07	1	c	n	11	505	A	5.6	5.6	.	.	.	36.27	23.82	10.82	34.10	18.30	6.37	33.50	19.03	7.77
03/26/07	1	c	n	15	506	A	5.9	5.8	.	.	.	32.06	19.78	6.17	32.77	21.01	7.48	32.65	16.22	4.95
03/26/07	1	c	n	21	507	A	5.7	5.8	.	.	.	35.96	19.61	7.57	38.18	21.37	8.74	39.54	20.39	7.90
03/26/07	1	y	h	4	500	B	6.6	6.4	4.67	5.23	11.99	29.24	12.74	2.53	30.29	13.19	3.74	31.59	14.87	3.43
03/26/07	1	y	h	6	501	B	6.9	7.0	3.09	3.46	11.97	32.10	15.89	3.87	32.75	12.98	3.95	32.98	16.34	5.29
03/26/07	1	y	n	3	502	B	5.9	5.9	3.85	4.31	11.95	42.53	25.37	12.01	39.32	22.59	9.63	38.09	23.82	10.19
03/26/07	1	y	n	5	503	B	5.6	5.7	4.48	5.02	12.05	36.83	25.67	11.42	38.01	26.27	11.64	42.58	26.04	12.68
03/26/07	1	c	n	23	504	B	5.7	5.7	2.04	2.28	11.76	34.27	26.64	11.56	35.41	24.33	9.09	36.29	23.93	8.48
03/26/07	1	c	n	11	505	B	5.8	5.7	2.5	2.8	12.00	38.40	26.35	11.78	37.97	25.46	11.34	35.52	21.93	8.96
03/26/07	1	c	n	15	506	B	5.7	6.0	3.6	4.03	11.94	31.84	19.59	7.43	33.14	18.38	6.17	33.40	18.56	6.13
03/26/07	1	c	n	21	507	B	5.8	5.7	0.82	0.92	12.20	37.22	19.81	6.68	39.28	23.79	9.34	38.40	21.71	7.18
03/26/07	1	y	h	4	500	C	6.6	6.6	4.19	4.69	11.93	32.70	15.54	3.92	28.90	12.21	3.41	28.59	12.41	2.82
03/26/07	1	y	h	6	501	C	7.1	6.9	4.11	4.6	11.92	30.56	15.32	3.73	30.18	14.76	3.34	29.05	12.71	2.91
03/26/07	1	y	n	3	502	C	5.7	5.7	3.68	4.12	11.96	39.19	22.92	10.04	42.74	19.68	8.03	37.99	21.99	8.85
03/26/07	1	y	n	5	503	C	5.6	5.6	3.78	4.23	11.90	37.08	25.94	11.66	35.45	24.81	10.65	33.58	22.69	9.82
03/26/07	1	c	n	23	504	C	5.8	5.8	2.96	3.32	12.16	32.72	19.80	5.88	31.99	20.85	6.48	35.12	21.58	6.44
03/26/07	1	c	n	11	505	C	5.6	5.6	2.69	3.01	11.90	36.15	19.95	7.95	35.08	21.78	8.51	34.30	22.17	8.98
03/26/07	1	c	n	15	506	C	5.7	5.8	3.73	4.18	12.06	32.72	19.47	6.66	30.77	16.79	5.90	32.13	20.88	7.08
03/26/07	1	c	n	21	507	C	5.7	5.8	1.08	1.21	12.04	36.77	19.95	8.00	37.27	18.57	6.24	38.50	20.88	8.04
03/26/07	1	y	h	4	500	D	6.6	6.6	4.17	4.67	11.99	29.59	14.73	3.91	29.17	13.63	3.60	29.13	14.60	4.09
03/26/07	1	y	h	6	501	D	6.9	6.9	3.14	3.52	12.10	31.46	15.36	4.33	28.00	11.67	2.84	30.07	14.70	3.74
03/26/07	1	y	n	3	502	D	5.6	5.6	4.54	5.08	11.89	36.15	22.32	9.59	39.34	23.49	10.03	38.48	25.30	10.84
03/26/07	1	y	n	5	503	D	5.6	5.6	3.29	3.69	12.16	34.80	25.51	10.87	36.41	25.51	10.65	36.91	24.66	10.77

03/26/07	1	c	n	23	504	D	5.8	5.8	2.39	2.66	11.30	33.86	23.53	7.42	33.57	22.37	7.63	34.39	21.77	6.56
03/26/07	1	c	n	11	505	D	5.6	5.5	2.89	3.24	12.11	33.53	19.96	5.75	38.67	24.52	8.39	36.74	24.06	8.77
03/26/07	1	c	n	15	506	D	5.8	5.8	4.06	4.56	12.32	30.96	18.26	6.74	30.63	22.79	8.99	33.85	20.83	7.3
03/26/07	1	c	n	21	507	D	5.8	5.8	1.3	1.46	12.31	38.89	19.31	7.46	40.15	22.23	9.53	38.49	23.66	10.26
03/27/07	2	y	h	3	508	A	7.2	7.3	4.21	.	.	26.49	10.49	2.02	25.48	9.91	1.97	27.63	11.62	2.09
03/27/07	2	y	h	2	509	A	6.1	6.0	5.41	.	.	31.89	13.79	2.19	32.89	14.81	2.20	32.55	13.18	1.75
03/27/07	2	y	n	4	510	A	5.7	5.6	3.78	.	.	35.10	20.20	6.44	36.52	20.51	6.00	37.70	23.79	9.54
03/27/07	2	y	n	6	511	A	5.5	5.6	3.85	.	.	46.55	23.12	12.02	43.94	24.28	10.20	42.08	23.62	10.86
03/27/07	2	c	h	24	512	A	6.0	6.0	2.24	.	.	34.53	20.68	7.07	34.50	20.15	6.79	33.31	21.21	6.99
03/27/07	2	c	n	100	513	A	5.7	5.7	3.4	.	.	29.05	16.94	4.79	31.42	16.56	5.58	34.19	18.94	6.15
03/27/07	2	c	n	26	514	A/D	5.7	5.7	2.18	.	.	37.29	20.70	9.50	39.08	22.22	11.23	39.18	24.02	11.83
03/27/07	2	c	n	22	515	A	5.9	6.0	1.7	.	.	.	.	.	.	.	.	.	.	.
03/27/07	2	y	h	3	508	B	7.3	7.4	3.98	4.41	10.80	28.16	10.96	1.97	26.59	12.61	2.89	27.35	10.56	1.97
03/27/07	2	y	h	2	509	B	6.1	6.0	4.01	4.44	10.72	36.45	15.50	6.48	39.22	19.09	8.74	35.84	14.41	5.79
03/27/07	2	y	n	4	510	B	5.6	5.7	3.58	3.96	10.61	38.98	23.69	10.27	40.60	27.31	12.22	36.32	21.98	9.11
03/27/07	2	y	n	6	511	B	5.6	5.6	3.96	4.7	18.69	41.75	21.36	10.58	46.22	29.91	14.14	45.46	23.78	11.50
03/27/07	2	c	h	24	512	B	6.2	6.2	1.57	1.75	11.46	39.58	21.85	10.37	39.52	21.71	9.85	42.24	21.04	11.62
03/27/07	2	c	n	100	513	B	5.8	5.8	2.4	2.68	11.67	31.40	18.55	6.41	32.24	17.65	4.74	35.38	21.64	7.40
03/27/07	2	c	n	26	514	B	5.9	5.8	2.27	2.53	11.45	31.66	22.11	8.65	35.82	17.71	8.34	34.12	23.93	9.37
03/27/07	2	c	n	22	515	B	5.9	5.8	1.81	2.01	11.05	35.92	15.15	5.41	33.52	18.49	7.08	31.72	17.09	6.42
03/27/07	2	y	h	3	508	C	7.4	7.4	3.76	4.23	12.50	27.91	10.31	1.66	25.88	9.89	1.83	25.57	10.56	2.20
03/27/07	2	y	h	2	509	C	6.0	6.3	4.1	4.7	14.63	31.87	14.18	4.04	31.45	13.66	3.83	29.73	14.21	3.70
03/27/07	2	y	n	4	510	C	5.7	5.7	3.27	3.63	11.01	36.06	19.31	6.12	36.82	21.45	7.23	36.49	21.15	6.96
03/27/07	2	y	n	6	511	C	5.6	5.6	4.7	5.24	11.49	43.49	22.24	9.79	44.25	21.98	10.33	42.17	21.73	10.55
03/27/07	2	c	h	24	512	C	6.2	6.0	2.68	3	11.94	31.26	21.71	7.30	33.59	18.83	5.55	32.71	19.24	5.20
03/27/07	2	c	n	100	513	C	5.7	5.8	2.5	2.8	12.00	36.39	17.26	7.18	32.44	17.25	6.06	33.68	18.58	8.32
03/27/07	2	c	n	26	514	C	5.7	5.8	1.86	2.03	9.14	38.16	18.56	11.29	41.21	18.72	11.96	39.57	16.83	10.60
03/27/07	2	c	n	22	515	C	5.9	5.8	1.57	1.75	11.46	29.45	16.53	5.47	31.15	14.71	3.66	33.75	20.16	5.49
03/27/07	2	y	h	3	508	D	7.1	7.3	3.9	4.4	12.82	25.32	9.34	1.61	25.34	10.92	2.20	26.10	9.37	0.93
03/27/07	2	y	h	2	509	D	6.1	6.2	4.7	5.29	12.55	32.15	13.63	4.27	34.86	14.24	4.18	33.74	17.62	6.14
03/27/07	2	y	n	4	510	D	5.6	5.6	3.74	4.2	12.30	36.44	20.22	8.57	37.20	24.45	11.41	36.00	23.90	10.79

03/27/07	2	y	n	6	511	D	5.5	5.5	4.32	4.89	13.19	47.13	22.68	11.76	42.36	22.51	10.75	40.90	20.17	9.28
03/27/07	2	c	h	24	512	D	6.2	6.1	1.97	2.2	11.68	33.35	19.48	5.50	33.23	19.76	5.83	32.96	20.80	5.74
03/27/07	2	c	n	100	513	D	5.7	5.7	3.15	3.5	11.11	31.13	16.74	5.48	31.77	16.94	4.62	33.23	18.73	6.36
03/27/07	2	c	n	26	514	D	5.6	5.7	1.46	1.64	12.33	32.38	18.17	7.56	34.27	19.76	8.58	38.07	16.86	9.45
03/27/07	2	c	n	22	515	D	5.8	5.9	2.04	2.3	12.75	30.52	17.52	6.22	30.89	17.63	5.28	32.41	20.25	6.72
03/28/07	3	y	h	5	516	A	6.3	6.2	3.11	.	.	35.03	17.01	6.32	33.22	15.11	5.42	37.77	20.56	8.28
03/28/07	3	y	h	1	517	A	6.6	6.8	3.66	.	.	30.26	14.80	4.23	28.59	11.64	2.89	29.17	13.49	3.48
03/28/07	3	y	n	2	518	A	5.3	5.5	2.7	.	.	43.47	21.21	10.24	47.26	25.97	13.17	43.22	25.92	12.87
03/28/07	3	y	n	1	519	A	5.8	5.6	3.36	.	.	41.36	25.62	12.28	43.43	23.86	11.49	41.96	22.86	10.63
03/28/07	3	c	h	101	520	A	6.7	6.8	1.42	.	.	32.73	14.92	4.07	27.87	13.91	3.69	30.70	16.94	3.93
03/28/07	3	c	h	102	521	A	7.1	7.1	1.08	.	.	37.83	15.89	5.89	34.90	15.56	5.77	33.95	15.71	5.77
03/28/07	3	c	h	105	522	A	7.1	7.2	1.6	.	.	31.56	17.07	4.09	32.23	16.88	3.51	31.10	15.24	3.63
03/28/07	3	c	h	103	523	A	6.5	7.1	1.09	.	.	34.87	18.09	5.04	35.10	19.38	6.20	32.91	19.82	7.96
03/28/07	3	y	h	5	516	B	6.2	6.0	2.74	3.03	10.58	33.73	13.68	2.96	32.58	15.09	4.84	34.88	15.97	5.10
03/28/07	3	y	h	1	517	B	6.8	6.9	3.5	3.9	11.43	31.16	14.40	4.32	30.27	13.25	3.76	27.44	11.90	2.82
03/28/07	3	y	n	2	518	B	5.5	5.5	2.9	3.27	12.76	43.28	23.99	12.02	41.28	20.15	8.94	44.47	22.02	11.03
03/28/07	3	y	n	1	519	B	5.5	5.6	3.55	3.96	11.55	41.12	26.39	12.13	40.76	22.27	9.80	38.47	19.04	7.78
03/28/07	3	c	h	101	520	B	6.7	6.9	1.48	1.65	11.49	32.02	19.97	5.95	30.37	16.36	4.60	32.92	17.86	4.54
03/28/07	3	c	h	102	521	B	6.4	6.7	0.97	1.08	11.34	34.79	16.91	5.94	35.67	18.96	7.13	38.12	21.86	9.02
03/28/07	3	c	h	105	522	B	7.1	7.2	1.56	1.74	11.54	32.96	17.37	5.28	31.81	20.11	6.80	34.81	19.72	5.72
03/28/07	3	c	h	103	523	B	6.8	6.9	0.89	0.99	11.24	35.71	22.13	5.97	33.93	20.91	7.19	34.01	21.70	6.35
03/28/07	3	y	h	5	516	C	6.0	6.1	3.09	3.41	10.36	33.69	16.95	6.70	37.65	15.47	5.29	36.12	18.65	6.81
03/28/07	3	y	h	1	517	C	6.5	6.5	3.55	3.98	12.11	30.62	14.61	4.00	29.56	12.28	3.16	29.33	13.78	3.71
03/28/07	3	y	n	2	518	C	5.8	5.8	3.04	3.4	11.84	41.31	19.47	8.04	42.82	19.97	8.98	40.33	20.02	8.91
03/28/07	3	y	n	1	519	C	5.6	5.6	3.24	3.62	11.73	40.67	22.36	10.54	42.09	22.91	10.66	42.11	23.32	11.04
03/28/07	3	c	h	101	520	C	6.8	7.1	2.29	3.56	55.46	31.98	16.17	4.33	31.44	18.96	6.34	33.74	20.39	7.55
03/28/07	3	c	h	102	521	C	6.5	6.5	0.86	0.96	11.63	34.36	16.55	6.43	34.98	18.34	6.03	34.82	17.54	6.07
03/28/07	3	c	h	105	522	C	6.9	6.8	1.56	1.74	11.54	31.43	19.26	5.66	31.00	17.50	4.11	35.04	16.71	3.38
03/28/07	3	c	h	103	523	C	7.1	7.0	1	1.13	13.00	33.65	21.32	7.26	35.97	21.62	8.37	38.72	24.00	7.96
03/28/07	3	y	h	5	516	D	6.2	5.9	2.26	2.53	11.95	35.10	16.60	5.34	36.36	15.93	4.83	43.58	17.68	7.85
03/28/07	3	y	h	1	517	D	6.5	6.7	3.62	4.05	11.88	30.94	11.55	2.92	33.01	15.02	4.42	34.17	13.30	3.99

03/28/07	3	y	n	2	518	D	5.7	5.6	2.74	3.05	11.31	44.08	20.89	10.57	43.60	19.92	8.93	43.11	23.77	11.35
03/28/07	3	y	n	1	519	D	5.6	5.6	3.3	3.68	11.52	43.41	23.67	9.94	40.08	21.42	8.82	39.54	24.67	10.81
03/28/07	3	c	h	101	520	D	7.2	7.1	1.5	1.67	11.33	30.07	18.10	4.96	29.91	19.96	6.26	30.26	17.00	4.47
03/28/07	3	c	h	102	521	D	6.9	6.9	1.13	1.28	13.27	37.52	15.78	5.14	35.62	13.63	3.14	34.29	16.20	5.25
03/28/07	3	c	h	105	522	D	7.2	6.9	1.18	1.32	11.86	33.10	20.01	5.98	32.61	17.59	5.60	33.48	20.94	6.53
03/28/07	3	c	h	103	523	D	7.0	6.9	0.79	0.88	11.39	37.13	22.32	7.34	33.29	21.48	6.40	39.32	20.33	7.47

J-2. Raw data for chemical analysis beef steaks.

Date	PS	SD	#	trt	iDrip1	iDrip2	48Drip-1	48Drip-2	pH1	pH2	L1	a1	b1	L2	a2	b2	L3	a3	b3
3/27/07	1	0	500	A	8.1671	9.1790	8.0533	9.0879	6.5	6.5	30.27	17.46	4.48	30.19	14.80	3.04	27.10	10.98	1.74
3/27/07	1	0	501	A	11.2115	10.0675	11.1144	9.9804	6.8	6.8	29.55	16.76	3.94	30.39	15.00	3.22	32.51	15.18	1.74
3/27/07	1	0	502	A	9.1676	10.3616	8.9412	10.2689	5.7	5.8	33.57	17.94	5.04	37.16	26.14	11.89	36.82	26.36	8.71
3/27/07	1	0	503	A	10.8100	9.8810	10.1162	9.7983	5.7	5.7	33.39	27.36	13.30	37.80	27.58	10.18	34.49	22.24	8.28
3/27/07	1	0	504	A	10.9523	9.4307	10.6595	9.3478	5.7	5.8	33.75	30.66	12.31	32.23	24.10	9.46	35.04	27.17	8.74
3/27/07	1	0	505	A	9.2021	10.7306	9.0840	10.5824	5.6	5.6	39.58	26.13	10.95	35.98	22.87	8.94	33.02	20.01	7.64
3/27/07	1	0	506	A	9.5731	10.6601	10.6195	9.5227	5.6	5.7	31.55	17.85	4.69	29.40	18.69	5.64	32.39	17.44	5.64
3/27/07	1	0	507	A	10.5803	9.8850	10.3930	9.6632	5.8	5.8	40.67	21.65	7.94	41.86	24.73	10.92	42.72	19.60	10.24
3/27/07	1	0	500	B	9.2214	10.7216	9.0744	10.6834	6.4	6.4	34.65	14.29	3.04	37.14	18.21	4.67	34.96	14.56	3.93
3/27/07	1	0	501	B	11.3352	9.9830	11.1497	9.8156	6.5	6.5	34.37	17.37	3.97	37.61	19.21	5.72	38.79	19.47	5.85
3/27/07	1	0	502	B	10.2989	9.2860	10.0902	8.9318	5.4	5.5	47.15	23.23	11.76	44.21	23.25	11.06	47.26	21.40	10.74
3/27/07	1	0	503	B	9.3078	10.9184	9.2476	10.7984	5.4	5.5	40.82	24.06	11.41	42.61	23.38	10.38	42.55	22.81	9.58
3/27/07	1	0	504	B	10.3577	11.5112	10.1869	10.9106	5.7	5.7	39.07	27.74	11.12	43.71	30.35	13.87	37.84	27.26	11.12
3/27/07	1	0	505	B	11.4737	8.6787	11.3727	8.6162	5.4	5.3	51.43	19.88	15.26	48.82	17.32	12.68	49.76	16.50	13.22
3/27/07	1	0	506	B	11.3499	8.8398	10.9639	8.6772	5.5	5.5	38.69	18.91	6.95	40.93	23.29	10.58	38.98	20.65	8.32
3/27/07	1	0	507	B	10.8950	10.6559	10.8547	10.3300	5.6	5.6	38.13	23.37	6.99	38.82	19.83	6.79	41.20	21.85	7.62
3/27/07	1	0	500	C	8.9324	9.3738	8.7649	9.2976	5.8	6.1	32.03	13.77	3.33	41.86	27.67	10.22	43.13	26.07	10.07
3/27/07	1	0	501	C	9.5186	11.8598	9.4260	11.7969	5.7	5.9	40.76	20.80	7.22	39.12	23.03	6.50	40.41	25.23	9.25
3/27/07	1	0	502	C	11.7787	10.6708	11.6348	10.4433	5.4	5.5	46.66	25.58	12.14	43.75	26.54	12.06	46.02	26.75	11.57
3/27/07	1	0	503	C	11.7925	9.7779	11.6547	9.6284	5.6	5.5	46.99	25.33	13.97	46.20	24.76	11.84	43.25	23.00	10.23
3/27/07	1	0	504	C	10.1396	11.8139	9.9130	11.6093	5.7	5.7	42.00	24.48	9.16	35.85	24.34	8.53	35.29	23.54	6.96
3/27/07	1	0	505	C	10.7218	10.3749	10.5725	10.3123	5.5	5.6	35.55	20.58	8.07	36.41	21.02	8.09	36.87	21.43	8.79
3/27/07	1	0	506	C	10.9884	11.5234	10.9137	11.3214	5.7	5.7	39.40	23.72	9.20	39.46	22.63	10.39	41.15	23.78	12.33
3/27/07	1	0	507	C	9.9005	10.1105	9.6435	9.9183	5.6	5.8	50.16	24.49	9.75	52.33	29.98	15.07	46.89	29.25	12.13
3/27/07	1	0	500	D	11.8200	11.0832	11.7942	10.9093	6.4	6.6	34.43	16.32	3.72	34.72	16.26	3.19	34.89	15.52	3.14
3/27/07	1	0	501	D	10.5769	9.9936	10.5560	9.8975	7.0	6.7	29.48	14.79	3.12	29.71	14.41	3.48	32.15	18.13	3.74
3/27/07	1	0	502	D	11.8364	11.5350	11.6128	11.4731	5.5	5.6	40.53	27.85	11.56	39.48	23.52	7.38	37.40	23.22	10.02
3/27/07	1	0	503	D	11.1268	11.2916	10.6777	11.0246	5.6	5.6	37.93	26.79	10.09	39.29	25.37	10.54	37.02	24.08	10.10

3/27/07	1	0	504	D	10.0691	10.0094	9.7729	9.8626	5.7	5.7	39.71	26.47	6.52	38.65	25.20	7.56	39.76	25.94	6.44
3/27/07	1	0	505	D	11.5241	10.6219	11.3986	10.5759	5.7	5.5	44.40	21.84	8.45	41.74	21.19	6.69	43.79	25.56	8.07
3/27/07	1	0	506	D	11.2339	11.1842	11.1446	11.0073	5.6	5.6	42.80	26.96	11.12	42.40	27.23	8.17	45.98	28.27	10.26
3/27/07	1	0	507	D	11.7394	10.7841	11.2724	10.3959	5.8	5.7	44.78	26.02	10.30	48.62	23.98	9.87	46.60	25.94	11.00
3/28/07	2	0	508	A	11.0477	9.0274	10.9238	8.8656	7.2	7.3	26.78	10.42	1.56	25.92	10.92	1.93	27.22	13.21	2.52
3/28/07	2	0	509	A	10.1367	8.6040	10.1044	8.5715	6.0	6.1	32.27	15.44	4.02	35.31	17.08	4.57	28.69	13.02	3.35
3/28/07	2	0	510	A	12.2532	8.2979	12.1639	8.2511	5.6	5.6	35.13	25.37	11.50	36.06	22.23	8.76	38.55	23.74	9.40
3/28/07	2	0	511	A	10.7603	8.2517	10.7145	8.2119	5.6	5.7	44.94	22.38	10.33	46.17	20.88	10.20	41.32	22.67	8.73
3/28/07	2	0	512	A	10.8261	6.6125	10.7885	6.5771	6.2	6.2	34.34	20.41	5.56	32.49	21.62	7.84	32.91	22.21	7.24
3/28/07	2	0	513	A	8.1466	7.8986	8.0841	7.8171	5.7	5.7	33.96	20.17	5.43	32.49	22.63	8.45	29.89	17.09	5.39
3/28/07	2	0	514	A	8.1440	9.5888	8.1131	9.5518	5.6	5.6	37.44	26.68	10.53	36.71	23.10	9.40	39.27	21.69	10.04
3/28/07	2	0	515	A	6.7647	6.2757	6.7263	6.2384	5.9	5.9	35.72	19.83	5.72	33.64	18.07	5.14	33.34	19.66	6.40
3/28/07	2	0	508	B	10.2485	12.0231	10.1614	11.9066	6.9	7.0	31.56	13.75	2.60	30.77	14.61	3.31	29.41	12.99	2.50
3/28/07	2	0	509	B	9.4001	8.3756	9.3370	8.3199	5.7	6.1	45.13	19.23	7.73	36.18	17.56	4.33	35.95	16.27	4.65
3/28/07	2	0	510	B	7.0945	8.2991	7.1709	8.2585	5.6	5.6	39.67	26.62	11.40	44.04	24.63	11.42	40.33	26.56	12.29
3/28/07	2	0	511	B	10.6322	10.5287	10.5542	10.4811	5.4	5.4	53.12	24.31	14.34	54.53	17.91	12.16	50.18	24.85	11.80
3/28/07	2	0	512	B	8.7533	8.4192	8.6966	8.3633	5.9	5.9	36.54	21.14	6.44	40.23	24.84	9.84	33.78	26.73	10.50
3/28/07	2	0	513	B	9.2694	8.4857	9.2104	8.4299	5.7	5.6	36.01	21.47	7.04	37.82	23.24	10.57	38.94	25.52	10.22
3/28/07	2	0	514	B	7.3175	6.9338	7.2676	6.8963	5.7	5.7	33.78	22.10	6.45	37.14	22.70	9.75	34.17	21.97	8.33
3/28/07	2	0	515	B	6.5840	7.8994	6.5585	7.8569	5.7	5.8	39.79	17.23	6.39	41.86	22.14	8.84	35.05	18.36	5.64
3/28/07	2	0	508	C	10.3919	8.2724	10.3039	8.1683	6.8	6.9	27.29	12.45	1.84	35.88	17.92	5.48	29.29	18.82	3.92
3/28/07	2	0	509	C	9.5218	8.1851	9.4217	8.1142	6.2	6.3	35.69	17.18	4.70	32.29	12.75	2.38	34.07	17.43	4.56
3/28/07	2	0	510	C	9.7223	13.1290	9.6800	13.0459	5.6	5.6	42.95	24.62	11.44	41.86	23.42	10.94	44.73	28.30	13.72
3/28/07	2	0	511	C	7.6339	8.0562	7.5436	7.9868	5.5	5.5	50.96	26.27	14.77	52.13	22.30	14.77	46.44	19.83	9.87
3/28/07	2	0	512	C	7.3590	6.9205	7.3085	6.8654	5.8	5.8	40.99	20.13	7.62	42.21	20.90	7.46	40.80	19.79	6.55
3/28/07	2	0	513	C	8.0753	8.4652	8.0146	8.3623	5.8	5.8	35.65	23.87	8.68	36.62	25.43	10.58	38.39	27.67	11.18
3/28/07	2	0	514	C	9.9548	13.0860	9.8988	12.9913	5.7	5.7	37.78	29.43	11.99	35.27	22.43	9.15	37.99	20.60	10.39
3/28/07	2	0	515	C	7.1958	8.2510	7.1599	8.1830	5.7	5.7	34.80	18.27	5.24	35.51	20.46	7.11	38.15	25.70	10.12
3/28/07	2	0	508	D	7.6918	7.0913	7.6043	6.9362	6.9	6.9	31.43	22.23	7.16	31.94	20.08	5.56	37.29	19.85	6.11
3/28/07	2	0	509	D	7.7683	9.5479	7.7224	9.4582	5.8	5.8	40.05	17.78	6.45	47.93	23.97	12.18	49.52	25.64	13.11
3/28/07	2	0	510	D	11.2208	7.4015	11.0600	7.3221	5.5	5.5	46.11	24.49	12.45	45.12	23.33	10.61	45.34	25.55	12.96

3/28/07	2	0	511	D	10.9696	11.1399	10.8772	10.9835	5.3	5.5	48.42	23.53	10.14	49.94	25.88	14.56	50.11	21.77	13.38
3/28/07	2	0	512	D	6.9750	8.4455	6.9349	8.3201	5.6	5.9	42.21	29.61	10.45	38.45	21.20	4.59	34.26	16.52	5.10
3/28/07	2	0	513	D	11.6015	11.6365	11.2020	11.0487	5.6	5.6	36.48	25.10	9.26	40.31	29.67	13.20	35.87	21.60	6.71
3/28/07	2	0	514	D	8.4768	12.0200	8.3955	11.9497	5.6	5.6	41.20	22.86	10.69	42.38	26.29	12.99	42.13	25.91	12.11
3/28/07	2	0	515	D	13.4937	13.6151	13.2205	13.4389	5.8	5.8	35.40	19.96	5.85	36.62	20.99	7.65	41.87	21.38	10.49
3/29/07	3	0	516	A	10.6559	8.5255	10.5743	8.4395	5.9	6.2	39.69	21.40	4.88	38.24	20.84	5.12	38.32	13.16	2.87
3/29/07	3	0	517	A	10.2718	10.5706	10.1386	10.4503	6.5	6.2	30.93	16.06	2.93	30.93	16.43	3.50	31.74	20.59	4.03
3/29/07	3	0	518	A	12.2288	9.9721	12.0110	9.7810	5.8	5.7	41.15	20.54	8.64	47.21	21.10	9.79	42.31	19.70	7.87
3/29/07	3	0	519	A	12.5153	11.5060	12.4107	11.4348	5.7	5.7	40.98	23.01	10.00	39.60	25.12	10.84	38.89	20.98	7.35
3/29/07	3	0	520	A	11.0870	10.8883	10.7781	10.9887	6.9	7.0	37.90	15.71	1.32	32.76	15.46	1.67	31.43	19.68	3.88
3/29/07	3	0	521	A	10.9692	12.1124	10.8286	11.9216	7.0	7.0									
3/29/07	3	0	522	A	10.7805	8.5375	9.2526	8.3775	7.0	7.0									
3/29/07	3	0	523	A	10.3221	9.6306	10.1993	9.5170	6.9	7.0									
3/29/07	3	0	516	B	11.8320	8.3945	11.7070	8.2887	5.7	5.7	47.26	18.15	5.56	42.70	19.33	7.04	42.09	18.77	6.89
3/29/07	3	0	517	B	7.4673	6.3645	7.3726	6.2652	6.5	6.4	30.51	14.21	2.98	30.86	13.54	3.10	33.28	16.83	2.33
3/29/07	3	0	518	B	8.8423	10.3183	8.7350	10.1922	5.3	5.3	52.04	15.55	11.83	48.07	23.08	11.03	47.19	14.47	9.70
3/29/07	3	0	519	B	9.8497	8.8214	9.7708	8.7710	5.6	5.9	46.87	24.84	11.05	47.32	20.99	11.27	42.76	25.71	10.22
3/29/07	3	0	520	B	9.4019	9.0916	9.3155	8.9540	6.5	5.9	33.69	15.37	1.89	34.94	17.80	3.38	35.75	17.32	2.32
3/29/07	3	0	521	B	11.3261	10.1992	11.1839	10.0461	6.0	6.6	39.66	25.41	8.83	38.29	21.12	6.08	37.40	21.64	6.77
3/29/07	3	0	522	B	8.6793	11.0480	8.4366	10.6900	6.6	6.5	33.50	16.45	2.32	36.15	17.66	4.05	41.22	19.38	4.62
3/29/07	3	0	523	B	7.6856	11.8818	7.4823	11.6035	6.4	6.5									
3/29/07	3	0	516	C	10.4302	12.5318	10.3279	12.4051	5.9	6.2	41.48	19.72	5.31	43.11	21.46	5.85	47.36	15.01	1.00
3/29/07	3	0	517	C	10.1575	10.2417	10.0534	10.1506	6.4	6.2	35.05	14.54	2.21	41.15	23.30	8.30	29.72	14.35	2.42
3/29/07	3	0	518	C	8.2127	7.1435	8.1408	7.0733	5.9	5.6	54.96	17.90	8.97	46.70	19.08	7.66	46.99	24.87	12.80
3/29/07	3	0	519	C	8.7560	9.4888	8.6339	9.4008	5.6	5.4	49.37	16.75	10.40	48.70	21.88	10.95	49.52	17.01	10.24
3/29/07	3	0	520	C	10.5377	9.7980	10.4321	9.3220	6.8	7.1	32.74	21.34	6.67	30.27	16.42	3.00	40.18	19.69	4.67
3/29/07	3	0	521	C	11.1660	9.7408	11.0442	9.6423	6.4	6.8	44.16	18.16	5.18	40.23	21.15	7.50	40.58	20.64	7.08
3/29/07	3	0	522	C	8.2616	9.9040	8.1620	9.7871	6.6	6.9	31.48	18.71	4.43	35.44	17.97	3.99	34.04	17.93	4.02
3/29/07	3	0	523	C	7.5426	7.8017	7.4208	7.7373	6.7	6.7									
3/29/07	3	0	516	D	12.5877	10.5580	12.1601	10.3432	6.0	6.1	41.27	20.72	4.54	41.22	22.48	7.78	38.58	17.47	2.60
3/29/07	3	0	517	D	11.9197	9.6113	11.8070	9.5321	6.3	6.4									

3/29/07	3	0	518	D	7.9210	10.1042	7.8582	10.0512	5.7	5.7	50.53	17.80	9.17	46.52	20.71	10.72	45.07	23.23	9.82
3/29/07	3	0	519	D	9.8705	9.7163	9.7704	9.6360	5.7	5.6	45.54	21.65	10.82	46.07	18.25	10.05	43.79	25.60	13.04
3/29/07	3	0	520	D	8.9674	9.6598	8.8707	9.5833	6.5	6.8	42.23	22.93	7.13	41.83	25.39	9.90	37.41	18.69	3.80
3/29/07	3	0	521	D	11.2658	8.4409	11.1505	8.1531	6.0	6.1									
3/29/07	3	0	522	D	8.3871	9.8218	8.2242	9.6622	6.0	6.4	36.55	23.46	5.78	34.19	20.48	4.80	33.37	26.26	6.79
3/29/07	3	0	523	D	9.0190	7.3981	8.8564	7.3006	6.9	6.8	37.60	22.76	5.75	46.31	19.95	9.97	37.40	21.56	5.39
4/10/07	1	14	500	A	8.3949	11.4708	8.2636	11.3466	6.5	6.3	30.38	12.33	0.72	33.62	17.74	3.85	30.04	13.09	0.83
4/10/07	1	14	501	A	12.1803	11.9880	12.0994	11.8887	6.8	6.3	41.45	24.00	9.85	41.39	18.98	5.59	38.76	24.37	9.29
4/10/07	1	14	502	A	9.8672	10.1846	9.6358	9.8325	5.8	5.7	39.10	24.06	8.87	36.89	23.10	8.33	35.92	19.61	4.70
4/10/07	1	14	503	A	8.9303	9.1982	8.8580	9.1076	6.4	6.1	37.54	23.60	8.74	35.80	21.49	6.87	38.38	21.40	7.99
4/10/07	1	14	504	A	7.8835	11.6918	7.7238	11.5144	6.1	5.6	35.78	22.86	7.99	35.10	23.49	8.70	37.03	18.98	4.75
4/10/07	1	14	505	A	10.2354	10.4535	10.1780	10.3811	6.0	5.6	34.45	20.29	6.69	42.50	24.69	13.58	38.54	20.12	8.28
4/10/07	1	14	506	A	9.9894	12.6621	9.9037	12.5496	5.7	5.8	33.95	21.80	7.38	26.37	15.48	5.05	37.90	24.01	9.45
4/10/07	1	14	507	A	9.3153	12.0444	9.2663	11.9711	5.6	5.7	42.20	14.81	7.55	39.27	25.02	9.33	38.95	20.07	5.50
4/10/07	1	14	500	B	9.0968	9.5062	8.9824	9.4189	6.4	6.2	31.65	12.66	0.89	33.22	13.64	2.51	33.11	12.74	2.38
4/10/07	1	14	501	B	11.0005	12.1651	10.7919	12.0381	6.6	6.4	34.06	12.42	1.41	33.43	13.67	2.10	38.66	14.87	2.70
4/10/07	1	14	502	B	11.1615	11.2937	11.0341	11.2089	5.5	5.4	45.19	23.35	10.81	48.71	21.26	10.45	45.45	25.21	10.83
4/10/07	1	14	503	B	11.3043	12.5513	11.1027	12.4017	5.4	5.4	42.87	23.78	10.74	47.28	19.81	9.37	42.03	22.65	9.58
4/10/07	1	14	504	B	13.2273	10.0557	12.8878	9.9566	5.8	5.7	39.26	26.70	10.51	39.50	23.33	7.84	38.61	23.07	7.33
4/10/07	1	14	505	B	10.2887	10.1983	10.2137	10.1161	5.4	5.5	44.96	21.93	10.30	40.64	20.03	8.73	37.19	20.94	8.23
4/10/07	1	14	506	B	9.7513	10.9789	9.6170	10.8955	5.4	5.4	39.72	19.73	8.08	38.40	21.89	7.96	41.13	21.59	9.96
4/10/07	1	14	507	B	7.1358	10.4077	7.0704	10.3014	5.8	5.5	43.83	27.88	11.32	42.47	21.02	7.88	51.12	22.44	13.97
4/10/07	1	14	500	C	11.4658	10.8896	11.2600	10.7055	6.3	6.1	36.59	16.44	2.15	34.92	14.45	2.42	35.53	16.29	1.75
4/10/07	1	14	501	C	12.9502	9.7763	12.7000	9.6020	6.6	6.6	30.81	11.83	0.50	30.04	13.35	0.52	33.48	17.34	2.68
4/10/07	1	14	502	C	9.3197	8.9331	9.1479	8.7364	5.6	5.5	44.76	21.51	8.68	45.74	25.15	11.14	47.18	24.49	11.56
4/10/07	1	14	503	C	10.5189	8.6846	10.4490	8.5931	5.5	5.5	42.95	24.44	10.55	41.09	22.00	9.00	46.15	23.54	10.66
4/10/07	1	14	504	C	9.7289	12.7518	9.1982	12.2189	5.6	5.6	38.94	19.92	4.46	37.51	21.30	6.85	40.54	26.87	10.46
4/10/07	1	14	505	C	11.2014	10.8542	11.1573	10.7505	5.5	5.5	42.94	20.46	10.31	41.05	17.33	7.91	39.36	18.36	5.82
4/10/07	1	14	506	C	9.2465	11.2107	9.1195	10.8441	5.6	5.6	35.28	19.65	6.17	41.44	22.36	9.29	41.65	18.65	6.55
4/10/07	1	14	507	C	9.3241	6.8340	9.2355	6.7420	5.6	5.5	48.21	22.28	9.94	57.01	18.42	12.89	46.67	18.57	6.27
4/10/07	1	14	500	D	9.0888	10.9660	8.9533	10.8396	6.3	6.3	34.75	15.52	0.80	35.85	15.60	1.17	36.92	17.77	3.34

4/10/07	1	14	501	D	11.6134	10.7826	11.3842	10.5698	6.6	6.7	36.98	15.79	1.58	31.40	13.48	1.18	33.39	17.79	4.17
4/10/07	1	14	502	D	12.0730	10.7337	11.8642	10.6408	5.6	5.6	42.38	22.55	9.05	41.61	19.93	6.94	44.22	24.25	11.00
4/10/07	1	14	503	D	11.3373	8.7176	11.1899	8.6110	5.6	5.8	40.90	24.46	9.20	40.85	18.05	7.04	39.63	23.81	9.26
4/10/07	1	14	504	D	9.3347	9.4006	9.0724	9.2309	5.7	5.7	35.94	19.81	4.99	35.45	21.61	4.82	38.12	22.41	8.19
4/10/07	1	14	505	D	13.2771	14.7184	12.9791	14.4492	5.9	5.5	35.11	17.63	9.56	40.10	21.23	10.08	41.82	17.32	8.44
4/10/07	1	14	506	D	11.7536	9.5415	11.4835	9.4012	5.8	5.6	41.79	24.23	10.29	37.03	21.28	7.60	38.65	20.82	8.21
4/10/07	1	14	507	D	8.0273	9.7551	7.8345	9.6303	5.7	5.6	48.41	14.04	9.43	40.96	16.61	9.16	44.93	21.71	13.06
4/11/07	2	14	508	A	10.4690	11.2055	10.3750	11.0928	6.9	6.8	28.28	13.58	2.00	36.40	9.56	2.45	30.75	14.84	4.32
4/11/07	2	14	509	A	12.1225	12.3816	12.0102	12.3093	5.7	5.6	34.07	15.47	1.95	34.08	15.01	1.92	39.35	21.42	6.38
4/11/07	2	14	510	A	11.8432	11.3675	11.7792	11.3005	5.6	5.4	41.11	23.74	8.97	37.49	23.18	8.70	39.50	23.74	9.13
4/11/07	2	14	511	A	12.5717	9.9771	12.5326	9.9348	5.5	5.5	45.48	24.39	10.45	43.89	20.99	9.08	44.39	22.62	9.43
4/11/07	2	14	512	A	12.5060	11.5976	12.3788	11.4962	5.9	5.9	38.59	23.83	7.40	32.90	21.61	6.65	33.50	23.45	7.35
4/11/07	2	14	513	A	11.2552	10.4895	11.1309	10.4070	5.6	5.6	35.64	22.69	7.49	35.60	18.30	6.31	36.69	24.03	8.98
4/11/07	2	14	514	A	11.6480	9.4321	11.5671	9.3484	5.5	5.5	41.07	25.04	10.89	40.92	25.03	11.15	35.18	19.93	6.75
4/11/07	2	14	515	A	9.2826	8.9878	9.1653	8.9272	5.7	5.7	34.19	19.28	7.05	31.72	20.56	5.72	34.73	23.04	7.65
4/11/07	2	14	508	B	10.5406	10.6467	10.4384	10.5613	6.8	6.9	27.89	11.42	0.13	29.69	13.32	3.65	28.92	14.54	2.36
4/11/07	2	14	509	B	11.9641	10.3508	11.6327	10.2364	6.4	6.0	37.58	17.44	2.48	40.02	21.17	5.27	34.26	15.84	4.69
4/11/07	2	14	510	B	11.9612	12.4266	11.7597	12.1619	5.5	5.5	39.49	22.47	8.78	44.60	24.58	11.01	41.69	23.38	9.17
4/11/07	2	14	511	B	9.2473	8.5976	9.1570	8.5284	5.5	5.4	45.00	22.35	9.70	47.39	27.39	12.13	51.10	24.59	12.70
4/11/07	2	14	512	B	6.7949	10.0878	6.7192	9.7203	5.8	5.9	34.65	19.60	4.18	42.63	25.74	8.94	34.81	20.23	3.67
4/11/07	2	14	513	B	7.6619	11.4959	7.5647	11.4000	5.5	5.5	37.49	23.09	7.96	40.73	24.10	9.65	43.36	19.41	9.27
4/11/07	2	14	514	B	10.7038	7.6783	10.6502	7.6023	5.4	5.6	43.56	31.46	13.70	44.42	33.67	14.87	41.13	26.30	11.73
4/11/07	2	14	515	B	7.8772	8.5987	7.8181	8.5007	6.0	5.8	35.11	22.09	7.43	37.61	21.84	4.56	34.92	16.60	2.19
4/11/07	2	14	508	C	10.5217	9.8396	10.3778	9.6580	6.8	6.7	29.97	13.02	0.79	30.11	16.79	2.88	31.24	17.86	3.91
4/11/07	2	14	509	C	9.4526	8.8882	9.1903	8.7905	6.0	5.9	36.84	18.04	4.09	35.33	17.46	5.35	34.52	16.55	2.66
4/11/07	2	14	510	C	11.1789	11.8685	11.0906	11.7224	5.5	5.5	42.56	23.60	9.40	40.73	25.20	10.48	44.24	25.84	10.99
4/11/07	2	14	511	C	10.1800	9.6016	9.9943	9.5172	5.3	5.3	47.58	20.91	11.44	49.53	23.01	12.53	49.64	22.52	10.90
4/11/07	2	14	512	C	10.6073	13.0774	10.4262	13.0086	5.8	5.8	37.29	24.37	7.85	33.09	19.29	3.74	37.47	24.65	8.86
4/11/07	2	14	513	C	13.6949	13.5101	13.5613	13.1925	5.6	5.6	37.96	23.03	7.02	35.79	26.00	9.05	39.30	26.45	10.17
4/11/07	2	14	514	C	6.4320	10.7684	6.3560	10.7284	5.6	5.5	37.53	22.11	8.16	38.50	25.14	10.71	35.74	24.23	9.33
4/11/07	2	14	515	C	12.3686	8.6687	12.2842	8.5532	5.6	5.8	36.04	22.71	6.11	34.32	18.20	2.49	34.02	19.22	3.57

