ECONOMIC AND DEMOGRAPHIC FACTORS ASSOCIATED WITH THE PROPENSITY TO PURCHASE GREEK AND NON-GREEK YOGURT IN THE UNITED STATES

A Thesis

by

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MASTER OF SCIENCE

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ABSTRACT

Health has become an increasing concern for many Americans. Producers and manufactures of food products in response are creating healthier options. As a result, there are many types of healthy food products available for consumers today. One of the most commonly desired food products is yogurt. In this light, the objective of this research is to determine socio-economic and demographic factors affecting the propensity of purchasing conventional (non-Greek) yogurt and Greek yogurt with and without reference to brands. To accomplish this objective, the study uses Nielsen Homescan Panel data concerning 61,380 households for the 2015 calendar year. In all, twelve different probit models for non-Greek and Greek yogurt were developed and estimated. The economic and socio-demographic factors considered were prices, household income, household size, region, age and presence of children, race, education of the household head, and age of the household head.

Income and price had an effect on every profile for the purchase of any type of yogurt. The statistically significant socio-demographic variables varied for each probit model. Model validation using expectation prediction-success tables was conducted, and probability resolution (sorting) and resolution graphs were constructed. The results showed reasonable sensitivity and specificity values for all twelve probit models. As well, all twelve models showed some degree of sorting power.

This study allows manufacturers and retailers the opportunity to reach households not yet purchasing yogurt/ Greek yogurt as well as to better understand households that are purchasing yogurt/ Greek yogurt. Further research could include examination of drinkable yogurt as well as consideration of additional factors, such as ethnicity and advertising. Next

steps should include the use of Tobit models or Heckman sample selection models to discern conditional and unconditional drivers of the quantities purchased of the respective yogurt types considered.

DEDICATION

I would like to dedicate this work to my mother and father. Thank you for your endless support throughout the years and for always guiding me in the right direction.

I would also like to dedicate this work to my sister. Thank you for always challenging me to be my very best, regardless of the circumstances. If it were not for our healthy sibling rivalry, I may not be where I am today.

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CHAPTER I

INTRODUCTION

Health has become an increasing concern for many Americans. Producers and manufactures of food products in response are creating healthier options. As a result, there are many types of healthy food products available for individuals today. One of the most commonly desired food products is yogurt. Yogurt was not introduced in the United States until the beginning of the 1900s, but has since become a staple in the diets of many Americans (Weerathilake, et al., 2014). Greek yogurt, which contains additional benefits than non-Greek yogurt, was first exported into the United States in 1998, by Fage ("About Fage."). Fage is one of the market leaders of Greek yogurt, as reinforced by the work in this paper.

Consumers have become aware of the benefits from a diet high in protein, resulting in part in the change in demand from non-Greek yogurt, also known as regular yogurt, to Greek yogurt. Douglas, Ortinau, Hoertel, and Leidy (2013) support this contention. Increased Greek yogurt sales come from a variety of purchasers, including women making the switch from regular yogurt to Greek yogurt and men consuming "Greek yogurt as a new sports nutrition product," (Boynton, and Novakovic, 2014). It is important to producers, manufacturers, and retailers to understand the similarities and differences between those purchasing Greek yogurt and those purchasing non-Greek yogurt because of the everchanging demands. According to Boynton and Novakovic (2014), "non-Greek yogurt fell 10.1% by volume from 2011 to 2012 while Greek yogurt volume rose 71.4% in this same one-year period." The demand for Greek yogurt will likely continue to grow in the future.

With this increase in purchases of Greek yogurt comes opportunity for producers and manufacturers as well as competition within the yogurt industry. Producers and manufacturers must be aware of the factors affecting purchases for Greek and non-Greek yogurt, while retailers must be aware of the factors affecting purchases for the respective brands of yogurt. A goal of this study if to profile purchasers of yogurt/ Greek yogurt so as to influence future purchases and to profile non-purchasers of yogurt/ Greek yogurt so as to influence purchasing decisions, thus generating increases in demand for the overall yogurt market. Through the construction of economic and socio-demographic profiles, this study will help producers, manufacturers, and retailers to better understand those who purchase yogurt as well as those who are not yet purchasers of yogurt. Since Greek yogurt is relatively new to the U.S. market, compared to that of non-Greek yogurt, little research is evident pertaining to the characteristics of purchasers.