4/11/07	2	14	508	D	12.3978	8.8938	12.1926	8.7986	6.8	6.8	29.81	12.93	1.66	26.86	12.75	2.05	33.00	16.51	3.00
4/11/07	2	14	509	D	9.5838	7.1849	9.5289	7.0592	5.8	6.00	34.15	15.78	4.02	41.33	18.65	6.29	38.44	19.12	6.84
4/11/07	2	14	510	D	8.1789	7.4051	8.0913	7.3578	5.5	5.60	44.13	23.11	10.57	42.30	20.45	8.15	42.17	23.04	10.57
4/11/07	2	14	511	D	9.0764	8.9629	8.8413	8.8740	5.4	5.30	46.93	21.71	10.13	43.85	17.86	8.40	49.05	20.36	9.45
4/11/07	2	14	512	D	8.0551	12.3864	7.8610	12.1486	5.9	5.70	37.42	19.94	5.19	38.94	24.20	8.47	35.91	19.65	2.96
4/11/07	2	14	513	D	9.0899	11.5505	8.9589	11.3889	5.5	5.60	34.48	18.39	6.05	41.33	25.79	10.42	38.97	22.21	8.61
4/11/07	2	14	514	D	11.6747	10.9851	11.5747	10.9100	5.7	5.50	36.63	22.66	7.49	35.87	21.98	5.63	37.47	19.96	7.42
4/11/07	2	14	515	D	9.5250	8.2037	9.4134	8.1044	5.8	5.80	35.15	21.43	7.29	33.71	19.35	4.22	35.87	19.96	5.29
4/12/07	3	14	516	A	12.3170	12.5026	12.2142	12.2553	6.0	5.8	36.10	18.83	3.64	33.58	15.68	3.26	36.12	19.54	5.69
4/12/07	3	14	517	A	8.6613	9.4776	8.5794	9.3730	6.6	6.5	30.81	13.06	2.06	29.78	10.76	1.38	33.33	16.18	4.45
4/12/07	3	14	518	A	9.7507	10.5833	9.6635	10.4724	5.4	5.5	46.56	19.74	7.82	45.30	19.44	7.99	46.57	23.72	10.44
4/12/07	3	14	519	A	12.0027	11.1746	11.8740	11.0648	5.4	5.5	40.73	22.89	9.41	41.29	20.89	7.67	44.68	21.10	9.18
4/12/07	3	14	520	A	8.8962	8.5813	8.7531	8.4206	6.4	6.5	34.33	17.11	3.40	31.99	19.63	3.65	39.85	21.44	5.94
4/12/07	3	14	521	A	7.2032	5.8742	7.1166	5.7861	6.8	6.8	34.44	13.39	3.05	34.38	13.58	3.86	36.71	15.91	6.01
4/12/07	3	14	522	A	7.9804	8.3648	7.8985	8.0363	6.7	6.5	31.49	18.30	3.60	38.43	21.43	5.09	37.28	22.80	8.52
4/12/07	3	14	523	A	6.3672	5.3910	6.3170	5.3338	6.7	6.7	39.89	17.51	6.35	38.28	18.03	5.20	37.28	21.60	5.70
4/12/07	3	14	516	B	9.1917	9.7192	9.0985	9.5779	5.9	5.7	40.89	22.72	8.62	34.90	17.85	5.19	48.27	25.69	11.10
4/12/07	3	14	517	B	7.2345	9.2584	7.1303	9.1818	6.2	6.3	34.88	15.95	2.33	37.19	13.69	3.19	29.33	13.86	2.96
4/12/07	3	14	518	B	8.2785	10.9115	8.1825	10.7875	5.3	5.5	50.81	21.01	10.99	51.18	19.28	10.47	48.78	20.07	9.35
4/12/07	3	14	519	B	11.1220	10.1200	10.9595	9.9607	5.4	5.5	44.56	22.12	9.41	45.38	22.91	9.94	47.35	26.38	12.07
4/12/07	3	14	520	B	7.6099	9.5439	7.5327	9.2988	6.4	6.4	35.41	20.13	4.93	33.02	21.25	3.65	32.39	19.07	3.70
4/12/07	3	14	521	B	5.8400	8.3405	5.7051	7.9431	6.0	6.2	44.07	20.05	6.39	44.56	20.28	7.38	43.83	15.89	5.22
4/12/07	3	14	522	B	6.6007	7.1500	6.2960	7.0199	6.7	6.7	35.30	23.75	6.23	36.95	18.89	2.75	34.35	23.74	5.71
4/12/07	3	14	523	B	5.2641	5.2247	5.1687	5.1384	6.8	6.8	38.88	20.45	4.90	39.58	21.64	6.64	40.43	17.97	3.59
4/12/07	3	14	516	C	8.0331	7.2592	7.9848	7.2007	5.9	6.0	36.20	17.12	3.84	41.31	21.04	7.54	37.65	16.98	3.92
4/12/07	3	14	517	C	8.4206	7.1574	8.2250	7.0416	5.8	6.5	30.96	15.61	3.42	32.74	16.77	3.21	30.70	16.27	3.32
4/12/07	3	14	518	C	8.0641	11.1061	7.8029	10.9268	5.4	5.5	47.16	18.71	8.60	49.41	19.36	8.84	47.12	21.63	8.96
4/12/07	3	14	519	C	8.5077	8.4653	8.2664	8.3862	5.6	5.5	45.50	23.23	10.46	45.98	21.83	7.47	44.95	25.76	10.71
4/12/07	3	14	520	C	11.3200	12.0415	11.1984	11.8897	7.1	6.8	32.30	20.07	4.06	37.77	26.73	7.57	39.40	18.02	4.69
4/12/07	3	14	521	C	8.3171	6.4292	8.2153	6.3551	6.5	6.5	37.77	18.73	6.72	39.45	19.36	5.08	36.42	17.66	5.05
4/12/07	3	14	522	C	8.6624	7.1155	8.5595	7.0109	6.7	6.9	36.08	20.14	4.31	35.24	22.82	6.76	33.26	20.24	5.97

4/12/07	3	14	523	C	6.8490	8.9778	6.7182	8.8412	6.7	6.7	38.03	22.98	7.31	39.03	24.23	8.05	41.23	20.41	6.20
4/12/07	3	14	516	D	9.7558	9.6351	9.5978	9.4971	5.7	5.7	43.98	21.38	6.93	42.73	20.84	6.78	43.54	21.81	8.01
4/12/07	3	14	517	D	10.7330	10.4183	10.5800	10.3267	6.6	6.5	32.72	15.64	3.36	33.28	13.47	2.65	38.77	16.40	4.20
4/12/07	3	14	518	D	7.8250	7.6092	7.7458	7.5333	5.5	5.5	44.86	21.29	8.54	48.31	19.97	9.13	50.51	22.15	10.37
4/12/07	3	14	519	D	9.6689	10.2933	9.3835	10.1453	5.4	5.5	44.56	19.77	7.79	45.50	23.90	10.31	41.75	24.00	9.15
4/12/07	3	14	520	D	7.6233	5.1404	7.4808	5.0748	6.6	6.7	38.58	26.83	9.29	40.44	20.34	4.03	40.54	29.31	8.07
4/12/07	3	14	521	D	8.8619	8.2525	8.6834	8.1542	6.3	6.4	39.39	17.68	4.88	39.21	23.70	9.29	39.83	21.45	6.95
4/12/07	3	14	522	D	9.5964	9.0666	9.3977	8.9335	6.9	6.9	35.35	21.87	5.51	37.69	29.22	9.50	38.16	19.69	5.65
4/12/07	3	14	523	D	8.2509	6.2931	8.1227	6.1595	6.9	6.9	36.38	21.03	6.18	32.90	20.19	6.62	36.39	18.53	4.93
4/24/07	1	28	500	A	8.8757	10.5892	8.8020	10.5432	6.51	6.52	34.12	20.76	3.89	38.37	12.24	2.49	38.20	17.96	8.28
4/24/07	1	28	501	A	10.3082	7.7219	10.2494	7.6826	6.55	6.49	31.56	12.58	1.14	30.52	12.14	1.14	31.96	14.72	3.44
4/24/07	1	28	502	A	7.7503	11.3126	7.6985	11.2517	5.54	5.47	38.85	28.32	12.95	38.74	24.49	10.90	37.86	24.59	10.41
4/24/07	1	28	503	A	13.3591	10.2656	13.2754	10.1712	5.46	5.38	39.53	27.95	12.48	40.04	26.61	12.37	45.07	23.09	10.93
4/24/07	1	28	504	A	11.5650	9.2430	11.4752	9.1429	5.55	5.56	38.55	20.97	8.14	38.72	22.65	8.55	38.30	24.96	10.56
4/24/07	1	28	505	A	12.3198	10.6093	12.2236	10.5129	5.56	5.36	39.16	18.73	9.87	37.95	21.34	9.71	38.16	20.26	9.71
4/24/07	1	28	506	A	10.0043	8.4506	9.9060	8.3617	5.52	5.57	34.48	22.38	9.81	35.70	19.86	7.99	34.36	19.77	7.53
4/24/07	1	28	507	A	11.5440	6.5327	11.4593	6.4703	5.52	5.53	40.71	20.84	9.77	43.84	21.07	10.89	44.17	18.81	7.86
4/24/07	1	28	500	B	11.4347	12.3617	11.4006	12.3119	5.84	5.79	43.04	18.87	8.02	40.20	19.03	7.18	47.18	16.82	8.76
4/24/07	1	28	501	B	10.1312	14.4608	10.0114	14.3105	6.54	6.57	35.08	13.56	1.97	35.52	15.15	4.86	33.83	16.30	4.92
4/24/07	1	28	502	B	10.4325	9.8958	10.3569	9.8117	5.37	5.29	49.89	23.57	14.04	46.30	23.33	12.26	45.40	16.62	11.95
4/24/07	1	28	503	B	10.5984	12.4148	10.4870	12.3287	5.52	5.21	45.19	24.25	13.15	45.94	20.57	11.36	40.60	19.29	10.43
4/24/07	1	28	504	B	9.4214	7.2230	9.3771	7.1930	5.52	5.45	43.17	27.71	12.82	43.78	21.50	7.59	46.87	27.77	14.51
4/24/07	1	28	505	B	12.2357	9.7468	12.1728	9.6842	5.33	5.29	38.74	21.96	9.68	39.27	24.72	11.99	37.49	21.59	9.87
4/24/07	1	28	506	B	13.3135	10.7987	13.2499	10.7252	5.46	5.40	45.73	24.62	14.79	38.15	18.38	5.79	44.26	24.40	13.54
4/24/07	1	28	507	B	5.1858	6.0403	5.1380	5.9971	5.38	5.35	45.17	21.51	10.92	44.51	24.17	12.35	45.46	23.65	11.98
4/24/07	1	28	500	C	11.0343	13.7379	10.9441	13.5440	6.31	6.41	29.31	13.88	2.42	32.91	14.97	2.14	33.41	15.26	2.52
4/24/07	1	28	501	C	13.7020	14.0737	13.5273	13.9750	6.45	6.45	32.78	17.55	6.94	33.97	16.62	4.53	31.93	15.08	2.11
4/24/07	1	28	502	C	14.7802	7.7750	14.6485	7.3450	5.34	5.29	46.04	23.86	13.34	49.56	19.83	11.77	43.56	26.05	12.36
4/24/07	1	28	503	C	11.0795	9.7517	10.8223	9.5899	5.29	5.31	42.78	22.43	11.80	41.45	22.49	11.33	41.65	23.83	12.24
4/24/07	1	28	504	C	11.2170	13.3503	11.0233	13.1772	5.39	5.46	39.61	26.50	11.71	43.93	20.44	9.03	42.44	29.37	14.13
4/24/07	1	28	505	C	9.9147	8.1566	9.8383	7.9756	5.37	5.33	45.78	26.78	12.85	46.77	25.77	12.76	52.61	21.91	16.08

4/24/07	1	28	506	C	14.0340	12.9853	13.8945	12.6301	5.47	5.36	41.25	23.13	9.53	38.69	25.61	10.91	42.31	23.85	11.82
4/24/07	1	28	507	C	7.8852	6.3786	7.7960	6.3130	5.47	5.43	50.32	18.42	10.02	46.33	22.76	6.08	46.83	25.60	14.31
4/24/07	1	28	500	D	9.6999	9.3829	9.5999	9.2762	6.38	6.47	37.69	18.67	4.72	35.39	15.73	3.98	35.69	23.24	9.90
4/24/07	1	28	501	D	13.5096	11.5519	13.2284	11.3765	6.55	6.62	36.26	20.75	9.14	37.34	17.41	5.25	37.13	19.15	7.84
4/24/07	1	28	502	D	11.7999	12.8003	11.7031	12.7523	5.73	5.49	44.35	28.17	15.79	43.59	25.53	13.49	43.80	23.10	10.65
4/24/07	1	28	503	D	8.3338	7.9863	8.1704	7.9098	5.33	5.34	40.99	21.75	8.21	38.61	22.69	9.75	41.35	24.40	11.93
4/24/07	1	28	504	D	8.5312	10.0806	8.4459	9.9757	5.42	5.46	41.68	25.49	11.11	36.24	25.79	10.88	39.33	23.23	8.84
4/24/07	1	28	505	D	8.5105	10.5179	8.4481	10.4247	5.53	5.51	38.74	19.14	8.82	38.67	21.41	10.33	41.69	21.44	10.77
4/24/07	1	28	506	D	8.6557	11.6505	8.4561	11.2343	5.42	5.53	43.02	26.31	13.20	36.65	23.05	11.94	38.95	21.74	7.34
4/24/07	1	28	507	D	7.0437	7.5960	6.9444	7.5058	5.57	5.50	48.45	23.27	13.41	47.67	22.02	12.39	46.90	22.44	11.97
4/25/07	2	28	508	A	15.3600	13.5303	15.2070	13.4353	6.85	6.68	28.67	12.70	3.64	30.08	15.25	5.95	33.62	21.31	8.10
4/25/07	2	28	509	A	11.7064	10.1695	11.6316	10.1006	5.49	5.56	35.26	16.01	2.71	34.75	14.45	3.22	36.29	16.15	4.34
4/25/07	2	28	510	A	12.0281	9.8218	11.9521	9.7759	6.22	5.84	40.53	25.91	11.76	41.55	17.62	9.01	40.74	24.73	11.24
4/25/07	2	28	511	A	8.0418	12.3389	7.9676	12.2357	5.72	5.55	47.04	22.08	11.87	46.40	22.46	11.86	44.34	22.87	11.15
4/25/07	2	28	512	A	9.0643	12.9113	8.9921	12.8623	6.25	6.10	40.41	19.50	7.52	38.05	22.73	9.15	38.59	22.11	8.97
4/25/07	2	28	513	A	7.7730	11.4871	7.7260	11.4420	5.82	5.80	33.90	22.14	8.65	35.21	23.08	8.28	33.26	20.22	7.63
4/25/07	2	28	514	A	10.1044	9.3632	10.0742	9.3173	5.58	5.66	39.49	24.03	12.03	39.91	24.34	11.85	39.99	27.24	14.62
4/25/07	2	28	515	A	14.0466	7.8134	13.9623	7.7786	5.97	5.90	38.03	21.68	8.03	34.94	19.67	7.16	32.89	16.15	4.44
4/25/07	2	28	508	B	16.2467	12.0996	16.0488	11.9488	6.91	6.96	30.95	15.40	3.64	36.23	14.88	4.99	27.75	11.91	2.76
4/25/07	2	28	509	B	14.1728	13.1268	14.1087	13.0432	6.13	6.05	36.85	16.94	5.36	33.22	13.53	2.33	38.29	20.53	6.28
4/25/07	2	28	510	B	15.1837	12.5602	15.1372	12.5313	5.49	5.54	44.75	26.50	12.93	47.74	28.09	14.21	39.94	23.70	11.84
4/25/07	2	28	511	B	7.4159	8.9144	7.2984	8.8633	5.54	5.55	50.27	23.11	15.05	50.05	27.06	15.20	48.94	25.34	13.39
4/25/07	2	28	512	B	8.8375	6.9613	8.7864	6.9182	5.93	6.06	39.72	24.58	8.73	37.66	22.80	7.87	36.30	23.53	6.91
4/25/07	2	28	513	B	8.2512	8.2518	7.9215	8.1442	5.91	5.75	42.72	23.87	11.07	37.94	25.44	10.50	36.80	21.70	8.51
4/25/07	2	28	514	B	10.8743	8.4714	10.8051	8.4401	5.61	5.65	39.01	27.63	12.84	38.23	22.65	10.00	41.25	27.71	12.92
4/25/07	2	28	515	B	9.3123	11.4539	9.1871	11.4183	5.86	5.84	39.86	25.36	8.78	38.50	22.95	8.60	33.73	18.84	6.77
4/25/07	2	28	508	C	12.6511	14.2585	12.5049	14.0802	6.97	7.02	32.51	15.70	4.25	28.06	12.24	1.99	31.20	16.96	4.80
4/25/07	2	28	509	C	10.5036	11.8191	10.3694	11.7476	6.06	6.05	40.87	19.66	8.25	38.49	16.81	4.54	38.55	19.72	5.86
4/25/07	2	28	510	C	8.4828	9.5817	8.4558	9.5557	5.52	5.49	39.11	22.32	9.74	37.99	21.49	8.53	41.20	24.36	12.06
4/25/07	2	28	511	C	13.6421	9.0330	13.4258	8.8942	6.17	5.49	49.68	23.78	12.56	51.82	26.58	15.23	49.02	27.33	15.17
4/25/07	2	28	512	C	9.9798	11.5367	9.8818	11.4414	5.99	6.08	37.89	21.87	7.40	38.55	23.66	7.26	41.53	26.61	9.48

4/25/07	2	28	513	C	9.2906	10.9590	9.1729	10.7963	5.66	5.63	38.09	22.30	9.28	37.31	21.59	8.97	38.82	25.71	11.94
4/25/07	2	28	514	C	12.3836	9.7219	12.3375	9.6858	5.59	5.55	41.20	27.62	13.95	38.72	26.62	13.58	38.60	25.88	11.75
4/25/07	2	28	515	C	9.8551	10.6007	9.7922	10.5443	5.93	5.84	36.70	22.14	8.76	36.64	22.40	10.17	34.89	18.90	8.22
4/25/07	2	28	508	D	13.1676	10.3551	13.1040	10.2616	7.09	7.10	28.75	12.30	3.75	29.78	12.90	2.89	31.17	13.85	3.24
4/25/07	2	28	509	D	10.2752	10.3764	10.1465	10.2990	5.99	6.07	39.76	18.47	5.27	42.24	21.03	7.51	39.80	17.43	4.52
4/25/07	2	28	510	D	9.9565	10.4082	9.9122	10.3529	5.54	5.49	39.90	22.34	9.37	41.25	23.12	10.12	38.74	21.89	9.21
4/25/07	2	28	511	D	9.1835	12.1114	9.1317	12.0323	5.49	5.48	46.88	19.11	10.57	50.28	22.29	13.00	46.98	19.31	11.13
4/25/07	2	28	512	D	13.4801	9.8176	13.3231	9.6695	5.97	5.77	38.79	24.62	9.25	35.82	23.10	8.19	36.89	22.14	7.48
4/25/07	2	28	513	D	14.1458	10.0882	14.1022	10.0004	5.66	5.73	40.92	23.54	11.31	39.77	29.14	11.81	38.28	22.36	5.84
4/25/07	2	28	514	D	9.1621	8.7926	9.1371	8.7688	5.54	5.57	39.53	25.70	12.30	41.31	25.24	12.12	39.95	26.39	11.04
4/25/07	2	28	515	D	13.0786	10.7546	12.9363	10.5110	5.71	5.72	40.20	21.84	9.30	41.87	20.05	10.03	39.18	20.66	8.83
4/26/07	3	28	516	A	12.3684	11.6777	12.2835	11.6306	5.72	5.80	41.87	19.94	7.66	42.50	22.32	9.94	40.35	20.73	7.88
4/26/07	3	28	517	A	7.9315	9.2188	7.8939	9.1332	5.58	6.06	42.06	26.66	12.20	32.78	19.38	7.17	37.12	15.67	6.99
4/26/07	3	28	518	A	7.0975	7.3853	7.0370	7.3346	5.70	5.45	44.93	20.22	9.63	45.95	23.49	12.93	44.64	22.05	10.00
4/26/07	3	28	519	A	11.4822	11.0877	11.4253	11.0389	5.56	5.60	42.40	20.27	9.21	40.46	19.58	8.27	43.70	18.37	9.15
4/26/07	3	28	520	A	8.7621	9.0218	8.6816	8.9485	6.76	6.76	29.74	14.82	2.69	30.68	17.02	3.74	29.27	11.96	1.54
4/26/07	3	28	521	A	9.7196	9.6500	9.6339	9.6018	6.70	6.85	36.36	19.58	8.91	34.41	16.08	5.59	35.88	16.83	6.08
4/26/07	3	28	522	A	7.9209	9.0148	7.8326	8.9486	6.55	6.38	32.82	19.50	6.63	32.65	18.02	6.31	34.85	20.00	8.45
4/26/07	3	28	523	A	6.8599	7.2479	6.7779	7.1370	6.69	6.67	40.49	21.47	13.54	38.61	22.80	8.49	37.65	24.99	10.73
4/26/07	3	28	516	B	8.8438	7.9845	8.6020	7.8517	5.81	5.81	44.07	22.23	10.24	40.74	20.57	9.41	45.33	18.73	7.09
4/26/07	3	28	517	B	11.9422	8.2724	11.8844	8.2066	6.49	6.51	36.32	18.75	4.92	33.61	16.92	2.98	39.00	23.03	9.90
4/26/07	3	28	518	B	7.7479	6.1571	7.6905	6.1199	5.34	5.38	52.17	15.70	11.05	49.93	18.38	12.29	47.91	14.43	10.60
4/26/07	3	28	519	B	10.6638	9.0513	10.5915	9.0204	5.47	5.50	45.66	19.13	10.70	42.45	21.52	10.90	45.40	23.02	12.46
4/26/07	3	28	520	B	9.1855	9.5677	9.1074	9.2932	5.94	6.42	37.24	22.13	3.66	32.26	16.91	3.31	35.39	18.41	3.65
4/26/07	3	28	521	B	6.9734	6.1140	6.9280	6.0602	5.83	5.88	45.39	25.04	12.39	51.30	20.46	13.64	47.41	25.69	14.69
4/26/07	3	28	522	B	7.0469	8.0857	6.8937	7.9881	6.22	6.66	36.40	20.61	4.39	36.30	20.84	6.03	31.39	17.27	4.86
4/26/07	3	28	523	B	5.2569	6.5030	5.1770	6.4234	6.48	6.99	35.37	20.99	6.54	35.89	20.11	7.18	36.83	17.90	5.65
4/26/07	3	28	516	C	5.8650	6.8719	5.7915	6.8224	5.89	5.96	46.09	23.89	10.61	40.55	22.56	9.89	38.98	16.62	3.16
4/26/07	3	28	517	C	11.2094	8.9717	10.9947	8.8926	6.57	6.63	29.51	14.82	3.94	30.26	15.71	4.63	34.76	16.95	6.37
4/26/07	3	28	518	C	10.7808	12.7522	10.7332	12.6761	5.53	5.48	54.53	23.01	13.49	49.13	22.47	12.52	54.20	25.55	13.62
4/26/07	3	28	519	C	10.3825	9.4508	10.3266	9.4142	5.57	5.55	48.89	21.46	11.56	47.19	24.27	12.76	44.34	18.54	9.88

4/26/07	3	28	520	C	9.0962	9.8507	9.0258	9.7743	6.89	6.92	39.81	18.74	4.15	31.89	17.16	2.75	31.56	16.01	3.19
4/26/07	3	28	521	C	13.6796	10.6920	13.5144	10.5133	6.76	6.77	37.93	18.00	6.85	37.20	17.56	5.47	39.30	22.89	8.65
4/26/07	3	28	522	C	10.8964	9.6518	10.5609	9.4123	6.72	6.79	37.05	19.42	5.12	35.06	21.15	6.83	35.71	23.22	7.79
4/26/07	3	28	523	C	6.9752	6.7469	6.9049	6.6718	6.72	6.76	37.22	18.90	7.25	37.92	21.84	7.75	38.58	28.19	10.72
4/26/07	3	28	516	D	6.4614	8.9270	6.4382	8.8675	5.70	5.64	44.50	24.38	10.77	46.21	26.47	11.91	48.81	23.07	10.39
4/26/07	3	28	517	D	12.7862	11.3674	12.5509	11.2793	6.43	6.55	35.28	17.61	3.49	35.52	15.60	3.75	32.94	17.20	3.65
4/26/07	3	28	518	D	9.5376	13.6815	9.4770	13.2719	5.49	5.50	45.45	19.30	8.63	49.60	23.42	12.78	50.24	18.05	7.68
4/26/07	3	28	519	D	8.7214	8.7493	8.6641	8.7013	5.54	5.44	46.84	25.14	12.07	46.96	26.41	14.05	42.33	20.98	9.29
4/26/07	3	28	520	D	9.1254	8.2671	9.0253	8.2004	6.66	6.74	32.78	19.54	3.54	32.39	23.06	5.21	34.94	20.52	5.61
4/26/07	3	28	521	D	8.2630	9.1370	8.1944	9.0357	6.56	6.55	38.58	19.69	5.94	37.58	18.69	6.29	36.97	19.00	5.49
4/26/07	3	28	522	D	9.1138	7.3668	8.9476	7.3009	6.72	6.85	34.79	23.66	10.09	35.00	18.29	4.27	36.06	19.11	5.48
4/26/07	3	28	523	D	5.8918	6.0444	5.8375	5.9491	6.84	6.96	35.81	18.75	5.60	37.33	18.09	4.00	35.12	15.57	4.50

J-3. Raw data for WBS analysis and storage day color analysis of beef steaks.

Date	PD	SD	#	trt	Totalwt.	DryPack	RawWt	CkWt	OnTemp	OnTime	OffTemp	OffTime	Shear1	Shear2	Shear3	Shear4	Shear5	Shear6
3/27/07	1	0	500	A	292.7	7.9	283.5	240.4	5.9	753	70.0	816	1.0173	1.8808	2.1765	2.4787	2.6704	1.6243
3/27/07	1	0	501	A	188.2	7.3	180.6	164.9	10.9	740	71.6	748	0.9150	1.5372	1.1047	1.7996	2.0830	.
3/27/07	1	0	502	A	171.8	9.2	160.0	124.6	9.6	755	70.1	810	3.2883	2.6941	3.8103	3.5829	1.4863	3.2497
3/27/07	1	0	503	A	.	.	.	167.3	4.1	725	70.4	734	3.0123	3.3282	3.1141	3.0857	2.5248	3.2630
3/27/07	1	0	504	A	106.4	8.8	96.9	78.9	12.4	759	70.0	808	4.0739	3.1852	3.4677	3.2273	4.1478	.
3/27/07	1	0	505	A	188.2	9.6	176.7	142.4	12.5	756	71.3	803	1.9087	1.7048	1.8429	22.6087	4.3215	2.9776
3/27/07	1	0	506	A	.	.	.	120.0	6.4	726	70.2	735	4.2195	4.4038	4.1637	4.2890	5.6783	.
3/27/07	1	0	507	A	163.2	9.5	153.4	111.0	8.9	737	70.0	749	4.2365	6.9875	5.9435	5.8734	6.1641	.
3/27/07	1	0	500	B	241.2	12.0	226.8	200.5	10.4	802	70.8	809	2.2765	2.4700	1.5786	1.6381	1.7476	2.2782
3/27/07	1	0	501	B	.	.	.	164.8	11.8	741	71.3	751	1.9633	0.9761	1.5587	2.0449	2.3808	1.7472
3/27/07	1	0	502	B	253.5	10.6	231.9	165.4	10.1	805	70.0	824	2.2732	2.5417	2.3063	2.9964	2.5903	3.3324
3/27/07	1	0	503	B	258.6	10.1	243.8	171.5	8.7	801	70.4	814	3.7549	2.9182	3.3356	3.8126	3.2723	4.6551
3/27/07	1	0	504	B	121.2	9.5	109.2	82.1	14.4	800	75.0	812	5.5603	1.8501	2.4219	.	.	.
3/27/07	1	0	505	B	160.7	10.5	148.7	99.5	18.0	805	70.1	815	1.4474	3.2461	4.1051	5.1767	.	.
3/27/07	1	0	506	B	.	.	.	107.4	5.7	728	71.6	737	3.4659	5.1652	4.3939	3.7696	7.7803	3.0429
3/27/07	1	0	507	B	54.8	7.2	47.6	33.0	13.8	729	71.2	736	5.9914	5.8271	4.3963	4.3599	.	.
3/27/07	1	0	500	C	231.6	9.2	224.4	181.1	12.3	753	70.4	804	2.3880	1.2354	1.1504	1.5427	1.4648	.
3/27/07	1	0	501	C	.	.	.	182.0	11.3	739	72.0	751	1.1122	1.2266	1.2903	1.3439	0.8408	1.2177
3/27/07	1	0	502	C	.	.	.	133.4	8.2	730	70.2	740	3.9317	3.1792	2.8726	2.6985	3.5407	3.6861
3/27/07	1	0	503	C	241.9	10.2	225.7	170.6	11.1	757	71.5	806	2.8043	3.0555	2.7598	3.2272	3.1614	4.5616
3/27/07	1	0	504	C	117.1	10.6	104.6	82.0	16.8	757	71.2	802	5.0108	3.6827	2.6934	5.0818	4.4724	2.7470
3/27/07	1	0	505	C	132.3	10.9	119.6	97.7	15.7	801	70.0	807	2.1415	4.0059	2.2413	1.8951	2.0979	.
3/27/07	1	0	506	C	151.3	11.1	131.5	89.8	14.0	752	70.3	759	3.2307	3.5731	4.1464	2.9063	2.7725	.
3/27/07	1	0	507	C	35.0	9.4	25.1	18.1	19.0	743	70.4	746	1.6527	4.1142	.	.	.	.
3/27/07	1	0	500	D	269.5	8.9	255.9	204.9	5.8	729	70.4	740	1.9867	3.3604	1.6192	1.7780	2.3050	1.8608
3/27/07	1	0	501	D	153.6	7.7	144.8	124.7	16.4	8.05	72.7	811	2.0743	1.5049	1.8858	1.9522	2.0741	1.6356
3/27/07	1	0	502	D	273.0	10.4	252.8	189.9	10.2	759	70.0	819	1.9775	3.1374	2.1271	1.9745	2.4813	1.9552
3/27/07	1	0	503	D	252.1	10.1	232.9	183.9	11.6	750	70.4	7.58	2.4887	3.4988	2.7001	2.8827	2.9799	3.3543
3/27/07	1	0	504	D	.	.	.	90.8	8.7	728	71.1	736	3.0843	4.6251	4.3381	3.0096	2.5866	.
3/27/07	1	0	505	D	203.4	11.0	186.6	136.7	10.3	747	70.6	800	1.6449	1.5431	2.2279	.	.	.
3/27/07	1	0	506	D	290.9	10.0	276.5	227.5	13.0	738	70.5	746	2.1144	1.4102	1.4760	1.6154	1.4611	1.5696

3/27/07	1	0	507	D	70.9	6.7	63.1	41.7	18.0	747	71.0	754	7.8648	6.1029	6.9868	.	.	.
3/28/07	2	0	508	A	240.0	6.0	232.2	215.1	6.4	726	70.0	738	1.3239	1.6613	1.1763	1.3923	1.3541	1.4967
3/28/07	2	0	509	A	310.5	8.9	299.2	243.1	4.8	726	70.0	743	3.5981	3.8439	4.3843	3.6840	3.0586	5.4580
3/28/07	2	0	510	A	156.3	9.1	145.1	114.6	4.8	726	70.0	734	2.4422	3.1919	3.6463	2.8555	3.7201	3.0158
3/28/07	2	0	511	A	146.3	8.3	136.9	115.7	10.7	739	70.0	744	1.4628	2.2266	2.0481	1.0969	2.8395	4.2960
3/28/07	2	0	512	A	110.9	8.5	101.7	89.4	7.5	745	70.0	749	4.5013	2.7323	4.7968	4.5751	3.0049	4.0196
3/28/07	2	0	513	A	190.6	9.0	179.5	155.0	8.2	748	71.0	758	2.2010	3.7247	3.9550	5.6145	2.8410	3.2270
3/28/07	2	0	514	A	98.8	8.8	89.3	74.6	9.8	753	70.9	802	2.0299	3.1706	2.5345	2.4959	2.9337	2.0244
3/28/07	2	0	515	A	64.5	7.7	56.4	50.5	16.2	802	70.0	806	3.9650	4.8325	2.4945	6.3532	4.8779	2.6789
3/28/07	2	0	508	B	237.3	8.6	226.9	202.1	6.6	726	70.0	739	1.4046	1.2684	1.7174	1.9821	1.5251	1.7515
3/28/07	2	0	509	B	160.0	9.2	147.9	119.9	10.5	726	70.0	732	2.2894	2.1858	2.8272	3.0976	2.3071	2.5603
3/28/07	2	0	510	B	185.7	10.1	171.6	135.1	9.6	739	70.0	749	3.0127	3.2431	3.0454	3.3906	2.6887	2.2066
3/28/07	2	0	511	B	193.4	9.1	182.5	150.0	11.1	743	70.0	747	1.9716	1.5398	1.5580	1.1480	1.3618	1.4831
3/28/07	2	0	512	B	71.5	9.2	61.4	44.5	12.1	746	70.0	752	5.1104	3.5072	6.3065	4.6530	6.2287	6.0088
3/28/07	2	0	513	B	164.6	9.8	153.2	134.0	9.2	750	70.0	755	2.1432	1.4548	3.7484	4.1875	2.2883	2.3189
3/28/07	2	0	514	B	119.9	8.8	108.3	81.3	11.6	755	70.0	8.13	2.7202	2.6521	2.7410	3.4640	2.0423	2.5613
3/28/07	2	0	515	B	117.4	8.4	105.7	87.6	14.9	802	70.0	803	5.3547	3.2803	3.9923	4.5782	2.8133	7.4569
3/28/07	2	0	508	C	298.0	7.4	289.0	256.0	4.2	726	70.1	740	1.3974	1.3964	1.6059	1.3910	1.5606	1.9651
3/28/07	2	0	509	C	257.3	8.1	246.1	186.4	6.7	726	70.0	733	2.5339	2.3875	2.8524	1.8286	1.8300	2.3597
3/28/07	2	0	510	C	148.6	9.9	135.5	50.6	10.7	739	70.0	747	2.1527	3.0302	3.5333	3.2925	3.6427	2.8611
3/28/07	2	0	511	C	253.4	11.0	237.1	192.3	7.5	743	70.0	750	2.9391	1.7283	1.1892	1.6658	1.8130	3.3221
3/28/07	2	0	512	C	103.5	8.2	93.7	73.6	11.8	748	70.0	752	4.7790	5.7511	4.0527	5.3963	5.0554	3.9573
3/28/07	2	0	513	C	132.3	8.5	121.0	106.7	9.8	751	71.0	754	2.6163	2.1743	1.9175	3.9754	2.0864	4.2487
3/28/07	2	0	514	C	124.8	8.9	114.0	101.6	10.1	755	70.0	802	2.4052	2.1378	1.6373	1.6005	1.8930	1.6906
3/28/07	2	0	515	C	96.4	7.8	87.5	71.6	13.5	802	70.2	808	5.0382	4.4600	3.8405	3.5538	6.7165	2.9103
3/28/07	2	0	508	D	190.2	7.0	181.9	166.5	6.0	726	70.1	733	1.6976	2.2627	1.5016	1.0859	2.1131	1.2534
3/28/07	2	0	509	D	213.7	8.7	198.2	145.8	4.2	726	71.0	737	4.3842	2.9368	2.4207	2.3620	1.8551	2.6577
3/28/07	2	0	510	D	223.1	9.3	207.1	175.6	7.0	739	70.0	743	3.1096	2.4710	1.5171	3.8555	2.1194	2.7694
3/28/07	2	0	511	D	264.0	8.1	250.5	194.3	6.8	744	70.0	752	1.6892	1.9115	1.9394	1.2282	1.7260	1.7539
3/28/07	2	0	512	D	113.5	9.3	102.8	84.6	7.6	750	70.0	757	5.3824	5.8095	3.2459	4.7573	2.7853	5.9380
3/28/07	2	0	513	D	146.3	8.4	132.1	105.9	10.2	752	84.7	801	2.8374	4.1210	3.2562	2.7684	3.2222	3.5453
3/28/07	2	0	514	D	74.8	8.7	64.7	58.9	12.2	756	70.0	800	1.3208	2.8202	2.5803	2.7110	2.3955	1.7223
3/28/07	2	0	515	D	116.8	8.5	104.5	93.2	14.1	802	74.0	807	4.6873	3.3983	4.0630	4.6415	.	.
3/29/07	3	0	516	A	136.1	7.4	128.1	101.7	12.0	711	70.0	718	2.0443	4.0552	.	.	.	.

3/29/07	3	0	517	A	168.1	7.2	159.6	138.3	13.9	742	70.4	752	2.9074	3.6537	4.0115	2.8563	1.8569	2.9277
3/29/07	3	0	518	A	188.8	8.2	179.0	145.9	13.6	727	70.0	733	2.0207	2.1064	2.0192	2.5284	2.9845	2.7028
3/29/07	3	0	519	A	178.0	8.0	169.7	145.1	.	.	70.4	732	1.7164	2.9973	1.6502	1.3598	2.2314	1.9614
3/29/07	3	0	520	A	74.9	6.4	68.9	55.9	14.3	727	70.4	734	2.2028	1.6709	1.7850	1.1645	1.5462	2.0714
3/29/07	3	0	521	A	74.1	6.7	67.9	60.8	17.6	740	72.3	744	2.1304	2.2528	2.0326	.	.	.
3/29/07	3	0	522	A	67.0	6.5	60.3	55.9	15.1	713	70.2	716	2.0274	1.8393	0.8718	1.8545	1.8681	.
3/29/07	3	0	523	A	61.8	6.4	55.2	46.6	.	.	70.1	728	2.7380	2.6757	2.2866	2.7439	1.9170	2.2365
3/29/07	3	0	516	B	155.3	8.0	143.9	120.8	14.1	744	71.2	750	1.8526	2.2151	1.6124	2.2831	2.0482	.
3/29/07	3	0	517	B	166.3	8.1	155.3	128.5	13.0	744	71.5	752	0.9250	1.9764	1.9208	2.6947	1.6269	.
3/29/07	3	0	518	B	166.0	8.2	152.0	118.5	12.5	742	70.1	754	1.5794	2.0187	1.3190	2.5900	2.8580	.
3/29/07	3	0	519	B	218.8	8.5	202.6	155.3	10.9	735	80.1	747	2.3660	2.9939	1.9946	2.8575	1.9981	2.9044
3/29/07	3	0	520	B	70.8	7.4	62.6	51.7	17.8	732	70.0	736	1.6763	1.5677	2.2202	1.3519	1.8235	2.2550
3/29/07	3	0	521	B	68.2	7.9	59.4	52.9	16.7	752	71.4	755	1.2901	2.3117	1.9886	1.9131	0.7696	.
3/29/07	3	0	522	B	103.4	7.4	94.5	78.5	13.5	750	70.5	758	2.2511	2.7947	1.8663	.	.	.
3/29/07	3	0	523	B	58.5	6.3	51.9	43.7	16.3	732	70.0	737	1.9935	5.8746	.	.	.	.
3/29/07	3	0	516	C	192.0	7.6	178.3	140.9	11.7	749	70.0	757	4.2847	1.6719	1.5981	2.2357	2.6019	1.6427
3/29/07	3	0	517	C	195.4	6.9	184.9	145.8	10.9	730	70.0	739	1.7043	2.8353	2.6860	1.4586	1.3778	4.5632
3/29/07	3	0	518	C	223.4	9.5	208.1	164.5	10.7	746	70.0	759	1.8443	1.8055	1.9473	2.4295	2.6180	1.3693
3/29/07	3	0	519	C	197.4	8.3	183.5	140.5	11.6	738	72.2	748	1.4280	2.7995	2.2045	2.0837	1.3801	1.3199
3/29/07	3	0	520	C	146.5	6.6	139.3	124.5	12.6	746	70.0	801	1.6554	1.6571	1.6654	.	.	.
3/29/07	3	0	521	C	52.9	6.5	46.2	36.7	16.6	738	72.3	743	2.2341	4.5568	2.8910	1.6912	.	.
3/29/07	3	0	522	C	73.6	6.7	66.3	61.9	17.0	753	70.1	756	2.0732	3.4788	2.6208	2.2618	.	.
3/29/07	3	0	523	C	61.1	6.5	53.9	40.6	17.0	741	70.3	744	.	.	.	.	.	.
3/29/07	3	0	516	D	130.4	6.5	120.9	92.9	15.3	740	70.0	745	3.7585	3.3277	1.6963	2.1382	1.8393	1.7529
3/29/07	3	0	517	D	183.8	7.6	173.9	152.6	12.4	.	70.7	742	1.3315	2.3005	0.9402	1.4438	1.2136	.
3/29/07	3	0	518	D	168.1	8.2	156.9	124.9	9.1	733	70.9	743	2.3500	2.1481	2.1794	1.8998	2.3402	1.8826
3/29/07	3	0	519	D	196.0	8.0	182.3	141.2	11.0	737	70.2	745	2.4866	1.2860	2.3570	1.5245	2.0643	.
3/29/07	3	0	520	D	92.8	7.7	84.5	75.0	10.7	734	70.0	741	1.7955	1.7411	0.8683	.	.	.
3/29/07	3	0	521	D	54.7	7.8	46.0	42.4	17.4	752	71.3	754	0.6219	2.3059	.	.	.	.
3/29/07	3	0	522	D	52.2	7.0	44.7	37.5	17.1	745	70.0	749	2.1644	2.6000	1.5944	3.5436	2.3843	2.9042
3/29/07	3	0	523	D	37.8	6.5	31.1	26.5	19.4	749	71.0	754	2.9162	3.7648	2.2168	.	.	.
4/10/07	1	14	500	A	273.9	10.7	257.5	219.5	10.2	1133	70.0	1146	2.6120	2.8496	2.5744	2.6880	2.2055	.
4/10/07	1	14	501	A	270.5	9.5	259.2	211.9	9.0	1138	72.3	1157	1.6355	1.5144	1.1699	1.5973	2.5465	1.6611
4/10/07	1	14	502	A	236.2	11.3	212.0	180.9	8.1	1142	70.0	1153	1.3279	1.5236	1.4040	1.3990	1.6522	1.6171

4/10/07	1	14	503	A	122.6	10.3	110.4	95.0	15.4	1149	70.2	1155	4.9777	2.0238	3.5602	4.0062	2.1471	2.9145
4/10/07	1	14	504	A	86.6	9.8	75.3	61.2	10.7	1156	71.0	1200	3.4020	3.6282	4.6110	4.5547	3.0632	.
4/10/07	1	14	505	A	214.0	11.1	198.7	156.6	10.5	1159	70.4	1213	1.7890	3.1514	2.8839	2.4242	.	.
4/10/07	1	14	506	A	226.5	11.4	211.0	176.8	13.8	1202	70.5	1211	4.7317	2.8186	2.0189	2.5067	3.1421	1.6068
4/10/07	1	14	507	A	117.0	11.1	104.3	82.1	16.6	1206	71.6	1212	4.0153	3.8617	2.4676	2.1841	1.5883	4.5403
4/10/07	1	14	500	B	245.8	12.2	222.3	187.0	2.4	12.19	70.0	1229	2.2412	2.4221	2.7114	2.7647	2.4943	1.9702
4/10/07	1	14	501	B	160.4	10.3	149.1	124.4	6.6	1221	70.2	1231	2.4457	1.8313	2.8112	1.9403	1.8276	.
4/10/07	1	14	502	B	210.2	12.7	182.9	142.6	5.0	1223	70.1	1234	2.0156	1.6880	2.6004	2.4645	3.0026	1.8077
4/10/07	1	14	503	B	249.4	12.2	222.1	180.2	8.7	1228	70.0	1237	5.2601	2.0608	2.0808	1.8933	2.4805	2.4317
4/10/07	1	14	504	B	118.2	10.8	98.3	78.0	7.9	150	71.0	157	1.6062	2.2037	2.4348	1.9752	2.6726	2.0015
4/10/07	1	14	505	B	132.3	10.9	115.6	87.0	15.0	200	70.0	204	5.1989	2.3910	2.5143	4.1532	3.4019	1.8882
4/10/07	1	14	506	B	215.5	11.3	191.6	147.5	7.5	205	70.0	216	2.1628	2.9541	3.8502	2.8553	3.6263	3.9247
4/10/07	1	14	507	B	51.3	10.0	40.3	34.1	14.8	208	70.0	211	3.1773	3.6908	3.2404	3.1974	.	.
4/10/07	1	14	500	C	246.0	11.3	235.0	192.3	6.5	213	70.1	221	2.7986	1.5717	1.3161	2.2888	2.7149	3.1859
4/10/07	1	14	501	C	243.0	11.1	227.2	206.3	7.1	218	71.8	227	2.2531	0.9980	1.5146	1.7687	1.8365	1.3954
4/10/07	1	14	502	C	240.6	11.5	209.0	158.0	7.7	221	70.1	232	3.1086	2.0708	3.0623	3.5372	1.7793	1.7973
4/10/07	1	14	503	C	189.0	11.6	164.6	140.7	9.0	223	72.9	229	2.1817	2.5799	2.8663	2.0045	2.1308	2.3502
4/10/07	1	14	504	C	166.2	12.0	139.8	119.9	9.7	228	71.4	234	4.4770	1.5296	1.9727	2.5529	1.7292	2.0675
4/10/07	1	14	505	C	158.7	11.6	137.5	99.8	9.3	231	71.2	245	4.7210	2.9225	1.6451	4.9804	5.7162	2.6812
4/10/07	1	14	506	C	187.3	11.3	168.6	138.4	10.9	235	72.3	245	2.8337	2.4692	2.9256	.	.	.
4/10/07	1	14	507	C	78.6	10.2	61.2	48.3	16.0	247	70.0	255	4.1005	5.0666	4.1710	3.0316	.	.
4/10/07	1	14	500	D	204.1	11.2	188.5	144.1	4.8	241	71.2	253	2.5004	1.8227	2.7466	2.6451	2.6004	1.7067
4/10/07	1	14	501	D	226.5	11.6	209.9	187.5	7.9	256	70.0	305	2.5691	2.1857	1.1448	2.5520	1.7297	2.1151
4/10/07	1	14	502	D	259.7	10.6	235.9	183.2	5.6	257	74.1	314	1.8193	3.3600	2.2995	1.7322	2.1379	2.5325
4/10/07	1	14	503	D	174.7	10.4	158.1	133.5	11.9	301	72.3	305	1.9864	3.8220	3.7153	3.3136	3.3151	.
4/10/07	1	14	504	D	121.4	9.6	106.4	87.7	11.1	307	70.3	313	2.3328	3.2538	2.1610	1.3288	2.0273	3.7040
4/10/07	1	14	505	D	180.3	11.4	158.2	118.0	10.6	316	70.2	324	3.0919	2.1589	2.3487	3.2389	3.5690	1.7134
4/10/07	1	14	506	D	196.2	10.8	172.4	142.7	8.6	317	70.0	325	2.1249	2.4670	5.0813	2.7095	4.1915	4.1803
4/10/07	1	14	507	D	75.9	9.6	62.2	46.4	16.2	326	70.2	330	4.0000	2.9725	2.8247	3.5971	3.7125	.
4/11/07	2	14	508	A	266.0	9.3	254.0	234.9	5.6	255	70.3	309	0.9626	1.9248	1.6906	1.5245	1.8531	1.9786
4/11/07	2	14	509	A	332.0	10.2	307.1	259.8	3.7	258	70.0	314	3.1530	4.8093	3.8893	2.9431	3.2066	3.1577
4/11/07	2	14	510	A	158.8	9.6	142.8	106.4	8.7	303	70.2	317	3.2855	2.9931	4.2063	3.2627	3.3321	3.4606
4/11/07	2	14	511	A	239.7	9.4	227.6	193.2	7.3	311	70.0	322	2.4211	1.9561	1.8874	1.2477	2.1592	1.2355
4/11/07	2	14	512	A	100.1	8.8	89.7	79.3	11.4	316	70.3	321	2.9262	2.3617	3.6647	2.1417	3.2155	3.5967

4/11/07	2	14	513	A	153.7	9.3	142.2	123.1	9.5	318	70.0	325	1.7547	1.8245	2.1878	1.8422	1.9623	2.2462
4/11/07	2	14	514	A	111.2	9.3	95.2	78.6	8.4	320	73.2	331	2.2240	1.8930	2.2640	1.2916	2.1436	2.1078
4/11/07	2	14	515	A	110.1	9.0	97.4	85.4	12.3	324	70.1	329	2.2119	1.9504	2.6915	1.9711	2.3039	2.8705
4/11/07	2	14	508	B	249.0	9.5	233.3	210.9	7.6	328	71.2	338	1.0921	1.6859	0.8575	1.5260	1.6744	1.6882
4/11/07	2	14	509	B	249.3	7.8	225.4	194.9	6.9	330	70.0	339	2.0338	2.1982	1.5956	2.3050	1.9908	1.2811
4/11/07	2	14	510	B	208.5	10.2	190.6	160.3	6.7	333	70.0	342	2.4465	2.1566	2.1073	2.5614	2.3828	2.7607
4/11/07	2	14	511	B	234.4	10.3	209.7	167.7	8.9	338	70.0	344	1.2338	1.1883	1.2102	1.4964	1.5031	1.1491
4/11/07	2	14	512	B	91.4	10.0	78.8	63.9	12.5	341	70.0	346	4.0045	2.4623	2.7662	4.4966	2.8399	2.6374
4/11/07	2	14	513	B	127.6	10.6	110.8	91.7	9.3	349	70.4	354	1.8399	4.6615	2.3499	2.5174	3.1387	3.2735
4/11/07	2	14	514	B	148.0	9.6	133.2	110.2	6.9	348	70.0	357	1.8346	3.7167	2.3723	1.6169	.	.
4/11/07	2	14	515	B	128.1	9.3	111.8	96.1	10.1	351	70.0	358	1.8596	2.8755	2.9534	1.8155	3.1537	2.6483
4/11/07	2	14	508	C	181.8	8.7	171.7	149.8	6.4	356	70.0	409	1.8491	1.7761	1.7388	1.4505	1.5050	1.7079
4/11/07	2	14	509	C	234.4	9.4	201.1	154.8	7.4	400	70.0	408	1.4606	2.1430	2.1725	2.1012	1.9444	2.6242
4/11/07	2	14	510	C	187.4	10.0	167.9	138.6	7.9	406	70.0	413	2.4226	2.1916	2.4700	2.7505	1.8522	2.2800
4/11/07	2	14	511	C	270.9	10.6	249.2	212.7	8.3	410	71.0	417	1.2183	1.6156	1.8231	1.2200	1.2126	0.8042
4/11/07	2	14	512	C	161.7	11.3	147.2	116.3	80.0	422	70.0	430	3.4333	4.5772	4.6483	4.2083	3.6431	4.6426
4/11/07	2	14	513	C	128.7	12.2	106.4	78.5	6.9	422	70.0	429	2.6908	2.4258	3.0940	2.8345	2.8709	3.1617
4/11/07	2	14	514	C	100.2	10.2	89.1	75.7	3.5	423	70.1	432	1.5923	2.0216	2.0168	1.8628	1.7532	1.8422
4/11/07	2	14	515	C	89.9	10.8	78.0	63.2	6.4	424	71.6	428	2.7853	4.1957	2.3296	2.5387	.	.
4/11/07	2	14	508	D	246.8	11.3	232.1	206.1	10.2	431	70.0	432	1.6839	1.6307	1.3174	0.9434	0.9559	1.5412
4/11/07	2	14	509	D	247.1	13.0	215.7	186.5	7.2	432	70.0	432	2.6775	1.4693	1.3673	1.6340	2.4818	1.7681
4/11/07	2	14	510	D	220.7	14.0	197.9	155.6	6.3	433	70.0	441	2.5590	2.0007	2.2367	2.2218	2.5296	2.4434
4/11/07	2	14	511	D	279.0	12.9	244.3	182.5	3.2	4.34	71.6	447	1.3026	1.6183	1.3778	1.1844	1.8883	2.0281
4/11/07	2	14	512	D	93.9	11.5	80.3	61.3	9.3	439	70.0	446	3.4223	4.0553	3.7577	3.2073	4.1952	2.5387
4/11/07	2	14	513	D	162.6	13.6	136.9	107.1	6.8	440	70.0	449	4.6422	2.6707	3.9043	2.2145	3.3131	3.7167
4/11/07	2	14	514	D	84.9	8.1	75.6	64.7	8.8	442	72.0	448	1.8473	2.4350	2.3487	2.2106	1.8796	2.2715
4/11/07	2	14	515	D	94.8	11.5	80.2	66.0	12.0	442	70.0	449	3.2230	3.0606	4.1985	3.7177	2.7982	3.2746
4/12/07	3	14	516	A	167.0	9.7	151.5	135.9	9.5	252	70.0	258	1.6602	2.1150	1.5970	2.1847	1.5367	1.8565
4/12/07	3	14	517	A	169.2	9.7	152.0	134.5	10.7	254	70.3	303	2.9965	2.7638	1.6467	2.1627	1.8762	1.5057
4/12/07	3	14	518	A	174.8	10.5	157.6	131.7	10.0	258	70.0	306	2.6262	1.6235	2.4254	1.9075	2.9822	2.0984
4/12/07	3	14	519	A	176.8	8.8	166.5	143.4	8.8	300	70.1	311	1.7410	1.8622	2.2984	1.7062	1.8920	1.5811
4/12/07	3	14	520	A	78.7	8.2	69.5	59.3	16.4	307	70.0	313	1.7467	3.4706	3.6642	2.1745	1.6302	2.4626
4/12/07	3	14	521	A	70.7	7.6	62.8	47.5	16.3	317	70.1	326.0	2.6299	1.8748	3.2950	3.0733	2.4580	.
4/12/07	3	14	522	A	101.0	9.0	89.6	71.3	14.9	318	70.1	329	1.2809	4.8678	1.4525	1.4421	.	.

4/12/07	3	14	523	A	54.0	6.8	47.1	41.0	16.0	319	70.0	324	3.5389	3.9925	2.6847	4.5677	.	.
4/12/07	3	14	516	B	133.6	9.4	113.4	98.0	3.8	328	70.0	337	2.3286	2.8615	2.2756	1.8838	2.1906	2.4086
4/12/07	3	14	517	B	224.2	9.3	209.5	183.0	4.5	334	70.1	344	2.1950	1.8054	1.9872	1.4402	2.5566	2.4277
4/12/07	3	14	518	B	169.5	9.9	149.6	117.2	5.8	336	70.3	345	1.6585	2.2072	2.3229	1.7280	1.8494	1.9251
4/12/07	3	14	519	B	196.8	10.6	179.8	142.9	6.4	339	70.0	347	2.0230	2.1725	1.8826	1.7288	3.1530	1.7364
4/12/07	3	14	520	B	76.6	9.0	64.5	53.4	12.7	352	70.1	357	1.8763	1.9100	2.3365	1.7558	3.0010	2.2147
4/12/07	3	14	521	B	58.0	8.9	46.4	33.5	12.9	352	70.3	357	2.9025	2.3145	4.1603	2.5872	.	.
4/12/07	3	14	522	B	100.6	9.2	86.6	.	13.6	358	70.0	407	1.3113	1.2450	2.9455	2.0655	3.4383	.
4/12/07	3	14	523	B	43.2	8.8	33.2	.	15.2	359	70.3	406	1.0207	1.7444	2.8843	1.9683	,	,
4/12/07	3	14	516	C	188.8	9.0	168.0	135.8	4.9	412	70.0	421	1.3687	2.3112	2.2754	2.2461	2.6849	2.2574
4/12/07	3	14	517	C	224.6	9.5	205.3	173.6	11.4	423	70.0	431	1.6248	1.7906	1.8277	2.9373	1.9099	2.7838
4/12/07	3	14	518	C	160.3	9.8	140.8	112.2	12.1	424	70.0	431	1.8181	2.4995	2.1718	2.9624	1.8361	2.7026
4/12/07	3	14	519	C	203.5	10.3	181.1	153.8	14.5	444	70.0	449	1.5702	1.6486	1.5992	1.7340	2.3219	1.7440
4/12/07	3	14	520	C	143.9	8.9	132.9	116.9	4.9	412	70.1	422	1.8516	1.7913	1.5505	0.8688	1.4508	1.4954
4/12/07	3	14	521	C	49.1	7.5	41.4	34.6	5.1	412	70.1	416	3.0520	2.6835	2.6266	2.3586	.	.
4/12/07	3	14	522	C	77.7	7.7	69.5	58.7	18.1	446	70.0	453	4.3525	3.1706	2.8424	2.4346	2.6332	2.3708
4/12/07	3	14	523	C	62.6	7.1	55.2	47.2	8.1	417	71.4	421	3.8910	2.3232	2.4165	2.5059	.	.
4/12/07	3	14	516	D	100.0	13.1	80.4	60.6	13.7	445	71.3	454	1.7572	2.0089	2.1666	1.9193	1.8466	.
4/12/07	3	14	517	D	202.7	8.4	190.0	170.2	13.3	444	70.0	751	2.1369	1.2365	1.8558	1.8429	2.0312	2.2207
4/12/07	3	14	518	D	138.6	11.2	120.4	91.8	12.5	433	70.0	441	2.5305	2.1304	2.5572	2.6549	3.7366	3.1061
4/12/07	3	14	519	D	228.3	9.4	204.7	171.3	8.7	433	70.0	443	2.1159	1.8123	1.4512	2.0974	1.8297	1.3426
4/12/07	3	14	520	D	86.3	8.6	77.2	68.2	15.4	451	70.0	456	1.7932	2.0015	2.0145	1.9979	1.6903	2.3807
4/12/07	3	14	521	D	72.3	8.4	63.3	54.4	13.7	434	70.0	439	1.7218	2.5453	3.6323	4.5587	.	.
4/12/07	3	14	522	D	58.6	8.0	50.5	43.8	12.0	427	70.6	432	2.4791	3.9909	3.7287	2.6742	.	.
4/12/07	3	14	523	D	51.9	7.3	44.4	38.6	11.4	423	70.1	427	2.9186	3.5459	3.7328	4.1405	.	.
4/24/07	1	28	500	A	200.6	10.1	187.3	174.6	11.4	700	70.2	709	1.4896	2.0205	1.2603	1.5184	1.5531	1.6355
4/24/07	1	28	501	A	214.6	10.4	199.3	178.4	9.8	701	70.0	713	1.5997	1.2415	1.4290	1.3298	1.6196	1.1661
4/24/07	1	28	502	A	234.3	10.0	217.3	174.0	11.4	710	70.0	722	1.4747	2.8164	2.0890	2.2259	2.8283	1.8141
4/24/07	1	28	503	A	173.8	10.5	156.2	141.0	12.4	714	70.9	720	2.0314	2.4482	2.6477	2.9385	2.4949	2.2230
4/24/07	1	28	504	A	94.8	10.3	79.5	67.2	10.6	701	70.4	707	3.3771	2.5544	3.7105	1.0996	3.8683	2.5038
4/24/07	1	28	505	A	172.9	11.3	155.4	129.1	11.9	715	70.0	725	1.8191	2.6785	1.9491	3.2134	1.1224	2.5336
4/24/07	1	28	506	A	173.7	10.5	154.8	131.2	13.9	721	70.0	730	3.0129	2.8521	3.6391	3.1191	5.2884	.
4/24/07	1	28	507	A	100.1	11.9	82.9	64.9	12.6	708	70.1	715	4.2355	2.3490	3.1042	3.7612	6.0625	.
4/24/07	1	28	500	B	258.1	11.1	233.8	185.8	11.7	723	70.3	742	2.1356	1.3248	2.2527	1.5551	1.4042	1.5501

4/24/07	1	28	501	B	209.3	10.4	186.8	161.8	14.1	731	70.5	740	2.0592	1.3328	2.6924	1.8052	1.5848	1.6563
4/24/07	1	28	502	B	186.3	10.7	171.7	135.1	14.3	742	70.7	750	2.4641	2.0572	2.0394	1.7218	1.5203	1.6613
4/24/07	1	28	503	B	224.8	10.4	196.3	150.0	13.5	743	70.1	756	3.3791	2.0979	2.4179	2.2418	4.2315	2.4204
4/24/07	1	28	504	B	51.2	11.0	33.6	26.6	15.1	732	72.1	735	2.2299	3.8177	2.4284	2.7320	3.1806	.
4/24/07	1	28	505	B	153.7	10.6	139.2	97.6	15.3	752	70.4	802	7.7376	2.87	3.0288	1.5858	1.9262	1.4350
4/24/07	1	28	506	B	218.6	12.0	186.9	137.2	13.1	736	70.3	753	3.9557	3.5260	2.2845	5.5256	2.7003	5.2418
4/24/07	1	28	507	B	51.8	9.8	38.2	29.8	15.4	726	70.1	730	4.7764	2.9226	4.1541	1.9927	3.5696	4.9659
4/24/07	1	28	500	C	221.9	10.7	196.6	175.4	14.6	757	70.1	804	3.0804	1.5461	1.6007	3.0695	1.4886	2.9543
4/24/07	1	28	501	C	262.3	10.2	242.2	201.8	13.6	805	70.1	820	2.2398	1.0589	1.3576	1.9491	2.4661	2.1535
4/24/07	1	28	502	C	200.0	10.6	174.9	143.4	14.7	802	70.5	808	1.8230	2.1346	1.9084	2.3401	1.7744	1.6374
4/24/07	1	28	503	C	223.2	10.9	198.2	162.5	14.0	809	70.9	818	2.4800	2.0066	2.2567	2.4800	2.2597	1.6632
4/24/07	1	28	504	C	179.3	12.1	147.0	109.7	14.6	803	70.0	815	4.3139	2.0443	2.0076	3.0992	2.0017	.
4/24/07	1	28	505	C	113.0	9.7	99.6	84.8	15.3	754	70.6	801	2.1336	1.6851	1.7645	2.1089	1.3586	2.1763
4/24/07	1	28	506	C	149.7	11.5	129.0	97.1	16.8	819	70.4	824	2.6854	3.1608	3.6401	2.6060	2.5276	3.7413
4/24/07	1	28	507	C	74.7	10.1	60.8	49.4	17.7	815	71.8	821	2.9543	3.3979	2.8325	.	.	.
4/24/07	1	28	500	D	247.4	10.9	221.2	193.9	15.0	820	70.3	832	1.3685	2.2666	2.4234	1.8290	2.8541	2.8700
4/24/07	1	28	501	D	152.3	10.5	140.3	122.7	17.1	842	70.0	849	1.5868	1.1244	1.5501	1.5501	1.7774	1.5769
4/24/07	1	28	502	D	242.1	11.5	209.3	170.6	14.6	824	70.0	837	2.0691	1.9947	1.5352	2.4244	2.0880	1.5184
4/24/07	1	28	503	D	153.8	12.3	134.0	111.1	16.7	838	70.4	846	2.2110	2.3490	2.0592	3.2471	2.5832	3.0288
4/24/07	1	28	504	D	135.9	12.9	116.9	88.3	15.9	826	70.0	837	1.9123	3.8465	5.0572	5.0393	5.5494	2.9663
4/24/07	1	28	505	D	156.6	11.5	138.3	105.0	15.1	839	70.1	848	5.2537	4.7754	3.9487	1.6871	2.8998	4.1631
4/24/07	1	28	506	D	242.0	11.2	211.0	163.2	15.6	832	70.6	842	3.1776	5.1465	5.6338	2.5068	3.1697	3.2005
4/24/07	1	28	507	D	87.9	11.0	71.0	56.5	17.1	821	70.4	825	1.8210	3.8465	3.2540	2.9911	2.4155	3.4674
4/25/07	2	28	508	A	194.9	9.6	165.9	153.6	11.7	1216	70.0	1228	1.1730	1.2335	0.8862	0.8803	1.0668	1.6166
4/25/07	2	28	509	A	311.4	9.2	259.1	207.0	15.7	1217	71.7	1243	2.0791	2.7023	2.0185	1.9818	1.9461	2.0701
4/25/07	2	28	510	A	171.8	9.6	107.6	80.0	11.0	1217	70.4	1227	2.0066	1.6226	2.6904	2.0175	2.1584	1.8109
4/25/07	2	28	511	A	265.5	8.9	203.8	164.1	17.5	1220	70.3	1232	1.4578	1.3368	1.3953	1.6583	1.9600	1.1412
4/25/07	2	28	512	A	185.3	9.4	82.5	72.5	13.2	1222	70.2	1229	1.4161	1.4181	1.5610	.	.	.
4/25/07	2	28	513	A	255.3	9.7	141.4	110.3	11.9	1222	70.4	1232	1.2236	2.2438	1.9649	.	.	.
4/25/07	2	28	514	A	132.6	9.4	110.3	94.3	12.7	1229	70.0	1239	0.9348	1.7813	2.0582	1.6900	1.7129	.
4/25/07	2	28	515	A	98.1	9.1	84.5	.	16.2	1230	70.8	1236	3.0784	3.0060	4.2851	3.6877	2.9434	1.9878
4/25/07	2	28	508	B	201.3	9.5	184.7	163.7	13.6	1231	70.7	1240	0.9725	1.4806	1.5839	1.2901	1.3685	1.2286
4/25/07	2	28	509	B	221.2	9.6	201.1	149.5	11.0	1233	70.4	1246	2.3014	2.4314	1.7655	2.5445	2.3143	2.2031
4/25/07	2	28	510	B	218.6	10.3	187.6	165.2	10.9	1234	70.7	1244	2.7926	2.2001	2.7658	3.2967	2.7985	2.2607

4/25/07	2	28	511	B	307.2	9.6	222.4	177.9	14.2	1245	70.4	1255	1.3477	1.0182	1.1472	1.0132	1.9292	1.1899
4/25/07	2	28	512	B	118.3	10.0	86.4	74.8	14.9	1247	70.1	1252	2.9325	2.8382	2.3559	2.8541	3.1439	2.0810
4/25/07	2	28	513	B	158.3	11.1	129.7	107.0	.	.	70.1	1252	1.8131	2.7499	1.3109	3.8912	1.0410	2.0324
4/25/07	2	28	514	B	123.9	9.7	99.5	86.0	14.2	1247	70.0	1253	1.6881	1.6454	2.8144	1.7158	1.2931	.
4/25/07	2	28	515	B	123.1	9.4	106.7	78.6	.	.	73.0	1251	3.3573	1.6543	3.3960	3.6113	3.7046	2.1465
4/25/07	2	28	508	C	223.3	9.3	204.6	189.7	14.5	129	70.1	138	1.2167	1.2881	1.2792	1.4439	1.4231	1.1204
4/25/07	2	28	509	C	192.1	9.8	165.9	134.9	16.1	129	70.0	136	0.8187	1.7466	2.0334	1.4003	.	.
4/25/07	2	28	510	C	209.3	10.4	182.6	164.3	12.6	129	71.0	135	1.5938	1.6196	0.9854	0.8991	1.5134	.
4/25/07	2	28	511	C	321.5	10.6	202.9	166.7	10.8	130	70.0	141	1.2693	1.0162	1.1909	1.3000	.	.
4/25/07	2	28	512	C	150.9	10.4	67.3	52.4	15.0	130	70.0	139	2.4681	1.9590	.	.	.	.
4/25/07	2	28	513	C	157.0	10.1	127.6	93.6	14.7	131	70.5	148	2.2974	3.7572	2.4532	3.9745	2.5524	.
4/25/07	2	28	514	C	128.2	9.9	112.6	94.0	15.3	137	70.9	148	1.2782	1.8389	1.1730	1.6355	1.4499	2.0810
4/25/07	2	28	515	C	83.5	9.7	71.3	60.7	19.1	139	70.5	142	1.8836	3.4257	2.0930	2.4532	1.9143	2.8065
4/25/07	2	28	508	D	247.9	10.1	201.4	186.9	14.4	143	70.0	149	2.0592	1.4717	2.0910	1.6672	1.0728	1.8756
4/25/07	2	28	509	D	360.8	9.9	241.3	200.6	13.6	150	70.4	203	1.4419	0.9070	2.1753	1.5293	1.8230	1.8677
4/25/07	2	28	510	D	179.3	9.3	143.7	120.5	16.6	150	70.1	158	1.4717	1.8984	1.4191	1.7188	1.4707	2.8095
4/25/07	2	28	511	D	289.1	9.6	211.1	174.1	19.5	153	70.0	203	1.4013	1.6325	1.5035	1.4261	2.0959	1.1105
4/25/07	2	28	512	D	109.0	10.1	79.4	66.2	17.7	158	70.0	204	3.0585	2.9275	3.5776	1.8210	2.8551	2.3897
4/25/07	2	28	513	D	203.5	11.1	98.7	76.3	17.8	205	70.0	213	2.9285	2.5435	5.1406	2.6040	.	.
4/25/07	2	28	514	D	89.6	9.5	77.5	63.6	18.9	205	70.0	215	2.3123	1.9540	1.3993	1.7049	1.7317	1.9500
4/25/07	2	28	515	D	157.7	9.8	117.2	92.1	19.0	205	70.0	214	1.6940	1.7972	3.2709	1.2236	.	.
4/26/07	3	28	516	A	149.7	9.6	131.4	113.1	11.3	1159	70.0	1205	2.6735	2.9216	2.7668	1.8349	1.8230	1.3536
4/26/07	3	28	517	A	275.4	9.4	260.3	233.9	5.7	1201	70.4	1215	2.6924	1.7655	1.9897	1.8349	2.0136	3.5468
4/26/07	3	28	518	A	132.7	8.5	118.3	103.5	15.8	1214	71.3	1216	2.4562	1.6226	1.5571	2.3152	1.4330	1.5491
4/26/07	3	28	519	A	172.6	9.5	156.0	129.7	8.6	1207	70.0	1218	1.7674	3.7304	2.1664	2.1230	1.6771	2.3301
4/26/07	3	28	520	A	84.5	8.7	76.0	66.1	15.0	1209	70.1	1212	2.0463	2.8392	2.2706	1.9371	2.4254	1.8240
4/26/07	3	28	521	A	66.1	9.3	55.3	47.8	11.0	1201	70.3	1205	1.5094	1.7873	3.0516	1.9848	3.2759	2.2150
4/26/07	3	28	522	A	102.0	9.3	92.6	82.5	13.6	1213	70.0	1219	2.4859	1.2782	2.1843	2.1932	2.3698	2.3579
4/26/07	3	28	523	A	91.3	9.1	79.3	64.7	11.6	1206	70.1	1212	.	.	.	.	.	.
4/26/07	3	28	516	B	151.8	8.7	149.0	116.5	9.9	1221	70.0	1231	2.7579	2.2547	2.3619	3.2570	2.4780	2.1396
4/26/07	3	28	517	B	260.7	10.0	228.0	186.4	11.0	1232	70.5	1242	1.8369	1.5398	1.6464	2.5445	1.2206	2.4204
4/26/07	3	28	518	B	134.6	9.5	119.7	95.4	13.2	1233	70.9	1238	1.2713	1.5749	1.3874	1.6315	1.4151	1.6513
4/26/07	3	28	519	B	199.8	9.5	179.0	138.7	11.6	1242	70.4	1253	1.8746	2.6447	2.6298	3.2650	2.5504	2.5663
4/26/07	3	28	520	B	115.0	9.2	88.2	66.3	13.0	1234	70.0	1241	2.1823	1.9262	2.7053	.	.	.

4/26/07	3	28	521	B	47.1	10.1	32.3	24.8	14.4	1236	70.1	1239	.	.	.	.	.	.
4/26/07	3	28	522	B	91.9	10.1	75.3	64.5	12.1	1240	72.3	1245	2.0453	1.7536	1.5829	2.0423	1.7724	.
4/26/07	3	28	523	B	70.3	9.4	.	55.1	16.0	1243	70.4	1246	2.7757	1.8399	2.8402	4.4191	1.8191	.
4/26/07	3	28	516	C	155.0	8.9	136.5	105.6	15.4	104	70.4	111	1.9193	3.1955	1.9788	2.4204	2.8730	2.8124
4/26/07	3	28	517	C	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4/26/07	3	28	518	C	157.4	9.5	136.1	97.1	12.7	1252	70.1	103	2.8730	1.8349	1.7913	2.6685	4.5044	2.2607
4/26/07	3	28	519	C	189.8	9.2	170.5	139.3	11.5	1258	70.8	107	1.9094	1.4777	2.0562	2.2081	.	.
4/26/07	3	28	520	C	149.0	9.3	137.9	119.5	11.6	1256	70.5	105	0.8892	2.3659	0.7770	1.6365	1.1204	1.5213
4/26/07	3	28	521	C	52.8	8.4	44.3	39.2	14.0	1252	71.0	1255	4.3169	1.7565	3.0367	2.3401	.	.
4/26/07	3	28	522	C	63.7	8.9	54.7	48.5	14.5	1254	70.4	1258	2.2081	2.0443	3.1985	.	.	.
4/26/07	3	28	523	C	38.2	9.1	28.0	21.7	16.1	1252	70.3	1254	3.9844	2.5882	.	.	.	.
4/26/07	3	28	516	D	116.7	9.9	97.1	76.1	13.3	115	70.0	121	2.7211	2.0146	2.6030	2.6904	2.3798	.
4/26/07	3	28	517	D	166.9	10.4	148.8	123.8	9.9	107	70.0	115	2.0443	2.5951	1.8240	2.6566	2.1505	1.9868
4/26/07	3	28	518	D	106.3	10.3	93.4	72.3	11.3	112	70.6	116	2.2805	1.5174	3.0963	2.0208	1.8657	2.1991
4/26/07	3	28	519	D	199.8	10.4	177.0	136.1	9.1	108	70.0	118	1.8498	1.6474	2.0999	1.5918	2.5306	2.0205
4/26/07	3	28	520	D	89.4	9.1	74.0	61.0	12.3	113	70.2	120	1.4251	1.3288	1.6672	2.1197	2.0800	2.9176
4/26/07	3	28	521	D	85.4	9.2	72.2	59.0	10.5	107	70.6	113	3.0188	1.9540	1.8111	1.7268	.	.
4/26/07	3	28	522	D	69.1	10.1	54.8	50.5	15.1	119	70.2	122	2.6894	2.8224	3.2660	4.4727	2.4830	2.9047
4/26/07	3	28	523	D	46.5	8.7	38.5	32.4	14.1	119	70.3	123	2.0999	4.0112	3.4178	4.4707	.	.

J-4. Raw data for broiling record of beef steaks.

Date	PD	SD	#	trt	Code	Order	Raw wt	Ckd Wt.	Temp On	Time On	Temp Off	TimeOff	L1	A1	B1	L2	A2	B2
3/27/07	1	0	503	D	911	1	22.9	191.2	15.4	5:28	70.2	5:34	50.07	24.61	10.78	46.51	26.63	10.84
3/27/07	1	0	505	A	847	2	179.2	156.3	15.7	5:29	70	5:35	53.20	19.87	9.39	47.72	25.82	10.89
3/27/07	1	0	504	C	943	3	129.3	97.4	16	5:37	70	5:46	56.65	21.17	11.29	51.01	24.12	12.17
3/27/07	1	0	506	A	168	4	192.3	170.3	17.5	5:38	70	5:46	.	.	.	.	.	.
3/27/07	1	0	500	A	49	5	272.9	253.4	14.6	5:41	70	5:51	53.18	33.92	15.21	54.83	33.23	14.99
3/27/07	1	0	501	D	225	6	194.2	174.9	16.6	5:47	70	5:55	60.33	20.00	9.45	57.46	24.73	9.36
3/27/07	1	0	500	B	895	7	220.8	204.6	15.7	5:48	70	5:54	50.10	20.74	3.97	48.86	20.40	4.54
3/27/07	1	0	503	B	334	8	224.5	178.3	16	5:53	70	6:03	61.31	23.67	9.26	61.62	21.10	13.75
3/27/07	1	0	507	B	407	9	47	41.3	21.5	6:27	70	6:30	60.70	23.61	11.11	61.23	23.10	10.78
3/27/07	1	0	501	C	101	10	244.5	205.8	19.6	6:30	70	6:42	61.78	25.15	11.24	61.20	26.74	12.10
3/27/07	1	0	503	A	827	11	234.4	212	19.2	6:34	70	6:41	51.70	26.80	8.75	54.24	27.06	10.18
3/27/07	1	0	505	D	800	12	147.9	115	20.3	6:44	70.2	6:53	61.96	21.79	13.54	62.31	25.15	14.56
3/27/07	1	0	504	D	366	13	113.3	93.8	20.6	6:51	70	6:57	54.25	30.56	10.36	53.78	31.05	9.07
3/27/07	1	0	503	C	404	14	256.6	205.9	19.9	6:55	70	7:05	51.53	29.13	8.86	50.82	25.90	9.76
3/27/07	1	0	505	B	50	15	108	76	20.6	6:59	72	7:07	53.24	28.18	11.90	52.53	16.29	15.89
3/27/07	1	0	507	C	871	16	48.1	38.7	20.7	7:04	70	7:09	59.80	22.54	9.11	62.32	22.02	10.53
3/27/07	1	0	500	C	544	1	259.7	211.1	13.1	5:27	70	5:38	51.43	21.76	12.70	54.68	21.78	12.30
3/27/07	1	0	501	A	352	2	180.1	163.6	13.6	5:29	70	5:39	58.65	16.56	11.18	38.10	19.48	3.67
3/27/07	1	0	500	D	760	3	227.2	211.7	16.4	5:40	71	5:44	.	.	.	.	.	.
3/27/07	1	0	501	B	870	4	169.1	138.8	16.8	5:40	70	5:49	59.70	19.31	8.29	59.89	21.04	10.61
3/27/07	1	0	506	D	765	5	258.7	220.2	15.6	5:42	70	5:50	58.43	25.79	14.01	54.11	29.99	15.01
3/27/07	1	0	505	C	612	6	155.2	122.1	16.2	5:45	70	5:56	.	.	.	.	.	.
3/27/07	1	0	504	A	473	7	89.1	76.9	19	5:51	70	5:57	61.99	22.87	9.33	56.61	26.32	10.63
3/27/07	1	0	502	B	576	8	192.1	139.7	17.2	5:53	70	6:09	.	.	.	.	.	.
3/27/07	1	0	502	D	275	9	237.4	186.5	19.7	6:29	70	6:43	65.84	19.78	12.52	57.23	29.76	11.69
3/27/07	1	0	502	C	85	10	195.8	155.8	20.7	6:31	72	6:38	61.89	20.77	8.77	63.39	21.69	10.08
3/27/07	1	0	507	A	618	11	116.8	96.6	21.1	6:34	72	6:40	56.45	19.95	10.42	62.21	19.81	13.83
3/27/07	1	0	504	B	242	12	140.5	113.7	20.8	6:44	71.2	6:52	57.32	26.86	10.39	52.86	30.54	10.76

3/27/07	1	0	502	A	179	13	218.7	188.1	20.6	6:51	70	7:00	55.52	26.23	11.70	57.50	28.66	12.55
3/27/07	1	0	506	B	585	14	163.2	121.7	21.2	6:55	70	7:03	59.16	21.98	15.86	58.02	23.82	17.58
3/27/07	1	0	507	D	283	15	65.9	46.1	21.7	7:00	70.1	7:07	56.31	27.76	16.29	61.24	23.37	15.66
3/27/07	1	0	506	C	593	16	203.2	173.5	21.2	7:05	70	7:09	48.23	32.15	10.29	53.54	29.23	11.44
3/28/07	2	0	513	C	256	1	134.2	88.9	15.7	536	72	551	52.6	13.7	11.23	53.51	11.62	13.26
3/28/07	2	0	510	D	11	2	154	102.4	16.5	537	70	5:49	60.39	14.41	11.71	69.62	11.71	12.17
3/28/07	2	0	512	D	174	3	96.6	80.2	.	5:51	72	5:54	50.79	23.45	10.71	51.35	24	11.67
3/28/07	2	0	508	B	740	4	195.1	163.9	16.4	5:52	70.4	6:08	47.25	25.52	11.28	46.96	24.5	12.91
3/28/07	2	0	514	A	522	5	105.2	89.4	16.8	5:56	70.4	6:06	45.04	26.12	13.15	43.51	28.4	12.64
3/28/07	2	0	512	A	665	6	78.1	58.2	19.3	6:02	70.6	6:14	46.18	16.55	13.02	45.16	14.28	13.35
3/28/07	2	0	511	C	484	7	250.6	196	16.2	6:07	70	6:18	60.01	16.75	12.85	59.73	13.5	11.82
3/28/07	2	0	513	B	530	8	106.3	81.3	18.3	6:09	72	6:17	50.68	21.68	11.14	52.21	23.09	12.92
3/28/07	2	0	514	B	813	9	139.1	118.2	17.5	6:15	70.2	6:25	46.59	22.83	11.91	48.57	26.5	12.71
3/28/07	2	0	508	C	703	10	247	204.1	17.3	6:23	70	6:43	45.64	22.91	8.13	49.35	21.6	11.68
3/28/07	2	0	508	A	77	11	244.7	221.6	17.7	6:26	70.1	6:44	46.1	22.07	9.09	48.94	20.85	8.18
3/28/07	2	0	510	A	652	12	167.9	138.4	17.1	6:35	70.2	6:47	52.34	22.24	11.95	53	20.09	11.07
3/28/07	2	0	511	B	212	13	175.3	129.1	18.5	6:41	70.6	6:50	56.9	18.52	13.29	59.52	13.23	12.69
3/28/07	2	0	514	C	443	14	79.8	66.6	17.8	6:45	70.2	6:53	47.3	21.36	12.86	45.76	19.37	13.71
3/28/07	2	0	509	D	372	15	255.6	212.1	18.2	6:48	70	6:58	51.51	20.6	12.19	52.16	20.52	10.76
3/28/07	2	0	514	D	248	16	61.3	48.5	19.6	6:50	70.6	7:04	43.59	20.57	12.69	40.28	13.96	11.4
3/28/07	2	0	509	C	141	1	277.4	212	15.4	5:37	73.6	5:46	49.75	21.53	8.98	56.98	20.28	12.68
3/28/07	2	0	513	A	623	2	191.9	167.7	14.5	5:38	70.2	.	44.25	23.99	8.04	47.22	23.83	9.86
3/28/07	2	0	511	A	399	3	187.7	156.5	14.6	5:47	70	5:54	61.91	13.49	11.25	59.84	13.76	11.06
3/28/07	2	0	515	D	991	4	95.7	75	17.6	5:51	70	5:58	46.39	25.45	8.58	51.64	22.17	11.77
3/28/07	2	0	512	C	971	5	157.4	140.9	17.2	5:56	70	6:01	46.35	22.54	6.18	49.33	24.44	8.73
3/28/07	2	0	509	B	916	6	207.9	166.8	16.6	6:01	70	6:08	52.77	21.44	11.19	56.33	20.22	12.14
3/28/07	2	0	513	D	858	7	145.8	117.6	16.7	6:07	70	6:16	43.52	26.33	10.92	47.35	22.97	8.93
3/28/07	2	0	508	D	825	8	260.4	241.2	17.9	6:10	70	6:17	45.05	22.49	7.62	50.12	22.18	10.68
3/28/07	2	0	515	B	486	9	65.3	51.8	18.1	6:14	70	6:24	48.03	20.35	12.42	43.12	28.09	10.75
3/28/07	2	0	515	A	189	10	93.2	76.2	19	6:22	70	6:31	52.4	22.18	11.19	45.66	23.61	8.19
3/28/07	2	0	509	A	37	11	268.4	229	17.8	6:27	70	6:37	53.95	19.59	9.76	53.03	21.29	11.82

3/28/07	2	0	510	B	6	12	206.4	160	17.4	6:31	71	6:45	51.85	23.37	10.74	54.29	23.32	10.09
3/28/07	2	0	511	D	380	13	252.3	188.4	18.8	6:40	70.5	6:49	60.66	14.54	11.97	58.95	10.7	13.56
3/28/07	2	0	515	C	995	14	88.7	74.1	18.6	6:44	71	6:50	51.99	20.25	13.26	51.02	19.81	13.65
3/28/07	2	0	512	B	669	15	94.8	82.5	19.4	6:48	71.2	6:56	54.81	20.54	12.49	49.73	25.86	11.31
3/28/07	2	0	510	C	563	16	176.6	141.8	18.6	6:51	70.1	7:01	55.76	19.15	9.31	52.14	19.73	8.25
3/29/07	3	0	521	B	499	1	64.8	46.4	15.2	5:26	70	5:34	41.01	23.33	1.00	40.46	25.29	2.35
3/29/07	3	0	521	C	530	2	41.2	32.9	15.2	5:27	71	5:33	55.84	19.56	9.41	54.90	18.26	9.04
3/29/07	3	0	518	C	206	3	122.5	107.7	13.8	5:35	71.6	5:41	63.18	18.93	7.02	61.69	21.68	8.17
3/29/07	3	0	521	A	678	4	64.9	54.8	17	5:38	70.8	5:42	49.30	23.22	6.33	48.59	25.06	7.73
3/29/07	3	0	522	D	643	5	55.7	49	16.4	5:43	70.4	5:47	38.81	20.98	7.19	55.23	25.16	7.60
3/29/07	3	0	520	A	786	6	89	84.2	15.5	5:48	70.1	5:51	44.12	29.30	2.59	44.91	26.99	4.01
3/29/07	3	0	523	C	235	7	81.6	64.5	15.7	5:52	70	5:59	47.09	24.30	3.29	50.75	24.55	6.22
3/29/07	3	0	518	A	985	8	122.7	96.5	14.7	5:55	70	6:03	60.78	22.94	8.24	55.87	23.64	10.53
3/29/07	3	0	519	B	594	9	184.9	154.5	14.9	6:09	72.1	6:20	56.81	16.60	6.11	56.07	17.86	12.38
3/29/07	3	0	519	D	833	10	174.8	140.3	16.3	6:13	70.5	6:23	60.24	20.21	8.26	52.51	27.66	8.07
3/29/07	3	0	523	B	296	11	46.9	40.2	19	6:23	70.2	6:27	50.53	21.85	11.03	49.06	21.43	11.50
3/29/07	3	0	516	C	544	12	145.1	96.9	17.2	6:25	70.2	6:40	60.19	19.55	7.59	56.87	23.08	8.30
3/29/07	3	0	519	C	96	13	190.1	162.6	17.7	6:29	71.9	6:35	59.09	17.59	9.61	52.96	25.92	7.77
3/29/07	3	0	523	D	679	14	35.1	27.2	.	.	71	6:40	52.04	25.83	8.23	45.81	23.54	12.38
3/29/07	3	0	517	A	953	15	168.4	155.6	.	.	71.9	6:45	44.12	25.20	4.70	50.79	17.01	10.43
3/29/07	3	0	516	B	90	16	151.3	127.3	12	.	71.5	6:49	48.77	28.62	9.23	51.72	25.96	7.04
3/29/07	3	0	522	A	753	1	54.6	48.5	14.7	5:28	70.1	5:36	49.44	22.88	12.39	55.29	23.82	11.24
3/29/07	3	0	523	A	935	2	49.9	44.1	15.2	5:28	71.6	5:34	54.35	22.02	8.65	52.92	23.87	5.79
3/29/07	3	0	518	C	887	3	183.4	139.3	13	5:36	70	5:46	54.43	26.81	7.19	52.16	29.56	7.42
3/29/07	3	0	516	A	36	4	144.8	126.2	13.4	5:39	71.9	5:46	53.79	26.71	9.16	55.23	25.16	7.60
3/29/07	3	0	520	C	15	5	96.8	84.2	14.4	5:43	70.3	5:53	51.75	27.81	7.84	51.32	29.43	8.25
3/29/07	3	0	518	D	142	6	176.8	137.8	14.6	5:48	72.7	5:59	60.76	17.86	10.23	62.26	20.25	7.70
3/29/07	3	0	517	C	987	7	221.4	190.2	13.7	5:52	70.4	6:04	52.53	26.31	9.19	51.75	26.17	8.97
3/29/07	3	0	520	B	527	8	64.1	51.4	18	5:58	70.3	6:05	49.37	21.52	7.04	56.76	20.07	7.54
3/29/07	3	0	521	D	425	9	50.7	41	18.3	6:10	70.6	6:15	54.78	22.99	7.64	56.78	23.17	7.68
3/29/07	3	0	522	C	343	10	75.3	64.5	18.9	6:13	72.4	6:20	47.93	22.44	4.15	49.34	23.65	4.41