The general objective of the research is to develop profiles of the Greek and non-Greek style yogurt purchaser in the United States in order for producers, manufacturers, and retailers to position their product strategically in the market. The specific research objectives are to: (i) to determine the socio-economic and demographic factors affecting the probability of purchasing conventional yogurt (non-Greek style) and Greek style yogurt in the United States without reference to brands; (ii) to determine the socio-economic and demographic factors affecting the probability of purchasing selected brands, namely Chobani, Fage, Stonyfield, Dannon, and Yoplait; and (iii) to perform model validation based on expectation-prediction success tables, probability resolution (co-variance) and resolution graphs associated with the respective models.

The brands previously mentioned are considered in this study because of their notable presence in the market. Chobani was the first Greek yogurt brand produced in the United States in 2007, with Fage following closely after in 2008. Fage is one of the most notable brands in the Greek yogurt industry both in the United States and internationally. Dannon began production in 1919 in Spain, but expanded to the United States in 1942. Dannon introduced its first Greek yogurt product in 2010. Yoplait is known for production of conventional (regular) yogurt but began production of Greek yogurt in 2011, shortly after Dannon. Stonyfield began production for organic conventional yogurt in 1983 and Greek yogurt in 2007, around the same time Chobani appeared in the market. Although Stonyfield was purchased by Dannon in 2014, the two brands are treated as separate entities for the purpose of this study.

This research utilizes the Nielsen Homescan Panel from calendar year 2015 of 61,380 households. This thesis is organized as follows. In Chapter II, we provide a review of the literature regarding what has been analyzed in the yogurt market thus far and reasons why there is a need for additional research on the industry. Chapter III entails a discussion of the theoretical model used in this research, the probit model. We present the probit equations used in this analysis, along with explanations of the economic and socio-demographic variables chosen. In Chapter IV we provide an in-depth examination of the 2015 Nielsen Homescan Panel data. The explanatory variables, summary statistics, and market penetration are described in this chapter. In Chapter V, we present the set of empirical results of the estimation of the respective probit models, along with their associated marginal effects. In Chapter VI, we present concluding remarks.

CHAPTER II

LITERATURE REVIEW

Robinson (2017) focused primarily on the yogurt market in order to analyze variables affecting quantity consumed of yogurt, by brand. The objectives consisted of providing a historical perspective on the yogurt industry as well as the major yogurt brands. Data from Nielsen on yogurt by brand were used for the time period 2009-2011. The yogurt brands included Chobani, Yoplait, Stonyfield, Dannon, and Private Label (store brand). Single-equation demand models and a seemingly unrelated regression (SUR) demand system model were estimated in order to determine demand elasticities as well as impacts of income, recession, and seasonality on demand for each yogurt brand. Additionally, the ability of the models to generate forecasts also was evaluated. Root mean squared error (RMSE), mean absolute error (MAE), and mean absolute percent error (MAPE) were the metrics used in the ex-post forecast evaluation.

The own-price elasticities for Chobani and Dannon were estimated to be -2.642 and -1.428 respectively. As such, consumers were responsive to price changes for these brands. The own-price elasticities for Yoplait and Stonyfield were -0.365 and -0.860. On the basis of these estimated elasticities, consumers were not sensitive to price changes for these brands. Few cross-price elasticities, among the respective brands were found to be significantly difference from zero. The resulting income elasticities given in parentheses demonstrated that Yoplait (1.981), Stonyfield (1.639), Dannon (2.336), and Chobani (2.893) were all luxury goods, while store brands (0.383) were necessities. Overall, the SUR model was found to be more favorable than the single-equation model.

Dharmasena, Okrent, and Capps (2014) centered attention on the demand for Greek yogurt and the implications to the dairy industry in the United States. Data for Greek yogurt and other dairy products from the Nielsen Homescan Panel (2008-2009) and the IRI National Consumer Panel (2010-2013) were used for this study. A censored quadratic almost ideal demand system was used in order to determine the various demand elasticities for the dairy products. The results revealed that the own-price elasticity of Greek yogurt was -0.20, which "is consistent with findings in the literature in that the own-price elasticity of demand for dairy products is generally found to be quite inelastic" (Dharmasena, Okrent, and Capps, 2014). The estimated income elasticity of 0.21 implies that Greek yogurt is a normal and necessary good. Age, education, region, race, and number of children all had significant impacts on the likelihood of households to purchase yogurt.

Boynton and Novakovic (2014) sought to analyze the Greek yogurt market and the impacts the market had on the dairy sector, specifically in New York State. The location was chosen based on the proximity to large distribution centers and ultimately, the short amount of time it takes to reach consumers. Many yogurt and dairy plants are located in New York, making it an ideal location to conduct a study on the Greek yogurt industry. Boynton and Novakovic (2014) used secondary data for milk and yogurt based on retail sales, while also conducting interviews with leaders in the yogurt industry and dairy farmers. The results showed that 83% of households purchased yogurt in 2012. The Greek yogurt market is experiencing an increase in competition, as various brands are beginning to come into the industry. Production in New York is growing as a result of the increasing demand for Greek yogurt. Demand for Greek yogurt is expected to continue to rise, benefiting dairy producers as there seems to be a consistent demand for their product.

Douglas, Ortinau, Hoertel, and Leidy (2013) investigated whether or not the various levels of protein in yogurt snacks had an impact on appetite control and satiety on women between the ages of 18-50 years old. Women were divided into four categories: low-protein consumers, moderate-protein consumers, high-protein consumers, and no snacking consumers. The women were acclimated to a certain eating schedule for three days prior to the test day as part of the study. They were given a lunch that consisted of a sandwich, chips, and applesauce. Three hours after lunch, the participants were given a yogurt snack specified to the category they were placed in. The participants were allowed to request dinner if they became hungry at any time after the snack. The high protein yogurt snack "led to greater post-snack fullness at 60, 90, and 150 [minutes]," (Douglas, Ortinau, Hoertel, and Leidy, 2013).

Desai, Shepard, and Drake (2013) sought to analyze sensory properties of Greek yogurt and to determine tastes and preferences of consumers, both qualitatively and quantitatively. The Greek yogurt used in the research was collected from various parts of the United States. Consumers participated in an online survey and evaluated flavors and texture properties. Both univariate and multivariate statistical analyses were used to analyze consumer testing. Desai, Shepard, and Drake (2013) also used analysis of variance (ANOVA) with Fisher's Least Significant Difference to test for equality of consumer scores of Greek yogurts. A Kruskal-Wallis test along with Dunn's post hoc test was conducted in order to analyze the intent to purchase by consumers. The biplot used consisted of taste, texture, strained, and fortified attributes. Least squares regression was used to aid in determining consumer preferences for flavor, texture, and visual attributes.

The results showed "ninety-five percent of the consumers surveyed consumed Greek yogurt at least once a month" and eighty-one percent preferred single-serving sizes (Desai, Shepard, and Drake, 2013). Consumers deemed flavor as the most important component with price following behind. Additionally, consumers preferred the thickness of Greek yogurt compared to regular or conventional yogurt. There was no difference in fortified versus strained yogurt, meaning the production of Greek yogurt can be accomplished in multiple ways. Ultimately, consumers had a preference of Greek yogurt with a "moderate amount of sweet and sour taste, high milk fat flavor, and high firm and dense texture" (Desai, Shepard, and Drake, 2013).