3/29/07	3	0	518	B	696	11	167.5	131.3	16.5	6:19	72.8	6:27	60.28	16.39	8.68	58.18	19.46	9.67
3/29/07	3	0	519	A	935	12	131.5	113.2	17.5	6:26	70.8	6:32	51.67	27.52	8.14	49.97	28.41	10.23
3/29/07	3	0	517	B	630	13	190.9	150.6	17.4	6:29	71.8	6:40	46.90	31.81	8.36	45.39	27.16	9.78
3/29/07	3	0	522	B	128	14	63.7	56.5	19.7	6:34	71.7	6:38	50.37	26.65	5.71	47.99	28.38	6.03
3/29/07	3	0	520	D	256	15	88.3	79	18.6	6:41	70.1	6:47	43.94	24.75	3.45	50.31	28.89	6.84
3/29/07	3	0	517	D	325	16	186.4	176.7	17.9	6:45	72.1	6:48	27.79	14.57	-0.76	27.79	12.72	-0.51
4/10/07	1	14	507	C	545	1	76.6	56.2	21	5:26	70.1	5:32	48.15	15.68	12.36	50.25	15.70	13.19
4/10/07	1	14	503	B	803	2	190.3	153.2	9.3	5:25	70	5:37	54.29	16.13	9.80	55.09	17.34	10.33
4/10/07	1	14	501	D	930	3	187.7	156.8	14.2	5:39	70	5:51	51.16	19.74	8.44	54.74	17.23	8.40
4/10/07	1	14	500	A	86	4	282.6	249.5	13.3	5:43	70	5:59	47.23	27.37	10.71	49.12	26.68	14.09
4/10/07	1	14	504	C	567	5	163.8	133.1	17.1	5:48	70.1	5:53	50.73	24.67	11.66	51.28	25.09	11.33
4/10/07	1	14	501	C	606	6	209.4	178.7	15.5	5:54	70	6:06	48.40	25.88	8.72	54.22	23.09	10.88
4/10/07	1	14	507	D	553	7	74.5	49.7	18.2	5:55	71.6	6:02	53.41	17.80	12.20	45.21	11.73	13.15
4/10/07	1	14	507	B	774	8	26.5	20.9	20.5	5:59	70.5	6:03	54.7	18.72	7	56.22	17.87	8.25
4/10/07	1	14	506	D	400	9	163.1	130.9	12.7	6:12	71.1	6:22	50.38	27.39	13.45	45.78	30.72	12.52
4/10/07	1	14	501	B	904	10	168	144	15.2	6:16	70.3	6:27	49.85	23.39	9.81	48.59	25.30	11.02
4/10/07	1	14	503	D	272	11	192.4	145.9	15.8	6:23	70	6:31	49.70	19.27	12.40	53.11	17.09	12.05
4/10/07	1	14	507	A	821	12	107.2	84.1	17.8	6:29	70.1	6:37	57.45	20.50	12.71	52.74	23.61	10.96
4/10/07	1	14	505	B	49	13	112.4	83.6	17.4	6:32	70.6	6:39	56.79	16.16	11.62	51.56	13.18	13.31
4/10/07	1	14	503	C	210	14	186.2	145.3	16.8	6:36	70	6:45	58.07	19.85	8.78	54.95	22.35	11.94
4/10/07	1	14	502	A	234	15	251.8	223.8	16.5	6:40	70	6:49	51.31	22.51	10.31	48.62	26.62	9.44
4/10/07	1	14	505	A	161	16	168.1	142.1	16.5	6:45	70.5	6:43	51.8	51.82	8.37	49.84	26.19	11.40
4/10/07	1	14	500	B	18	1	276.3	231.2	11.2	5:26	70.9	5:39	56.05	22.71	11.35	57.35	22.66	11.04
4/10/07	1	14	506	C	221	2	180.7	131	12.5	5:26	71.1	5:38	49.65	17.10	10.01	46.85	24.20	10.39
4/10/07	1	14	505	D	305	3	147	108.7	12.4	5:40	70	5:51	58.93	13.26	10.70	56.29	13.12	11.76
4/10/07	1	14	503	A	425	4	182.3	155	12.4	5:44	71.6	5:54	49.23	26.57	8.91	52.04	23.82	9.36
4/10/07	1	14	506	B	719	5	123.2	97.3	16.1	5:50	70.2	5:57	49.29	18.93	10.27	47.67	21.94	10.92
4/10/07	1	14	500	D	864	6	215.7	173.7	13.9	5:55	70	6:04	47.23	27.37	10.71	49.12	26.68	14.09
4/10/07	1	14	502	C	796	7	216.2	170.3	13.9	5:55	72	6:05	54.96	22.19	11.74	52.02	23.99	12.44
4/10/07	1	14	504	A	893	8	87.2	66.3	16.8	5:57	70	6:06	50.81	22.79	11.68	50.83	27.52	13.27
4/10/07	1	14	506	A	41	9	196.7	162.2	11.2	6:13	70	6:24	44.79	25.28	8.90	47.08	27.54	9.42

4/10/07	1	14	502	D	664	10	217.3	170.3	12.6	6:17	70.8	6:28	53.34	22.60	9.66	50.13	27.21	10.31
4/10/07	1	14	505	C	408	11	132	105.3	13.5	6:25	70	6:34	56.49	17.80	11.64	56.68	20.93	12.14
4/10/07	1	14	504	D	761	12	123	97.3	12.3	6:29	70.1	6:36	48.49	24.47	9.98	49.65	26.97	10.53
4/10/07	1	14	501	A	871	13	216.8	191.9	15.4	6:35	70.7	6:45	43.93	25.91	7.72	40.39	24.82	6.37
4/10/07	1	14	502	B	405	14	166.6	120.2	13.5	6:38	70.1	6:49	62.07	14.85	12.29	59.58	15.01	10.23
4/10/07	1	14	500	C	123	15	242.6	187.3	16.7	6:47	73.1	7:00	53.77	24.56	10.83	48.64	29.28	12.77
4/10/07	1	14	504	B	191	16	81.1	56.9	17	6:50	70.3	6:59	54.42	21.47	9.53	53.78	17.75	10.49
4/11/07	2	14	509	C	225	1	201.2	165.5	11.3	5:30	70.8	5:36	53.33	20.02	9.20	57.57	19.37	9.91
4/11/07	2	14	512	A	414	2	92	75	10.9	5:32	70	5:38	53.93	19.17	7.79	47.34	22.99	8.58
4/11/07	2	14	510	A	797	3	179.9	141.2	6.2	5:37	70	5:50	46.58	21.13	8.29	49.09	20.99	8.18
4/11/07	2	14	509	B	336	4	252.4	218.6	9.2	5:42	70.3	5:52	54.14	19.82	8.56	51.32	18.91	7.64
4/11/07	2	14	513	B	416	5	78.8	69.5	13.3	5:51	70.3	5:54	46.81	22.74	6.93	45.47	21.62	7.17
4/11/07	2	14	511	B	44	6	221.2	189.8	11.4	.	70.3	6:00	56.38	19.84	6.97	55.27	23.11	10.49
4/11/07	2	14	514	C	330	7	81	68.2	13.7	5:59	71	6:05	46.51	22.44	7.21	44.45	21.79	8.62
4/11/07	2	14	511	C	980	8	181.5	142.2	11.4	6:02	70	6:13	63.47	16.30	9.88	60.70	16.25	9.64
4/11/07	2	14	514	B	340	9	138.9	114.4	9.3	6:24	70.1	6:38	43.53	21.33	5.59	45.90	24.81	9.60
4/11/07	2	14	515	A	605	10	95	74	10.5	6:28	70	6:38	44.10	16.12	9.01	44.56	16.02	10.06
4/11/07	2	14	508	A	690	11	186.8	174.7	11.6	6:40	70	6:49	40.86	16.39	1.72	42.99	19.24	4.36
4/11/07	2	14	515	D	341	12	110.8	78.9	14.9	6:41	72	6:52	53.67	16.67	8.21	46.98	12.96	9.36
4/11/07	2	14	509	D	666	13	209.6	152.4	9.9	6:47	71.3	6:57	59.74	16.44	8.39	57.25	15.43	10.97
4/11/07	2	14	512	D	218	14	90.6	73.8	11.8	6:48	70.4	6:55	53.14	16.94	6.79	50.87	20.33	10.35
4/11/07	2	14	513	C	656	15	127	96.5	14.5	6:50	70.5	6:59	64.25	16.66	8.17	50.49	17.12	11.64
4/11/07	2	14	510	D	96	16	221.1	165.6	14.8	6:54	70	7:05	59.47	15.03	.	52.40	19.32	.
4/11/07	2	14	513	A	550	1	159.8	131.9	9	5:26	72.9	5:38	46.31	22.09	8.00	50.72	20.27	9.57
4/11/07	2	14	510	C	991	2	200.1	155.7	13.4	5:36	70.1	5:44	52.26	13.59	11.28	52.11	16.45	9.37
4/11/07	2	14	508	C	237	3	238.5	220.4	13.1	5:39	72	5:45	47.02	20.01	8.20	38.25	18.32	3.14
4/11/07	2	14	508	D	957	4	286.2	254.6	11.9	5:42	70	5:53	46.93	20.15	9.65	47.76	21.21	8.58
4/11/07	2	14	509	A	685	5	215.5	191.1	11.7	5:46	70.1	5:57	51.68	19.24	5.78	59.08	17.35	8.79
4/11/07	2	14	514	A	783	6	93.6	80.2	13.5	5:55	70	6:02	.	21.25	7.43	46.53	23.19	9.79
4/11/07	2	14	511	A	624	7	166.2	146	14.5	6:00	70.1	6:08	59.55	19.05	9.57	56.10	18.86	7.43
4/11/07	2	14	511	D	992	8	260	205.4	12.9	6:03	70	6:13	.	20.93	8.23	.	19.17	10.07

4/11/07	2	14	514	D	524	9	73.1	65.9	13.5	6:25	70.7	6:29	47.01	24.23	10.50	47.49	21.31	12.02
4/11/07	2	14	515	B	970	10	95.9	74.3	11.4	6:28	73	6:38	46.54	24.17	12.25	48.03	23.65	11.50
4/11/07	2	14	512	B	323	11	88.2	72.1	14.9	6:35	70.1	6:43	50.44	19.05	11.35	52.63	19.66	49.35
4/11/07	2	14	515	C	404	12	74.3	57.2	12.5	6:40	71.2	6:45	52.01	22.05	8.31	43.04	9.52	9.80
4/11/07	2	14	513	D	516	13	129	102.5	12	6:43	70.1	6:51	51.99	20.43	7.73	53.89	18.35	11.11
4/11/07	2	14	508	B	8	14	254.1	222.7	11.3	6:46	70.4	6:57	44.99	21.41	6.00	50.90	22.20	10.12
4/11/07	2	14	510	B	645	15	158.9	129.5	11.1	6:49	70.4	6:57	55.56	17.97	8.04	53.07	18.86	7.56
4/11/07	2	14	512	C	739	16	159.8	109.8	14.4	6:49	70	7:05	52.09	19.56	7.9	48.73	16.68	10.00
4/12/07	3	14	522	C	135	1	74.1	66.5	13.5	5:46	70.1	5:50	42.95	22.50	6.3	42.63	25.52	7.87
4/12/07	3	14	520	D	905	2	73.8	60	13	.	70.5	5:55	47.92	24.07	9.42	49.73	23.75	8.12
4/12/07	3	14	516	A	797	3	144.5	100	14.1	5:50	71.5	5:59	52.38	21.23	6.37	43.94	29.74	9.69
4/12/07	3	14	521	A	511	4	70.3	57.6	16.5	5:57	70.1	6:03	49.15	20.95	8.6	53.52	20.07	11.19
4/12/07	3	14	516	C	418	5	190.2	164	14.1	6:02	71.2	6:07	46.85	22.52	6.12	49.16	24.25	6.25
4/12/07	3	14	521	D	597	6	46.1	38.2	16	6:03	70.5	6:07	55.97	19.27	13.16	57.46	19.5	12.53
4/12/07	3	14	522	B	455	7	73.1	61.5	.	6:08	72	6:14	50.2	21.57	8.11	49.73	21.9	7.12
4/12/07	3	14	521	C	641	8	39.1	26.8	14	6:08	70.5	6:14	60.89	13.58	11.6	57.5	15.87	13.7
4/12/07	3	14	518	D	506	9	136.2	110.5	10.5	6:26	70	6:33	56.82	21.96	7.72	56.86	19.87	11.55
4/12/07	3	14	519	A	121	10	184.7	156.4	10.7	6:27	70	6:39	50.93	23.55	7.63	49.09	21.23	9.87
4/12/07	3	14	516	B	281	11	137.6	116.2	11.5	6:32	72	6:40	57.9	22.73	10.72	57.02	21.07	10.07
4/12/07	3	14	516	D	338	12	107.4	77	13.3	6:35	71.2	6:43	59.8	18.83	9.28	61.28	12.89	10.92
4/12/07	3	14	522	A	402	13	118.6	102.6	13.8	6:38	70.1	6:47	49.06	20.59	7.42	49.67	22.41	10.43
4/12/07	3	14	518	C	259	14	148.3	110.1	12.2	6:42	70.9	6:54	62.01	17.44	10.99	62.09	19.51	12.88
4/12/07	3	14	523	B	158	15	29.1	21.8	16.2	6:48	70	6:52	52.64	18.53	10.9	52.76	16.74	14.29
4/12/07	3	14	519	B	950	16	180.9	134	.	6:46	70.5	6:58	59.64	14.81	11.81	59.42	21.77	9.86
4/12/07	3	14	519	D	508	1	110.8	77.4	.	.	72	5:37	58.52	14.66	9.8	56.28	16.56	10.97
4/12/07	3	14	517	A	115	2	161.6	143.2	12	.	70	5:56	45.42	23.08	7.3	45.43	24.23	7.96
4/12/07	3	14	519	C	573	3	180.9	129.7	11.1	5:47	70	5:58	62.48	12.95	11.07	52.98	22.95	12.15
4/12/07	3	14	523	A	105	4	52.6	42.6	17.1	5:55	70	6:02	48.15	16.8	10.47	48.65	10.94	14.15
4/12/07	3	14	523	D	957	5	37.5	28.5	18.4	6:03	70.5	6:09	48.16	21.45	6.32	54.82	16.74	11.22
4/12/07	3	14	520	B	810	6	61.5	46.7	18	6:04	70	6:09	54.05	20.73	8.92	53.04	17.13	13.61
4/12/07	3	14	520	A	102	7	88.3	74.2	15.3	6:06	70	6:14	47.85	19.51	6.73	46.82	20.89	5.77

4/12/07	3	14	520	C	388	8	165.2	143.2	13.8	6:10	74.2	6:18	41.27	23.9	4.63	42.28	24.73	5.84
4/12/07	3	14	518	B	30	9	145.5	110.4	5.5	6:24	70.8	6:33	58.88	22.02	9.93	58.8	20.08	10.16
4/12/07	3	14	518	A	439	10	101	81	10.8	6:28	70.6	6:34	63.95	17.27	11.03	59.67	18.3	12.6
4/12/07	3	14	517	B	918	11	204.6	175.3	7.3	6:30	70.8	6:41	49.13	27.06	9.97	46.55	23.75	9.98
4/12/07	3	14	521	B	284	12	60.4	39.9	14	6:36	70.2	6:43	60.97	15.25	15.29	58.26	17.7	14.28
4/12/07	3	14	517	C	264	13	168.3	125.2	10.3	6:37	71.1	6:52	.	.	.	.	.	.
4/12/07	3	14	522	D	853	14	50.7	44.3	.	6:45	71	6:50	51.31	18.13	11.15	52.96	23.25	9.32
4/12/07	3	14	523	C	406	15	55.4	44.4	15.7	6:46	72	6:53	.	.	.	.	.	.
4/12/07	3	14	517	D	495	16	189.3	150.4	13.5	6:48	70	6:59	53.17	21.77	9.08	46.12	25.45	8.92
4/24/07	1	28	500	C	70	1	174.8	150.1	3.5	9:26	70	9:34	59.47	16.43	9.49	61.45	15.45	9.51
4/24/07	1	28	504	B	469	2	59.2	47.8	8.3	9:43	70	9:49	53.97	19.74	9.92	54.28	18.42	11.14
4/24/07	1	28	504	D	549	3	97	79.2	13.6	9:44	70.5	9:51	48.6	22.53	7.65	50.72	23.9	9.76
4/24/07	1	28	506	A	23	4	146	125.5	9.3	9:38	70	9:47	55	19.08	8.29	53.79	19.79	10.38
4/24/07	1	28	503	A	543	5	207.1	177.5	13.7	9:48	70	9:55	57.81	17.56	9.12	49.09	19.1	9.9
4/24/07	1	28	505	D	227	6	173.4	135.3	9.3	9:50	70.4	10:00	54.07	19.56	8.72	55.69	17.27	11.15
4/24/07	1	28	504	C	193	7	121.1	97	15.4	9:56	70.1	10:01	54.62	19.64	7.63	56.51	20	9.32
4/24/07	1	28	500	B	262	8	278.3	221.9	11.7	9:57	70	10:20	59	15.14	9.36	57.92	15.88	11.45
4/24/07	1	28	503	B	288	9	196.8	147.7	8.4	10:06	70	10:27	56.18	16.85	9.19	52.57	18.52	10.33
4/24/07	1	28	505	A	911	10	174.4	130	13.3	10:22	70.2	10:29	57.2	16.93	9.64	55.36	14.21	14.53
4/24/07	1	28	506	C	407	11	172.5	145.8	15.8	10:23	70.9	10:30	50.91	17.13	6.6	51.5	19.64	9.71
4/24/07	1	28	502	D	917	12	221.7	150.4	10.9	10:33	70	10:53	56.38	16.59	9.81	58.11	16.8	11.36
4/24/07	1	28	501	D	284	13	185	148.6	12.7	10:32	70.5	10:46	56.43	16.18	10.43	59.01	14.65	9.71
4/24/07	1	28	503	C	224	14	212.5	151.6	10.8	10:32	70	10:55	55.15	15.32	9.76	50.02	19.37	9.78
4/24/07	1	28	507	B	243	15	36.6	27.1	18	10:58	70.2	11:03	55.56	16.09	11.14	57.67	14.28	12.2
4/24/07	1	28	500	A	366	16	186.7	163.3	16	10:58	70.9	11:08	57.06	15.81	8.87	58.09	15.96	12.84
4/24/07	1	28	502	A	37	1	243.8	210.6	13.2	5:13	70	5:23	42.13	21.87	5.76	42.2	27.23	8.13
4/24/07	1	28	502	C	896	2	208.9	156.7	13.5	5:14	70.1	5:23	56.88	16.23	10.26	56.76	17.92	12.62
4/24/07	1	28	507	D	31	3	72	44.8	16.2	5:18	72	5:27	55.89	16.68	13.67	55.71	18.08	14
4/24/07	1	28	502	B	396	4	117	84.8	14.5	5:22	70.2	5:31	59.89	11.92	9.95	59.18	14.92	11.51
4/24/07	1	28	501	B	949	5	175.4	148.8	15.1	5:28	70	5:36	53.54	19.41	8.96	54.78	20.34	8.92
4/24/07	1	28	504	A	587	6	76.3	56.8	17.7	5:32	72	5:40	54.77	20.44	9.56	53.11	18.55	11.15

4/24/07	1	28	500	D	280	7	226.5	191.7	19.8	5:33	70.2	5:43	57.64	18.77	10.18	62.5	15.63	11.11
4/24/07	1	28	501	C	389	8	155.4	131.3	14.2	5:35	70.3	5:47	54.94	16.71	7.35	54.76	19.73	8.88
4/24/07	1	28	501	A	39	9	186.6	169.2	12.9	6:15	70	6:27	53.57	20.51	6.98	53.02	21.13	9.02
4/24/07	1	28	506	D	717	10	188.3	162.3	14.5	6:18	70.4	6:24	46.7	25.15	7.4	51.09	23.08	10.46
4/24/07	1	28	503	D	837	11	167.7	121.6	13.6	6:24	70.2	6:34	54.72	20.19	10.8	54.03	22.38	10.07
4/24/07	1	28	505	B	784	12	149	121.5	15.5	6:25	73.5	6:33	48.37	22.87	10.68	49.32	22.02	10.35
4/24/07	1	28	506	B	72	13	174.2	136.5	14.5	6:31	73.6	6:39	50.98	22.71	11.19	54.14	19.99	10.11
4/24/07	1	28	505	C	962	14	136.3	101.6	15.8	6:31	70.1	6:40	51.25	22.09	10.07	53.37	14.42	11.53
4/24/07	1	28	507	A	199	15	53	40.2	18	6:41	71.9	6:45	52.45	21.01	10.75	50.01	23.47	11.34
4/24/07	1	28	507	C	53	16	72.6	53.9	17.8	6:42	70	6:49	57.29	17.22	9.43	56.14	20.88	9.03
4/25/07	2	28	515	D	402	1	136.8	94.4	4.3	9:51	.	.	54.42	14.89	11.63	52.44	19.49	12.42
4/25/07	2	28	512	B	922	2	111	88.7	5.3	9:52	70	10:02	53.23	20.11	12.03	50.25	23.16	10.89
4/25/07	2	28	512	A	99	3	131.4	111.2	7.5	10:01	70.3	10:09	47.63	22.86	10.29	48.14	24.07	12.39
4/25/07	2	28	511	D	251	4	200.7	141.5	7.7	10:08	70	10:22	64.23	11.63	10.76	60.13	15.05	12.22
4/25/07	2	28	510	C	401	5	206.9	150.7	7.5	10:14	70	10:30	52.97	20.38	7.96	51.76	23.24	11.3
4/25/07	2	28	513	D	391	6	129.5	92.8	6	10:09	70	10:17	54.26	19.97	10.45	52.69	21.63	10.51
4/25/07	2	28	509	A	394	7	232.3	199.5	2	10:11	70	10:29	54.46	21.45	9.4	56.35	18.79	10.43
4/25/07	2	28	511	A	668	8	199.7	164	4.4	10:13	70.2	10:26	63.12	13.57	10.63	57.73	17.03	9.45
4/25/07	2	28	512	C	508	9	181.3	121.9	9.2	10:49	80	11:03	46	19.83	10.8	51.35	23.77	11.36
4/25/07	2	28	515	B	255	10	110.6	95.7	7.6	10:49	73	11:00	49.95	23.52	9.16	49.47	25.36	9.89
4/25/07	2	28	509	D	71	11	262.2	207.4	6.5	10:50	70	11:06	56.98	18.08	9.71	55.32	19.81	10.3
4/25/07	2	28	509	C	574	12	183.4	150.6	8.5	10:54	71	11:04	55.24	19.47	11.31	57.3	17.89	9.62
4/25/07	2	28	508	B	928	13	186.5	166.9	6.2	10:53	74	11:02	54.71	18.64	7.4	56.18	18.81	10.55
4/25/07	2	28	515	A	452	14	124.2	73.9	18.3	10:50	70.3	11:07	52.83	14.3	11.1	57.13	11.91	12.18
4/25/07	2	28	511	B	372	15	253.6	195.3	9	11:04	70.5	11:18	56.55	19.06	11.97	58.83	19	10.45
4/25/07	2	28	514	C	249	16	97.3	87.7	8.8	11:04	70	11:14	49.87	20	8.3	48.98	19.5	10.66
4/25/07	2	28	513	C	538	1	172.6	123.3	1.9	.	75	5:23	51.38	19.74	11.04	50.72	20.49	11.47
4/25/07	2	28	513	B	29	2	119.3	86.3	7.2	5:11	70.8	5:19	51.31	13.68	12.4	54.61	19.35	13.16
4/25/07	2	28	510	D	988	3	183	138.3	7.2	5:15	70	5:28	53.45	21.22	9.14	50.79	24.32	9.49
4/25/07	2	28	509	B	667	4	130.3	102.8	10.1	5:17	70	5:25	51.8	19.5	6.51	53.39	19.53	11.47
4/25/07	2	28	512	D	133	5	72.5	52.5	13	5:24	74	5:31	58.69	16.2	9.91	56.75	15.89	10.32

4/25/07	2	28	514	D	951	6	77.8	65.6	9.7	5:26	74.8	5:35	43.58	22.79	8.95	48.44	22.57	12.44
4/25/07	2	28	510	A	697	7	137.5	114	10.5	5:28	70	5:37	49.07	21.96	10.1	51.89	22.78	9.76
4/25/07	2	28	510	B	137	8	195.6	140.4	6.1	6:02	70	6:17	54.67	15.1	11.68	54.71	16.66	11.83
4/25/07	2	28	513	A	239	9	129.6	102.1	5.9	6:07	70.2	6:19	51.73	19	10.99	48.45	19.17	12.55
4/25/07	2	28	514	B	407	10	86.9	67.9	9	6:14	70	6:22	40.94	21.08	9.53	42.43	20.36	9.77
4/25/07	2	28	514	A	421	11	98.1	72.5	9.5	6:14	72.9	6:25	48.4	19.74	11.87	45.18	18.73	12.46
4/25/07	2	28	515	C	869	12	72.2	49	13.3	6:21	70.1	6:27	49.32	15.08	10.35	48.84	15.17	10.77
4/25/07	2	28	511	C	611	13	230.5	175.6	9.9	6:21	70.2	6:33	53.83	20.69	9.14	55.25	19.71	9.62
4/26/07	2	28	521	B	470	1	28.1	19.8	16.9	9:39	70	9:44	51.63	8.84	12.76	54.47	8.53	14.91
4/26/07	3	28	516	A	411	2	163.3	124.9	10.2	9:27	70	9:38	62.23	16.05	13.31	52.65	20.34	12.16
4/26/07	3	28	516	D	90	3	151.3	91.7	10.4	9:28	70	9:35	47.94	13.49	15.44	57.25	16.90	13.91
4/26/07	3	28	520	B	14	4	74	45.7	14.5	9:40	71.9	9:52	54.65	16.94	9.45	54.86	17.40	14.83
4/26/07	3	28	519	D	434	5	174	120.7	10.7	9:40	70.8	9:54	59.17	16.07	10.50	57.16	10.94	12.18
4/26/07	3	28	522	A	159	6	84.1	61.4	15.3	9:48	70.1	10:05	48.62	13.47	10.28	51.01	14.87	10.15
4/26/07	3	28	516	C	474	7	185.6	128.6	13.7	9:54	70	10:15	61.47	12.21	11.12	62.45	15.38	9.75
4/26/07	3	28	523	A	386	8	47.2	38.1	15.6	9:56	70.9	9:59	54.54	16.23	9.40	54.34	15.35	10.86
4/26/07	3	28	516	B	602	9	124..2	98.4	9.8	10:30	70	10:38	57.87	17.26	10.81	62.89	11.97	10.16
4/26/07	3	28	522	C	517	10	100.7	65.2	12.5	10:35	73.3	10:42	45.49	21.23	5.65	45.05	20.33	4.49
4/26/07	3	28	520	D	703	11	79.8	60.7	12.3	10:37	71.2	10:44	51.96	17.83	10.74	52.96	17.54	10.07
4/26/07	3	28	519	C	943	12	150	111.3	10.5	10:46	72.2	10:56	59.01	14.00	10.94	59.82	14.00	11.25
4/26/07	3	28	519	B	496	13	188.6	149.1	5	10:49	70.6	10:59	58.72	14.98	9.96	62.09	12.74	11.18
4/26/07	3	28	521	D	690	14	87.9	58	12.3	10:52	72.4	11:04	55.50	12.53	13.68	56.16	12.21	13.05
4/26/07	3	28	520	C	846	15	108.6	81.2	10.1	10:59	70.4	11:12	57.55	13.18	9.95	57.07	13.20	10.95
4/26/07	3	28	518	A	527	16	155.8	124.7	8.1	11:02	70	11:14	63.53	14.42	8.65	58.24	16.66	10.64
4/26/07	3	28	522	D	970	1	49.8	41.1	16.3	5:21	70	5:26	55.65	19.22	11.73	51.11	21.19	9.05
4/26/07	3	28	517	D	286	2	169.6	142	3	4:59	70	5:08	55.37	19.22	10.76	53.74	19.90	14.42
4/26/07	3	28	519	A	18	3	147.2	124.9	5.2	5:01	70	5:07	59.00	13.43	9.08	48.84	19.70	10.78
4/26/07	3	28	517	B	177	4	222.4	188.9	3.5	5:02	70	5:12	53.21	20.95	8.47	53.00	22.84	10.53
4/26/07	3	28	518	C	760	5	119.5	96.5	10.3	6:24	70.4	5:29	61.39	15.53	8.55	59.02	9.60	8.21
4/26/07	3	28	522	B	374	6	105.1	83	126	5:28	70	5:35	48.88	22.69	7.80	53.68	19.10	11.09
4/26/07	3	28	523	C	97	7	46.6	35.4	15.5	.	70	5:42	55.54	17.91	12.94	57.69	16.25	12.96

4/26/07	3	28	517	A	465	8	237	208.9	1	6:01	70	6:12	48.54	22.70	7.73	43.52	21.67	6.56
4/26/07	3	28	523	D	72	9	44.1	35.1	14.1	6:15	70	6:19	48.06	15.08	6.38	49.16	16.22	7.41
4/26/07	3	28	517	C	224	10	185.4	159.6	2.6	6:03	70	6:14	58.90	17.80	8.20	52.30	19.90	8.76
4/26/07	3	28	518	D	16	11	104.6	78.5	4.2	6:05	70	6:10	66.13	12.56	10.71	58.37	21.74	10.05
4/26/07	3	28	523	B	600	12	64.4	52.7	14.4	6:27	70	6:34	42.68	22.66	8.25	43.19	22.58	8.11
4/26/07	3	28	521	C	771	13	47	36.1	14.8	6:35	70	6:41	48.94	21.55	11.34	44.97	22.47	9.17
4/26/07	3	28	518	B	375	14	112	72	11.8	6:28	70	6:43	67.28	9.24	11.07	65.00	97.57	10.99

J-5. Raw data for trained descriptive attribute sensory evaluation of beef steaks.

Date	PD	SD	Panel	#	trt	Code	Order	Session	Panelists	Juicy	MFTend	CT	Otend	oflavint	CBLean	CBFat	serum	liver	cowy	salt
3/27/07	1	0	1	503	D	911	1	1	Bradley	5	5	6	5	5	5	0	1	0	0	1
3/27/07	1	0	1	505	A	847	2	1	Bradley	6	6	5	5	5	5	1	1	0	1	2
3/27/07	1	0	1	504	C	943	3	1	Bradley	5	3	2	2	5	5	0	2	0	1	1
3/27/07	1	0	1	506	A	168	4	1	Bradley	5	5	3	4	6	5	1	3	0	0	2
3/27/07	1	0	1	500	A	49	5	1	Bradley	6	7	7	7	6	5	1	1	0	1	0
3/27/07	1	0	1	501	D	225	6	1	Bradley	7	7	7	7	6	4	0	1	0	0	1
3/27/07	1	0	1	500	B	895	7	1	Bradley	5	7	7	7	5	5	1	1	0	0	1
3/27/07	1	0	1	503	B	334	8	1	Bradley	5	4	4	4	5	5	0	0	0	0	1
3/27/07	1	0	1	507	B	407	9	2	Bradley	6	4	2	3	4	4	1	1	0	0	1
3/27/07	1	0	1	501	C	101	10	2	Bradley	6	6	5	5	5	4	2	0	0	0	1
3/27/07	1	0	1	503	A	827	11	2	Bradley	6	6	6	5	5	5	1	1	0	1	2
3/27/07	1	0	1	505	D	800	12	2	Bradley	5	6	6	6	6	5	0	1	0	0	1
3/27/07	1	0	1	504	D	366	13	2	Bradley	5	5	3	4	6	5	1	2	0	1	1
3/27/07	1	0	1	503	C	404	14	2	Bradley	6	5	6	5	6	5	2	0	0	0	2
3/27/07	1	0	1	505	B	50	15	2	Bradley	6	5	4	4	5	4	0	1	0	0	0
3/27/07	1	0	1	507	C	871	16	2	Bradley	6	5	5	5	7	5	0	0	0	0	2
3/27/07	1	0	1	503	D	911	1	1	Aldredge	4	4	7	4	5	4	0	1	0	0	1
3/27/07	1	0	1	505	A	847	2	1	Aldredge	7	5	4	5	5	5	0	2	0	1	0
3/27/07	1	0	1	504	C	943	3	1	Aldredge	6	4	3	4	4	4	0	1	0	1	0
3/27/07	1	0	1	506	A	168	4	1	Aldredge	7	4	3	4	7	5	0	1	0	4	2
3/27/07	1	0	1	500	A	49	5	1	Aldredge	7	8	7	8	5	3	1	1	0	0	1
3/27/07	1	0	1	501	D	225	6	1	Aldredge	6	7	8	7	5	4	0	0	0	0	0
3/27/07	1	0	1	500	B	895	7	1	Aldredge	7	7	7	7	6	5	0	2	0	0	0
3/27/07	1	0	1	503	B	334	8	1	Aldredge	6	4	6	4	6	6	0	2	0	0	2
3/27/07	1	0	1	507	B	407	9	2	Aldredge	6	5	4	5	6	5	0	1	0	0	2
3/27/07	1	0	1	501	C	101	10	2	Aldredge	7	6	6	6	6	5	1	1	0	0	1
3/27/07	1	0	1	503	A	827	11	2	Aldredge	7	5	7	5	6	6	1	2	0	0	2
3/27/07	1	0	1	505	D	800	12	2	Aldredge	5	4	2	3	5	5	0	0	0	0	2

3/27/07	1	0	1	504	D	366	13	2	Aldredge	6	4	5	4	5	5	0	1	0	0	1
3/27/07	1	0	1	503	C	404	14	2	Aldredge	7	6	6	6	6	5	1	0	0	2	1
3/27/07	1	0	1	505	B	50	15	2	Aldredge	6	4	2	3	6	5	0	1	0	1	2
3/27/07	1	0	1	507	C	871	16	2	Aldredge	5	2	4	2	6	4	1	1	0	2	2
3/27/07	1	0	1	503	D	911	1	1	Bailey	5	6	4	5	5	5	0	1	0	0	0
3/27/07	1	0	1	505	A	847	2	1	Bailey	5	7	5	6	6	5	1	1	0	0	1
3/27/07	1	0	1	504	C	943	3	1	Bailey	5	5	3	3	5	4	0	0	1	0	0
3/27/07	1	0	1	506	A	168	4	1	Bailey	6	5	2	2	6	5	0	1	0	0	1
3/27/07	1	0	1	500	A	49	5	1	Bailey	6	7	7	7	5	5	2	0	0	0	1
3/27/07	1	0	1	501	D	225	6	1	Bailey	6	7	6	7	5	5	2	0	0	0	0
3/27/07	1	0	1	500	B	895	7	1	Bailey	7	7	7	7	5	4	3	0	0	0	0
3/27/07	1	0	1	503	B	334	8	1	Bailey	5	5	5	5	7	5	0	1	0	0	1
3/27/07	1	0	1	507	B	407	9	2	Bailey	5	6	6	6	4	4	1	0	0	0	1
3/27/07	1	0	1	501	C	101	10	2	Bailey	6	7	6	7	5	5	2	0	0	0	1
3/27/07	1	0	1	503	A	827	11	2	Bailey	6	6	6	6	6	6	1	2	0	0	1
3/27/07	1	0	1	505	D	800	12	2	Bailey	5	5	6	5	6	5	1	0	0	0	0
3/27/07	1	0	1	504	D	366	13	2	Bailey	6	4	4	4	6	5	0	0	1	0	0
3/27/07	1	0	1	503	C	404	14	2	Bailey	5	5	5	5	6	5	0	1	0	0	1
3/27/07	1	0	1	505	B	50	15	2	Bailey	5	5	6	5	6	6	0	0	0	0	1
3/27/07	1	0	1	507	C	871	16	2	Bailey	6	6	6	6	5	4	2	0	0	0	0
3/27/07	1	0	1	503	D	911	1	1	Inglis	5	5	6	5	4	3	1	3	0	0	1
3/27/07	1	0	1	505	A	847	2	1	Inglis	6	6	7	6	5	4	1	3	0	0	1
3/27/07	1	0	1	504	C	943	3	1	Inglis	5	4	6	4	4	2	1	3	0	0	1
3/27/07	1	0	1	506	A	168	4	1	Inglis	4	4	5	4	4	3	1	3	0	0	1
3/27/07	1	0	1	500	A	49	5	1	Inglis	7	8	8	8	7	6	2	3	0	0	1
3/27/07	1	0	1	501	D	225	6	1	Inglis	7	7	8	7	6	5	1	3	1	0	1
3/27/07	1	0	1	500	B	895	7	1	Inglis	6	8	8	8	5	4	2	3	0	0	1
3/27/07	1	0	1	503	B	334	8	1	Inglis	5	5	6	5	5	4	1	3	0	0	1
3/27/07	1	0	1	507	B	407	9	2	Inglis	5	4	5	4	4	3	1	3	0	0	1
3/27/07	1	0	1	501	C	101	10	2	Inglis	7	7	8	7	5	4	1	3	0	0	1
3/27/07	1	0	1	503	A	827	11	2	Inglis	7	7	7	7	5	4	1	3	0	0	1

3/27/07	1	0	1	505	D	800	12	2	Inglis	4	3	5	3	4	3	1	2	0	0	1
3/27/07	1	0	1	504	D	366	13	2	Inglis	5	4	5	4	4	3	1	2	0	0	1
3/27/07	1	0	1	503	C	404	14	2	Inglis	3	3	4	3	4	3	1	2	0	0	1
3/27/07	1	0	1	505	B	50	15	2	Inglis	5	3	4	3	4	3	1	3	0	0	1
3/27/07	1	0	1	507	C	871	16	2	Inglis	3	3	4	3	4	3	1	2	0	0	1
3/27/07	1	0	1	503	D	911	1	1	Amen	6	5	6	5	7	4	0	0	0	1	1
3/27/07	1	0	1	505	A	847	2	1	Amen	7	6	6	6	7	5	1	1	0	1	2
3/27/07	1	0	1	504	C	943	3	1	Amen	6	5	5	4	6	4	1	1	0	2	0
3/27/07	1	0	1	506	A	168	4	1	Amen	5	6	5	5	6	5	0	0	1	0	1
3/27/07	1	0	1	500	A	49	5	1	Amen	7	8	8	8	5	5	1	1	0	0	0
3/27/07	1	0	1	501	D	225	6	1	Amen	7	8	7	8	4	4	1	0	0	0	0
3/27/07	1	0	1	500	B	895	7	1	Amen	6	8	8	8	5	4	0	0	0	0	0
3/27/07	1	0	1	503	B	334	8	1	Amen	5	4	5	4	6	5	0	0	0	0	0
3/27/07	1	0	1	507	B	407	9	2	Amen	6	6	6	6	6	5	1	0	0	0	0
3/27/07	1	0	1	501	C	101	10	2	Amen	7	8	6	7	4	4	1	0	0	0	0
3/27/07	1	0	1	503	A	827	11	2	Amen	6	6	6	6	6	5	0	0	0	0	1
3/27/07	1	0	1	505	D	800	12	2	Amen	5	4	6	4	7	5	0	0	0	3	0
3/27/07	1	0	1	504	D	366	13	2	Amen	5	4	5	4	6	5	0	0	0	0	1
3/27/07	1	0	1	503	C	404	14	2	Amen	5	5	5	5	6	4	0	0	0	2	1
3/27/07	1	0	1	505	B	50	15	2	Amen	4	5	6	5	7	5	0	0	0	0	0
3/27/07	1	0	1	507	C	871	16	2	Amen	6	6	6	6	7	5	1	0	0	3	0
3/27/07	1	0	2	500	C	544	1	1	Cunningham	6	7	8	7	6	6	2	1	0	0	0
3/27/07	1	0	2	501	A	352	2	1	Cunningham	5	7	8	7	6	5	0	2	0	1	2
3/27/07	1	0	2	500	D	760	3	1	Cunningham	6	7	7	7	4	4	0	3	0	0	0
3/27/07	1	0	2	501	B	870	4	1	Cunningham	5	6	6	6	5	5	0	0	0	1	0
3/27/07	1	0	2	506	D	765	5	1	Cunningham	5	5	4	4	6	5	0	1	0	3	0
3/27/07	1	0	2	505	C	612	6	1	Cunningham	6	5	4	4	5	5	0	0	0	0	0
3/27/07	1	0	2	504	A	473	7	1	Cunningham	6	6	5	5	6	6	0	1	0	0	0
3/27/07	1	0	2	502	B	576	8	1	Cunningham	6	6	6	6	5	4	1	0	0	0	1
3/27/07	1	0	2	502	D	275	9	2	Cunningham	6	7	7	7	5	5	0	0	0	0	0
3/27/07	1	0	2	502	C	85	10	2	Cunningham	6	7	7	7	5	5	0	0	0	1	0

3/27/07	1	0	2	507	A	618	11	2	Cunningham	6	6	5	5	6	4	0	1	0	2	0
3/27/07	1	0	2	504	B	242	12	2	Cunningham	6	6	6	6	5	5	0	0	0	0	0
3/27/07	1	0	2	502	A	179	13	2	Cunningham	7	7	7	7	6	6	1	2	0	0	0
3/27/07	1	0	2	506	B	585	14	2	Cunningham	5	5	4	4	6	4	0	0	0	1	0
3/27/07	1	0	2	507	D	283	15	2	Cunningham	5	4	4	4	4	4	0	1	0	0	0
3/27/07	1	0	2	506	C	593	16	2	Cunningham	6	6	6	6	6	5	0	4	1	0	0
3/27/07	1	0	2	500	C	544	1	1	Edwards	7	7	7	7	5	5	0	0	0	0	1
3/27/07	1	0	2	501	A	352	2	1	Edwards	7	6	6	6	5	5	1	0	0	1	1
3/27/07	1	0	2	500	D	760	3	1	Edwards	6	6	6	6	6	6	1	0	0	1	1
3/27/07	1	0	2	501	B	870	4	1	Edwards	6	6	7	6	5	5	0	0	0	3	1
3/27/07	1	0	2	506	D	765	5	1	Edwards	6	4	5	4	6	6	1	1	2	1	1
3/27/07	1	0	2	505	C	612	6	1	Edwards	6	4	6	4	6	6	0	0	0	0	1
3/27/07	1	0	2	504	A	473	7	1	Edwards	6	6	7	6	6	6	0	0	1	3	1
3/27/07	1	0	2	502	B	576	8	1	Edwards	6	6	7	6	6	6	0	0	2	0	1
3/27/07	1	0	2	502	D	275	9	2	Edwards	7	6	7	6	6	6	0	1	0	0	1
3/27/07	1	0	2	502	C	85	10	2	Edwards	6	6	7	6	6	5	0	0	2	2	1
3/27/07	1	0	2	507	A	618	11	2	Edwards	6	5	7	5	6	6	0	0	0	3	2
3/27/07	1	0	2	504	B	242	12	2	Edwards	7	5	7	5	6	6	0	0	1	2	1
3/27/07	1	0	2	502	A	179	13	2	Edwards	7	7	7	7	6	6	1	0	1	0	1
3/27/07	1	0	2	506	B	585	14	2	Edwards	6	5	6	5	6	6	0	0	0	3	1
3/27/07	1	0	2	507	D	283	15	2	Edwards	6	4	6	4	5	5	0	0	0	0	1
3/27/07	1	0	2	506	C	593	16	2	Edwards	7	6	7	6	7	6	1	2	0	0	1
3/27/07	1	0	2	500	C	544	1	1	CodyJohnson	6	7	8	7	5	4	0	0	0	0	0
3/27/07	1	0	2	501	A	352	2	1	CodyJohnson	7	7	7	7	5	5	1	0	0	0	1
3/27/07	1	0	2	500	D	760	3	1	CodyJohnson	6	8	7	8	6	6	0	0	0	0	1
3/27/07	1	0	2	501	B	870	4	1	CodyJohnson	6	6	6	6	5	5	2	0	0	0	1
3/27/07	1	0	2	506	D	765	5	1	CodyJohnson	7	4	3	4	5	4	3	0	0	2	2
3/27/07	1	0	2	505	C	612	6	1	CodyJohnson	6	5	5	5	6	5	1	2	0	0	1
3/27/07	1	0	2	504	A	473	7	1	CodyJohnson	6	6	6	6	5	5	1	0	0	0	1
3/27/07	1	0	2	502	B	576	8	1	CodyJohnson	5	6	7	6	6	5	0	0	0	0	1
3/27/07	1	0	2	502	D	275	9	2	CodyJohnson	6	6	7	6	6	5	1	0	0	0	2

3/27/07	1	0	2	502	C	85	10	2	CodyJohnson	6	7	7	7	5	5	0	0	1	1	1
3/27/07	1	0	2	507	A	618	11	2	CodyJohnson	6	6	5	5	6	4	4	0	1	0	2
3/27/07	1	0	2	504	B	242	12	2	CodyJohnson	6	6	7	6	5	5	1	1	0	0	0
3/27/07	1	0	2	502	A	179	13	2	CodyJohnson	7	7	8	7	7	6	0	0	0	0	1
3/27/07	1	0	2	506	B	585	14	2	CodyJohnson	6	5	6	5	5	5	1	0	0	0	1
3/27/07	1	0	2	507	D	283	15	2	CodyJohnson	5	6	5	5	6	5	1	0	0	1	1
3/27/07	1	0	2	506	C	593	16	2	CodyJohnson	6	6	6	6	7	5	2	2	2	1	2
3/27/07	1	0	2	500	C	544	1	1	Sartor	5	7	8	7	7	7	0	0	0	1	1
3/27/07	1	0	2	501	A	352	2	1	Sartor	5	7	7	8	5	4	1	0	0	0	1
3/27/07	1	0	2	500	D	760	3	1	Sartor	6	8	6	7	6	6	3	1	0	0	0
3/27/07	1	0	2	501	B	870	4	1	Sartor	6	6	7	6	6	5	1	2	0	0	1
3/27/07	1	0	2	506	D	765	5	1	Sartor	7	5	4	5	7	6	1	2	0	0	1
3/27/07	1	0	2	505	C	612	6	1	Sartor	6	4	2	4	5	5	0	1	0	1	1
3/27/07	1	0	2	504	A	473	7	1	Sartor	6	6	6	6	5	5	0	1	0	0	0
3/27/07	1	0	2	502	B	576	8	1	Sartor	5	5	3	4	5	5	1	1	0	0	1
3/27/07	1	0	2	502	D	275	9	2	Sartor	6	7	8	7	5	5	0	1	0	0	1
3/27/07	1	0	2	502	C	85	10	2	Sartor	5	5	5	5	6	5	0	1	0	1	0
3/27/07	1	0	2	507	A	618	11	2	Sartor	5	5	3	4	5	4	2	1	0	1	0
3/27/07	1	0	2	504	B	242	12	2	Sartor	6	5	5	5	7	6	1	1	0	1	1
3/27/07	1	0	2	502	A	179	13	2	Sartor	6	6	8	7	6	5	0	1	0	0	0
3/27/07	1	0	2	506	B	585	14	2	Sartor	5	5	4	5	6	6	0	1	0	1	0
3/27/07	1	0	2	507	D	283	15	2	Sartor	5	5	4	5	5	5	0	1	0	0	1
3/27/07	1	0	2	506	C	593	16	2	Sartor	6	5	4	5	6	6	0	1	0	1	1
3/27/07	1	0	2	500	C	544	1	1	Benli	6	6	7	6	5	4	0	0	0	0	1
3/27/07	1	0	2	501	A	352	2	1	Benli	7	8	7	7	6	5	1	1	0	0	1
3/27/07	1	0	2	500	D	760	3	1	Benli	7	8	6	6	5	5	1	1	0	0	1
3/27/07	1	0	2	501	B	870	4	1	Benli	6	7	6	6	5	4	2	0	0	1	1
3/27/07	1	0	2	506	D	765	5	1	Benli	7	5	5	5	7	6	0	0	0	1	2
3/27/07	1	0	2	505	C	612	6	1	Benli	6	3	3	3	6	6	0	2	0	0	2
3/27/07	1	0	2	504	A	473	7	1	Benli	6	5	5	5	5	4	0	0	0	2	1
3/27/07	1	0	2	502	B	576	8	1	Benli	6	5	6	5	6	6	1	0	0	1	1