CHAPTER III

METHODOLOGY

Data from the Nielsen Homescan Panel for the 2015 calendar year were used to examine household purchases or non-purchases of non-Greek and Greek yogurt. The probit model is used to analyze such binary choices. With binary choice models, the predicted probabilities are restricted to be between 0 and 1. The probit model is based on the standard normal probability density function, with a mean of 0 and standard deviation of 1.

$$(1) f_{(z)} = \frac{1}{\sqrt{2\pi}} e^{-z^2/2}$$

$$(2) P_i(y_i = 1) = F(Z_i) = \int_{-\infty}^{z_i} (2\pi)^{-\frac{1}{2}} e\left(-\frac{Z_i^2}{2}\right) ds,$$

$$Z_i = x_i' \beta$$

 $f_{(z)}$ represents the standard normal probability density function and $F(Z_i)$ represents the cumulative distribution function. The probability that y_i =1 (purchase) or that y_i =0 (non-purchase) is a function of the linear combination of each explanatory variable with its associated coefficient. This linear combination is represented by Z_i . The subscript i in the analysis refers to the ith household. Z_i is calculated by multiplying each explanatory variable associated with household i, (x_i) , by the corresponding coefficient, β_i .

Knowing the probability density function for our probit model, we can calculate the marginal effect for each explanatory variable for each household. In this way, we determine how the probability of purchasing a specified non-Greek or Greek yogurt product would change, given a unit change in any explanatory variable. The marginal effect for a particular explanatory variable is given as:

$$(3)\frac{\partial P_i}{\partial d_{ik}} = f(x'_i\beta, y_i = 1) - f(x'_i\beta, y_i = 0) = f_{(z)}\beta$$

We assess the validity and usefulness of the probit model in determining the likelihood of purchasing Greek and/ or non-Greek yogurt. This model validation rests on expectation-prediction success tables, probability resolution (sorting), and resolution graphs (Dharmasena, 2010). The expectation-prediction success table is a relationship between the expected and predicted outcomes. This method also serves as a goodness-of-fit measure which focuses on the ability to classify outcomes, in this case whether or not households purchase non-Greek yogurt and Greek yogurt. The prediction-success table used for this validation is comprised of four quadrants, as exhibited in Table 1.

The expectation-prediction success table contains the number of times the model makes a correct classification (denoted by a and d) as well as the number of times the model makes an incorrect classification (denoted by b and c). On the basis of a within-sample evaluation, we record the number of times the model makes either the correct or incorrect decision. The sum of the diagonal elements divided by the number of observations, $\frac{(a+d)}{(a+b+c+d)}$, provides a measure of the accuracy of the model to correctly classify all outcomes.

Table 1. Expectation-Prediction Success

	Actual $y = 0$	Actual $y = 1$
Predicted $y = 0$	a	b
Predicted $y = 1$	С	d

Additionally, this method allows measures of sensitivity and specificity of the model. Sensitivity, expressed as d/(b+d), relates to the accuracy of the model in predicting these individuals who purchase. Specificity, expressed as a/(a+c), relates to the accuracy of the model in predicting correctly those individuals who did not purchase (Dharmasena, Bessler, Capps, 2016).

The probability resolution and resolution graph is a metric of goodness of sorting power. This method measures how accurate the model is in sorting the probabilities between a household purchasing non-Greek and/ or Greek yogurt and a household not purchasing non-Greek and/ or Greek yogurt.

Once we are able to generate and analyze the resolution graph, we subsequently produce an outcome index in order to test the validity of the resolution graph and ultimately, the model. The outcome index, from the resolution regression, is an index containing values of 0 or 1, where 0 is associated with the household not purchasing and 1 is associated with the household purchasing. Ideally, we would like to see a value of 1 for purchasing and a value of 0 for non-purchasing. The resolution regression equation is shown in equation (4), with D representing the outcome index and P(y=1) representing the probability of purchase (Dharmasena, Bessler, Capps, 2016).

$$(4)P(y = 1) = \alpha + \beta D + e$$

The goal is for this model to produce a resolution graph with a 45-degree line, resulting in perfect resolution. Perfect resolution is tantamount to the null hypothesis that the intercept is equal to 0 and the slope is equal to 1 jointly. The joint test of the null hypothesis for all respective models is conducted using F-tests.