3/27/07	1	0	2	502	D	275	9	2	Benli	6	6	5	5	6	6	0	0	0	2	1
3/27/07	1	0	2	502	C	85	10	2	Benli	6	7	6	6	6	6	0	1	0	0	1
3/27/07	1	0	2	507	A	618	11	2	Benli	6	3	4	3	6	5	1	0	0	3	1
3/27/07	1	0	2	504	B	242	12	2	Benli	6	6	7	6	6	6	1	0	0	2	1
3/27/07	1	0	2	502	A	179	13	2	Benli	7	6	7	6	6	6	0	0	0	0	1
3/27/07	1	0	2	506	B	585	14	2	Benli	5	3	4	3	6	6	0	1	0	1	1
3/27/07	1	0	2	507	D	283	15	2	Benli	5	3	4	3	5	5	0	0	0	2	1
3/27/07	1	0	2	506	C	593	16	2	Benli	6	6	6	6	6	6	0	1	0	1	1
3/28/07	2	0	1	513	C	256	1	1	Amen	6	6	7	6	7	5	0	0	0	2	1
3/28/07	2	0	1	510	D	11	2	1	Amen	4	5	7	5	5	5	0	0	0	0	0
3/28/07	2	0	1	512	D	174	3	1	Amen	6	6	6	6	6	4	0	0	0	0	1
3/28/07	2	0	1	508	B	740	4	1	Amen	8	8	7	8	6	2	6	0	0	0	0
3/28/07	2	0	1	514	A	522	5	1	Amen	7	7	7	7	7	6	0	1	0	0	2
3/28/07	2	0	1	512	A	665	6	1	Amen	6	6	6	6	6	5	1	0	0	0	1
3/28/07	2	0	1	511	C	484	7	1	Amen	6	7	8	7	7	4	1	0	0	3	0
3/28/07	2	0	1	513	B	530	8	1	Amen	7	6	8	6	6	5	1	0	0	2	0
3/28/07	2	0	1	514	B	813	9	2	Amen	8	7	8	7	6	5	1	2	0	0	1
3/28/07	2	0	1	508	C	703	10	2	Amen	7	8	8	8	5	3	4	0	0	0	0
3/28/07	2	0	1	508	A	77	11	2	Amen	7	8	7	8	5	4	4	0	0	0	1
3/28/07	2	0	1	510	A	652	12	2	Amen	6	6	7	6	6	6	1	0	0	0	0
3/28/07	2	0	1	511	B	212	13	2	Amen	6	7	8	7	6	5	0	0	0	1	0
3/28/07	2	0	1	514	C	443	14	2	Amen	7	7	6	7	6	5	1	0	0	1	1
3/28/07	2	0	1	509	D	372	15	2	Amen	6	7	6	7	4	4	2	0	0	0	0
3/28/07	2	0	1	514	D	248	16	2	Amen	6	7	7	7	7	6	1	0	0	0	1
3/28/07	2	0	1	513	C	256	1	1	Morrow	5	5	6	5	5	5	0	0	0	1	1
3/28/07	2	0	1	510	D	11	2	1	Morrow	4	7	8	7	6	5	0	1	0	0	1
3/28/07	2	0	1	512	D	174	3	1	Morrow	6	6	6	6	5	5	0	0	0	0	1
3/28/07	2	0	1	508	B	740	4	1	Morrow	6	8	7	8	6	4	0	0	0	0	0
3/28/07	2	0	1	514	A	522	5	1	Morrow	6	7	6	7	6	5	1	0	0	0	1
3/28/07	2	0	1	512	A	665	6	1	Morrow	6	5	6	5	5	5	0	0	0	0	1
3/28/07	2	0	1	511	C	484	7	1	Morrow	6	7	8	7	5	5	0	2	0	0	1

3/28/07	2	0	1	513	B	530	8	1	Morrow	6	6	7	6	6	5	0	2	0	0	1
3/28/07	2	0	1	514	B	813	9	2	Morrow	4	4	6	7	6	5	1	0	0	0	2
3/28/07	2	0	1	508	C	703	10	2	Morrow	6	8	8	8	5	4	0	0	0	0	1
3/28/07	2	0	1	508	A	77	11	2	Morrow	5	7	8	7	5	5	1	0	0	0	1
3/28/07	2	0	1	510	A	652	12	2	Morrow	6	6	7	6	6	5	0	2	0	0	1
3/28/07	2	0	1	511	B	212	13	2	Morrow	4	7	8	7	5	5	0	0	0	0	1
3/28/07	2	0	1	514	C	443	14	2	Morrow	6	6	6	6	6	5	2	2	0	0	1
3/28/07	2	0	1	509	D	372	15	2	Morrow	6	7	7	7	5	5	0	0	0	0	1
3/28/07	2	0	1	514	D	248	16	2	Morrow	6	7	7	7	5	5	1	0	0	0	1
3/28/07	2	0	1	513	C	256	1	1	Anzola	6	6	6	6	6	5	1	0	0	0	0
3/28/07	2	0	1	510	D	11	2	1	Anzola	4	5	5	5	5	5	1	0	0	0	1
3/28/07	2	0	1	512	D	174	3	1	Anzola	6	4	5	4	5	5	1	0	0	1	0
3/28/07	2	0	1	508	B	740	4	1	Anzola	7	8	8	8	6	5	1	0	0	0	0
3/28/07	2	0	1	514	A	522	5	1	Anzola	7	7	7	7	7	6	1	1	0	0	1
3/28/07	2	0	1	512	A	665	6	1	Anzola	4	4	4	4	5	5	1	0	0	2	1
3/28/07	2	0	1	511	C	484	7	1	Anzola	8	8	8	8	7	6	2	0	0	0	1
3/28/07	2	0	1	513	B	530	8	1	Anzola	6	6	7	6	6	6	1	1	0	0	1
3/28/07	2	0	1	514	B	813	9	2	Anzola	7	6	6	6	7	6	2	0	0	0	0
3/28/07	2	0	1	508	C	703	10	2	Anzola	8	8	8	8	5	5	1	1	0	1	0
3/28/07	2	0	1	508	A	77	11	2	Anzola	6	8	8	8	6	5	2	1	0	1	0
3/28/07	2	0	1	510	A	652	12	2	Anzola	7	6	6	6	7	6	1	1	0	0	1
3/28/07	2	0	1	511	B	212	13	2	Anzola	6	8	8	8	8	6	5	1	0	0	0
3/28/07	2	0	1	514	C	443	14	2	Anzola	7	5	5	5	6	5	2	0	0	1	1
3/28/07	2	0	1	509	D	372	15	2	Anzola	8	8	8	8	6	6	1	1	0	0	0
3/28/07	2	0	1	514	D	248	16	2	Anzola	6	6	7	6	6	6	0	0	0	1	0
3/28/07	2	0	1	513	C	256	1	1	Philip	6	6	6	6	6	6	0	0	0	0	1
3/28/07	2	0	1	510	D	11	2	1	Philip	5	6	7	6	6	6	0	0	0	0	1
3/28/07	2	0	1	512	D	174	3	1	Philip	6	5	5	5	5	5	0	0	0	2	0
3/28/07	2	0	1	508	B	740	4	1	Philip	5	7	7	7	7	5	0	0	2	0	0
3/28/07	2	0	1	514	A	522	5	1	Philip	6	7	6	7	6	5	1	0	0	0	2
3/28/07	2	0	1	512	A	665	6	1	Philip	5	5	5	5	6	6	0	0	0	1	1

3/28/07	2	0	1	511	C	484	7	1	Philip	7	6	6	6	6	5	1	0	0	0	2
3/28/07	2	0	1	513	B	530	8	1	Philip	6	6	7	6	4	6	0	0	0	0	0
3/28/07	2	0	1	514	B	813	9	2	Philip	7	6	5	6	5	5	2	0	0	0	2
3/28/07	2	0	1	508	C	703	10	2	Philip	6	7	6	7	7	5	1	0	2	0	1
3/28/07	2	0	1	508	A	77	11	2	Philip	5	7	7	7	6	5	0	0	1	0	0
3/28/07	2	0	1	510	A	652	12	2	Philip	6	5	6	5	5	5	0	0	0	0	1
3/28/07	2	0	1	511	B	212	13	2	Philip	5	7	8	7	6	5	0	0	0	0	1
3/28/07	2	0	1	514	C	443	14	2	Philip	6	6	6	6	5	4	1	0	0	0	1
3/28/07	2	0	1	509	D	372	15	2	Philip	6	6	7	6	7	5	0	0	1	0	1
3/28/07	2	0	1	514	D	248	16	2	Philip	7	7	7	7	6	5	1	0	0	0	0
3/28/07	2	0	1	513	C	256	1	1	Asif	7	7	6	6	5	4	0	0	0	1	0
3/28/07	2	0	1	510	D	11	2	1	Asif	5	7	7	7	6	6	1	0	0	0	0
3/28/07	2	0	1	512	D	174	3	1	Asif	5	4	5	4	7	4	0	2	0	1	0
3/28/07	2	0	1	508	B	740	4	1	Asif	5	8	7	8	7	6	2	1	1	0	0
3/28/07	2	0	1	514	A	522	5	1	Asif	7	5	6	5	6	5	0	0	0	0	1
3/28/07	2	0	1	512	A	665	6	1	Asif	3	3	4	3	6	5	0	0	0	1	0
3/28/07	2	0	1	511	C	484	7	1	Asif	6	7	7	7	7	5	0	0	0	0	1
3/28/07	2	0	1	513	B	530	8	1	Asif	7	6	7	6	6	5	0	1	0	0	0
3/28/07	2	0	1	514	B	813	9	2	Asif	7	7	6	6	7	6	2	0	0	0	0
3/28/07	2	0	1	508	C	703	10	2	Asif	8	8	8	8	7	4	5	2	0	2	0
3/28/07	2	0	1	508	A	77	11	2	Asif	6	8	8	8	6	4	4	0	0	1	0
3/28/07	2	0	1	510	A	652	12	2	Asif	7	7	7	7	6	4	0	1	0	0	0
3/28/07	2	0	1	511	B	212	13	2	Asif	4	8	8	8	4	4	0	0	0	0	0
3/28/07	2	0	1	514	C	443	14	2	Asif	7	6	6	6	6	4	2	0	0	0	1
3/28/07	2	0	1	509	D	372	15	2	Asif	7	6	5	5	6	4	0	0	0	0	1
3/28/07	2	0	1	514	D	248	16	2	Asif	7	7	6	6	7	5	0	0	0	1	0
3/28/07	2	0	2	509	C	141	1	1	Bradley	5	7	7	7	7	5	1	0	3	2	0
3/28/07	2	0	2	513	A	623	2	1	Bradley	6	6	5	5	6	5	1	1	0	1	1
3/28/07	2	0	2	511	A	399	3	1	Bradley	5	6	7	6	6	6	0	0	0	0	1
3/28/07	2	0	2	515	D	991	4	1	Bradley	5	4	3	3	6	5	0	2	0	0	1
3/28/07	2	0	2	512	C	971	5	1	Bradley	6	4	3	4	5	5	1	1	0	1	1

3/28/07	2	0	2	509	B	916	6	1	Bradley	4	6	6	6	6	5	1	0	0	2	1
3/28/07	2	0	2	513	D	858	7	1	Bradley	6	6	7	6	6	5	1	0	0	1	1
3/28/07	2	0	2	508	D	825	8	1	Bradley	5	7	7	7	7	4	1	0	3	1	0
3/28/07	2	0	2	515	B	486	9	2	Bradley	5	5	6	5	5	5	0	1	0	0	2
3/28/07	2	0	2	515	A	189	10	2	Bradley	6	5	3	4	6	6	1	1	0	1	1
3/28/07	2	0	2	509	A	37	11	2	Bradley	6	6	7	6	7	5	2	1	2	0	0
3/28/07	2	0	2	510	B	6	12	2	Bradley	4	5	7	5	5	5	0	1	0	0	2
3/28/07	2	0	2	511	D	380	13	2	Bradley	3	7	7	7	5	5	0	1	0	0	1
3/28/07	2	0	2	515	C	995	14	2	Bradley	4	5	3	4	6	6	0	2	0	0	2
3/28/07	2	0	2	512	B	669	15	2	Bradley	6	5	3	4	6	5	1	1	0	0	1
3/28/07	2	0	2	510	C	563	16	2	Bradley	4	1	6	6	5	5	1	1	0	0	1
3/28/07	2	0	2	509	C	141	1	1	Davis	7	7	8	7	5	5	1	1	0	0	1
3/28/07	2	0	2	513	A	623	2	1	Davis	6	5	4	4	6	5	0	1	0	0	0
3/28/07	2	0	2	511	A	399	3	1	Davis	5	7	8	7	5	6	0	0	0	0	0
3/28/07	2	0	2	515	D	991	4	1	Davis	5	4	3	3	6	5	0	0	0	2	0
3/28/07	2	0	2	512	C	971	5	1	Davis	6	5	4	4	5	6	0	2	0	0	1
3/28/07	2	0	2	509	B	916	6	1	Davis	7	6	7	6	6	5	2	0	0	0	0
3/28/07	2	0	2	513	D	858	7	1	Davis	7	7	5	6	6	5	1	2	0	0	0
3/28/07	2	0	2	508	D	825	8	1	Davis	6	8	8	8	6	5	1	1	0	0	0
3/28/07	2	0	2	515	B	486	9	2	Davis	5	5	5	5	4	4	0	0	0	2	0
3/28/07	2	0	2	515	A	189	10	2	Davis	4	5	4	5	6	5	0	0	0	1	0
3/28/07	2	0	2	509	A	37	11	2	Davis	7	7	7	7	6	6	1	0	0	0	1
3/28/07	2	0	2	510	B	6	12	2	Davis	5	6	5	6	5	5	1	0	0	2	0
3/28/07	2	0	2	511	D	380	13	2	Davis	4	7	8	7	6	5	0	0	0	0	0
3/28/07	2	0	2	515	C	995	14	2	Davis	5	4	3	3	6	5	5	0	0	1	0
3/28/07	2	0	2	512	B	669	15	2	Davis	5	5	4	4	5	5	1	2	0	1	2
3/28/07	2	0	2	510	C	563	16	2	Davis	7	6	6	6	5	5	1	1	0	0	1
3/28/07	2	0	2	509	C	141	1	1	CodyJohnson	7	7	8	7	4	5	2	0	0	0	1
3/28/07	2	0	2	513	A	623	2	1	CodyJohnson	8	6	7	6	5	6	2	2	1	0	1
3/28/07	2	0	2	511	A	399	3	1	CodyJohnson	6	7	8	7	6	5	1	0	0	0	1
3/28/07	2	0	2	515	D	991	4	1	CodyJohnson	6	5	4	5	5	5	2	0	0	0	0

3/28/07	2	0	2	512	C	971	5	1	CodyJohnson	5	6	6	6	5	4	1	1	0	1	1
3/28/07	2	0	2	509	B	916	6	1	CodyJohnson	7	6	7	6	6	6	1	0	0	0	1
3/28/07	2	0	2	513	D	858	7	1	CodyJohnson	6	6	6	6	7	6	2	0	0	1	1
3/28/07	2	0	2	508	D	825	8	1	CodyJohnson	7	8	6	7	6	5	3	0	0	0	0
3/28/07	2	0	2	515	B	486	9	2	CodyJohnson	6	6	6	6	6	5	1	0	1	0	1
3/28/07	2	0	2	515	A	189	10	2	CodyJohnson	6	6	7	6	6	6	1	0	0	0	0
3/28/07	2	0	2	509	A	37	11	2	CodyJohnson	7	7	8	7	5	6	0	0	0	0	2
3/28/07	2	0	2	510	B	6	12	2	CodyJohnson	6	6	7	6	7	5	1	0	0	0	2
3/28/07	2	0	2	511	D	380	13	2	CodyJohnson	4	8	8	8	4	4	0	0	0	0	0
3/28/07	2	0	2	515	C	995	14	2	CodyJohnson	6	6	6	6	6	5	1	2	0	0	0
3/28/07	2	0	2	512	B	669	15	2	CodyJohnson	6	7	5	5	5	5	2	0	0	0	1
3/28/07	2	0	2	510	C	563	16	2	CodyJohnson	7	7	7	7	7	6	1	1	0	0	1
3/28/07	2	0	2	509	C	141	1	1	Benli	7	7	7	7	6	5	1	0	0	0	1
3/28/07	2	0	2	513	A	623	2	1	Benli	6	5	5	5	6	6	2	0	0	0	2
3/28/07	2	0	2	511	A	399	3	1	Benli	6	8	8	8	6	6	1	0	0	0	1
3/28/07	2	0	2	515	D	991	4	1	Benli	6	4	5	4	6	5	0	0	0	2	1
3/28/07	2	0	2	512	C	971	5	1	Benli	6	4	5	4	6	5	1	0	0	1	1
3/28/07	2	0	2	509	B	916	6	1	Benli	7	7	7	7	6	6	1	1	0	0	1
3/28/07	2	0	2	513	D	858	7	1	Benli	7	6	6	6	6	6	1	1	0	0	1
3/28/07	2	0	2	508	D	825	8	1	Benli	7	8	8	8	6	4	3	0	0	0	1
3/28/07	2	0	2	515	B	486	9	2	Benli	5	4	5	4	6	5	0	0	0	2	1
3/28/07	2	0	2	515	A	189	10	2	Benli	6	5	5	5	6	6	0	0	0	1	1
3/28/07	2	0	2	509	A	37	11	2	Benli	7	7	8	7	7	6	2	1	0	0	1
3/28/07	2	0	2	510	B	6	12	2	Benli	5	6	8	6	6	5	0	0	0	0	1
3/28/07	2	0	2	511	D	380	13	2	Benli	6	8	8	8	5	5	0	0	0	0	1
3/28/07	2	0	2	515	C	995	14	2	Benli	6	5	4	4	6	5	1	0	0	1	1
3/28/07	2	0	2	512	B	669	15	2	Benli	6	5	5	5	6	5	1	0	0	2	1
3/28/07	2	0	2	510	C	563	16	2	Benli	7	7	6	6	6	6	1	0	0	0	2
3/28/07	2	0	2	509	C	141	1	1	Johnson	7	7	7	7	6	5	1	0	0	1	0
3/28/07	2	0	2	513	A	623	2	1	Johnson	7	6	6	6	6	6	0	0	0	0	1
3/28/07	2	0	2	511	A	399	3	1	Johnson	6	7	7	7	5	5	0	0	0	0	2

3/28/07	2	0	2	515	D	991	4	1	Johnson	5	5	6	5	7	5	0	0	0	1	1
3/28/07	2	0	2	512	C	971	5	1	Johnson	6	6	5	6	7	6	2	0	0	1	1
3/28/07	2	0	2	509	B	916	6	1	Johnson	7	7	7	7	7	6	0	0	0	0	2
3/28/07	2	0	2	513	D	858	7	1	Johnson	7	6	7	6	6	5	0	0	0	0	1
3/28/07	2	0	2	508	D	825	8	1	Johnson	6	7	7	7	5	4	1	0	0	0	1
3/28/07	2	0	2	515	B	486	9	2	Johnson	6	5	6	5	6	5	0	0	0	0	1
3/28/07	2	0	2	515	A	189	10	2	Johnson	6	6	6	6	6	5	1	0	0	1	1
3/28/07	2	0	2	509	A	37	11	2	Johnson	6	7	6	7	7	5	0	0	0	0	2
3/28/07	2	0	2	510	B	6	12	2	Johnson	6	5	6	5	6	5	0	0	0	0	1
3/28/07	2	0	2	511	D	380	13	2	Johnson	6	7	7	7	7	5	0	0	0	0	1
3/28/07	2	0	2	515	C	995	14	2	Johnson	6	6	6	6	6	5	1	0	0	1	1
3/28/07	2	0	2	512	B	669	15	2	Johnson	7	6	6	6	6	6	1	0	0	1	0
3/28/07	2	0	2	510	C	563	16	2	Johnson	7	6	7	6	6	6	0	0	0	0	2
3/29/07	3	0	1	521	B	499	1	1	Asif	4	6	4	5	5	4	3	0	0	1	0
3/29/07	3	0	1	521	C	530	2	1	Asif	5	6	5	5	5	4	2	0	0	1	0
3/29/07	3	0	1	518	C	206	3	1	Asif	6	6	7	6	6	6	1	1	0	0	2
3/29/07	3	0	1	521	A	678	4	1	Asif	4	5	4	4	5	3	1	0	0	0	0
3/29/07	3	0	1	522	D	643	5	1	Asif	4	4	3	3	5	3	4	1	0	2	0
3/29/07	3	0	1	520	A	786	6	1	Asif	6	6	4	4	5	3	3	1	0	1	1
3/29/07	3	0	1	523	C	235	7	1	Asif	4	4	5	4	4	4	2	1	0	2	1
3/29/07	3	0	1	518	A	985	8	1	Asif	6	6	7	6	6	5	1	1	0	0	2
3/29/07	3	0	1	519	B	594	9	2	Asif	5	6	6	6	6	5	0	0	0	0	1
3/29/07	3	0	1	519	D	833	10	2	Asif	4	6	7	6	6	6	1	0	0	0	1
3/29/07	3	0	1	523	B	296	11	2	Asif	5	3	2	2	4	3	3	1	0	3	1
3/29/07	3	0	1	516	C	544	12	2	Asif	6	6	6	6	6	5	1	1	0	0	2
3/29/07	3	0	1	519	C	96	13	2	Asif	7	7	6	6	6	5	0	0	0	0	0
3/29/07	3	0	1	523	D	679	14	2	Asif	5	5	4	4	6	3	2	1	0	2	2
3/29/07	3	0	1	517	A	953	15	2	Asif	6	6	6	6	6	5	2	0	0	0	0
3/29/07	3	0	1	516	B	90	16	2	Asif	7	6	7	7	6	5	2	0	0	0	1
3/29/07	3	0	1	521	B	499	1	1	Edwards	6	4	6	4	4	4	0	0	0	2	0
3/29/07	3	0	1	521	C	530	2	1	Edwards	5	5	6	5	3	2	0	0	0	0	0

3/29/07	3	0	1	518	C	206	3	1	Edwards	6	6	7	6	6	5	0	1	0	0	1
3/29/07	3	0	1	521	A	678	4	1	Edwards	5	4	6	4	6	3	0	0	0	3	0
3/29/07	3	0	1	522	D	643	5	1	Edwards	6	5	6	5	5	4	0	2	0	2	0
3/29/07	3	0	1	520	A	786	6	1	Edwards	7	6	6	6	6	5	0	0	1	0	1
3/29/07	3	0	1	523	C	235	7	1	Edwards	6	5	7	5	6	4	2	0	0	1	1
3/29/07	3	0	1	518	A	985	8	1	Edwards	6	6	7	6	6	6	1	0	0	0	1
3/29/07	3	0	1	519	B	594	9	2	Edwards	6	6	7	6	6	5	1	1	0	0	1
3/29/07	3	0	1	519	D	833	10	2	Edwards	5	6	7	6	5	4	1	0	0	0	1
3/29/07	3	0	1	523	B	296	11	2	Edwards	6	5	6	5	5	3	0	0	0	2	0
3/29/07	3	0	1	516	C	544	12	2	Edwards	6	7	7	7	6	5	0	0	0	0	1
3/29/07	3	0	1	519	C	96	13	2	Edwards	7	7	7	7	6	5	1	0	0	0	1
3/29/07	3	0	1	523	D	679	14	2	Edwards	6	5	6	5	6	6	0	0	0	2	0
3/29/07	3	0	1	517	A	953	15	2	Edwards	5	5	6	5	5	4	1	0	0	0	1
3/29/07	3	0	1	516	B	90	16	2	Edwards	7	6	7	6	6	4	1	1	0	0	1
3/29/07	3	0	1	521	B	499	1	1	Morrow	5	7	5	7	4	4	0	0	0	0	0
3/29/07	3	0	1	521	C	530	2	1	Morrow	5	6	4	6	4	4	0	0	0	0	0
3/29/07	3	0	1	518	C	206	3	1	Morrow	6	6	8	6	5	5	1	1	0	0	1
3/29/07	3	0	1	521	A	678	4	1	Morrow	5	6	5	6	4	4	0	0	0	1	0
3/29/07	3	0	1	522	D	643	5	1	Morrow	5	6	5	6	4	4	0	0	0	1	1
3/29/07	3	0	1	520	A	786	6	1	Morrow	6	7	6	7	5	5	0	1	0	1	1
3/29/07	3	0	1	523	C	235	7	1	Morrow	7	6	6	6	5	5	0	1	0	1	1
3/29/07	3	0	1	518	A	985	8	1	Morrow	5	6	8	6	6	5	0	1	0	0	1
3/29/07	3	0	1	519	B	594	9	2	Morrow	5	6	8	6	5	5	0	0	0	0	2
3/29/07	3	0	1	519	D	833	10	2	Morrow	4	6	8	6	5	5	0	1	0	0	1
3/29/07	3	0	1	523	B	296	11	2	Morrow	5	5	4	5	4	4	0	0	0	1	0
3/29/07	3	0	1	516	C	544	12	2	Morrow	5	6	6	6	5	5	1	0	0	0	1
3/29/07	3	0	1	519	C	96	13	2	Morrow	6	7	8	7	5	5	0	1	0	0	1
3/29/07	3	0	1	523	D	679	14	2	Morrow	6	6	5	6	4	4	0	0	0	1	0
3/29/07	3	0	1	517	A	953	15	2	Morrow	7	7	7	7	5	5	0	1	1	0	1
3/29/07	3	0	1	516	B	90	16	2	Morrow	7	6	8	6	6	5	1	1	0	0	2
3/29/07	3	0	1	521	B	499	1	1	Thurman	6	7	5	6	4	2	4	0	0	0	0

3/29/07	3	0	1	521	C	530	2	1	Thurman	5	6	6	6	5	4	1	0	0	0	0
3/29/07	3	0	1	518	C	206	3	1	Thurman	5	4	5	5	5	4	0	1	0	0	0
3/29/07	3	0	1	521	A	678	4	1	Thurman	6	6	6	6	5	4	1	0	0	0	0
3/29/07	3	0	1	522	D	643	5	1	Thurman	7	6	6	6	5	3	3	1	0	0	0
3/29/07	3	0	1	520	A	786	6	1	Thurman	8	7	7	7	6	5	1	1	0	1	1
3/29/07	3	0	1	523	C	235	7	1	Thurman	7	8	8	8	6	6	1	1	0	1	0
3/29/07	3	0	1	518	A	985	8	1	Thurman	6	5	6	5	7	5	0	1	2	0	1
3/29/07	3	0	1	519	B	594	9	2	Thurman	3	4	4	4	5	4	0	2	0	0	2
3/29/07	3	0	1	519	D	833	10	2	Thurman	4	5	5	5	5	4	0	0	0	0	0
3/29/07	3	0	1	523	B	296	11	2	Thurman	7	6	6	6	6	5	4	1	0	0	0
3/29/07	3	0	1	516	C	544	12	2	Thurman	5	6	6	6	6	5	0	1	0	2	0
3/29/07	3	0	1	519	C	96	13	2	Thurman	6	6	6	6	6	6	0	0	0	0	2
3/29/07	3	0	1	523	D	679	14	2	Thurman	6	5	5	5	6	5	3	0	0	0	0
3/29/07	3	0	1	517	A	953	15	2	Thurman	6	7	6	6	5	4	2	1	0	0	0
3/29/07	3	0	1	516	B	90	16	2	Thurman	6	6	6	6	6	6	0	2	0	1	0
3/29/07	3	0	1	521	B	499	1	1	Johnson	6	8	7	8	5	4	0	0	0	0	0
3/29/07	3	0	1	521	C	530	2	1	Johnson	5	6	7	6	6	5	1	0	0	1	0
3/29/07	3	0	1	518	C	206	3	1	Johnson	5	6	6	6	6	5	0	0	0	0	2
3/29/07	3	0	1	521	A	678	4	1	Johnson	5	7	6	7	5	4	2	0	0	0	1
3/29/07	3	0	1	522	D	643	5	1	Johnson	6	7	7	7	6	5	1	0	0	0	1
3/29/07	3	0	1	520	A	786	6	1	Johnson	6	8	7	8	6	5	1	1	0	0	1
3/29/07	3	0	1	523	C	235	7	1	Johnson	6	7	6	7	5	4	1	1	0	1	1
3/29/07	3	0	1	518	A	985	8	1	Johnson	6	7	6	7	6	5	0	1	0	0	2
3/29/07	3	0	1	519	B	594	9	2	Johnson	5	6	7	6	6	5	0	0	0	0	1
3/29/07	3	0	1	519	D	833	10	2	Johnson	5	6	7	6	6	5	0	0	0	0	1
3/29/07	3	0	1	523	B	296	11	2	Johnson	5	5	5	5	5	4	2	0	0	1	1
3/29/07	3	0	1	516	C	544	12	2	Johnson	5	6	6	6	6	5	0	0	0	0	2
3/29/07	3	0	1	519	C	96	13	2	Johnson	6	7	6	7	6	5	1	0	0	0	1
3/29/07	3	0	1	523	D	679	14	2	Johnson	5	6	5	6	5	5	1	0	0	0	1
3/29/07	3	0	1	517	A	953	15	2	Johnson	6	7	6	7	6	5	1	0	0	0	1
3/29/07	3	0	1	516	B	90	16	2	Johnson	5	7	7	7	6	5	0	0	0	0	1

3/29/07	3	0	2	522	A	753	1	1	Inglis	6	6	7	6	5	4	1	3	0	0	1
3/29/07	3	0	2	523	A	935	2	1	Inglis	5	4	5	4	3	1	1	3	0	0	1
3/29/07	3	0	2	516	D	887	3	1	Inglis	5	6	7	6	5	4	1	3	0	0	1
3/29/07	3	0	2	516	A	36	4	1	Inglis	5	5	7	5	5	4	1	3	0	0	1
3/29/07	3	0	2	520	C	15	5	1	Inglis	6	8	8	8	6	3	2	3	0	0	1
3/29/07	3	0	2	518	D	142	6	1	Inglis	5	5	7	5	5	4	1	2	0	0	1
3/29/07	3	0	2	517	C	987	7	1	Inglis	7	8	8	8	5	4	2	3	0	0	1
3/29/07	3	0	2	520	B	527	8	1	Inglis	5	7	8	7	5	3	1	3	0	0	1
3/29/07	3	0	2	521	D	425	9	2	Inglis	6	7	8	7	5	3	1	3	0	0	1
3/29/07	3	0	2	522	C	343	10	2	Inglis	5	6	7	6	4	2	1	2	0	0	1
3/29/07	3	0	2	518	B	696	11	2	Inglis	5	6	7	6	5	4	1	3	0	0	1
3/29/07	3	0	2	519	A	935	12	2	Inglis	5	6	7	6	5	5	1	2	0	0	1
3/29/07	3	0	2	517	B	630	13	2	Inglis	6	7	7	7	5	5	2	3	0	0	1
3/29/07	3	0	2	522	B	128	14	2	Inglis	5	4	5	4	3	1	1	3	0	0	1
3/29/07	3	0	2	520	D	256	15	2	Inglis	6	8	8	8	6	2	2	4	0	0	1
3/29/07	3	0	2	517	D	325	16	2	Inglis	7	8	8	8	5	2	2	3	0	0	1
3/29/07	3	0	2	522	A	753	1	1	Aldredge	6	5	4	5	6	4	0	0	0	2	0
3/29/07	3	0	2	523	A	935	2	1	Aldredge	5	4	4	4	3	2	0	2	0	1	0
3/29/07	3	0	2	516	D	887	3	1	Aldredge	6	6	7	6	6	5	1	1	0	0	1
3/29/07	3	0	2	516	A	36	4	1	Aldredge	7	5	7	5	6	6	0	2	0	0	2
3/29/07	3	0	2	520	C	15	5	1	Aldredge	6	6	5	6	7	3	0	1	2	4	0
3/29/07	3	0	2	518	D	142	6	1	Aldredge	7	6	8	6	6	6	1	0	0	0	2
3/29/07	3	0	2	517	C	987	7	1	Aldredge	6	7	4	6	7	4	0	2	3	4	0
3/29/07	3	0	2	520	B	527	8	1	Aldredge	5	7	7	7	6	4	0	0	0	2	1
3/29/07	3	0	2	521	D	425	9	2	Aldredge	5	4	5	4	4	3	0	0	0	0	0
3/29/07	3	0	2	522	C	343	10	2	Aldredge	6	6	4	5	6	2	0	0	0	3	0
3/29/07	3	0	2	518	B	696	11	2	Aldredge	7	6	7	6	6	5	0	1	0	0	2
3/29/07	3	0	2	519	A	935	12	2	Aldredge	7	7	7	7	7	6	0	1	0	0	2
3/29/07	3	0	2	517	B	630	13	2	Aldredge	6	6	8	6	6	4	0	0	0	4	0
3/29/07	3	0	2	522	B	128	14	2	Aldredge	6	5	3	4	6	2	0	3	0	1	0
3/29/07	3	0	2	520	D	256	15	2	Aldredge	5	6	5	6	7	2	0	0	2	6	1

3/29/07	3	0	2	517	D	325	16	2	Aldredge	7	6	4	5	6	4	0	0	2	2	2
3/29/07	3	0	2	522	A	753	1	1	Davis	6	5	2	4	6	5	1	0	0	2	0
3/29/07	3	0	2	523	A	935	2	1	Davis	5	4	1	3	7	4	3	1	2	2	1
3/29/07	3	0	2	516	D	887	3	1	Davis	7	7	7	7	5	6	2	2	0	0	0
3/29/07	3	0	2	516	A	36	4	1	Davis	5	5	6	5	6	6	1	0	0	2	1
3/29/07	3	0	2	520	C	15	5	1	Davis	7	7	3	5	7	5	2	3	0	3	0
3/29/07	3	0	2	518	D	142	6	1	Davis	5	6	6	6	6	6	1	1	0	0	1
3/29/07	3	0	2	517	C	987	7	1	Davis	7	7	7	7	6	6	1	1	0	1	0
3/29/07	3	0	2	520	B	527	8	1	Davis	6	6	2	4	6	5	1	3	0	2	0
3/29/07	3	0	2	521	D	425	9	2	Davis	6	5	4	5	6	6	0	0	0	0	2
3/29/07	3	0	2	522	C	343	10	2	Davis	6	5	2	4	5	5	1	0	0	2	0
3/29/07	3	0	2	518	B	696	11	2	Davis	6	5	6	5	5	6	0	0	0	0	1
3/29/07	3	0	2	519	A	935	12	2	Davis	4	5	6	5	6	5	0	0	0	0	0
3/29/07	3	0	2	517	B	630	13	2	Davis	4	4	6	4	6	6	0	0	0	1	0
3/29/07	3	0	2	522	B	128	14	2	Davis	6	5	1	3	6	4	0	2	0	3	0
3/29/07	3	0	2	520	D	256	15	2	Davis	6	6	4	5	6	5	0	2	0	1	0
3/29/07	3	0	2	517	D	325	16	2	Davis	6	4	1	2	4	4	1	2	0	2	0
3/29/07	3	0	2	522	A	753	1	1	Philip	6	5	5	5	7	5	0	0	0	0	1
3/29/07	3	0	2	523	A	935	2	1	Philip	6	7	5	7	4	5	1	0	0	0	1
3/29/07	3	0	2	516	D	887	3	1	Philip	6	7	6	7	5	5	1	0	0	0	1
3/29/07	3	0	2	516	A	36	4	1	Philip	7	7	6	7	6	6	0	0	0	0	0
3/29/07	3	0	2	520	C	15	5	1	Philip	6	7	7	7	7	5	1	0	2	0	0
3/29/07	3	0	2	518	D	142	6	1	Philip	7	6	7	6	5	5	1	0	0	0	1
3/29/07	3	0	2	517	C	987	7	1	Philip	6	7	7	7	7	5	0	0	1	0	1
3/29/07	3	0	2	520	B	527	8	1	Philip	5	6	6	6	6	5	0	0	0	0	2
3/29/07	3	0	2	521	D	425	9	2	Philip	5	6	6	6	6	6	0	0	0	0	1
3/29/07	3	0	2	522	C	343	10	2	Philip	6	6	5	6	6	5	2	0	0	0	2
3/29/07	3	0	2	518	B	696	11	2	Philip	5	6	8	6	6	5	0	0	0	0	2
3/29/07	3	0	2	519	A	935	12	2	Philip	5	6	7	6	5	5	0	0	0	0	2
3/29/07	3	0	2	517	B	630	13	2	Philip	6	7	7	7	7	5	0	0	2	1	1
3/29/07	3	0	2	522	B	128	14	2	Philip	6	6	5	6	6	6	0	0	0	0	1

3/29/07	3	0	2	520	D	256	15	2	Philip	7	7	7	7	6	6	0	1	0	0	2
3/29/07	3	0	2	517	D	325	16	2	Philip	6	7	7	7	4	5	0	1	0	0	1
3/29/07	3	0	2	522	A	753	1	1	CodyJohnson	6	7	5	6	5	5	1	0	0	0	0
3/29/07	3	0	2	523	A	935	2	1	CodyJohnson	6	7	4	5	5	4	4	0	0	0	0
3/29/07	3	0	2	516	D	887	3	1	CodyJohnson	6	6	7	6	5	6	0	0	0	0	1
3/29/07	3	0	2	516	A	36	4	1	CodyJohnson	8	7	7	7	5	5	1	0	0	0	1
3/29/07	3	0	2	520	C	15	5	1	CodyJohnson	7	7	6	7	4	5	1	0	0	0	1
3/29/07	3	0	2	518	D	142	6	1	CodyJohnson	8	6	7	6	6	5	1	0	0	0	1
3/29/07	3	0	2	517	C	987	7	1	CodyJohnson	8	8	7	8	7	6	2	1	0	0	2
3/29/07	3	0	2	520	B	527	8	1	CodyJohnson	6	7	6	6	6	6	1	0	0	0	1
3/29/07	3	0	2	521	D	425	9	2	CodyJohnson	6	6	6	6	4	3	1	0	0	0	0
3/29/07	3	0	2	522	C	343	10	2	CodyJohnson	6	6	4	5	5	5	1	0	0	0	0
3/29/07	3	0	2	518	B	696	11	2	CodyJohnson	6	6	7	6	6	6	0	0	0	0	0
3/29/07	3	0	2	519	A	935	12	2	CodyJohnson	6	6	8	6	6	5	2	0	0	0	1
3/29/07	3	0	2	517	B	630	13	2	CodyJohnson	5	5	7	5	5	5	2	0	0	0	1
3/29/07	3	0	2	522	B	128	14	2	CodyJohnson	6	5	2	4	5	4	4	0	0	0	0
3/29/07	3	0	2	520	D	256	15	2	CodyJohnson	6	7	6	6	6	5	3	0	0	0	2
3/29/07	3	0	2	517	D	325	16	2	CodyJohnson	7	6	5	5	5	5	2	0	0	0	1
4/10/07	1	14	1	507	C	545	1	1	Aldredge	6	4	5	4	4	2	0	1	0	2	0
4/10/07	1	14	1	503	B	803	2	1	Aldredge	7	7	7	7	6	6	1	1	0	0	2
4/10/07	1	14	1	501	D	930	3	1	Aldredge	8	7	6	7	7	4	0	0	0	0	0
4/10/07	1	14	1	500	A	86	4	1	Aldredge	7	7	7	7	6	4	0	0	0	0	1
4/10/07	1	14	1	504	C	567	5	1	Aldredge	6	3	3	3	6	5	0	0	0	2	1
4/10/07	1	14	1	501	C	606	6	1	Aldredge	7	7	7	7	7	3	0	0	0	0	0
4/10/07	1	14	1	507	D	553	7	1	Aldredge	5	4	4	4	6	4	0	1	0	3	2
4/10/07	1	14	1	507	B	774	8	1	Aldredge	6	4	4	4	5	5	0	0	0	1	1
4/10/07	1	14	1	506	D	400	9	2	Aldredge	7	6	6	6	6	4	0	0	0	3	0
4/10/07	1	14	1	501	B	904	10	2	Aldredge	7	8	6	8	6	4	1	0	0	0	0
4/10/07	1	14	1	503	D	272	11	2	Aldredge	6	5	8	5	5	5	0	0	0	0	1
4/10/07	1	14	1	507	A	821	12	2	Aldredge	7	4	4	4	7	4	0	0	0	2	2
4/10/07	1	14	1	505	B	49	13	2	Aldredge	6	6	5	6	6	5	0	0	1	0	0

4/10/07	1	14	1	503	C	210	14	2	Aldredge	7	6	7	6	5	5	0	0	0	0	2
4/10/07	1	14	1	502	A	234	15	2	Aldredge	8	7	6	7	6	4	0	0	0	2	2
4/10/07	1	14	1	505	A	161	16	2	Aldredge	7	5	4	5	6	3	0	1	0	1	0
4/10/07	1	14	1	507	C	545	1	1	Amen	6	6	7	6	6	5	0	0	2	0	1
4/10/07	1	14	1	503	B	803	2	1	Amen	5	4	7	4	6	6	0	0	0	0	1
4/10/07	1	14	1	501	D	930	3	1	Amen	7	8	7	8	6	4	5	0	0	0	0
4/10/07	1	14	1	500	A	86	4	1	Amen	7	8	8	8	5	4	3	0	0	0	1
4/10/07	1	14	1	504	C	567	5	1	Amen	5	4	5	3	6	5	1	0	1	0	0
4/10/07	1	14	1	501	C	606	6	1	Amen	6	8	7	8	6	4	4	0	0	1	0
4/10/07	1	14	1	507	D	553	7	1	Amen	5	4	6	4	6	5	1	0	0	1	2
4/10/07	1	14	1	507	B	774	8	1	Amen	5	6	6	6	6	5	2	0	0	0	0
4/10/07	1	14	1	506	D	400	9	2	Amen	6	5	6	5	6	6	1	0	0	0	2
4/10/07	1	14	1	501	B	904	10	2	Amen	5	8	7	8	4	3	3	0	0	0	0
4/10/07	1	14	1	503	D	272	11	2	Amen	5	4	7	4	5	5	0	0	0	0	0
4/10/07	1	14	1	507	A	821	12	2	Amen	6	5	6	4	7	4	1	0	0	1	0
4/10/07	1	14	1	505	B	49	13	2	Amen	5	6	6	6	7	6	1	0	2	0	1
4/10/07	1	14	1	503	C	210	14	2	Amen	5	6	6	6	6	6	1	0	0	0	1
4/10/07	1	14	1	502	A	234	15	2	Amen	7	7	7	7	7	6	1	1	0	0	0
4/10/07	1	14	1	505	A	161	16	2	Amen	6	6	6	6	7	4	2	0	0	0	0
4/10/07	1	14	1	507	C	545	1	1	Bradley	5	5	5	5	5	5	1	2	0	0	1
4/10/07	1	14	1	503	B	803	2	1	Bradley	6	6	6	6	6	6	0	1	0	0	2
4/10/07	1	14	1	501	D	930	3	1	Bradley	7	8	7	8	7	5	2	2	0	0	0
4/10/07	1	14	1	500	A	86	4	1	Bradley	6	8	7	8	5	5	2	1	0	0	1
4/10/07	1	14	1	504	C	567	5	1	Bradley	5	5	5	5	5	5	0	2	0	0	2
4/10/07	1	14	1	501	C	606	6	1	Bradley	7	8	8	8	7	4	3	1	0	0	1
4/10/07	1	14	1	507	D	553	7	1	Bradley	5	5	3	4	5	5	0	1	0	0	1
4/10/07	1	14	1	507	B	774	8	1	Bradley	5	6	4	5	6	5	1	0	0	0	1
4/10/07	1	14	1	506	D	400	9	2	Bradley	5	6	5	5	6	6	0	1	0	0	2
4/10/07	1	14	1	501	B	904	10	2	Bradley	6	7	7	7	6	5	2	1	0	0	1
4/10/07	1	14	1	503	D	272	11	2	Bradley	4	6	7	6	5	4	0	1	0	0	2
4/10/07	1	14	1	507	A	821	12	2	Bradley	5	4	3	4	6	5	0	1	0	0	2