III. 1. Probit Models

The twelve probit models in this study correspond to household purchases/ non-purchases of: (1) All yogurt; (2) Greek yogurt only; (3) non-Greek yogurt only; (4) both Greek yogurt and non-Greek yogurt; and different brands of yogurt such as, (5) Chobani; (6) Fage; (7) Dannon Greek; (8) Dannon non-Greek; (9) Stonyfield Greek; (10) Stonyfield non-Greek; (11) Yoplait Greek; and (12) Yoplait non-Greek. These respective models are shown in the Figure 1 below and the respective explanatory variables are shown in Tables 2 and 3.

Figure 1. Yogurt Flow Chart for the Twelve Probit Models

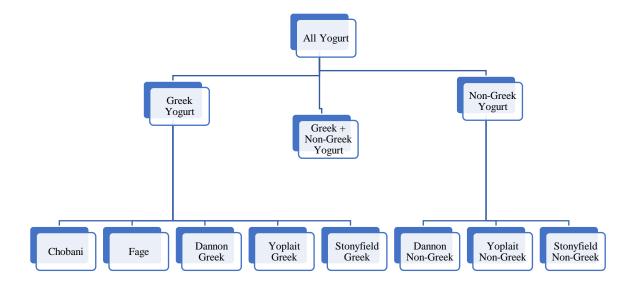


Table 2. Continuous Explanatory Variables Considered in the Analysis for the Respective Models

Quantity				
(ounces)	Price (\$/ ounce)	Expenditure (\$)	Income (\$)	Household Size
All Yogurt	All Yogurt	All Yogurt	Household income corresponds to the	1-9+ Members
Greek	Greek	Greek	use of midpoints of various	
Non-Greek	Non-Greek	Non-Greek	intervals from the 2015 Nielsen	
Greek + Non- Greek	Greek + Non- Greek	Greek + Non- Greek	Homescan data.	
Chobani	Chobani	Chobani		
Fage	Fage	Fage		
Dannon Greek	Dannon Greek	Dannon Greek		
Dannon Non- Greek	Dannon Non- Greek	Dannon Non- Greek		
Stonyfield Greek	Stonyfield Greek	Stonyfield Greek		
Stonyfield Non- Greek	Stonyfield Non- Greek	Stonyfield Non- Greek		
Yoplait Greek	Yoplait Greek	Yoplait Greek		
Yoplait Non- Greek	Yoplait Non- Greek	Yoplait Non- Greek		
Greek	Greek	Greek		

Table 3. Socio-Demographic Variables Considered in the Analysis for the Respective Models

Region	Race	Education	Presence and Age of Children	Age
New England	White/Caucasian	Grade School	No Children Under 18	Under 25 Years
Middle Atlantic	Black/ African American	Some High School	Under 6 only	25-29 Years
East North Central	Asian	Graduated High School	6-12 only	30-34 Years
West North Central	Other	Some College	13-17 only	35-39 Years
South Atlantic		Graduated College	Under 6 & 6-12	40-44 Years
East South Central		Post College Grad	Under 6 & 13-17	45-49 Years
West South Central			6-12 & 13-17	50-54 Years
Mountain			Under 6 & 6-12 & 13-17	55-64 Years
Pacific				65+ Years

^{*}Base or reference categories are in italics.

Nielsen records quantity and expenditure for each household; then taking the ratio of the quantity and expenditure values, we were able to generate unit values for each household. These unit values serve as proxies for prices. Some individuals from the Nielsen data set did not purchase any yogurt, therefore, the quantity for the variable would be equal to zero, resulting in a zero value for expenditure. In this case, we imputed prices for each Greek and non-Greek yogurt variable. The price imputation equation is shown in equation (5).

(5)
$$P_{i,observed} = a_1 + (a_2 \times HH_{i,income}) + (a_3 \times HH_{i,size}) + (a_4 \times HH_{i,region}) + \mu_i$$

In equation (5), observed price is regressed on household income, household size, and region. Then, estimated parameters from equation (5) are used to forecast the respective missing prices. This method is common among researchers (Alviola and Capps (2010); Capps, et al, (1994); Dharmasena and Capps (2014); and Kyureghian, Nayga and Capps (2011)). In order to insure consistency between observed and imputed prices, summary statistics of these variables are provided in Table 4. As can be seen in Table 4, the observed and imputed price values are very similar, which justifies the price imputation in this analysis. The details of the price imputation equations are shown in Appendix Table 1.

Table 4. Summary Statistics of Observed and Imputed Prices

	Observe (\$/ ou			ed Price unce)
	Mean	Standard Deviation	Mean	Standard Deviation
All Yogurt	0.1365	0.0469	0.1368	0.0427
Greek Only	0.1857	0.0380	0.1880	0.0133
Non-Greek Only	0.1045	0.0388	0.1068	0.0223
Greek + Non-Greek	0.1840	0.0330	0.1857	0.0247
Non-Greek + Greek	0.1202	0.0424	0.1215	0.0319
Chobani	0.1955	0.0362	0.1991	0.0222
Fage	0.2007	0.0420	0.2067	0.0171
Dannon Greek	0.1744	0.0207	0.1780	0.0123
Dannon Non-Greek	0.1144	0.0352	0.1175	0.0193
Stonyfield Greek	0.2524	0.0547	0.2592	0.0154
Stonyfield Non- Greek	0.1719	0.0604	0.1773	0.0190
Yoplait Greek	0.1970	0.0342	0.2006	0.0183
Yoplait Non-Greek	0.0989	0.0194	0.1009	0.0144

CHAPTER IV

DATA

The Nielsen Homescan Panel consisting of 61,380 households for purchases of non-Greek yogurt and Greek yogurt for calendar year 2015 was used in this study. Table 5 represents the quantity, expenditure, and price for each product considered in this work. Price is not originally reported in the data. The "unit value" as a proxy for price was calculated by taking the ratio, expenditure to quantity. Summary statistics for the households during the 2015 calendar year are as follows. The average expenditure and quantity for households that purchased all yogurt were \$55.90 per year and 427.37 ounces per year. The average expenditure and quantity for households that purchased Greek yogurt were \$38.54 per year and 217.11 ounces per year. The average expenditure and quantity for households that purchased non-Greek yogurt were \$28.72 per year and 299.99 ounces per year. The average expenditure and quantity for households that purchased non-Greek yogurt and Greek yogurt together were \$73.57 per year and 533.92 ounces per year.

The average expenditure and quantity for households that purchased Chobani were \$19.81 per year and 104.22 ounces per year. The average expenditure and quantity for households that purchased Fage were \$17.84 per year and 95.23 ounces per year. The average expenditure and quantity for households that purchased Dannon Greek yogurt were \$24.81 per year and 144.01 ounces per year. The average expenditure and quantity for households that purchased Dannon non-Greek yogurt were \$18.00 per year and 163.41 ounces per year. The average expenditure and quantity for households that purchased Stonyfield Greek yogurt were \$9.85 per year and 39.72 ounces per year. The average

expenditure and quantity for households that purchased Stonyfield non-Greek yogurt were \$13.59 per year and 91.23 ounces per year. The average expenditure and quantity for households that purchased Yoplait Greek yogurt were \$14.34 per year and 74.48 ounces per year. The average expenditure and quantity for households that purchased Yoplait non-Greek yogurt were \$19.61 per year and 203.74 ounces per year.

The market penetration for each variable in the conditional sample is shown in Table 5. Overall, 82.14% of the households purchased some type of yogurt. 31.56% of the households sampled purchased non-Greek yogurt only, while 11.78% purchased Greek yogurt only. However, households that purchased both Greek and non-Greek yogurt represented 55.37% of the sample. Concerning brands, Yoplait non-Greek represents the largest proportion with a market penetration of 49.36%. Chobani follows closely with a 36.58% market penetration. Dannon Greek yogurt has the next highest percentage of 31.50%. Dannon non-Greek yogurt and Yoplait Greek yogurt are close behind with 27.91% and 26.48%. Fage has a value of 10.16%. Stonyfield contains the smallest values for both Greek and non-Greek yogurt, 1.94% and 5.53% respectively.