4/10/07	1	14	1	505	B	49	13	2	Bradley	4	6	5	5	7	5	2	1	0	0	2
4/10/07	1	14	1	503	C	210	14	2	Bradley	5	6	5	5	7	6	0	2	0	0	2
4/10/07	1	14	1	502	A	234	15	2	Bradley	6	7	6	7	7	6	1	2	0	0	2
4/10/07	1	14	1	505	A	161	16	2	Bradley	5	6	6	6	6	6	1	1	0	0	1
4/10/07	1	14	1	507	C	545	1	1	Inglis	5	5	6	5	6	4	1	3	0	0	1
4/10/07	1	14	1	503	B	803	2	1	Inglis	5	6	7	6	6	5	1	3	0	0	1
4/10/07	1	14	1	501	D	930	3	1	Inglis	7	6	7	6	6	4	2	2	3	0	1
4/10/07	1	14	1	500	A	86	4	1	Inglis	7	8	8	8	6	4	2	2	2	0	1
4/10/07	1	14	1	504	C	567	5	1	Inglis	6	5	6	5	5	4	2	3	0	0	1
4/10/07	1	14	1	501	C	606	6	1	Inglis	8	8	8	8	7	4	2	3	2	0	1
4/10/07	1	14	1	507	D	553	7	1	Inglis	5	5	6	5	6	4	2	3	0	0	1
4/10/07	1	14	1	507	B	774	8	1	Inglis	3	4	4	4	4	3	2	2	0	0	1
4/10/07	1	14	1	506	D	400	9	2	Inglis	6	6	7	6	4	3	2	3	0	0	1
4/10/07	1	14	1	501	B	904	10	2	Inglis	6	8	8	8	5	3	2	3	0	0	1
4/10/07	1	14	1	503	D	272	11	2	Inglis	3	6	7	6	4	3	2	2	0	0	1
4/10/07	1	14	1	507	A	821	12	2	Inglis	6	5	7	5	4	3	1	2	0	0	1
4/10/07	1	14	1	505	B	49	13	2	Inglis	2	5	7	5	4	3	1	2	0	0	1
4/10/07	1	14	1	503	C	210	14	2	Inglis	5	7	7	7	5	4	1	3	0	0	1
4/10/07	1	14	1	502	A	234	15	2	Inglis	7	7	8	7	5	4	2	3	0	0	1
4/10/07	1	14	1	505	A	161	16	2	Inglis	7	7	8	7	5	4	2	3	0	0	1
4/10/07	1	14	1	507	C	545	1	1	Bailey	6	6	6	6	7	5	1	3	1	0	0
4/10/07	1	14	1	503	B	803	2	1	Bailey	5	6	7	6	5	5	0	2	0	0	1
4/10/07	1	14	1	501	D	930	3	1	Bailey	7	7	7	7	6	4	2	1	0	0	1
4/10/07	1	14	1	500	A	86	4	1	Bailey	7	7	8	7	5	5	2	1	0	0	2
4/10/07	1	14	1	504	C	567	5	1	Bailey	6	6	7	6	6	5	1	0	1	0	0
4/10/07	1	14	1	501	C	606	6	1	Bailey	8	7	8	7	5	4	3	1	0	0	1
4/10/07	1	14	1	507	D	553	7	1	Bailey	6	6	7	6	5	5	0	1	0	0	1
4/10/07	1	14	1	507	B	774	8	1	Bailey	7	6	7	6	5	5	1	0	0	0	1
4/10/07	1	14	1	506	D	400	9	2	Bailey	7	6	7	6	6	5	1	2	0	0	1
4/10/07	1	14	1	501	B	904	10	2	Bailey	7	7	8	7	5	4	3	1	0	0	1
4/10/07	1	14	1	503	D	272	11	2	Bailey	6	7	8	7	5	5	1	2	0	0	0

4/10/07	1	14	1	507	A	821	12	2	Bailey	7	8	6	7	6	5	2	1	0	0	2
4/10/07	1	14	1	505	B	49	13	2	Bailey	4	6	7	6	6	5	1	0	0	0	1
4/10/07	1	14	1	503	C	210	14	2	Bailey	5	7	7	7	7	5	0	0	0	0	1
4/10/07	1	14	1	502	A	234	15	2	Bailey	8	7	8	7	7	6	0	1	0	0	1
4/10/07	1	14	1	505	A	161	16	2	Bailey	8	7	7	7	7	6	1	2	0	0	1
4/10/07	1	14	2	500	B	18	1	1	Edwards	6	6	6	6	5	4	2	0	0	0	1
4/10/07	1	14	2	506	C	221	2	1	Edwards	5	6	7	6	6	5	0	0	0	3	1
4/10/07	1	14	2	505	D	305	3	1	Edwards	6	4	6	4	5	4	0	1	0	1	0
4/10/07	1	14	2	503	A	425	4	1	Edwards	6	6	7	6	6	5	1	1	0	0	1
4/10/07	1	14	2	506	B	719	5	1	Edwards	6	5	5	5	5	5	1	0	0	2	1
4/10/07	1	14	2	500	D	864	6	1	Edwards	7	6	6	6	6	4	0	0	1	3	1
4/10/07	1	14	2	502	C	796	7	1	Edwards	6	6	7	6	6	5	0	1	0	0	0
4/10/07	1	14	2	504	A	893	8	1	Edwards	5	5	6	5	5	4	1	0	0	2	1
4/10/07	1	14	2	506	A	41	9	2	Edwards	5	5	6	5	6	5	1	0	0	0	2
4/10/07	1	14	2	502	D	664	10	2	Edwards	6	6	7	6	5	5	1	1	0	0	1
4/10/07	1	14	2	505	C	408	11	2	Edwards	5	6	6	6	5	4	0	0	0	0	1
4/10/07	1	14	2	504	D	761	12	2	Edwards	6	5	5	5	6	4	0	0	0	2	1
4/10/07	1	14	2	501	A	871	13	2	Edwards	5	6	6	6	6	4	1	0	0	3	2
4/10/07	1	14	2	502	B	405	14	2	Edwards	5	6	7	6	6	6	0	0	0	0	2
4/10/07	1	14	2	500	C	123	15	2	Edwards	6	7	7	7	5	4	0	0	0	1	1
4/10/07	1	14	2	504	B	191	16	2	Edwards	5	6	6	6	5	0	0	0	0	0	0
4/10/07	1	14	2	500	B	18	1	1	.	6	6	7	6	7	5	2	1	0	0	1
4/10/07	1	14	2	506	C	221	2	1	.	4	5	7	5	7	6	0	2	0	0	1
4/10/07	1	14	2	505	D	305	3	1	.	4	3	6	3	5	4	0	1	1	1	1
4/10/07	1	14	2	503	A	425	4	1	.	5	5	7	5	5	5	1	1	0	0	1
4/10/07	1	14	2	506	B	719	5	1	.	6	6	6	6	6	4	1	1	0	0	1
4/10/07	1	14	2	500	D	864	6	1	.	7	7	8	7	7	5	0	2	0	1	1
4/10/07	1	14	2	502	C	796	7	1	.	6	7	8	7	6	6	1	1	0	0	1
4/10/07	1	14	2	504	A	893	8	1	.	3	3	6	3	7	4	0	1	0	2	1
4/10/07	1	14	2	506	A	41	9	2	.	7	5	7	5	6	6	0	1	0	0	1
4/10/07	1	14	2	502	D	664	10	2	.	4	7	7	7	5	5	0	0	0	0	1

4/10/07	1	14	2	505	C	408	11	2	.	5	6	6	6	5	4	0	1	0	0	1
4/10/07	1	14	2	504	D	761	12	2	.	5	4	6	4	6	4	0	2	0	2	1
4/10/07	1	14	2	501	A	871	13	2	.	7	8	7	7	7	5	0	2	0	0	1
4/10/07	1	14	2	502	B	405	14	2	.	6	6	6	6	6	6	1	1	0	0	1
4/10/07	1	14	2	500	C	123	15	2	.	7	7	8	8	6	6	1	1	0	0	1
4/10/07	1	14	2	504	B	191	16	2	.	4	4	5	4	6	4	0	1	0	1	1
4/10/07	1	14	2	500	B	18	1	1	Anzola	7	7	7	7	6	6	1	1	0	0	0
4/10/07	1	14	2	506	C	221	2	1	Anzola	6	6	6	6	6	6	1	0	0	0	1
4/10/07	1	14	2	505	D	305	3	1	Anzola	6	5	6	5	7	6	1	0	0	0	2
4/10/07	1	14	2	503	A	425	4	1	Anzola	5	7	8	7	6	5	1	1	0	0	1
4/10/07	1	14	2	506	B	719	5	1	Anzola	6	7	7	7	7	6	2	0	0	1	0
4/10/07	1	14	2	500	D	864	6	1	Anzola	7	8	8	8	5	5	1	0	0	1	0
4/10/07	1	14	2	502	C	796	7	1	Anzola	6	6	7	6	6	6	1	0	0	0	1
4/10/07	1	14	2	504	A	893	8	1	Anzola	5	4	5	4	6	5	0	0	1	0	0
4/10/07	1	14	2	506	A	41	9	2	Anzola	7	5	6	5	7	6	1	1	0	1	0
4/10/07	1	14	2	502	D	664	10	2	Anzola	5	6	7	6	6	5	1	0	0	0	1
4/10/07	1	14	2	505	C	408	11	2	Anzola	6	7	7	7	7	6	0	0	0	0	0
4/10/07	1	14	2	504	D	761	12	2	Anzola	3	5	5	5	4	4	1	0	0	1	0
4/10/07	1	14	2	501	A	871	13	2	Anzola	7	8	8	8	6	5	2	0	1	0	0
4/10/07	1	14	2	502	B	405	14	2	Anzola	3	7	7	7	7	6	2	0	0	0	1
4/10/07	1	14	2	500	C	123	15	2	Anzola	8	8	8	8	6	5	1	0	0	0	1
4/10/07	1	14	2	504	B	191	16	2	Anzola	4	7	7	7	7	6	2	0	0	0	1
4/10/07	1	14	2	500	B	18	1	1	Thurman	8	7	7	7	6	5	1	0	0	0	0
4/10/07	1	14	2	506	C	221	2	1	Thurman	7	5	5	5	6	5	0	1	2	2	0
4/10/07	1	14	2	505	D	305	3	1	Thurman	7	5	5	5	6	6	0	0	0	1	1
4/10/07	1	14	2	503	A	425	4	1	Thurman	6	6	7	6	5	4	1	1	0	0	1
4/10/07	1	14	2	506	B	719	5	1	Thurman	7	6	4	6	4	4	1	0	0	0	0
4/10/07	1	14	2	500	D	864	6	1	Thurman	8	8	7	8	6	4	1	0	0	0	0
4/10/07	1	14	2	502	C	796	7	1	Thurman	8	7	8	7	5	5	0	1	0	0	0
4/10/07	1	14	2	504	A	893	8	1	Thurman	0	4	4	4	7	5	0	2	0	2	2
4/10/07	1	14	2	506	A	41	9	2	Thurman	6	5	5	5	6	5	0	1	0	0	0

4/10/07	1	14	2	502	D	664	10	2	Thurman	4	4	4	4	5	4	0	0	2	0	0
4/10/07	1	14	2	505	C	408	11	2	Thurman	7	7	8	7	6	5	0	0	0	0	0
4/10/07	1	14	2	504	D	761	12	2	Thurman	6	5	6	5	6	5	0	2	0	0	0
4/10/07	1	14	2	501	A	871	13	2	Thurman	6	7	6	7	6	4	2	1	0	0	1
4/10/07	1	14	2	502	B	405	14	2	Thurman	6	4	5	5	5	5	0	1	2	2	0
4/10/07	1	14	2	500	C	123	15	2	Thurman	7	7	8	7	5	4	0	1	0	0	0
4/10/07	1	14	2	504	B	191	16	2	Thurman	4	5	6	5	5	4	1	1	0	0	0
4/11/07	2	14	1	509	C	225	1	1	Philip	5	7	7	7	7	6	0	0	3	0	0
4/11/07	2	14	1	512	A	414	2	1	Philip	6	6	6	6	6	5	0	1	0	2	2
4/11/07	2	14	1	510	A	797	3	1	Philip	6	6	7	6	5	5	1	0	0	0	2
4/11/07	2	14	1	509	B	336	4	1	Philip	6	6	7	6	7	5	0	0	4	0	1
4/11/07	2	14	1	513	B	416	5	1	Philip	7	6	7	6	6	5	0	1	0	0	2
4/11/07	2	14	1	511	B	44	6	1	Philip	6	7	8	7	5	5	1	0	0	0	2
4/11/07	2	14	1	514	C	330	7	1	Philip	7	6	6	6	6	5	1	1	0	0	2
4/11/07	2	14	1	511	C	980	8	1	Philip	6	8	8	8	6	5	0	0	0	0	1
4/11/07	2	14	1	514	B	340	9	2	Philip	7	7	6	7	5	4	2	0	0	0	1
4/11/07	2	14	1	515	A	605	10	2	Philip	6	5	5	5	6	5	0	0	0	2	1
4/11/07	2	14	1	508	A	690	11	2	Philip	6	7	8	7	7	5	0	0	2	0	1
4/11/07	2	14	1	515	D	341	12	2	Philip	6	5	5	5	5	5	0	0	0	0	1
4/11/07	2	14	1	509	D	666	13	2	Philip	6	7	8	7	7	6	0	0	2	0	1
4/11/07	2	14	1	512	D	218	14	2	Philip	6	5	6	5	6	5	0	0	0	0	0
4/11/07	2	14	1	513	C	656	15	2	Philip	7	6	7	6	6	5	1	0	0	0	1
4/11/07	2	14	1	510	D	96	16	2	Philip	5	6	7	6	4	6	0	0	0	0	0
4/11/07	2	14	1	509	C	225	1	1	CodyJohnson	7	8	8	8	5	4	1	0	0	0	0
4/11/07	2	14	1	512	A	414	2	1	CodyJohnson	6	6	6	6	5	4	2	1	1	2	0
4/11/07	2	14	1	510	A	797	3	1	CodyJohnson	8	7	7	7	6	5	1	2	0	0	1
4/11/07	2	14	1	509	B	336	4	1	CodyJohnson	7	7	5	6	6	5	2	2	1	0	1
4/11/07	2	14	1	513	B	416	5	1	CodyJohnson	7	7	4	5	6	5	2	3	0	1	1
4/11/07	2	14	1	511	B	44	6	1	CodyJohnson	6	7	7	7	5	5	0	0	0	0	1
4/11/07	2	14	1	514	C	330	7	1	CodyJohnson	6	6	7	6	5	5	0	1	0	0	1
4/11/07	2	14	1	511	C	980	8	1	CodyJohnson	6	8	8	8	5	5	0	0	0	0	2

4/11/07	2	14	1	514	B	340	9	2	CodyJohnson	6	6	5	5	6	5	2	0	0	2	0
4/11/07	2	14	1	515	A	605	10	2	CodyJohnson	5	5	6	5	5	5	1	0	1	1	1
4/11/07	2	14	1	508	A	690	11	2	CodyJohnson	7	8	8	8	6	5	0	1	0	0	1
4/11/07	2	14	1	515	D	341	12	2	CodyJohnson	6	6	7	6	6	6	0	0	0	2	0
4/11/07	2	14	1	509	D	666	13	2	CodyJohnson	6	8	7	8	5	4	0	0	0	0	1
4/11/07	2	14	1	512	D	218	14	2	CodyJohnson	6	7	6	6	6	5	0	0	0	1	0
4/11/07	2	14	1	513	C	656	15	2	CodyJohnson	6	6	6	6	5	5	1	0	1	0	0
4/11/07	2	14	1	510	D	96	16	2	CodyJohnson	6	6	7	6	6	5	0	0	0	0	1
4/11/07	2	14	1	509	C	225	1	1	Morrow	7	8	8	8	5	5	0	0	1	1	1
4/11/07	2	14	1	512	A	414	2	1	Morrow	6	6	6	6	7	5	0	0	0	0	1
4/11/07	2	14	1	510	A	797	3	1	Morrow	5	7	7	7	6	6	1	1	0	0	1
4/11/07	2	14	1	509	B	336	4	1	Morrow	6	8	7	8	6	5	0	0	1	2	1
4/11/07	2	14	1	513	B	416	5	1	Morrow	7	6	5	6	6	5	1	2	0	0	1
4/11/07	2	14	1	511	B	44	6	1	Morrow	5	8	8	8	5	5	0	1	0	1	1
4/11/07	2	14	1	514	C	330	7	1	Morrow	7	6	6	6	6	5	2	0	0	2	1
4/11/07	2	14	1	511	C	980	8	1	Morrow	6	8	8	8	6	5	0	1	0	0	2
4/11/07	2	14	1	514	B	340	9	2	Morrow	7	7	7	7	5	6	2	0	0	1	1
4/11/07	2	14	1	515	A	605	10	2	Morrow	6	5	6	5	6	5	0	0	0	1	1
4/11/07	2	14	1	508	A	690	11	2	Morrow	6	8	8	8	7	5	0	0	0	3	1
4/11/07	2	14	1	515	D	341	12	2	Morrow	5	5	6	5	7	5	0	0	1	2	1
4/11/07	2	14	1	509	D	666	13	2	Morrow	5	7	7	7	6	5	0	0	1	1	1
4/11/07	2	14	1	512	D	218	14	2	Morrow	5	6	6	6	5	5	0	0	0	1	1
4/11/07	2	14	1	513	C	656	15	2	Morrow	6	6	5	6	5	5	1	0	0	1	1
4/11/07	2	14	1	510	D	96	16	2	Morrow	5	7	7	7	6	5	0	1	1	1	1
4/11/07	2	14	1	509	C	225	1	1	Benli	6	7	8	7	6	4	1	1	0	0	1
4/11/07	2	14	1	512	A	414	2	1	Benli	6	4	7	4	6	4	1	0	0	1	1
4/11/07	2	14	1	510	A	797	3	1	Benli	6	5	6	5	6	6	0	2	0	0	2
4/11/07	2	14	1	509	B	336	4	1	Benli	7	7	8	7	6	4	0	1	0	0	1
4/11/07	2	14	1	513	B	416	5	1	Benli	7	6	6	6	6	5	1	2	0	1	1
4/11/07	2	14	1	511	B	44	6	1	Benli	6	7	8	7	6	6	0	2	0	0	2
4/11/07	2	14	1	514	C	330	7	1	Benli	7	6	6	6	6	5	1	1	0	0	1

4/11/07	2	14	1	511	C	980	8	1	Benli	5	7	7	7	6	6	0	2	0	0	1
4/11/07	2	14	1	514	B	340	9	2	Benli	7	6	7	6	6	5	2	1	0	0	1
4/11/07	2	14	1	515	A	605	10	2	Benli	6	4	6	4	6	5	0	2	0	0	1
4/11/07	2	14	1	508	A	690	11	2	Benli	7	7	8	7	7	5	1	2	1	3	0
4/11/07	2	14	1	515	D	341	12	2	Benli	5	5	6	5	6	6	0	1	0	0	1
4/11/07	2	14	1	509	D	666	13	2	Benli	6	6	7	6	6	4	0	2	1	1	1
4/11/07	2	14	1	512	D	218	14	2	Benli	5	4	6	4	7	5	0	1	0	1	1
4/11/07	2	14	1	513	C	656	15	2	Benli	5	7	7	7	6	6	0	2	0	0	1
4/11/07	2	14	1	510	D	96	16	2	Benli	4	7	7	7	6	6	0	2	0	0	2
4/11/07	2	14	1	509	C	225	1	1	Thurman	7	8	7	8	5	5	0	2	0	0	0
4/11/07	2	14	1	512	A	414	2	1	Thurman	8	6	7	6	6	5	0	2	0	0	2
4/11/07	2	14	1	510	A	797	3	1	Thurman	7	6	7	6	5	4	0	1	0	0	1
4/11/07	2	14	1	509	B	336	4	1	Thurman	6	6	8	7	6	5	0	0	0	0	1
4/11/07	2	14	1	513	B	416	5	1	Thurman	7	6	6	6	6	5	0	1	0	0	0
4/11/07	2	14	1	511	B	44	6	1	Thurman	6	8	8	8	5	4	0	1	0	0	0
4/11/07	2	14	1	514	C	330	7	1	Thurman	6	5	5	5	7	6	1	1	0	0	1
4/11/07	2	14	1	511	C	980	8	1	Thurman	6	6	8	7	7	6	0	0	0	2	1
4/11/07	2	14	1	514	B	340	9	2	Thurman	8	7	7	7	7	5	3	2	0	0	0
4/11/07	2	14	1	515	A	605	10	2	Thurman	5	4	4	4	6	4	0	2	0	1	2
4/11/07	2	14	1	508	A	690	11	2	Thurman	8	8	8	8	7	6	1	2	0	1	0
4/11/07	2	14	1	515	D	341	12	2	Thurman	6	6	7	6	5	4	0	1	0	0	1
4/11/07	2	14	1	509	D	666	13	2	Thurman	5	6	7	6	5	5	0	0	0	0	0
4/11/07	2	14	1	512	D	218	14	2	Thurman	7	6	5	5	5	5	0	1	0	0	0
4/11/07	2	14	1	513	C	656	15	2	Thurman	5	6	8	7	6	5	0	2	2	0	0
4/11/07	2	14	1	510	D	96	16	2	Thurman	6	6	7	7	6	5	0	1	0	0	0
4/11/07	2	14	2	513	A	550	1	1	Johnson	7	7	6	7	6	5	1	0	0	0	0
4/11/07	2	14	2	510	C	991	2	1	Johnson	6	7	6	7	6	5	1	0	0	0	1
4/11/07	2	14	2	508	C	237	3	1	Johnson	7	8	7	8	7	6	1	0	0	1	2
4/11/07	2	14	2	508	D	957	4	1	Johnson	7	8	7	8	7	5	2	0	0	1	1
4/11/07	2	14	2	509	A	685	5	1	Johnson	7	7	6	7	6	5	1	0	0	1	2
4/11/07	2	14	2	514	A	783	6	1	Johnson	6	6	7	6	6	5	1	0	0	0	1

4/11/07	2	14	2	511	A	624	7	1	Johnson	6	7	6	7	6	5	2	0	0	0	2
4/11/07	2	14	2	511	D	992	8	1	Johnson	6	6	7	6	6	5	1	0	0	0	2
4/11/07	2	14	2	514	D	524	9	2	Johnson	7	7	7	7	7	5	1	0	0	0	0
4/11/07	2	14	2	515	B	970	10	2	Johnson	7	6	6	6	6	5	0	0	0	1	2
4/11/07	2	14	2	512	B	323	11	2	Johnson	5	6	6	6	6	5	2	0	0	2	1
4/11/07	2	14	2	515	C	404	12	2	Johnson	6	6	6	6	7	6	0	0	0	2	2
4/11/07	2	14	2	513	D	516	13	2	Johnson	6	7	5	6	6	5	0	0	0	0	1
4/11/07	2	14	2	508	B	8	14	2	Johnson	6	8	7	8	8	5	2	0	0	0	1
4/11/07	2	14	2	510	B	645	15	2	Johnson	6	7	7	7	6	5	1	0	0	0	2
4/11/07	2	14	2	512	C	739	16	2	Johnson	5	6	6	6	6	5	1	0	0	2	1
4/11/07	2	14	2	513	A	550	1	1	Bradley	6	6	7	6	6	6	1	1	0	1	1
4/11/07	2	14	2	510	C	991	2	1	Bradley	5	7	7	7	5	5	1	0	0	0	1
4/11/07	2	14	2	508	C	237	3	1	Bradley	5	7	7	7	7	5	1	1	2	0	0
4/11/07	2	14	2	508	D	957	4	1	Bradley	6	7	7	7	7	5	0	2	1	1	0
4/11/07	2	14	2	509	A	685	5	1	Bradley	5	6	7	6	6	5	1	1	0	0	1
4/11/07	2	14	2	514	A	783	6	1	Bradley	5	6	4	5	5	4	0	0	0	0	1
4/11/07	2	14	2	511	A	624	7	1	Bradley	4	7	7	7	7	6	1	1	0	0	2
4/11/07	2	14	2	511	D	992	8	1	Bradley	5	7	7	7	6	6	0	1	0	0	1
4/11/07	2	14	2	514	D	524	9	2	Bradley	5	6	5	6	6	5	1	1	0	0	1
4/11/07	2	14	2	515	B	970	10	2	Bradley	6	5	4	4	5	4	0	1	0	0	1
4/11/07	2	14	2	512	B	323	11	2	Bradley	5	6	5	5	5	4	2	0	0	0	0
4/11/07	2	14	2	515	C	404	12	2	Bradley	6	5	4	4	6	5	0	2	0	0	0
4/11/07	2	14	2	513	D	516	13	2	Bradley	6	6	7	6	6	5	1	1	0	0	1
4/11/07	2	14	2	508	B	8	14	2	Bradley	6	7	7	7	7	5	1	2	2	0	1
4/11/07	2	14	2	510	B	645	15	2	Bradley	6	6	7	6	6	5	1	1	0	0	2
4/11/07	2	14	2	512	C	739	16	2	Bradley	6	5	3	4	5	5	0	1	0	0	0
4/11/07	2	14	2	513	A	550	1	1	Davis	7	6	7	6	5	5	1	0	0	0	1
4/11/07	2	14	2	510	C	991	2	1	Davis	7	6	7	6	6	6	1	2	0	0	1
4/11/07	2	14	2	508	C	237	3	1	Davis	6	7	7	7	6	5	0	0	0	0	0
4/11/07	2	14	2	508	D	957	4	1	Davis	7	7	8	7	5	5	0	2	0	0	0
4/11/07	2	14	2	509	A	685	5	1	Davis	6	5	7	5	6	4	0	1	0	0	1

4/11/07	2	14	2	514	A	783	6	1	Davis	6	6	5	6	5	5	0	0	1	0	2
4/11/07	2	14	2	511	A	624	7	1	Davis	5	7	7	7	6	4	0	1	0	0	0
4/11/07	2	14	2	511	D	992	8	1	Davis	5	7	8	7	5	5	0	2	0	0	0
4/11/07	2	14	2	514	D	524	9	2	Davis	7	6	5	5	5	4	1	0	0	0	0
4/11/07	2	14	2	515	B	970	10	2	Davis	5	4	5	4	7	5	0	0	0	0	0
4/11/07	2	14	2	512	B	323	11	2	Davis	5	4	4	4	5	4	0	0	0	0	1
4/11/07	2	14	2	515	C	404	12	2	Davis	5	5	4	5	5	4	0	0	0	0	0
4/11/07	2	14	2	513	D	516	13	2	Davis	6	6	6	6	6	5	0	0	0	0	1
4/11/07	2	14	2	508	B	8	14	2	Davis	6	8	8	8	6	5	0	0	2	0	0
4/11/07	2	14	2	510	B	645	15	2	Davis	5	6	7	6	6	6	0	0	0	0	0
4/11/07	2	14	2	512	C	739	16	2	Davis	6	2	2	2	6	4	0	0	0	0	0
4/11/07	2	14	2	513	A	550	1	1	Amen	6	6	7	6	6	5	1	0	0	1	0
4/11/07	2	14	2	510	C	991	2	1	Amen	6	6	7	6	6	6	1	0	0	0	0
4/11/07	2	14	2	508	C	237	3	1	Amen	6	8	7	8	5	4	5	0	0	1	0
4/11/07	2	14	2	508	D	957	4	1	Amen	7	8	7	8	4	3	3	0	0	0	0
4/11/07	2	14	2	509	A	685	5	1	Amen	7	7	6	7	6	5	1	1	0	1	1
4/11/07	2	14	2	514	A	783	6	1	Amen	7	5	6	5	7	5	1	0	0	2	0
4/11/07	2	14	2	511	A	624	7	1	Amen	6	7	6	6	6	6	0	0	0	0	0
4/11/07	2	14	2	511	D	992	8	1	Amen	5	7	7	7	6	5	1	0	0	0	0
4/11/07	2	14	2	514	D	524	9	2	Amen	6	6	6	6	7	6	1	1	0	2	0
4/11/07	2	14	2	515	B	970	10	2	Amen	5	4	6	4	6	5	0	0	0	1	0
4/11/07	2	14	2	512	B	323	11	2	Amen	5	4	5	4	5	5	2	0	0	0	0
4/11/07	2	14	2	515	C	404	12	2	Amen	5	4	6	4	6	6	1	0	0	1	0
4/11/07	2	14	2	513	D	516	13	2	Amen	6	5	6	5	6	5	1	0	0	2	0
4/11/07	2	14	2	508	B	8	14	2	Amen	7	8	7	8	6	5	4	0	0	0	0
4/11/07	2	14	2	510	B	645	15	2	Amen	5	4	6	4	6	6	0	0	0	0	1
4/11/07	2	14	2	512	C	739	16	2	Amen	5	4	5	3	4	4	1	0	0	0	0
4/11/07	2	14	2	513	A	550	1	1	Anzola	7	6	7	6	7	6	1	1	0	0	3
4/11/07	2	14	2	510	C	991	2	1	Anzola	5	7	7	7	6	5	1	1	0	0	1
4/11/07	2	14	2	508	C	237	3	1	Anzola	3	8	8	8	4	4	0	0	0	1	0
4/11/07	2	14	2	508	D	957	4	1	Anzola	6	8	8	8	5	5	1	1	0	0	1

4/11/07	2	14	2	509	A	685	5	1	Anzola	8	8	8	8	7	6	2	0	0	0	2
4/11/07	2	14	2	514	A	783	6	1	Anzola	7	7	7	7	7	6	2	0	0	0	2
4/11/07	2	14	2	511	A	624	7	1	Anzola	6	7	7	7	6	6	1	0	0	0	2
4/11/07	2	14	2	511	D	992	8	2	Anzola	7	7	7	7	7	6	2	0	0	0	2
4/11/07	2	14	2	514	D	524	9	2	Anzola	6	6	5	5	6	5	2	0	0	0	1
4/11/07	2	14	2	515	B	970	10	2	Anzola	6	5	7	5	6	6	1	0	0	0	1
4/11/07	2	14	2	512	B	323	11	2	Anzola	5	4	5	4	5	5	1	0	0	0	0
4/11/07	2	14	2	515	C	404	12	2	Anzola	6	6	7	6	5	5	2	2	1	0	0
4/11/07	2	14	2	513	D	516	13	2	Anzola	7	7	7	7	6	6	1	2	0	0	1
4/11/07	2	14	2	508	B	8	14	2	Anzola	7	8	8	8	6	6	1	0	0	0	0
4/11/07	2	14	2	510	B	645	15	2	Anzola	6	7	7	7	6	6	2	0	0	0	1
4/11/07	2	14	2	512	C	739	16	2	Anzola	4	6	6	6	6	6	1	0	0	1	0
4/12/07	3	14	1	522	C	135	1	1	Edwards	7	5	6	5	6	5	0	0	0	4	1
4/12/07	3	14	1	520	D	905	2	1	Edwards	6	6	7	6	6	5	0	0	3	0	2
4/12/07	3	14	1	516	A	797	3	1	Edwards	5	5	7	5	5	4	2	0	0	0	2
4/12/07	3	14	1	521	A	511	4	1	Edwards	6	6	6	6	5	4	0	0	0	2	0
4/12/07	3	14	1	516	C	418	5	1	Edwards	7	7	7	7	6	5	1	3	0	0	1
4/12/07	3	14	1	521	D	597	6	1	Edwards	6	5	5	5	6	4	0	0	1	2	1
4/12/07	3	14	1	522	B	455	7	1	Edwards	6	6	6	6	6	4	0	0	0	1	1
4/12/07	3	14	1	521	C	641	8	1	Edwards	5	6	5	6	6	5	0	0	0	1	0
4/12/07	3	14	1	518	D	506	9	2	Edwards	6	6	7	6	6	5	1	1	0	0	1
4/12/07	3	14	1	519	A	121	10	2	Edwards	6	6	7	6	6	6	0	0	0	0	0
4/12/07	3	14	1	516	B	281	11	2	Edwards	6	7	7	7	6	5	0	0	0	0	2
4/12/07	3	14	1	516	D	338	12	2	Edwards	6	7	8	7	6	4	0	0	0	1	1
4/12/07	3	14	1	522	A	402	13	2	Edwards	5	4	4	4	5	3	0	0	0	3	0
4/12/07	3	14	1	518	C	259	14	2	Edwards	6	6	6	6	6	5	2	1	0	0	1
4/12/07	3	14	1	523	B	158	15	2	Edwards	6	5	6	5	5	3	0	0	0	1	0
4/12/07	3	14	1	519	B	950	16	2	Edwards	6	6	7	6	6	5	1	0	0	0	1
4/12/07	3	14	1	522	C	135	1	1	Inglis	7	4	6	4	4	3	0	3	0	0	1
4/12/07	3	14	1	520	D	905	2	1	Inglis	7	5	6	5	4	3	0	3	0	0	1
4/12/07	3	14	1	516	A	797	3	1	Inglis	6	6	7	6	5	4	0	3	0	0	1

4/12/07	3	14	1	521	A	511	4	1	Inglis	6	5	6	5	4	3	0	3	0	0	1
4/12/07	3	14	1	516	C	418	5	1	Inglis	7	7	7	7	6	5	2	2	0	0	1
4/12/07	3	14	1	521	D	597	6	1	Inglis	5	5	6	5	4	3	0	2	0	0	1
4/12/07	3	14	1	522	B	455	7	1	Inglis	5	6	6	6	4	3	1	3	0	0	1
4/12/07	3	14	1	521	C	641	8	1	Inglis	3	3	5	3	3	2	0	3	0	0	1
4/12/07	3	14	1	518	D	506	9	2	Inglis	8	8	8	8	7	6	1	3	0	0	1
4/12/07	3	14	1	519	A	121	10	2	Inglis	6	7	8	7	7	6	2	3	0	0	1
4/12/07	3	14	1	516	B	281	11	2	Inglis	6	7	8	7	6	5	2	2	0	0	1
4/12/07	3	14	1	516	D	338	12	2	Inglis	5	5	7	5	5	4	1	1	0	0	1
4/12/07	3	14	1	522	A	402	13	2	Inglis	5	5	6	5	5	4	1	2	0	0	1
4/12/07	3	14	1	518	C	259	14	2	Inglis	6	6	6	6	5	4	1	2	0	0	1
4/12/07	3	14	1	523	B	158	15	2	Inglis	3	4	5	4	4	3	0	3	0	0	1
4/12/07	3	14	1	519	B	950	16	2	Inglis	6	7	8	7	6	5	2	2	0	0	1
4/12/07	3	14	1	522	C	135	1	1	Philip	6	6	6	6	7	5	1	0	1	0	1
4/12/07	3	14	1	520	D	905	2	1	Philip	6	7	7	7	7	5	1	0	2	1	0
4/12/07	3	14	1	516	A	797	3	1	Philip	7	7	8	7	7	5	0	0	2	0	1
4/12/07	3	14	1	521	A	511	4	1	Philip	6	6	5	6	7	5	0	0	3	0	1
4/12/07	3	14	1	516	C	418	5	1	Philip	7	6	7	6	6	6	0	1	0	0	1
4/12/07	3	14	1	521	D	597	6	1	Philip	6	6	5	6	6	5	0	0	1	0	0
4/12/07	3	14	1	522	B	455	7	1	Philip	7	6	6	6	7	5	0	0	2	0	1
4/12/07	3	14	1	521	C	641	8	1	Philip	5	6	5	6	6	4	2	0	1	0	1
4/12/07	3	14	1	518	D	506	9	2	Philip	7	6	8	6	5	5	0	1	0	0	2
4/12/07	3	14	1	519	A	121	10	2	Philip	6	7	7	7	6	5	0	0	0	0	2
4/12/07	3	14	1	516	B	281	11	2	Philip	6	7	8	7	5	5	0	0	0	0	2
4/12/07	3	14	1	516	D	338	12	2	Philip	5	6	6	6	5	6	0	0	0	0	1
4/12/07	3	14	1	522	A	402	13	2	Philip	7	7	7	7	7	6	0	2	0	0	1
4/12/07	3	14	1	518	C	259	14	2	Philip	5	6	7	6	6	5	0	0	0	0	2
4/12/07	3	14	1	523	B	158	15	2	Philip	6	5	5	5	6	5	0	0	0	1	1
4/12/07	3	14	1	519	B	950	16	2	Philip	6	6	7	6	7	5	0	0	0	0	1
4/12/07	3	14	1	522	C	135	1	1	Amen	7	7	6	7	6	4	3	0	0	0	1
4/12/07	3	14	1	520	D	905	2	1	Amen	7	8	6	7	6	4	3	0	0	0	0

4/12/07	3	14	1	516	A	797	3	1	Amen	6	6	6	6	7	5	1	1	0	0	1
4/12/07	3	14	1	521	A	511	4	1	Amen	7	7	6	7	6	4	2	0	0	1	0
4/12/07	3	14	1	516	C	418	5	1	Amen	7	6	6	6	5	5	0	0	0	0	0
4/12/07	3	14	1	521	D	597	6	1	Amen	6	6	5	5	6	4	2	0	0	0	1
4/12/07	3	14	1	522	B	455	7	1	Amen	6	7	7	7	7	4	2	0	0	0	0
4/12/07	3	14	1	521	C	641	8	1	Amen	5	6	6	6	6	5	1	0	0	0	2
4/12/07	3	14	1	518	D	506	9	2	Amen	7	5	7	5	6	5	0	1	0	0	0
4/12/07	3	14	1	519	A	121	10	2	Amen	6	6	7	6	7	6	0	0	0	0	2
4/12/07	3	14	1	516	B	281	11	2	Amen	7	6	7	6	6	5	0	1	0	1	0
4/12/07	3	14	1	516	D	338	12	2	Amen	5	6	7	6	5	4	0	0	0	0	1
4/12/07	3	14	1	522	A	402	13	2	Amen	7	7	6	7	7	5	4	0	0	0	2
4/12/07	3	14	1	518	C	259	14	2	Amen	6	4	6	4	6	6	0	0	0	0	1
4/12/07	3	14	1	523	B	158	15	2	Amen	5	6	5	5	5	4	2	0	0	1	1
4/12/07	3	14	1	519	B	950	16	2	Amen	6	5	7	5	6	5	0	0	0	0	1
4/12/07	3	14	2	519	D	508	1	1	Anzola	3	7	7	7	4	5	1	0	0	0	1
4/12/07	3	14	2	517	A	115	2	1	Anzola	4	6	6	6	5	5	1	0	0	0	1
4/12/07	3	14	2	519	C	573	3	1	Anzola	5	7	7	7	6	6	1	0	0	0	1
4/12/07	3	14	2	523	A	105	4	1	Anzola	5	6	6	6	5	5	1	0	0	1	0
4/12/07	3	14	2	523	D	957	5	1	Anzola	4	5	5	5	4	5	0	0	0	1	0
4/12/07	3	14	2	520	B	810	6	1	Anzola	5	7	7	7	5	5	1	1	0	0	0
4/12/07	3	14	2	520	A	102	7	1	Anzola	5	6	5	6	6	5	1	0	0	0	0
4/12/07	3	14	2	520	C	388	8	1	Anzola	6	7	7	7	6	6	2	2	0	0	1
4/12/07	3	14	2	518	B	30	9	2	Anzola	5	6	7	6	7	6	2	0	0	0	1
4/12/07	3	14	2	518	A	439	10	2	Anzola	5	7	7	7	6	6	1	0	0	0	1
4/12/07	3	14	2	517	B	918	11	2	Anzola	6	7	7	7	5	5	1	0	0	0	0
4/12/07	3	14	2	521	B	284	12	2	Anzola	3	3	2	2	4	4	3	0	0	2	0
4/12/07	3	14	2	517	C	264	13	2	Anzola	6	7	7	7	6	6	2	0	0	0	0
4/12/07	3	14	2	522	D	853	14	2	Anzola	6	6	5	6	6	6	1	0	0	0	0
4/12/07	3	14	2	523	C	406	15	2	Anzola	5	5	4	4	5	5	2	0	0	1	0
4/12/07	3	14	2	517	D	495	16	2	Anzola	6	7	7	7	6	6	1	0	0	0	1
4/12/07	3	14	2	519	D	508	1	1	Cunningham	5	6	7	6	5	5	0	0	0	1	0

4/12/07	3	14	2	517	A	115	2	1	Cunningham	6	7	7	7	6	5	0	1	0	3	2
4/12/07	3	14	2	519	C	573	3	1	Cunningham	6	7	7	7	5	5	0	0	0	0	0
4/12/07	3	14	2	523	A	105	4	1	Cunningham	6	6	5	5	5	4	0	2	3	0	1
4/12/07	3	14	2	523	D	957	5	1	Cunningham	6	6	6	6	5	4	0	0	0	1	1
4/12/07	3	14	2	520	B	810	6	1	Cunningham	6	6	7	6	5	5	1	0	0	2	0
4/12/07	3	14	2	520	A	102	7	1	Cunningham	6	7	7	7	6	5	1	1	0	0	1
4/12/07	3	14	2	520	C	388	8	1	Cunningham	8	8	8	8	5	5	0	1	0	0	1
4/12/07	3	14	2	518	B	30	9	2	Cunningham	7	7	7	7	6	5	0	0	0	0	0
4/12/07	3	14	2	518	A	439	10	2	Cunningham	5	7	7	7	5	4	0	0	0	0	1
4/12/07	3	14	2	517	B	918	11	2	Cunningham	6	6	7	6	6	5	1	0	0	1	1
4/12/07	3	14	2	521	B	284	12	2	Cunningham	6	6	6	6	6	5	0	0	0	2	0
4/12/07	3	14	2	517	C	264	13	2	Cunningham	6	6	7	6	6	6	0	0	0	0	0
4/12/07	3	14	2	522	D	853	14	2	Cunningham	7	7	7	7	5	5	1	1	2	0	0
4/12/07	3	14	2	523	C	406	15	2	Cunningham	6	5	5	5	4	3	0	0	0	0	0
4/12/07	3	14	2	517	D	495	16	2	Cunningham	6	7	7	7	6	6	2	0	0	0	1
4/12/07	3	14	2	519	D	508	1	1	Thurman	3	5	7	6	6	4	0	2	3	0	0
4/12/07	3	14	2	517	A	115	2	1	Thurman	6	7	7	7	7	4	3	0	0	0	2
4/12/07	3	14	2	519	C	573	3	1	Thurman	5	6	8	7	6	5	1	0	0	0	1
4/12/07	3	14	2	523	A	105	4	1	Thurman	7	5	4	4	7	5	3	2	0	0	0
4/12/07	3	14	2	523	D	957	5	1	Thurman	7	5	4	5	6	4	2	1	0	0	0
4/12/07	3	14	2	520	B	810	6	1	Thurman	6	5	5	5	6	6	1	0	0	0	1
4/12/07	3	14	2	520	A	102	7	1	Thurman	8	8	7	0	6	5	2	2	0	0	1
4/12/07	3	14	2	520	C	388	8	1	Thurman	8	7	7	0	6	4	2	2	0	0	0
4/12/07	3	14	2	518	B	30	9	2	Thurman	6	6	7	6	8	6	1	0	2	0	0
4/12/07	3	14	2	518	A	439	10	2	Thurman	5	6	8	6	6	5	1	1	0	0	0
4/12/07	3	14	2	517	B	918	11	2	Thurman	6	7	7	7	6	5	3	0	0	0	1
4/12/07	3	14	2	521	B	284	12	2	Thurman	6	6	7	6	5	4	2	0	1	2	0
4/12/07	3	14	2	517	C	264	13	2	Thurman	6	6	7	6	7	5	2	1	2	0	0
4/12/07	3	14	2	522	D	853	14	2	Thurman	6	6	6	6	8	6	3	1	0	0	0
4/12/07	3	14	2	523	C	406	15	2	Thurman	7	7	6	7	8	6	4	0	0	0	0
4/12/07	3	14	2	517	D	495	16	2	Thurman	7	6	8	7	6	5	2	2	0	0	0