The demographic variables included in this study were household income, household size, region, race, education level of household head, age of household head, and age and presence of children in the household. In order to avoid the dummy variable trap (singularity of the variance-covariance matrix) during the regression analysis, a category for each sociodemographic variable must be dropped from the regression.

Household income and household size were both continuous variables in this study. Household income ranged from under \$5,000 to over \$100,000 per year. Household income refers to the midpoint of the respective intervals considered in the 2015 Nielsen Homescan

Panel. Household size in this study represented the number of members in each household. Household size was broken into nine categories, with the first category including a single member and the last category including 9 or more members. Table 6 shows the summary statistics for the respective socio-demographic variables.

Different regions may result in diverse preferences but also varied prices for the same product; therefore, it is important to incorporate geographical location in the respective models. The region variable was divided into nine categories across the United States. Table 7, represents a breakdown of these nine regions and their respective categories. Northeast included the New England and Middle Atlantic regions. Midwest included East North Central and West North Central regions. South included the South Atlantic, East South Central, and West South Central regions. West included the Mountain and Pacific regions. The West South Central region was chosen as the base category for this study.

Table 5. Summary Statistics on (Unit Value) Price, Quantity, and Expenditure, Conditional upon Purchases

	All Yogurt	Greek Only	Non- Greek	Greek+ Non- Greek	Chobani	Fage	Dannon Greek	Dannon Non- Greek	Stonyfield Greek	Stonyfield Non- Greek	Yoplait Greek	Yoplait Non- Greek
Quantity (oun	ces)											
Mean	427.3729	217.11	299.99	533.9174	104.22	95.23	144.01	163.41	39.72	91.23	74.48	203.74
Standard Deviation	497.929	322.37	402.41	516.8917	161.61	167.68	222.67	251.71	60.23	163.29	115.65	272.38
Min	4	4	4	8.8	3.5	5.3	5	4	5.3	5.3	4	4
Max	5,536	2,573	3,880	4,627	1,362	1,632	2,025	2,560	539	1,664	1,018	2,484
Expenditure (S	\$)											
Mean	55.90	38.54	28.72	73.57	19.81	17.84	24.81	18.00	9.85	13.59	14.34	19.61
Standard Deviation	65.59	56.21	37.08	71.47	30.54	30.18	38.36	27.78	15.16	22.24	22.25	25.71
Min	0.20	0.20	0.25	1.14	0.21	0.50	0.33	0.25	0.50	0.50	0.30	0.25
Max	404.96	336.74	239.76	589.81	216.76	228.8	267.86	196.06	137.09	196.97	164.39	170.93
Price (\$/ounce	e)											
Mean	0.1368	0.1880	0.1045	-	0.1991	0.2067	0.1780	0.1175	0.2592	0.1773	0.2006	0.1009
Standard Deviation	0.0427	0.0133	0.0388	-	0.0222	0.0171	0.0123	0.0193	0.0154	0.0190	0.0183	0.0144
Min	0.0192	0.0309	0.0192	-	0.0250	0.0564	0.0373	0.0309	0.0934	0.0469	0.0247	0.0258
Max	0.3499	0.4419	0.3585	-	0.4528	0.3094	0.2000	0.2696	0.3617	0.3383	0.3100	0.1500
Market Penetration	82.14%	11.78%	31.56%	55.37%	36.58%	10.16%	31.50%	27.91%	1.94%	5.53%	26.48%	49.36%