4/12/07	3	14	2	519	D	508	1	1	CodyJohnson	3	6	7	6	4	3	0	0	0	0	0
4/12/07	3	14	2	517	A	115	2	1	CodyJohnson	6	6	6	6	5	5	0	0	0	0	1
4/12/07	3	14	2	519	C	573	3	1	CodyJohnson	5	5	6	5	6	5	1	0	0	0	1
4/12/07	3	14	2	523	A	105	4	1	CodyJohnson	5	4	3	3	5	5	2	0	0	0	0
4/12/07	3	14	2	523	D	957	5	1	CodyJohnson	5	7	3	5	4	4	1	0	0	0	0
4/12/07	3	14	2	520	B	810	6	1	CodyJohnson	6	6	7	6	6	5	1	0	0	0	1
4/12/07	3	14	2	520	A	102	7	1	CodyJohnson	7	7	6	6	6	5	1	0	0	0	1
4/12/07	3	14	2	520	C	388	8	1	CodyJohnson	8	8	5	6	5	5	2	0	0	0	1
4/12/07	3	14	2	518	B	30	9	2	CodyJohnson	7	7	7	7	7	6	0	0	0	0	2
4/12/07	3	14	2	518	A	439	10	2	CodyJohnson	5	7	7	7	6	5	0	0	0	0	2
4/12/07	3	14	2	517	B	918	11	2	CodyJohnson	7	6	6	6	5	5	1	0	0	0	0
4/12/07	3	14	2	521	B	284	12	2	CodyJohnson	6	6	5	5	5	4	2	0	0	0	0
4/12/07	3	14	2	517	C	264	13	2	CodyJohnson	6	6	7	6	6	5	0	0	0	0	1
4/12/07	3	14	2	522	D	853	14	2	CodyJohnson	7	6	4	5	5	5	2	1	0	0	0
4/12/07	3	14	2	523	C	406	15	2	CodyJohnson	6	6	3	4	5	3	4	0	0	0	0
4/12/07	3	14	2	517	D	495	16	2	CodyJohnson	6	6	7	6	6	5	1	0	0	0	1
4/12/07	3	14	2	519	D	508	1	1	Davis	6	6	7	6	6	6	0	0	0	0	0
4/12/07	3	14	2	517	A	115	2	1	Davis	6	7	7	7	6	6	0	0	0	1	1
4/12/07	3	14	2	519	C	573	3	1	Davis	5	5	6	5	6	6	0	1	0	0	0
4/12/07	3	14	2	523	A	105	4	1	Davis	5	6	3	5	6	4	0	0	2	0	0
4/12/07	3	14	2	523	D	957	5	1	Davis	5	5	3	4	6	4	0	0	1	1	0
4/12/07	3	14	2	520	B	810	6	1	Davis	5	6	5	5	5	5	0	0	0	0	0
4/12/07	3	14	2	520	A	102	7	1	Davis	6	7	5	6	6	5	0	2	0	0	1
4/12/07	3	14	2	520	C	388	8	1	Davis	7	7	5	6	6	6	0	1	0	0	1
4/12/07	3	14	2	518	B	30	9	2	Davis	4	6	6	6	6	5	0	0	0	0	0
4/12/07	3	14	2	518	A	439	10	2	Davis	5	6	7	6	5	5	0	0	0	0	1
4/12/07	3	14	2	517	B	918	11	2	Davis	7	6	7	6	6	5	0	0	0	0	0
4/12/07	3	14	2	521	B	284	12	2	Davis	5	4	3	4	5	4	0	0	0	0	0
4/12/07	3	14	2	517	C	264	13	2	Davis	6	7	8	7	5	5	0	0	0	0	2
4/12/07	3	14	2	522	D	853	14	2	Davis	6	6	4	5	6	4	0	0	1	0	0
4/12/07	3	14	2	523	C	406	15	2	Davis	6	5	3	4	7	4	0	1	0	0	0

4/12/07	3	14	2	517	D	495	16	2	Davis	5	6	7	6	6	5	0	0	0	0	0
4/24/07	1	28	1	500	C	70	1	1	Amen	6	7	7	7	6	5	2	0	0	0	1
4/24/07	1	28	1	504	B	469	2	1	Amen	5	6	6	6	5	4	1	0	0	0	0
4/24/07	1	28	1	504	D	549	3	1	Amen	5	5	6	5	6	6	1	0	0	1	1
4/24/07	1	28	1	506	A	23	4	1	Amen	7	6	6	6	7	5	1	0	0	0	1
4/24/07	1	28	1	503	A	543	5	1	Amen	5	7	7	7	6	6	0	0	0	0	1
4/24/07	1	28	1	505	D	227	6	1	Amen	5	4	6	4	6	5	0	0	0	0	0
4/24/07	1	28	1	504	C	193	7	1	Amen	6	6	7	6	5	5	1	0	0	0	0
4/24/07	1	28	1	500	B	262	8	1	Amen	7	6	7	6	5	5	2	0	0	0	1
4/24/07	1	28	1	503	B	288	9	2	Amen	5	6	6	6	6	5	0	0	0	0	1
4/24/07	1	28	1	505	A	911	10	2	Amen	6	6	6	6	6	6	0	0	0	1	0
4/24/07	1	28	1	506	C	407	11	2	Amen	5	5	5	4	7	5	0	0	0	0	1
4/24/07	1	28	1	502	D	917	12	2	Amen	5	6	7	6	6	6	0	0	0	0	1
4/24/07	1	28	1	501	D	284	13	2	Amen	6	7	6	7	6	4	3	0	0	0	0
4/24/07	1	28	1	503	C	224	14	2	Amen	4	5	6	5	5	5	0	0	0	0	0
4/24/07	1	28	1	507	B	243	15	2	Amen	5	4	5	4	6	5	1	0	0	1	0
4/24/07	1	28	1	500	A	366	16	2	Amen	6	7	8	7	6	5	2	0	0	0	1
4/24/07	1	28	1	500	C	70	1	1	Inglis	7	8	8	8	6	5	2	2	0	0	1
4/24/07	1	28	1	504	B	469	2	1	Inglis	5	5	6	5	5	4	1	2	0	2	1
4/24/07	1	28	1	504	D	549	3	1	Inglis	6	6	7	6	5	4	1	2	0	2	1
4/24/07	1	28	1	506	A	23	4	1	Inglis	6	5	6	5	6	5	1	2	0	2	1
4/24/07	1	28	1	503	A	543	5	1	Inglis	6	6	7	6	6	6	2	2	0	0	1
4/24/07	1	28	1	505	D	227	6	1	Inglis	6	6	7	6	5	4	2	2	0	2	1
4/24/07	1	28	1	504	C	193	7	1	Inglis	6	6	7	6	5	3	2	2	0	2	1
4/24/07	1	28	1	500	B	262	8	1	Inglis	6	6	7	6	6	6	2	2	0	0	1
4/24/07	1	28	1	503	B	288	9	2	Inglis	4	8	8	8	6	5	2	2	0	0	1
4/24/07	1	28	1	505	A	911	10	2	Inglis	5	7	7	7	5	4	1	2	0	2	1
4/24/07	1	28	1	506	C	407	11	2	Inglis	6	7	7	7	5	4	1	2	0	0	1
4/24/07	1	28	1	502	D	917	12	2	Inglis	3	6	6	6	4	4	1	2	0	0	1
4/24/07	1	28	1	501	D	284	13	2	Inglis	6	7	7	7	6	3	2	2	0	3	1
4/24/07	1	28	1	503	C	224	14	2	Inglis	6	6	7	6	5	3	2	2	0	2	1

4/24/07	1	28	1	507	B	243	15	2	Inglis	5	4	6	4	4	3	1	1	0	2	1
4/24/07	1	28	1	500	A	366	16	2	Inglis	6	7	7	7	5	4	2	2	0	0	1
4/24/07	1	28	1	500	C	70	1	1	Runyon	6	7	7	7	6	5	2	2	0	0	1
4/24/07	1	28	1	504	B	469	2	1	Runyon	5	6	8	6	6	4	1	3	0	0	1
4/24/07	1	28	1	504	D	549	3	1	Runyon	6	5	7	5	6	4	1	3	0	0	1
4/24/07	1	28	1	506	A	23	4	1	Runyon	6	5	8	5	7	4	1	3	0	3	1
4/24/07	1	28	1	503	A	543	5	1	Runyon	5	7	8	7	6	5	1	3	1	0	1
4/24/07	1	28	1	505	D	227	6	1	Runyon	5	5	7	5	6	5	0	2	0	0	1
4/24/07	1	28	1	504	C	193	7	1	Runyon	5	5	7	5	6	4	0	3	0	0	0
4/24/07	1	28	1	500	B	262	8	1	Runyon	6	8	8	8	6	5	0	1	0	0	1
4/24/07	1	28	1	503	B	288	9	2	Runyon	5	6	8	6	6	6	1	2	0	0	1
4/24/07	1	28	1	505	A	911	10	2	Runyon	5	5	7	5	6	3	1	2	0	2	0
4/24/07	1	28	1	506	C	407	11	2	Runyon	6	5	6	5	7	3	0	2	0	4	0
4/24/07	1	28	1	502	D	917	12	2	Runyon	4	7	8	7	6	5	0	1	0	0	2
4/24/07	1	28	1	501	D	284	13	2	Runyon	4	7	8	7	6	3	0	0	0	0	0
4/24/07	1	28	1	503	C	224	14	2	Runyon	4	6	7	6	6	5	1	2	0	0	1
4/24/07	1	28	1	507	B	243	15	2	Runyon	4	4	7	4	7	3	0	2	0	4	1
4/24/07	1	28	1	500	A	366	16	2	Runyon	5	8	7	7	7	4	2	1	0	0	0
4/24/07	1	28	1	500	C	70	1	1	Higgins	6	7	8	7	6	6	3	2	0	2	2
4/24/07	1	28	1	504	B	469	2	1	Higgins	5	5	6	5	5	5	2	2	0	1	2
4/24/07	1	28	1	504	D	549	3	1	Higgins	6	6	6	6	5	5	2	2	0	0	2
4/24/07	1	28	1	506	A	23	4	1	Higgins	6	6	7	6	6	6	2	2	0	0	1
4/24/07	1	28	1	503	A	543	5	1	Higgins	7	7	8	7	6	6	1	3	0	0	1
4/24/07	1	28	1	505	D	227	6	1	Higgins	5	5	6	5	5	5	2	1	0	0	2
4/24/07	1	28	1	504	C	193	7	1	Higgins	6	6	7	6	5	5	1	2	1	1	1
4/24/07	1	28	1	500	B	262	8	1	Higgins	6	6	7	6	6	5	2	2	0	2	1
4/24/07	1	28	1	503	B	288	9	2	Higgins	6	5	6	5	6	5	2	1	0	1	2
4/24/07	1	28	1	505	A	911	10	2	Higgins	6	6	7	6	6	6	1	1	0	1	1
4/24/07	1	28	1	506	C	407	11	2	Higgins	5	5	6	5	6	6	1	1	0	2	2
4/24/07	1	28	1	502	D	917	12	2	Higgins	5	6	7	6	6	6	2	2	0	0	2
4/24/07	1	28	1	501	D	284	13	2	Higgins	5	6	7	6	7	4	2	2	0	3	2

4/24/07	1	28	1	503	C	224	14	2	Higgins	5	5	6	5	6	6	2	1	0	0	1
4/24/07	1	28	1	507	B	243	15	2	Higgins	5	4	5	4	6	5	2	0	0	2	2
4/24/07	1	28	1	500	A	366	16	2	Higgins	6	7	8	7	6	5	3	2	0	2	2
4/24/07	1	28	2	502	A	37	1	1	Benli	6	7	6	6	6	5	1	1	0	0	1
4/24/07	1	28	2	502	C	896	2	1	Benli	5	7	7	7	6	6	1	2	0	0	2
4/24/07	1	28	2	507	D	31	3	1	Benli	4	4	6	4	6	4	0	1	0	1	1
4/24/07	1	28	2	502	B	396	4	1	Benli	5	7	7	7	6	6	0	1	0	0	1
4/24/07	1	28	2	501	B	949	5	1	Benli	6	6	6	6	7	5	0	0	0	2	1
4/24/07	1	28	2	504	A	587	6	1	Benli	5	5	6	5	6	5	0	1	0	1	1
4/24/07	1	28	2	500	D	280	7	1	Benli	4	7	7	7	7	4	1	0	0	0	1
4/24/07	1	28	2	501	C	389	8	1	Benli	6	7	6	6	7	4	1	0	0	0	1
4/24/07	1	28	2	501	A	39	9	2	Benli	6	6	6	6	6	5	2	1	0	0	1
4/24/07	1	28	2	506	D	717	10	2	Benli	6	5	7	5	6	6	1	2	0	0	1
4/24/07	1	28	2	503	D	837	11	2	Benli	4	7	7	7	6	6	0	0	0	0	1
4/24/07	1	28	2	505	B	784	12	2	Benli	6	6	6	6	6	6	1	1	0	0	1
4/24/07	1	28	2	506	B	72	13	2	Benli	5	4	4	4	7	5	0	1	0	2	1
4/24/07	1	28	2	505	C	962	14	2	Benli	5	6	5	5	5	5	0	0	0	0	1
4/24/07	1	28	2	507	A	199	15	2	Benli	5	4	4	4	8	4	0	0	0	6	0
4/24/07	1	28	2	507	C	53	16	2	Benli	5	4	3	3	6	4	1	0	0	2	1
4/24/07	1	28	2	502	A	37	1	1	Davis	5	6	6	6	6	5	2	1	0	0	0
4/24/07	1	28	2	502	C	896	2	1	Davis	4	6	5	6	4	3	0	0	0	0	1
4/24/07	1	28	2	507	D	31	3	1	Davis	5	4	2	3	5	4	0	0	0	2	0
4/24/07	1	28	2	502	B	396	4	1	Davis	4	7	7	7	5	5	0	0	0	0	1
4/24/07	1	28	2	501	B	949	5	1	Davis	5	8	8	8	6	4	0	2	3	0	0
4/24/07	1	28	2	504	A	587	6	1	Davis	4	5	4	5	5	3	0	0	0	3	0
4/24/07	1	28	2	500	D	280	7	1	Davis	5	7	7	7	5	4	0	0	0	1	1
4/24/07	1	28	2	501	C	389	8	1	Davis	5	6	7	6	6	4	0	0	0	0	0
4/24/07	1	28	2	501	A	39	9	2	Davis	5	6	6	6	7	3	0	0	0	0	0
4/24/07	1	28	2	506	D	717	10	2	Davis	6	4	5	4	5	6	0	1	0	0	0
4/24/07	1	28	2	503	D	837	11	2	Davis	5	4	5	4	5	5	0	0	0	0	0
4/24/07	1	28	2	505	B	784	12	2	Davis	6	5	5	5	6	4	0	0	0	0	0

4/24/07	1	28	2	506	B	72	13	2	Davis	6	4	4	4	5	5	0	0	0	0	0
4/24/07	1	28	2	505	C	962	14	2	Davis	6	4	2	3	5	4	0	2	0	0	0
4/24/07	1	28	2	507	A	199	15	2	Davis	5	2	2	2	5	3	1	0	0	2	0
4/24/07	1	28	2	507	C	53	16	2	Davis	5	2	1	2	3	1	1	2	0	0	0
4/24/07	1	28	2	502	A	37	1	1	Anzola	6	7	7	7	6	5	1	1	0	0	1
4/24/07	1	28	2	502	C	896	2	1	Anzola	5	6	7	6	5	5	0	0	0	0	1
4/24/07	1	28	2	507	D	31	3	1	Anzola	5	4	6	4	5	5	0	0	0	0	2
4/24/07	1	28	2	502	B	396	4	1	Anzola	4	5	5	5	4	5	0	0	0	0	1
4/24/07	1	28	2	501	B	949	5	1	Anzola	6	8	8	8	5	5	1	1	0	0	0
4/24/07	1	28	2	504	A	587	6	1	Anzola	6	5	6	5	5	5	0	0	0	1	0
4/24/07	1	28	2	500	D	280	7	1	Anzola	6	7	7	7	6	5	1	2	1	0	0
4/24/07	1	28	2	501	C	389	8	1	Anzola	5	8	8	8	5	5	2	0	0	1	0
4/24/07	1	28	2	501	A	39	9	2	Anzola	7	8	8	8	7	6	1	0	0	0	1
4/24/07	1	28	2	506	D	717	10	2	Anzola	7	6	6	6	6	6	2	1	0	0	1
4/24/07	1	28	2	503	D	837	11	2	Anzola	4	7	7	7	7	6	2	0	0	0	0
4/24/07	1	28	2	505	B	784	12	2	Anzola	6	6	6	6	6	5	1	1	1	0	0
4/24/07	1	28	2	506	B	72	13	2	Anzola	6	5	6	5	6	6	1	0	0	0	1
4/24/07	1	28	2	505	C	962	14	2	Anzola	6	6	6	6	6	6	2	0	0	0	0
4/24/07	1	28	2	507	A	199	15	2	Anzola	4	4	6	4	5	5	1	0	0	1	0
4/24/07	1	28	2	507	C	53	16	2	Anzola	5	6	5	5	5	5	1	1	0	0	0
4/24/07	1	28	2	502	A	37	1	1	Bailey	7	6	7	6	6	6	1	1	0	0	1
4/24/07	1	28	2	502	C	896	2	1	Bailey	5	6	6	6	5	6	0	1	0	1	1
4/24/07	1	28	2	507	D	31	3	1	Bailey	6	5	6	5	6	5	0	1	1	0	1
4/24/07	1	28	2	502	B	396	4	1	Bailey	5	6	7	6	6	6	1	1	0	0	1
4/24/07	1	28	2	501	B	949	5	1	Bailey	6	7	7	7	5	4	2	1	0	0	0
4/24/07	1	28	2	504	A	587	6	1	Bailey	5	6	7	6	6	5	1	1	1	0	0
4/24/07	1	28	2	500	D	280	7	1	Bailey	6	7	8	7	5	4	2	1	0	0	1
4/24/07	1	28	2	501	C	389	8	1	Bailey	6	7	8	7	6	4	2	0	0	0	1
4/24/07	1	28	2	501	A	39	9	2	Bailey	7	7	7	7	5	4	3	0	0	0	1
4/24/07	1	28	2	506	D	717	10	2	Bailey	7	5	6	5	6	5	1	1	0	0	1
4/24/07	1	28	2	503	D	837	11	2	Bailey	5	6	7	6	6	6	1	0	0	0	1

4/24/07	1	28	2	505	B	784	12	2	Bailey	6	6	7	6	6	5	0	1	0	0	0
4/24/07	1	28	2	506	B	72	13	2	Bailey	7	6	6	6	6	5	0	1	0	0	1
4/24/07	1	28	2	505	C	962	14	2	Bailey	6	6	6	6	6	5	1	0	0	0	1
4/24/07	1	28	2	507	A	199	15	2	Bailey	7	6	6	6	6	5	1	1	0	0	1
4/24/07	1	28	2	507	C	53	16	2	Bailey	6	7	6	6	6	5	1	1	0	0	1
4/24/07	1	28	2	502	A	37	1	1	Thurman	6	7	8	7	6	4	2	1	0	0	0
4/24/07	1	28	2	502	C	896	2	1	Thurman	4	6	6	6	6	4	1	0	1	0	0
4/24/07	1	28	2	507	D	31	3	1	Thurman	3	3	2	3	7	5	0	0	1	0	0
4/24/07	1	28	2	502	B	396	4	1	Thurman	4	5	6	5	6	5	0	0	0	0	1
4/24/07	1	28	2	501	B	949	5	1	Thurman	6	8	8	8	7	6	2	1	3	0	0
4/24/07	1	28	2	504	A	587	6	1	Thurman	6	5	5	5	6	5	1	1	0	0	0
4/24/07	1	28	2	500	D	280	7	1	Thurman	6	7	8	7	7	5	1	0	0	0	0
4/24/07	1	28	2	501	C	389	8	1	Thurman	6	7	7	7	7	5	2	1	0	0	0
4/24/07	1	28	2	501	A	39	9	2	Thurman	7	8	7	8	7	7	2	3	0	0	1
4/24/07	1	28	2	506	D	717	10	2	Thurman	7	6	6	6	6	5	0	1	0	0	1
4/24/07	1	28	2	503		837	11	2	Thurman	5	5	6	5	6	5	0	1	0	0	2
4/24/07	1	28	2	505	B	784	12	2	Thurman	5	5	5	5	6	5	1	2	0	0	0
4/24/07	1	28	2	506	B	72	13	2	Thurman	7	4	5	4	6	4	0	2	0	0	1
4/24/07	1	28	2	505	C	962	14	2	Thurman	5	5	6	5	5	4	1	0	0	0	1
4/24/07	1	28	2	507	A	199	15	2	Thurman	7	5	4	5	7	6	0	3	2	0	1
4/24/07	1	28	2	507	C	53	16	2	Thurman	6	7	5	6	6	5	2	1	0	0	0
4/25/07	2	28	1	515	D	402	1	1	Philip	5	5	6	5	5	1	0	1	1	2	1
4/25/07	2	28	1	512	B	922	2	1	Philip	6	6	7	6	5	1	0	1	1	2	2
4/25/07	2	28	1	512	A	99	3	1	Philip	6	5	6	5	5	2	0	2	0	1	0
4/25/07	2	28	1	511	D	251	4	1	Philip	4	8	8	8	6	0	0	0	0	1	2
4/25/07	2	28	1	510	C	401	5	1	Philip	5	7	7	7	6	0	0	0	0	2	2
4/25/07	2	28	1	513	D	391	6	1	Philip	6	6	6	6	5	1	0	0	1	1	2
4/25/07	2	28	1	509	A	394	7	1	Philip	5	6	7	6	5	0	0	3	0	1	0
4/25/07	2	28	1	511	A	668	8	1	Philip	7	7	8	7	5	1	0	0	0	1	1
4/25/07	2	28	1	512	C	508	9	2	Philip	6	6	6	6	5	2	0	1	0	0	1
4/25/07	2	28	1	515	B	255	10	2	Philip	6	6	6	6	6	0	0	0	0	2	1

4/25/07	2	28	1	509	D	71	11	2	Philip	5	7	8	7	6	0	0	2	0	1	1
4/25/07	2	28	1	509	C	574	12	2	Philip	6	7	7	7	5	0	0	2	0	0	1
4/25/07	2	28	1	508	B	928	13	2	Philip	6	8	8	8	6	0	0	2	0	1	0
4/25/07	2	28	1	515	A	452	14	2	Philip	6	4	5	4	5	0	0	1	0	1	0
4/25/07	2	28	1	511	B	372	15	2	Philip	6	8	7	8	6	0	0	0	0	2	1
4/25/07	2	28	1	514	C	349	16	2	Philip	7	7	7	7	5	1	0	0	0	2	1
4/25/07	2	28	1	515	D	402	1	1	Runyon	5	4	7	4	6	4	2	2	0	3	2
4/25/07	2	28	1	512	B	922	2	1	Runyon	5	4	7	4	6	4	1	3	0	3	2
4/25/07	2	28	1	512	A	99	3	1	Runyon	6	6	7	6	7	3	2	3	0	3	1
4/25/07	2	28	1	511	D	251	4	1	Runyon	4	8	8	8	7	7	1	1	0	0	2
4/25/07	2	28	1	510	C	401	5	1	Runyon	5	7	8	7	6	6	2	1	0	0	2
4/25/07	2	28	1	513	D	391	6	1	Runyon	5	3	6	3	7	4	2	3	0	4	1
4/25/07	2	28	1	509	A	394	7	1	Runyon	5	7	8	7	7	3	0	1	0	6	0
4/25/07	2	28	1	511	A	668	8	1	Runyon	5	8	8	8	7	2	0	0	0	0	0
4/25/07	2	28	1	512	C	508	9	2	Runyon	5	6	7	6	6	4	2	3	0	3	0
4/25/07	2	28	1	515	B	255	10	2	Runyon	7	5	7	5	6	4	0	3	0	2	0
4/25/07	2	28	1	509	D	71	11	2	Runyon	6	7	7	7	6	4	0	2	0	3	0
4/25/07	2	28	1	509	C	574	12	2	Runyon	5	7	8	7	6	4	0	2	0	0	1
4/25/07	2	28	1	508	B	928	13	2	Runyon	5	8	8	8	7	3	0	0	0	0	1
4/25/07	2	28	1	515	A	452	14	2	Runyon	2	2	7	2	7	4	0	0	0	5	1
4/25/07	2	28	1	511	B	372	15	2	Runyon	4	8	8	8	6	3	0	0	0	0	0
4/25/07	2	28	1	514	C	349	16	2	Runyon	6	7	6	6	6	5	2	1	0	0	2
4/25/07	2	28	1	515	D	402	1	1	Higgins	5	5	6	5	5	5	2	1	0	1	1
4/25/07	2	28	1	512	B	922	2	1	Higgins	5	4	5	4	5	4	2	1	0	1	1
4/25/07	2	28	1	512	A	99	3	1	Higgins	5	5	5	5	6	5	3	2	1	3	2
4/25/07	2	28	1	511	D	251	4	1	Higgins	5	7	8	7	6	5	1	0	0	0	2
4/25/07	2	28	1	510	C	401	5	1	Higgins	6	6	7	6	6	6	1	1	0	0	2
4/25/07	2	28	1	513	D	391	6	1	Higgins	5	5	5	5	4	4	2	0	1	0	1
4/25/07	2	28	1	509	A	394	7	1	Higgins	6	6	7	6	5	5	2	2	0	0	2
4/25/07	2	28	1	511	A	668	8	1	Higgins	6	7	8	7	6	5	2	1	1	0	2
4/25/07	2	28	1	512	C	508	9	2	Higgins	4	4	5	4	4	5	1	0	1	1	1

4/25/07	2	28	1	515	B	255	10	2	Higgins	5	5	6	5	5	5	2	1	0	2	1
4/25/07	2	28	1	509	D	71	11	2	Higgins	6	7	8	7	5	6	2	2	0	0	2
4/25/07	2	28	1	509	C	574	12	2	Higgins	6	8	8	8	6	5	2	1	1	0	2
4/25/07	2	28	1	508	B	928	13	2	Higgins	6	6	6	6	5	4	2	1	0	3	2
4/25/07	2	28	1	515	A	452	14	2	Higgins	4	4	4	4	4	5	1	0	1	1	1
4/25/07	2	28	1	511	B	372	15	2	Higgins	5	6	7	6	6	5	2	1	0	0	2
4/25/07	2	28	1	514	C	349	16	2	Higgins	6	5	6	5	5	5	2	2	1	1	2
4/25/07	2	28	1	515	D	402	1	1	Inglis	5	6	7	6	5	4	1	2	0	0	1
4/25/07	2	28	1	512	B	922	2	1	Inglis	5	5	6	5	4	3	1	1	0	2	1
4/25/07	2	28	1	512	A	99	3	1	Inglis	4	3	5	3	4	3	0	2	0	3	1
4/25/07	2	28	1	511	D	251	4	1	Inglis	2	7	8	7	5	4	0	1	0	0	1
4/25/07	2	28	1	510	C	401	5	1	Inglis	5	8	8	8	5	5	2	0	0	0	1
4/25/07	2	28	1	513	D	391	6	1	Inglis	5	6	6	6	5	4	0	0	0	1	1
4/25/07	2	28	1	509	A	394	7	1	Inglis	6	6	7	6	5	4	2	1	0	0	1
4/25/07	2	28	1	511	A	668	8	1	Inglis	3	8	8	8	6	4	2	1	0	0	1
4/25/07	2	28	1	512	C	508	9	2	Inglis	5	5	6	5	4	3	1	1	0	2	1
4/25/07	2	28	1	515	B	255	10	2	Inglis	7	6	6	6	6	4	2	2	0	0	1
4/25/07	2	28	1	509	D	71	11	2	Inglis	6	8	8	8	6	5	2	2	0	0	1
4/25/07	2	28	1	509	C	574	12	2	Inglis	6	8	8	8	6	5	2	2	0	0	1
4/25/07	2	28	1	508	B	928	13	2	Inglis	6	7	8	7	5	3	2	2	0	3	1
4/25/07	2	28	1	515	A	452	14	2	Inglis	5	5	6	5	5	2	0	1	0	4	0
4/25/07	2	28	1	511	B	372	15	2	Inglis	6	8	8	8	6	5	2	1	0	0	1
4/25/07	2	28	1	514	C	349	16	2	Inglis	7	6	7	6	6	5	2	1	0	0	1
4/25/07	2	28	1	515	D	402	1	1	Johnson	6	7	6	7	6	6	2	0	0	1	1
4/25/07	2	28	1	512	B	922	2	1	Johnson	7	7	7	7	6	5	2	0	0	2	1
4/25/07	2	28	1	512	A	99	3	1	Johnson	7	7	5	6	6	5	3	0	0	1	1
4/25/07	2	28	1	511	D	251	4	1	Johnson	6	7	8	7	5	5	1	0	0	0	2
4/25/07	2	28	1	510	C	401	5	1	Johnson	5	6	6	6	6	6	1	0	0	0	2
4/25/07	2	28	1	513	D	391	6	1	Johnson	7	7	5	6	6	6	2	0	0	1	1
4/25/07	2	28	1	509	A	394	7	1	Johnson	7	8	6	7	6	5	2	1	0	2	2
4/25/07	2	28	1	511	A	668	8	1	Johnson	6	7	7	7	6	5	2	0	0	0	1

4/25/07	2	28	1	512	C	508	9	2	Johnson	6	7	6	7	6	5	3	0	0	0	1
4/25/07	2	28	1	515	B	255	10	2	Johnson	7	7	6	7	6	5	1	1	0	2	2
4/25/07	2	28	1	509	D	71	11	2	Johnson	7	8	7	8	6	5	2	0	0	1	2
4/25/07	2	28	1	509	C	574	12	2	Johnson	7	7	7	7	5	5	2	0	0	0	2
4/25/07	2	28	1	508	B	928	13	2	Johnson	7	8	8	8	7	5	2	0	0	1	2
4/25/07	2	28	1	515	A	452	14	2	Johnson	5	6	6	6	6	5	1	0	0	0	3
4/25/07	2	28	1	511	B	372	15	2	Johnson	6	8	7	8	6	5	1	0	0	0	1
4/25/07	2	28	1	514	C	349	16	2	Johnson	7	7	7	7	6	5	2	0	0	1	2
4/25/07	2	28	2	513	C	538	1	1	Amen	5	6	6	6	6	5	0	0	0	1	1
4/25/07	2	28	2	513	B	29	2	1	Amen	5	6	7	6	6	6	0	0	0	0	1
4/25/07	2	28	2	510	D	988	3	1	Amen	4	5	7	5	5	5	0	0	0	0	1
4/25/07	2	28	2	509	B	667	4	1	Amen	4	6	7	6	4	4	1	0	0	0	0
4/25/07	2	28	2	512	D	133	5	1	Amen	5	6	6	6	5	4	0	0	0	0	0
4/25/07	2	28	2	514	D	951	6	1	Amen	7	7	6	7	7	6	0	0	2	0	0
4/25/07	2	28	2	510	A	697	7	1	Amen	5	6	7	6	8	5	0	0	0	0	1
4/25/07	2	28	2	510	B	137	8	1	Amen	6	5	7	5	6	6	1	1	0	0	2
4/25/07	2	28	2	513	A	239	9	2	Amen	4	4	6	4	7	5	0	0	0	0	1
4/25/07	2	28	2	514	B	407	10	2	Amen	7	6	7	6	6	6	0	1	0	0	1
4/25/07	2	28	2	514	A	421	11	2	Amen	6	6	6	6	6	5	0	0	1	0	1
4/25/07	2	28	2	515	C	869	12	2	Amen	4	4	5	3	7	6	0	0	0	2	1
4/25/07	2	28	2	511	C	611	13	2	Amen	7	8	8	8	5	4	0	0	0	0	1
4/25/07	2	28	2	513	C	538	1	1	Bradley	5	6	6	6	6	5	1	1	0	0	1
4/25/07	2	28	2	513	B	29	2	1	Bradley	5	7	6	7	5	4	0	0	0	0	1
4/25/07	2	28	2	510	D	988	3	1	Bradley	4	7	7	7	6	5	2	0	0	0	1
4/25/07	2	28	2	509	B	667	4	1	Bradley	4	7	7	7	5	4	0	1	1	1	1
4/25/07	2	28	2	512	D	133	5	1	Bradley	5	5	5	5	5	4	0	0	0	0	1
4/25/07	2	28	2	514	D	951	6	1	Bradley	5	7	6	6	6	5	1	1	0	0	1
4/25/07	2	28	2	510	A	697	7	1	Bradley	5	5	6	5	6	5	1	0	0	0	2
4/25/07	2	28	2	510	B	137	8	1	Bradley	6	7	7	7	6	5	1	0	0	0	1
4/25/07	2	28	2	513	A	239	9	2	Bradley	5	5	5	5	6	5	0	0	0	1	1
4/25/07	2	28	2	514	B	407	10	2	Bradley	6	6	7	6	6	5	2	0	0	0	2

4/25/07	2	28	2	514	A	421	11	2	Bradley	5	6	6	6	5	5	0	0	0	0	1
4/25/07	2	28	2	515	C	869	12	2	Bradley	4	5	6	5	4	3	0	0	0	0	0
4/25/07	2	28	2	511	C	611	13	2	Bradley	7	7	7	7	6	5	1	1	0	0	2
4/25/07	2	28	2	513	C	538	1	1	Philip	5	5	6	5	7	5	0	0	0	2	1
4/25/07	2	28	2	513	B	29	2	1	Philip	5	6	7	6	5	6	0	0	0	0	2
4/25/07	2	28	2	510	D	988	3	1	Philip	6	7	7	7	5	6	0	0	0	0	1
4/25/07	2	28	2	509	B	667	4	1	Philip	6	6	7	6	7	5	0	0	2	0	1
4/25/07	2	28	2	512	D	133	5	1	Philip	5	5	6	5	7	5	0	0	1	0	1
4/25/07	2	28	2	514	D	951	6	1	Philip	7	6	7	6	6	5	1	0	0	0	3
4/25/07	2	28	2	510	A	697	7	1	Philip	6	7	7	7	6	5	0	0	0	0	2
4/25/07	2	28	2	510	B	137	8	1	Philip	7	6	5	5	6	5	2	0	0	0	2
4/25/07	2	28	2	513	A	239	9	2	Philip	7	6	6	6	6	5	1	0	0	1	2
4/25/07	2	28	2	514	B	407	10	2	Philip	7	7	6	7	6	5	1	0	0	0	1
4/25/07	2	28	2	514	A	421	11	2	Philip	6	6	7	6	5	5	1	0	0	0	1
4/25/07	2	28	2	515	C	869	12	2	Philip	5	5	5	5	5	5	0	0	0	0	1
4/25/07	2	28	2	511	C	611	13	2	Philip	6	8	8	8	6	5	1	0	0	0	1
4/25/07	2	28	2	513	C	538	1	1	Davis	4	6	6	6	5	4	0	0	0	2	0
4/25/07	2	28	2	513	B	29	2	1	Davis	5	7	7	7	5	4	0	0	0	0	0
4/25/07	2	28	2	510	D	988	3	1	Davis	5	6	6	6	5	4	1	0	0	0	1
4/25/07	2	28	2	509	B	667	4	1	Davis	6	7	7	7	6	5	2	1	0	0	1
4/25/07	2	28	2	512	D	133	5	1	Davis	5	5	4	5	6	4	0	0	0	2	0
4/25/07	2	28	2	514	D	951	6	1	Davis	7	6	5	6	5	4	2	0	0	0	2
4/25/07	2	28	2	510	A	697	7	1	Davis	6	7	7	7	6	5	2	0	0	0	1
4/25/07	2	28	2	510	B	137	8	1	Davis	6	6	2	4	6	6	4	0	0	0	2
4/25/07	2	28	2	513	A	239	9	2	Davis	6	6	5	6	7	6	3	0	0	0	0
4/25/07	2	28	2	514	B	407	10	2	Davis	7	6	5	6	7	6	4	0	0	0	1
4/25/07	2	28	2	514	A	421	11	2	Davis	5	7	5	6	5	4	0	0	0	0	0
4/25/07	2	28	2	515	C	869	12	2	Davis	4	5	5	5	6	3	0	0	0	2	0
4/25/07	2	28	2	511	C	611	13	2	Davis	6	6	4	5	6	5	4	0	0	0	1
4/25/07	2	28	2	513	C	538	1	1	Anzola	5	6	7	6	6	6	1	0	0	0	0
4/25/07	2	28	2	513	B	29	2	1	Anzola	7	7	6	6	6	6	0	0	0	0	1

4/25/07	2	28	2	510	D	988	3	1	Anzola	5	6	7	6	6	6	2	0	0	0	1
4/25/07	2	28	2	509	B	667	4	1	Anzola	5	7	7	7	5	5	1	0	0	0	0
4/25/07	2	28	2	512	D	133	5	1	Anzola	4	3	4	3	5	5	1	0	0	0	0
4/25/07	2	28	2	514	D	951	6	1	Anzola	6	6	5	5	6	6	2	1	0	0	0
4/25/07	2	28	2	510	A	697	7	1	Anzola	6	7	7	7	6	5	1	1	0	0	0
4/25/07	2	28	2	510	B	137	8	1	Anzola	6	6	7	6	7	7	2	0	0	0	0
4/25/07	2	28	2	513	A	239	9	2	Anzola	7	6	5	5	6	6	2	0	0	0	0
4/25/07	2	28	2	514	B	407	10	2	Anzola	6	6	5	5	6	6	1	0	1	0	0
4/25/07	2	28	2	514	A	421	11	2	Anzola	5	7	6	6	5	5	1	0	0	0	0
4/25/07	2	28	2	515	C	869	12	2	Anzola	3	6	6	6	5	5	1	0	0	0	1
4/25/07	2	28	2	511	C	611	13	2	Anzola	7	8	8	8	6	5	1	0	0	0	1
4/26/07	3	28	1	521	B	470	1	1	Cunningham	5	6	6	6	6	4	2	1	0	2	1
4/26/07	3	28	1	516	A	411	2	1	Cunningham	4	6	6	6	5	5	0	0	0	1	0
4/26/07	3	28	1	516	D	90	3	1	Cunningham	5	6	7	6	5	5	1	0	0	0	2
4/26/07	3	28	1	520	B	14	4	1	Cunningham	5	6	6	6	6	5	0	1	0	2	0
4/26/07	3	28	1	519	D	434	5	1	Cunningham	5	7	6	6	5	5	1	0	0	0	1
4/26/07	3	28	1	522	A	159	6	1	Cunningham	6	6	5	5	6	5	1	0	0	2	0
4/26/07	3	28	1	516	C	474	7	1	Cunningham	5	7	7	7	5	5	1	0	0	0	1
4/26/07	3	28	1	523	A	386	8	1	Cunningham	6	6	6	6	6	5	0	0	0	1	0
4/26/07	3	28	1	516	B	602	9	2	Cunningham	5	6	6	6	5	5	0	0	0	0	0
4/26/07	3	28	1	522	C	517	10	2	Cunningham	6	7	6	6	6	5	1	1	0	0	1
4/26/07	3	28	1	520	D	703	11	2	Cunningham	6	7	6	6	6	5	2	2	2	0	0
4/26/07	3	28	1	519	C	943	12	2	Cunningham	5	7	7	7	6	6	0	0	0	0	1
4/26/07	3	28	1	519	B	496	13	2	Cunningham	5	6	7	6	6	6	1	0	0	0	1
4/26/07	3	28	1	521	D	690	14	2	Cunningham	4	6	5	5	6	5	2	1	0	0	2
4/26/07	3	28	1	520	C	846	15	2	Cunningham	6	7	7	7	6	5	0	1	0	1	0
4/26/07	3	28	1	518	A	527	16	2	Cunningham	6	6	7	6	6	5	1	0	0	0	2
4/26/07	3	28	1	521	B	470	1	1	Higgins	5	4	5	4	5	4	2	0	0	2	1
4/26/07	3	28	1	516	A	411	2	1	Higgins	5	6	7	6	6	5	2	0	0	0	2
4/26/07	3	28	1	516	D	90	3	1	Higgins	5	5	6	5	5	5	2	1	0	0	1
4/26/07	3	28	1	520	B	14	4	1	Higgins	3	3	3	3	4	4	2	1	2	2	1

4/26/07	3	28	1	519	D	434	5	1	Higgins	5	5	6	5	5	5	2	2	0	0	2
4/26/07	3	28	1	522	A	159	6	1	Higgins	6	6	7	6	6	5	3	1	1	2	1
4/26/07	3	28	1	516	C	474	7	1	Higgins	5	5	6	5	5	5	2	1	0	0	1
4/26/07	3	28	1	523	A	386	8	1	Higgins	6	5	6	5	5	4	2	1	0	3	1
4/26/07	3	28	1	516	B	602	9	2	Higgins	5	6	7	6	6	5	2	1	0	0	1
4/26/07	3	28	1	522	C	517	10	2	Higgins	5	5	6	5	6	4	1	1	2	3	1
4/26/07	3	28	1	520	D	703	11	2	Higgins	6	6	7	6	6	5	3	2	0	1	1
4/26/07	3	28	1	519	C	943	12	2	Higgins	5	5	6	5	5	5	2	1	0	0	2
4/26/07	3	28	1	519	B	496	13	2	Higgins	6	6	6	6	6	5	2	1	0	2	1
4/26/07	3	28	1	521	D	690	14	2	Higgins	4	3	3	3	5	4	2	0	1	2	1
4/26/07	3	28	1	520	C	846	15	2	Higgins	6	6	7	6	6	5	2	1	0	0	1
4/26/07	3	28	1	518	A	527	16	2	Higgins	6	7	8	7	6	5	2	1	0	0	1
4/26/07	3	28	1	521	B	470	1	1	Amen	5	5	5	5	4	4	1	0	0	0	1
4/26/07	3	28	1	516	A	411	2	1	Amen	5	6	6	6	7	6	0	0	0	0	1
4/26/07	3	28	1	516	D	90	3	1	Amen	5	6	7	6	5	5	0	0	0	0	1
4/26/07	3	28	1	520	B	14	4	1	Amen	5	5	5	4	6	5	1	0	1	0	1
4/26/07	3	28	1	519	D	434	5	1	Amen	5	5	7	5	6	6	0	0	0	0	2
4/26/07	3	28	1	522	A	159	6	1	Amen	6	7	6	7	6	5	3	0	0	0	2
4/26/07	3	28	1	516	C	474	7	1	Amen	4	5	6	5	6	6	0	0	0	0	2
4/26/07	3	28	1	523	A	386	8	1	Amen	5	5	4	4	7	4	2	0	0	3	0
4/26/07	3	28	1	516	B	602	9	2	Amen	4	6	7	6	5	5	1	0	0	0	1
4/26/07	3	28	1	522	C	517	10	2	Amen	6	6	6	6	6	6	2	0	0	0	2
4/26/07	3	28	1	520	D	703	11	2	Amen	6	6	6	6	7	6	1	0	0	1	1
4/26/07	3	28	1	519	C	943	12	2	Amen	4	6	7	6	6	6	0	0	0	0	1
4/26/07	3	28	1	519	B	496	13	2	Amen	5	6	7	6	6	6	0	0	0	0	2
4/26/07	3	28	1	521	D	690	14	2	Amen	5	4	5	4	6	5	1	0	0	1	1
4/26/07	3	28	1	520	C	846	15	2	Amen	5	5	5	5	5	4	2	0	0	1	1
4/26/07	3	28	1	518	A	527	16	2	Amen	5	6	7	6	7	5	0	0	0	0	1
4/26/07	3	28	1	521	B	470	1	1	Inglis	2	3	5	3	3	2	0	0	0	3	1
4/26/07	3	28	1	516	A	411	2	1	Inglis	5	5	6	5	4	3	0	1	0	2	1
4/26/07	3	28	1	516	D	90	3	1	Inglis	5	5	6	5	4	3	0	1	0	2	1

4/26/07	3	28	1	520	B	14	4	1	Inglis	5	5	6	5	4	3	1	0	0	2	1
4/26/07	3	28	1	519	D	434	5	1	Inglis	3	6	7	6	5	4	2	0	0	0	1
4/26/07	3	28	1	522	A	159	6	1	Inglis	3	3	5	3	3	2	0	0	0	4	1
4/26/07	3	28	1	516	C	474	7	1	Inglis	4	7	7	7	6	5	1	0	0	0	1
4/26/07	3	28	1	523	A	386	8	1	Inglis	2	3	5	3	3	2	0	0	0	4	1
4/26/07	3	28	1	516	B	602	9	2	Inglis	5	6	7	6	5	4	1	1	0	0	1
4/26/07	3	28	1	522	C	517	10	2	Inglis	6	6	6	6	4	3	0	2	0	4	1
4/26/07	3	28	1	520	D	703	11	2	Inglis	5	6	6	6	4	3	0	1	0	3	1
4/26/07	3	28	1	519	C	943	12	2	Inglis	4	7	7	7	6	5	1	0	0	0	1
4/26/07	3	28	1	519	B	496	13	2	Inglis	4	7	7	7	5	4	1	1	0	0	1
4/26/07	3	28	1	521	D	690	14	2	Inglis	3	3	4	3	3	2	0	0	0	4	1
4/26/07	3	28	1	520	C	846	15	2	Inglis	5	5	6	5	3	2	0	0	0	4	1
4/26/07	3	28	1	518	A	527	16	2	Inglis	6	7	7	7	6	5	2	1	0	0	1
4/26/07	3	28	1	521	B	470	1	1	Runyon	5	6	7	6	6	3	2	1	0	4	0
4/26/07	3	28	1	516	A	411	2	1	Runyon	4	6	6	6	7	2	2	0	4	6	0
4/26/07	3	28	1	516	D	90	3	1	Runyon	4	6	8	6	6	5	1	0	0	0	2
4/26/07	3	28	1	520	B	14	4	1	Runyon	3	5	6	5	5	4	2	1	0	3	1
4/26/07	3	28	1	519	D	434	5	1	Runyon	5	7	8	7	7	7	2	1	0	0	2
4/26/07	3	28	1	522	A	159	6	1	Runyon	4	6	6	6	5	4	0	0	3	0	0
4/26/07	3	28	1	516	C	474	7	1	Runyon	4	5	7	5	5	5	0	0	0	0	1
4/26/07	3	28	1	523	A	386	8	1	Runyon	5	5	7	5	7	1	1	0	0	5	0
4/26/07	3	28	1	516	B	602	9	2	Runyon	5	6	8	6	5	4	0	1	0	0	0
4/26/07	3	28	1	522	C	517	10	2	Runyon	5	5	6	5	6	3	1	2	0	5	0
4/26/07	3	28	1	520	D	703	11	2	Runyon	5	5	6	5	7	3	1	0	0	7	0
4/26/07	3	28	1	519	C	943	12	2	Runyon	4	6	8	6	6	4	0	0	0	0	1
4/26/07	3	28	1	519	B	496	13	2	Runyon	4	6	8	6	6	3	0	0	0	0	0
4/26/07	3	28	1	521	D	690	14	2	Runyon	4	4	6	4	8	2	0	0	0	6	0
4/26/07	3	28	1	520	C	846	15	2	Runyon	5	4	5	4	6	4	1	0	2	4	0
4/26/07	3	28	1	518	A	527	16	2	Runyon	4	6	8	6	6	2	0	0	0	0	0
4/26/07	3	28	2	522	D	970	1	1	Thurman	6	6	6	6	6	4	3	0	2	0	0
4/26/07	3	28	2	517	D	286	2	1	Thurman	6	7	6	7	6	5	1	0	0	0	0

4/26/07	3	28	2	519	A	18	3	1	Thurman	5	6	6	6	5	4	1	0	0	0	1
4/26/07	3	28	2	517	B	177	4	1	Thurman	6	6	6	6	7	6	1	1	0	0	0
4/26/07	3	28	2	518	C	760	5	1	Thurman	5	6	7	6	5	4	1	2	0	0	0
4/26/07	3	28	2	522	B	374	6	1	Thurman	6	6	5	6	6	5	2	0	0	0	0
4/26/07	3	28	2	523	C	97	7	1	Thurman	6	6	6	6	7	5	2	0	2	0	0
4/26/07	3	28	2	517	A	465	8	2	Thurman	7	7	7	7	7	5	1	3	0	0	1
4/26/07	3	28	2	523	D	72	9	2	Thurman	7	6	5	6	7	6	3	1	0	0	0
4/26/07	3	28	2	517	C	224	10	2	Thurman	6	6	6	6	6	5	2	2	0	0	1
4/26/07	3	28	2	518	D	16	11	2	Thurman	4	5	6	5	5	5	0	0	0	0	0
4/26/07	3	28	2	523	B	600	12	2	Thurman	7	6	6	6	7	5	3	2	0	0	1
4/26/07	3	28	2	521	C	771	13	2	Thurman	7	7	6	7	6	4	2	1	0	0	0
4/26/07	3	28	2	518	B	375	14	2	Thurman	5	6	6	6	7	5	1	0	0	0	0
4/26/07	3	28	2	522	D	970	1	1	Bailey	7	6	7	6	6	4	2	0	0	1	1
4/26/07	3	28	2	517	D	286	2	1	Bailey	7	7	7	7	5	5	1	0	1	0	1
4/26/07	3	28	2	519	A	18	3	1	Bailey	5	7	7	7	6	5	1	1	0	0	1
4/26/07	3	28	2	517	B	177	4	1	Bailey	7	6	7	6	6	5	2	1	0	0	1
4/26/07	3	28	2	518	C	760	5	1	Bailey	6	6	7	6	6	5	1	1	0	0	1
4/26/07	3	28	2	522	B	374	6	1	Bailey	6	6	5	5	6	4	2	0	1	0	1
4/26/07	3	28	2	523	C	97	7	1	Bailey	7	5	6	5	6	5	1	1	0	1	1
4/26/07	3	28	2	517	A	465	8	2	Bailey	7	6	7	6	6	5	1	1	1	0	1
4/26/07	3	28	2	523	D	72	9	2	Bailey	7	6	5	6	5	4	1	0	1	0	0
4/26/07	3	28	2	517	C	224	10	2	Bailey	6	6	7	6	6	5	1	1	0	0	1
4/26/07	3	28	2	518	D	16	11	2	Bailey	5	7	7	7	6	5	0	1	0	0	1
4/26/07	3	28	2	523	B	600	12	2	Bailey	7	6	6	6	5	4	1	0	0	1	1
4/26/07	3	28	2	521	C	771	13	2	Bailey	6	6	6	6	6	5	2	0	0	0	1
4/26/07	3	28	2	518	B	375	14	2	Bailey	5	6	7	6	6	5	0	0	0	0	1
4/26/07	3	28	2	522	D	970	1	1	Philip	5	5	6	5	7	5	1	0	0	1	1
4/26/07	3	28	2	517	D	286	2	1	Philip	5	6	7	6	7	5	0	0	1	0	1
4/26/07	3	28	2	519	A	18	3	1	Philip	5	7	7	7	6	5	2	0	0	0	1
4/26/07	3	28	2	517	B	177	4	1	Philip	5	6	6	6	7	5	1	0	1	0	0
4/26/07	3	28	2	518	C	760	5	1	Philip	6	7	7	7	5	4	2	0	0	0	1

4/26/07	3	28	2	522	B	374	6	1	Philip	6	6	6	6	7	5	1	0	0	0	0
4/26/07	3	28	2	523	C	97	7	1	Philip	5	6	5	5	6	5	1	0	0	0	1
4/26/07	3	28	2	517	A	465	8	2	Philip	6	6	6	6	7	5	1	0	2	0	2
4/26/07	3	28	2	523	D	72	9	2	Philip	6	5	6	5	7	5	2	0	0	0	1
4/26/07	3	28	2	517	C	224	10	2	Philip	6	7	6	7	7	5	0	0	2	1	2
4/26/07	3	28	2	518	D	16	11	2	Philip	5	7	8	7	5	5	0	0	0	0	1
4/26/07	3	28	2	523	B	600	12	2	Philip	5	6	5	6	7	5	1	0	1	0	1
4/26/07	3	28	2	521	C	771	13	2	Philip	5	6	5	6	6	5	0	0	0	0	1
4/26/07	3	28	2	518	B	375	14	2	Philip	4	6	7	6	6	6	0	0	0	0	2
4/26/07	3	28	2	522	D	970	1	1	Johnson	6	7	6	7	7	4	1	0	0	2	1
4/26/07	3	28	2	517	D	286	2	1	Johnson	7	7	7	7	7	5	1	1	0	1	1
4/26/07	3	28	2	519	A	18	3	1	Johnson	6	6	7	6	6	4	1	0	0	0	2
4/26/07	3	28	2	517	B	177	4	1	Johnson	7	7	7	7	6	4	2	0	0	1	1
4/26/07	3	28	2	518	C	760	5	1	Johnson	6	7	7	7	6	4	0	0	0	0	1
4/26/07	3	28	2	522	B	374	6	1	Johnson	6	7	6	7	6	4	3	0	0	1	1
4/26/07	3	28	2	523	C	97	7	1	Johnson	6	6	6	6	6	5	1	0	0	0	2
4/26/07	3	28	2	517	A	465	8	2	Johnson	7	7	6	7	6	4	2	0	0	1	1
4/26/07	3	28	2	523	D	72	9	2	Johnson	6	6	6	6	7	5	3	0	0	0	1
4/26/07	3	28	2	517	C	224	10	2	Johnson	7	7	7	7	6	4	1	0	0	0	2
4/26/07	3	28	2	518	D	16	11	2	Johnson	6	7	6	7	6	5	1	0	0	0	2
4/26/07	3	28	2	523	B	600	12	2	Johnson	6	7	6	7	6	5	2	0	0	0	2
4/26/07	3	28	2	521	C	771	13	2	Johnson	6	7	6	7	6	4	1	0	0	1	2
4/26/07	3	28	2	518	B	375	14	2	Johnson	5	6	7	6	5	4	0	0	0	0	2
4/26/07	3	28	2	522	D	970	1	1	Anzola	4	4	4	4	4	5	0	0	0	1	0
4/26/07	3	28	2	517	D	286	2	1	Anzola	5	7	7	7	5	5	1	0	0	0	0
4/26/07	3	28	2	519	A	18	3	1	Anzola	5	7	7	7	6	6	1	1	0	0	0
4/26/07	3	28	2	517	B	177	4	1	Anzola	6	7	6	6	6	5	1	0	0	0	0
4/26/07	3	28	2	518	C	760	5	1	Anzola	5	7	8	7	6	6	1	0	0	0	1
4/26/07	3	28	2	522	B	374	6	1	Anzola	5	6	5	5	5	5	2	0	0	0	0
4/26/07	3	28	2	523	C	97	7	1	Anzola	5	5	4	5	4	4	1	0	0	0	0
4/26/07	3	28	2	517	A	465	8	2	Anzola	7	7	6	7	6	6	2	0	0	0	1

4/26/07	3	28	2	523	D	72	9	2	Anzola	3	3	3	3	4	5	1	0	0	2	0
4/26/07	3	28	2	517	C	224	10	2	Anzola	6	6	6	6	6	6	0	0	0	0	0
4/26/07	3	28	2	518	D	16	11	2	Anzola	5	7	8	7	6	6	0	0	0	0	1
4/26/07	3	28	2	523	B	600	12	2	Anzola	5	5	3	4	5	5	1	0	0	2	0
4/26/07	3	28	2	521	C	771	13	2	Anzola	5	5	3	4	5	5	1	0	0	1	0
4/26/07	3	28	2	518	B	375	14	2	Anzola	4	6	7	6	7	7	1	0	0	0	2

bitter	metallic	chemburn	ofacid	ofbitter	ofmetal	ofgrassy	ofbrown	ofsoured	ofsweet	ofmilky	ofliver	ofcardboard	ofpainty	ofnutty	ofFishy	OfOnion	Oburnt	Omusty
1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

J-6. Raw cook ANOVA data for beef loin steaks.

Dependent Variable: Juicy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	89.1136458	0.9186974	3.06	<.0001
Error	185	55.5050114	0.3000271		
Corrected Total	282	144.6186572			

R-Square	Coeff Var	Root MSE	Juicy Mean
0.616197	9.558641	0.547747	5.730389

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	26.16270013	1.30813501	4.36	<.0001
Sample(Animal*trt)	69	28.00825666	0.40591676	1.35	0.0576
Animal	3	16.80985506	5.60328502	18.68	<.0001
trt	3	3.46880191	1.15626730	3.85	0.0105
Sday	2	12.96790522	6.48395261	21.61	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	16.80985506	5.60328502	4.28	0.0173

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	3.46880191	1.15626730	2.85	0.0437

Dependent Variable: MFTend

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	184.3118469	1.7894354	8.58	<.0001
Error	179	37.3532768	0.2086775		
Corrected Total	282	221.6651237			

R-Square	Coeff Var	Root MSE	MFTend Mean
0.831488	7.596315	0.456812	6.013604

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	64.66045187	3.23302259	15.49	<.0001
Sample(Animal*trt)	69	14.60665038	0.21169059	1.01	0.4597
Animal	3	98.74912815	32.91637605	157.74	<.0001
trt	3	1.60142435	0.53380812	2.56	0.0567
Sday	2	1.50077058	0.75038529	3.60	0.0294
Animal*Sday	6	3.08614629	0.51435772	2.46	0.0258

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	98.74912815	32.91637605	10.18	0.0003

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	1.60142435	0.53380812	2.52	0.0649

Dependent Variable: CT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	206.6898450	2.1308231	6.32	<.0001
Error	185	62.3421161	0.3369844		
Corrected Total	282	269.0319611			

R-Square	Coeff Var	Root MSE	CT Mean
0.768272	9.316501	0.580504	6.230919

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	35.1741797	1.7587090	5.22	<.0001
Sample(Animal*trt)	69	16.3533116	0.2370045	0.70	0.9536
Animal	3	144.8892813	48.2964271	143.32	<.0001
trt	3	0.2217272	0.0739091	0.22	0.8829
Sday	2	10.3308006	5.1654003	15.33	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Animal	3	144.8892813	48.2964271	27.46	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.22172723	0.07390908	0.31	0.8167

Dependent Variable: Otend

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	208.2257509	2.1466572	8.60	<.0001
Error	185	46.1630477	0.2495300		
Corrected Total	282	254.3887986			

R-Square	Coeff Var	Root MSE	Otend Mean
0.818533	8.481083	0.499530	5.889929

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	60.7175818	3.0358791	12.17	<.0001
Sample(Animal*trt)	69	16.5596954	0.2399956	0.96	0.5651
Animal	3	128.8133192	42.9377731	172.07	<.0001
trt	3	1.1328345	0.3776115	1.51	0.2125
Sday	2	2.8669523	1.4334761	5.74	0.0038

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	128.8133192	42.9377731	14.14	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	1.13283446	0.37761149	1.57	0.2037

Dependent Variable: oflavint

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	24.24174206	0.24991487	1.97	<.0001
Error	185	23.41677384	0.12657716		
Corrected Total	282	47.65851590			

R-Square	Coeff Var	Root MSE	oflavint Mean
0.508655	6.218185	0.355777	5.721555

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	6.93214420	0.34660721	2.74	0.0002
Sample(Animal*trt)	60	6.79665854	0.11327764	0.89	0.6866
Animal	3	4.30099071	1.43366357	11.33	<.0001
trt	3	1.66014872	0.55338291	4.37	0.0053
Sday	2	1.68489283	0.84244641	6.66	0.0016
Animal*trt	9	2.39962013	0.26662446	2.11	0.0310

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	4.30099071	1.43366357	4.14	0.0196

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	1.66014872	0.55338291	4.89	0.0042
Animal*trt	9	2.39962013	0.26662446	2.35	0.0239

Dependent Variable: CBLean

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	52.04254184	0.53652105	2.29	<.0001
Error	185	43.43214014	0.23476833		
Corrected Total	282	95.47468198			

R-Square	Coeff Var	Root MSE	CBLean Mean
0.545093	10.19833	0.484529	4.751060

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	15.02168961	0.75108448	3.20	<.0001
Sample(Animal*trt)	69	11.24532472	0.16297572	0.69	0.9593
Animal	3	21.55323135	7.18441045	30.60	<.0001
trt	3	0.03113633	0.01037878	0.04	0.9876

Sday	2	4.70952653	2.35476326	10.03	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	21.55323135	7.18441045	9.57	0.0004

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.03113633	0.01037878	0.06	0.9788

Dependent Variable: CBFat

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	43.87497386	0.45231932	2.95	<.0001
Error	185	28.34092720	0.15319420		
Corrected Total	282	72.21590106			

R-Square	Coeff Var	Root MSE	CBFat Mean
0.607553	44.63683	0.391400	0.876855

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	13.21670315	0.66083516	4.31	<.0001
Sample(Animal*trt)	69	13.93366293	0.20193714	1.32	0.0749

Animal	3	12.45429638	4.15143213	27.10	<.0001
trt	3	0.96483653	0.32161218	2.10	0.1018
Sday	2	4.54240614	2.27120307	14.83	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	12.45429638	4.15143213	6.28	0.0035

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.96483653	0.32161218	1.59	0.1991

Dependent Variable: serum

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	25.50377552	0.26292552	1.45	0.0166
Error	185	33.64519975	0.18186594		
Corrected Total	282	59.14897527			

R-Square	Coeff Var	Root MSE	serum Mean
0.431179	64.28093	0.426457	0.663428

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Sample(Animal)	20	12.72748395	0.63637420	3.50	<.0001
Sample(Animal*trt)	69	10.45680023	0.15154783	0.83	0.8075
Animal	3	1.34296396	0.44765465	2.46	0.0640
trt	3	0.72658561	0.24219520	1.33	0.2655
Sday	2	0.06105025	0.03052513	0.17	0.8456

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1.34296396	0.44765465	0.70	0.5611

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.72658561	0.24219520	1.60	0.1978

Dependent Variable: liver

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	7.25077056	0.07475021	1.43	0.0195
Error	185	9.67324004	0.05228778		
Corrected Total	282	16.92401060			

R-Square	Coeff Var	Root MSE	liver Mean
0.428431	147.0733	0.228665	0.155477

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	1.97665486	0.09883274	1.89	0.0153
Sample(Animal*trt)	69	3.14381928	0.04556260	0.87	0.7424
Animal	3	1.64067362	0.54689121	10.46	<.0001
trt	3	0.06289768	0.02096589	0.40	0.7525
Sday	2	0.37634329	0.18817165	3.60	0.0293

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1.64067362	0.54689121	5.53	0.0062

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.06289768	0.02096589	0.46	0.7110

Dependent Variable: cowy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	56.10779613	0.54473588	2.57	<.0001
Error	179	37.96732755	0.21210798		
Corrected Total	282	94.07512367			

R-Square	Coeff Var	Root MSE	cowy Mean

0.596415	89.67056	0.460552	0.513604

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	6.81638434	0.34081922	1.61	0.0551
Sample(Animal*trt)	69	12.74623006	0.18472797	0.87	0.7426
Animal	3	24.09144512	8.03048171	37.86	<.0001
trt	3	0.88547092	0.29515697	1.39	0.2469
Sday	2	6.92484573	3.46242287	16.32	<.0001
Animal*Sday	6	5.53392546	0.92232091	4.35	0.0004

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	24.09144512	8.03048171	23.56	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.88547092	0.29515697	1.60	0.1978

Dependent Variable: cowy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	56.10779613	0.54473588	2.57	<.0001
Error	179	37.96732755	0.21210798		
Corrected Total	282	94.07512367			

R-Square	Coeff Var	Root MSE	cowy Mean
0.596415	89.67056	0.460552	0.513604

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	6.81638434	0.34081922	1.61	0.0551
Sample(Animal*trt)	69	12.74623006	0.18472797	0.87	0.7426
Animal	3	24.09144512	8.03048171	37.86	<.0001
trt	3	0.88547092	0.29515697	1.39	0.2469
Sday	2	6.92484573	3.46242287	16.32	<.0001
Animal*Sday	6	5.53392546	0.92232091	4.35	0.0004

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	24.09144512	8.03048171	23.56	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.88547092	0.29515697	1.60	0.1978

Dependent Variable: sour

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	47.2569244	0.4871848	1.30	0.0650
Error	185	69.3287117	0.3747498		

Corrected Total	282	116.5856360

R-Square	Coeff Var	Root MSE	sour Mean
0.405341	51.67594	0.612168	1.184629

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	10.20594737	0.51029737	1.36	0.1464
Sample(Animal*trt)	69	23.00102472	0.33334818	0.89	0.7088
Animal	3	6.99976378	2.33325459	6.23	0.0005
trt	3	0.51466603	0.17155534	0.46	0.7121
Sday	2	5.80920501	2.90460251	7.75	0.0006

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	6.99976378	2.33325459	4.57	0.0135

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.51466603	0.17155534	0.51	0.6736

Dependent Variable: bitter

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	37.81609260	0.38985662	1.31	0.0619

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Error	185	55.24049751	0.29859728		
Corrected Total	282	93.05659011			

R-Square	Coeff Var	Root MSE	bitter Mean
0.406377	38.09402	0.546441	1.434452

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	8.40640157	0.42032008	1.41	0.1230
Sample(Animal*trt)	69	19.26336991	0.27917927	0.93	0.6195
Animal	3	3.75967239	1.25322413	4.20	0.0067
trt	3	0.41149235	0.13716412	0.46	0.7110
Sday	2	5.51116916	2.75558458	9.23	0.0002

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	3.75967239	1.25322413	2.98	0.0558

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.41149235	0.13716412	0.49	0.6895

Dependent Variable: metallic

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F

Model	97	37.03845484	0.38183974	1.57	0.0044
Error	185	44.90714586	0.24274133		
Corrected Total	282	81.94560071			

R-Square	Coeff Var	Root MSE	metallic Mean
0.451988	34.83154	0.492688	1.414488

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	11.38349019	0.56917451	2.34	0.0016
Sample(Animal*trt)	69	20.13369252	0.29179265	1.20	0.1676
Animal	3	0.80733897	0.26911299	1.11	0.3469
trt	3	0.84995744	0.28331915	1.17	0.3236
Sday	2	3.30785414	1.65392707	6.81	0.0014

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	0.80733897	0.26911299	0.47	0.7047

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.84995744	0.28331915	0.97	0.4115

Dependent Variable: ofacid

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F

Model	97	46.38598989	0.47820608	1.98	<.0001
Error	185	44.58853308	0.24101910		
Corrected Total	282	90.97452297			

R-Square	Coeff Var	Root MSE	ofacid Mean
0.509879	111.3262	0.490937	0.440989

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	13.51062515	0.67553126	2.80	0.0001
Sample(Animal*trt)	69	17.51721237	0.25387264	1.05	0.3854
Animal	3	0.13738448	0.04579483	0.19	0.9031
trt	3	0.12848945	0.04282982	0.18	0.9114
Sday	2	14.04438359	7.02219179	29.14	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	0.13738448	0.04579483	0.07	0.9764

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.12848945	0.04282982	0.17	0.9172

Dependent Variable: ofbrown

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	10.79678517	0.11130706	1.02	0.4559
Error	185	20.25766712	0.10950090		
Corrected Total	282	31.05445230			

R-Square	Coeff Var	Root MSE	ofbrown Mean
0.347673	142.8639	0.330909	0.231625

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	4.12663156	0.20633158	1.88	0.0157
Sample(Animal*trt)	69	5.67065229	0.08218337	0.75	0.9151
Animal	3	0.58631965	0.19543988	1.78	0.1516
trt	3	0.31293295	0.10431098	0.95	0.4164
Sday	2	0.00066621	0.00033310	0.00	0.9970

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	0.58631965	0.19543988	0.95	0.4366

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.31293295	0.10431098	1.27	0.2918

Dependent Variable: Juicy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	89.1136458	0.9186974	3.06	<.0001
Error	185	55.5050114	0.3000271		
Corrected Total	282	144.6186572			

R-Square	Coeff Var	Root MSE	Juicy Mean
0.616197	9.558641	0.547747	5.730389

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	26.16270013	1.30813501	4.36	<.0001
Sample(Animal*trt)	69	28.00825666	0.40591676	1.35	0.0576
Animal	3	16.80985506	5.60328502	18.68	<.0001
trt	3	3.46880191	1.15626730	3.85	0.0105
Sday	2	12.96790522	6.48395261	21.61	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	16.80985506	5.60328502	4.28	0.0173

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	3.46880191	1.15626730	2.85	0.0437

Dependent Variable: MFTend

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	184.3118469	1.7894354	8.58	<.0001
Error	179	37.3532768	0.2086775		
Corrected Total	282	221.6651237			

R-Square	Coeff Var	Root MSE	MFTend Mean
0.831488	7.596315	0.456812	6.013604

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	64.66045187	3.23302259	15.49	<.0001
Sample(Animal*trt)	69	14.60665038	0.21169059	1.01	0.4597
Animal	3	98.74912815	32.91637605	157.74	<.0001
trt	3	1.60142435	0.53380812	2.56	0.0567
Sday	2	1.50077058	0.75038529	3.60	0.0294
Animal*Sday	6	3.08614629	0.51435772	2.46	0.0258

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	98.74912815	32.91637605	10.18	0.0003

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	1.60142435	0.53380812	2.52	0.0649

Dependent Variable: CT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	206.6898450	2.1308231	6.32	<.0001
Error	185	62.3421161	0.3369844		
Corrected Total	282	269.0319611			

R-Square	Coeff Var	Root MSE	CT Mean
0.768272	9.316501	0.580504	6.230919

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	35.1741797	1.7587090	5.22	<.0001
Sample(Animal*trt)	69	16.3533116	0.2370045	0.70	0.9536
Animal	3	144.8892813	48.2964271	143.32	<.0001
trt	3	0.2217272	0.0739091	0.22	0.8829
Sday	2	10.3308006	5.1654003	15.33	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	144.8892813	48.2964271	27.46	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.22172723	0.07390908	0.31	0.8167

Dependent Variable: Otend

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	208.2257509	2.1466572	8.60	<.0001
Error	185	46.1630477	0.2495300		
Corrected Total	282	254.3887986			

R-Square	Coeff Var	Root MSE	Otend Mean
0.818533	8.481083	0.499530	5.889929

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	60.7175818	3.0358791	12.17	<.0001
Sample(Animal*trt)	69	16.5596954	0.2399956	0.96	0.5651
Animal	3	128.8133192	42.9377731	172.07	<.0001
trt	3	1.1328345	0.3776115	1.51	0.2125
Sday	2	2.8669523	1.4334761	5.74	0.0038

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	128.8133192	42.9377731	14.14	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	1.13283446	0.37761149	1.57	0.2037

Dependent Variable: oflavint

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	24.24174206	0.24991487	1.97	<.0001
Error	185	23.41677384	0.12657716		
Corrected Total	282	47.65851590			

R-Square	Coeff Var	Root MSE	oflavint Mean
0.508655	6.218185	0.355777	5.721555

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	6.93214420	0.34660721	2.74	0.0002
Sample(Animal*trt)	60	6.79665854	0.11327764	0.89	0.6866
Animal	3	4.30099071	1.43366357	11.33	<.0001
trt	3	1.66014872	0.55338291	4.37	0.0053
Sday	2	1.68489283	0.84244641	6.66	0.0016
Animal*trt	9	2.39962013	0.26662446	2.11	0.0310

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	4.30099071	1.43366357	4.14	0.0196

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	1.66014872	0.55338291	4.89	0.0042
Animal*trt	9	2.39962013	0.26662446	2.35	0.0239

Dependent Variable: CBLean

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	52.04254184	0.53652105	2.29	<.0001
Error	185	43.43214014	0.23476833		
Corrected Total	282	95.47468198			

R-Square	Coeff Var	Root MSE	CBLean Mean
0.545093	10.19833	0.484529	4.751060

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	15.02168961	0.75108448	3.20	<.0001
Sample(Animal*trt)	69	11.24532472	0.16297572	0.69	0.9593
Animal	3	21.55323135	7.18441045	30.60	<.0001
trt	3	0.03113633	0.01037878	0.04	0.9876
Sday	2	4.70952653	2.35476326	10.03	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	21.55323135	7.18441045	9.57	0.0004

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.03113633	0.01037878	0.06	0.9788

Dependent Variable: CBLean

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	52.04254184	0.53652105	2.29	<.0001
Error	185	43.43214014	0.23476833		
Corrected Total	282	95.47468198			

R-Square	Coeff Var	Root MSE	CBLean Mean
0.545093	10.19833	0.484529	4.751060

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	15.02168961	0.75108448	3.20	<.0001
Sample(Animal*trt)	69	11.24532472	0.16297572	0.69	0.9593
Animal	3	21.55323135	7.18441045	30.60	<.0001
trt	3	0.03113633	0.01037878	0.04	0.9876

Sday	2	4.70952653	2.35476326	10.03	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	21.55323135	7.18441045	9.57	0.0004

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.03113633	0.01037878	0.06	0.9788

Dependent Variable: serum

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	25.50377552	0.26292552	1.45	0.0166
Error	185	33.64519975	0.18186594		
Corrected Total	282	59.14897527			

R-Square	Coeff Var	Root MSE	serum Mean
0.431179	64.28093	0.426457	0.663428

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	12.72748395	0.63637420	3.50	<.0001
Sample(Animal*trt)	69	10.45680023	0.15154783	0.83	0.8075

Animal	3	1.34296396	0.44765465	2.46	0.0640
trt	3	0.72658561	0.24219520	1.33	0.2655
Sday	2	0.06105025	0.03052513	0.17	0.8456

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1.34296396	0.44765465	0.70	0.5611

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.72658561	0.24219520	1.60	0.1978

Dependent Variable: liver

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	7.25077056	0.07475021	1.43	0.0195
Error	185	9.67324004	0.05228778		
Corrected Total	282	16.92401060			

R-Square	Coeff Var	Root MSE	liver Mean
0.428431	147.0733	0.228665	0.155477

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Sample(Animal)	20	1.97665486	0.09883274	1.89	0.0153
Sample(Animal*trt)	69	3.14381928	0.04556260	0.87	0.7424
Animal	3	1.64067362	0.54689121	10.46	<.0001
trt	3	0.06289768	0.02096589	0.40	0.7525
Sday	2	0.37634329	0.18817165	3.60	0.0293

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1.64067362	0.54689121	5.53	0.0062

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.06289768	0.02096589	0.46	0.7110

Dependent Variable: cowy

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	56.10779613	0.54473588	2.57	<.0001
Error	179	37.96732755	0.21210798		
Corrected Total	282	94.07512367			

R-Square	Coeff Var	Root MSE	cowy Mean
0.596415	89.67056	0.460552	0.513604

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	6.81638434	0.34081922	1.61	0.0551
Sample(Animal*trt)	69	12.74623006	0.18472797	0.87	0.7426
Animal	3	24.09144512	8.03048171	37.86	<.0001
trt	3	0.88547092	0.29515697	1.39	0.2469
Sday	2	6.92484573	3.46242287	16.32	<.0001
Animal*Sday	6	5.53392546	0.92232091	4.35	0.0004

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	24.09144512	8.03048171	23.56	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.88547092	0.29515697	1.60	0.1978

Dependent Variable: salt

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	19.06318599	0.18507948	2.14	<.0001
Error	179	15.50958786	0.08664574		
Corrected Total	282	34.57277385			

R-Square   Coeff Var   Root MSE   salt Mean

0.551393	35.32777	0.294356	0.833216

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	3.66151349	0.18307567	2.11	0.0053
Sample(Animal*trt)	69	6.78199426	0.09828977	1.13	0.2536
Animal	3	5.72231126	1.90743709	22.01	<.0001
trt	3	0.47123341	0.15707780	1.81	0.1465
Sday	2	0.46952659	0.23476330	2.71	0.0693
trt*Sday	6	1.96207952	0.32701325	3.77	0.0015

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	5.72231126	1.90743709	10.42	0.0002

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.47123341	0.15707780	1.60	0.1978

Dependent Variable: sour

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	47.2569244	0.4871848	1.30	0.0650
Error	185	69.3287117	0.3747498		
Corrected Total	282	116.5856360			

R-Square	Coeff Var	Root MSE	sour Mean
0.405341	51.67594	0.612168	1.184629

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	10.20594737	0.51029737	1.36	0.1464
Sample(Animal*trt)	69	23.00102472	0.33334818	0.89	0.7088
Animal	3	6.99976378	2.33325459	6.23	0.0005
trt	3	0.51466603	0.17155534	0.46	0.7121
Sday	2	5.80920501	2.90460251	7.75	0.0006

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	6.99976378	2.33325459	4.57	0.0135

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.51466603	0.17155534	0.51	0.6736

Dependent Variable: bitter

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	37.81609260	0.38985662	1.31	0.0619
Error	185	55.24049751	0.29859728		

Corrected Total	282	93.05659011

R-Square	Coeff Var	Root MSE	bitter Mean
0.406377	38.09402	0.546441	1.434452

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	8.40640157	0.42032008	1.41	0.1230
Sample(Animal*trt)	69	19.26336991	0.27917927	0.93	0.6195
Animal	3	3.75967239	1.25322413	4.20	0.0067
trt	3	0.41149235	0.13716412	0.46	0.7110
Sday	2	5.51116916	2.75558458	9.23	0.0002

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	3.75967239	1.25322413	2.98	0.0558

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.41149235	0.13716412	0.49	0.6895

Dependent Variable: metallic

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	37.03845484	0.38183974	1.57	0.0044

Error	185	44.90714586	0.24274133
Corrected Total	282	81.94560071	

R-Square	Coeff Var	Root MSE	metallic Mean
0.451988	34.83154	0.492688	1.414488

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	11.38349019	0.56917451	2.34	0.0016
Sample(Animal*trt)	69	20.13369252	0.29179265	1.20	0.1676
Animal	3	0.80733897	0.26911299	1.11	0.3469
trt	3	0.84995744	0.28331915	1.17	0.3236
Sday	2	3.30785414	1.65392707	6.81	0.0014

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	0.80733897	0.26911299	0.47	0.7047

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.84995744	0.28331915	0.97	0.4115

Dependent Variable: ofacid

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F

Model	97	46.38598989	0.47820608	1.98	<.0001
Error	185	44.58853308	0.24101910		
Corrected Total	282	90.97452297			

R-Square	Coeff Var	Root MSE	ofacid Mean
0.509879	111.3262	0.490937	0.440989

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	13.51062515	0.67553126	2.80	0.0001
Sample(Animal*trt)	69	17.51721237	0.25387264	1.05	0.3854
Animal	3	0.13738448	0.04579483	0.19	0.9031
trt	3	0.12848945	0.04282982	0.18	0.9114
Sday	2	14.04438359	7.02219179	29.14	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	0.13738448	0.04579483	0.07	0.9764

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.12848945	0.04282982	0.17	0.9172

Dependent Variable: ofbrown

Sum of

Source	DF	Squares	Mean Square	F Value	Pr > F
Model	97	10.79678517	0.11130706	1.02	0.4559
Error	185	20.25766712	0.10950090		
Corrected Total	282	31.05445230			

R-Square	Coeff Var	Root MSE	ofbrown Mean
0.347673	142.8639	0.330909	0.231625

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	4.12663156	0.20633158	1.88	0.0157
Sample(Animal*trt)	69	5.67065229	0.08218337	0.75	0.9151
Animal	3	0.58631965	0.19543988	1.78	0.1516
trt	3	0.31293295	0.10431098	0.95	0.4164
Sday	2	0.00066621	0.00033310	0.00	0.9970

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	0.58631965	0.19543988	0.95	0.4366

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.31293295	0.10431098	1.27	0.2918

Dependent Variable: xrawph

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	35	29.76643552	0.85046959	64.71	<.0001
Error	60	0.78856448	0.01314274		
Corrected Total	95	30.55500000			

R-Square	Coeff Var	Root MSE	xrawph Mean
0.974192	1.864094	0.114642	6.150000

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	6.75168254	0.33758413	25.69	<.0001
Animal	3	22.81212967	7.60404322	578.57	<.0001
trt	3	0.00688735	0.00229578	0.17	0.9131
Animal*trt	9	0.10286302	0.01142922	0.87	0.5570

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	22.81212967	7.60404322	22.52	<.0001

Dependent Variable: xrawL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	35	1680.747110	48.021346	20.84	<.0001

Error	59	135.955989	2.304339
Corrected Total	94	1816.703099	

R-Square	Coeff Var	Root MSE	xrawL Mean
0.925163	4.332162	1.518005	35.04035

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	567.734095	28.386705	12.32	<.0001
Animal	3	1083.488933	361.162978	156.73	<.0001
trt	3	17.850649	5.950216	2.58	0.0618
Animal*trt	9	17.218718	1.913191	0.83	0.5911

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1083.488933	361.162978	12.72	<.0001

The GLM Procedure

Dependent Variable: xrawa

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	35	1424.011877	40.686054	36.03	<.0001
Error	59	66.626486	1.129262		

Corrected Total	94	1490.638363			

R-Square	Coeff Var	Root MSE	xrawa Mean
0.955303	5.575535	1.062668	19.05947

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	248.479642	12.423982	11.00	<.0001
Animal	3	1109.544018	369.848006	327.51	<.0001
trt	3	25.066425	8.355475	7.40	0.0003
Animal*trt	9	33.646988	3.738554	3.31	0.0025

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1109.544018	369.848006	29.77	<.0001

The GLM Procedure

Dependent Variable: xrawb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	35	687.0485245	19.6299578	15.90	<.0001
Error	59	72.8288666	1.2343876		
Corrected Total	94	759.8773911			

R-Square	Coeff Var	Root MSE	xrawb Mean
0.904157	15.82814	1.111030	7.019333

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	115.0642336	5.7532117	4.66	<.0001
Animal	3	543.5505037	181.1835012	146.78	<.0001
trt	3	12.3521674	4.1173891	3.34	0.0253
Animal*trt	9	12.2733984	1.3637109	1.10	0.3737

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	543.5505037	181.1835012	31.49	<.0001

Dependent Variable: xchemph

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	67.96365200	0.65984128	27.72	<.0001
Error	184	4.37960347	0.02380219		
Corrected Total	287	72.34325547			

R-Square	Coeff Var	Root MSE	xchemph Mean
0.939461	2.589421	0.154280	5.958073

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Sample(Animal)	20	14.97789234	0.74889462	31.46	<.0001
Sample(Animal*trt)	60	2.34554091	0.03909235	1.64	0.0065
Animal	3	48.62132771	16.20710924	680.91	<.0001
trt	3	0.90161687	0.30053896	12.63	<.0001
Sday	2	0.15204427	0.07602214	3.19	0.0433
Animal*trt	9	0.72290535	0.08032282	3.37	0.0007
trt*Sday	6	0.32503559	0.05417260	2.28	0.0383

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	48.62132771	16.20710924	21.64	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.90161687	0.30053896	7.69	0.0002
Animal*trt	9	0.72290535	0.08032282	2.05	0.0483

Dependent Variable: xchemL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	6691.834715	64.969269	11.93	<.0001
Error	177	964.162709	5.447247		
Corrected Total	280	7655.997424			

R-Square	Coeff Var	Root MSE	xchemL Mean

0.874064	5.947076	2.333934	39.24507

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	2176.019946	108.800997	19.97	<.0001
Sample(Animal*trt)	69	525.660765	7.618272	1.40	0.0413
Animal	3	3200.200705	1066.733568	195.83	<.0001
trt	3	602.521793	200.840598	36.87	<.0001
Sday	2	42.533370	21.266685	3.90	0.0219
trt*Sday	6	104.073232	17.345539	3.18	0.0054

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	3200.200705	1066.733568	9.80	0.0003

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	602.5217930	200.8405977	26.36	<.0001

Dependent Variable: xchema

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	2510.400080	25.880413	6.21	<.0001
Error	183	762.895725	4.168829		
Corrected Total	280	3273.295804			

R-Square	Coeff Var	Root MSE	xchema Mean
0.766933	9.783210	2.041771	20.87015

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	586.638407	29.331920	7.04	<.0001
Sample(Animal*trt)	69	302.881738	4.389590	1.05	0.3863
Animal	3	1527.903854	509.301285	122.17	<.0001
trt	3	61.443372	20.481124	4.91	0.0026
Sday	2	34.916416	17.458208	4.19	0.0167

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1527.903854	509.301285	17.36	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	61.44337161	20.48112387	4.67	0.0050

Dependent Variable: xchemb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	2310.997620	23.824718	10.55	<.0001
Error	183	413.308057	2.258514		

Source	DF	Sum of Squares
Corrected Total	280	2724.305678

R-Square	Coeff Var	Root MSE	xchemb Mean
0.848289	19.13110	1.502835	7.855457

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	290.994134	14.549707	6.44	<.0001
Sample(Animal*trt)	69	170.215826	2.466896	1.09	0.3178
Animal	3	1620.215099	540.071700	239.13	<.0001
trt	3	35.316273	11.772091	5.21	0.0018
Sday	2	174.097630	87.048815	38.54	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1620.215099	540.071700	37.12	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	35.31627334	11.77209111	4.77	0.0044

Dependent Variable: xDrip

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	90.9881671	0.9380223	1.68	0.0012

Source	DF	Sum of Squares	Mean Square
Error	190	105.8217100	0.5569564
Corrected Total	287	196.8098771	

R-Square	Coeff Var	Root MSE	xDrip Mean
0.462315	58.44608	0.746295	1.276895

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	38.06293535	1.90314677	3.42	<.0001
Sample(Animal*trt)	69	30.63475323	0.44398193	0.80	0.8614
Animal	3	7.61203567	2.53734522	4.56	0.0042
trt	3	4.11042337	1.37014112	2.46	0.0641
Sday	2	10.56801949	5.28400974	9.49	0.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	7.61203567	2.53734522	1.33	0.2916

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	4.11042337	1.37014112	3.09	0.0328

Dependent Variable: xWBS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F

Model	97	144.1669746	1.4862575	4.09	<.0001
Error	186	67.6190603	0.3635433		
Corrected Total	283	211.7860350			

R-Square	Coeff Var	Root MSE	xWBS Mean
0.680720	23.94132	0.602946	2.518430

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	63.91419707	3.19570985	8.79	<.0001
Sample(Animal*trt)	69	20.11484285	0.29151946	0.80	0.8544
Animal	3	49.70159708	16.56719903	45.57	<.0001
trt	3	0.48516819	0.16172273	0.44	0.7212
Sday	2	9.93311310	4.96655655	13.66	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	49.70159708	16.56719903	5.18	0.0082

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	0.48516819	0.16172273	0.55	0.6467

Dependent Variable: CkYield

Sum of

Source	DF	Squares	Mean Square	F Value	Pr > F
Model	97	5572.96902	57.45329	2.21	<.0001
Error	178	4628.12712	26.00071		
Corrected Total	275	10201.09615			

R-Square	Coeff Var	Root MSE	CkYield Mean
0.546311	6.219657	5.099090	81.98346

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	1908.879516	95.443976	3.67	<.0001
Sample(Animal*trt)	69	1578.487215	22.876626	0.88	0.7261
Animal	3	1326.653998	442.217999	17.01	<.0001
trt	3	598.023388	199.341129	7.67	<.0001
Sday	2	119.732215	59.866107	2.30	0.1030

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1326.653998	442.217999	4.63	0.0129

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	598.0233881	199.3411294	8.71	<.0001

Dependent Variable: Purge

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	6953.27092	71.68321	1.92	<.0001
Error	181	6770.08894	37.40381		
Corrected Total	278	13723.35986			

R-Square	Coeff Var	Root MSE	Purge Mean
0.506674	125.0109	6.115865	4.892267

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	2312.018197	115.600910	3.09	<.0001
Sample(Animal*trt)	69	1468.715712	21.285735	0.57	0.9960
Animal	3	174.249030	58.083010	1.55	0.2025
trt	3	58.532320	19.510773	0.52	0.6679
Sday	2	2951.635408	1475.817704	39.46	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	174.2490303	58.0830101	0.50	0.6849

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	58.53231971	19.51077324	0.92	0.4375

Dependent Variable: xcookL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	5098.374125	49.498778	3.29	<.0001
Error	172	2586.472352	15.037630		
Corrected Total	275	7684.846477			

R-Square	Coeff Var	Root MSE	xcookL Mean
0.663432	7.342809	3.877838	52.81138

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	1942.724665	97.136233	6.46	<.0001
Sample(Animal*trt)	69	1009.732412	14.633803	0.97	0.5421
Animal	3	1359.990275	453.330092	30.15	<.0001
trt	3	217.823721	72.607907	4.83	0.0030
Sday	2	150.378499	75.189250	5.00	0.0077
Animal*Sday	6	253.210947	42.201825	2.81	0.0125

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	1359.990275	453.330092	4.67	0.0125

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	217.8237214	72.6079071	4.96	0.0035

Dependent Variable: xcooka

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	97	2649.242681	27.311780	2.38	<.0001
Error	179	2056.826596	11.490651		
Corrected Total	276	4706.069277			

R-Square	Coeff Var	Root MSE	xcooka Mean
0.562942	16.55136	3.389786	20.48042

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	613.6653889	30.6832694	2.67	0.0003
Sample(Animal*trt)	69	826.0374739	11.9715576	1.04	0.4073
Animal	3	160.1904979	53.3968326	4.65	0.0037
trt	3	57.1217225	19.0405742	1.66	0.1780
Sday	2	933.9451665	466.9725832	40.64	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Animal	3	160.1904979	53.3968326	1.74	0.1910

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	57.12172247	19.04057416	1.59	0.1996

Dependent Variable: xcookb

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	103	644.251017	6.254864	1.77	0.0005
Error	171	605.069312	3.538417		
Corrected Total	274	1249.320329			

R-Square	Coeff Var	Root MSE	xcookb Mean
0.515681	18.71435	1.881068	10.05147

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Sample(Animal)	20	137.5735861	6.8786793	1.94	0.0123
Sample(Animal*trt)	69	244.5478021	3.5441710	1.00	0.4854
Animal	3	112.2257947	37.4085982	10.57	<.0001
trt	3	41.6173209	13.8724403	3.92	0.0097
Sday	2	8.1774114	4.0887057	1.16	0.3173
Animal*Sday	6	108.3283482	18.0547247	5.10	<.0001

Tests of Hypotheses Using the Type III MS for Sample(Animal) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Animal	3	112.2257947	37.4085982	5.44	0.0067

Tests of Hypotheses Using the Type III MS for Sample(Animal*trt) as an Error Term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
trt	3	41.61732086	13.87244029	3.91	0.0122

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