 Table 6. Summary Statistics for the Respective Socio-demographic Variables

Variable	Mean	Std. Dev	Min	Max
Household Size	2.3824	1.3013	1	9
Household Income	58,421	29,224	2,500	100,000
New England	0.0475	0.2128		
Middle Atlantic	0.1289	0.3351		
East North Central	0.1756	0.3805		
West North Central	0.0826	0.2753		
South Atlantic	0.2031	0.4023		
East South Central	0.0618	0.2408		
West South Central	0.1051	0.3067		
Mountain	0.0734	0.2609		
Pacific	0.1218	0.3271		
White	0.8146	0.3886		
Black	0.1069	0.3089		
Asian	0.0327	0.1779		
Other	0.0458	0.2090		
Grade	0.0014	0.0380		
Education some high school	0.0101	0.1001		
Education high school grad	0.1839	0.3874		
Education some college	0.2859	0.4519		
Education college grad	0.3379	0.4730		
Education post college	0.1807	0.3848		
Children < 6 years	0.0302	0.1713		
Children 6- 12 years	0.0530	0.2240		
Children 13- 17 years	0.0661	0.2484		
Children < 6 & 6-12 years	0.0269	0.1617		
Children < 6 & 13-17 years	0.0040	0.0633		
Children 6-12 & 13-17 years	0.0366	0.1877		
Children < 6 & 6-12 & 13-17 years	0.0062	0.0788		
No Child	0.7770	0.4163		
Age of Household Head 24 years & under	0.0017	0.0407		
Age of Household Head 25-29 years	0.0133	0.1147		
Age of Household Head 30-34 years	0.0394	0.1946		
Age of Household Head 35-39 years	0.0617	0.2406		
Age of Household Head 40-44 years	0.0701	0.2553		
Age of Household Head 45-49 years	0.0910	0.2876		
Age of Household Head 50-54 years	0.1203	0.3254		
Age of Household Head 55-64 years	0.2989	0.4578		
Age of Household Head 65+ years	0.3036	0.4598	_	

Table 7. United States Census Bureau Regions and States (adapted from Copeland, 2016).

NORTHEAST								
New England		Middle Atlantic						
Connecticut, Maine, Massachus Hampshire, Rhode Island, V		New Jersey	, New York, Pennsylvania					
	MIDWEST	[
East North Central		We	est North Central					
Indiana, Illinois, Michigan, Wisconsin	Ohio,	Iowa, Nebraska, Kansas, North Dakota, South Dakota, Minnesota, Missouri						
SOUTH								
South Atlantic	East South Cer	<u>ntral</u>	West South Central					
Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia	Alabama, Kentu Mississippi, Teni	•	Arkansas, Louisiana, Oklahoma, Texas					
	WEST							
<u>Mountain</u>			<u>Pacific</u>					
Arizona, Colorado, Idaho, Nev Montana, Utah, Nevada, Wy		Alaska, California, Hawaii, Oregon, Washington						

Source: Copeland (2016) and "Census Regions and Divisions of the United States", modified by author

CHAPTER V

EMPIRICAL RESULTS

The empirical results of the twelve probit regressions are shown in Tables 8, 9, and 10. The software packages used in the estimation of the respective probit models was SAS 9.4 and Stata. The respective goodness-of-fit measurements for each model, McFadden's R^2 and Chi-squared statistics, are also shown in the respective tables. The Stonyfield non-Greek model had the largest McFadden's R^2 at 0.1045, and the Greek and non-Greek yogurt model had the McFadden's lowest R^2 at 0.0217. The level of significance chosen for this analysis was 0.05. Hence, any estimated coefficient with a *p-value* equal or less than 0.05 was deemed statistically different from zero.

V. 1. Probit Regression Results and Marginal Effects

It is important for yogurt manufacturers and retailers to understand how the probability of purchasing for a household changes relative to a change in one of the explanatory variables. These changes in probabilities are referred to as marginal effects, given as the product of $f_{(z)}$ with each estimated coefficient (see equation (3)). In the ensuing subsections of this chapter, we present the respective marginal effects calculated at the sample means of the explanatory variables. The marginal effects for the models are shown in Tables 11 and 12.

 $Table\ 8.\ Empirical\ Results\ for\ the\ Probit\ Models\ of\ Yogurt,\ Greek,\ Non-Greek,\ and\ Greek\ +Non-Greek$

		All Yogurt		Greek Only				on-Greek Or	ıly	Greek + Non-Greek		
	Estimate	Std Error	p-Value	Estimate	Std Error	p-Value	Estimate	Std Error	p-Value	Estimate	Std Error	p-Value
Price of All Yogurt	-0.9193	0.1565	0.0000	-	-	-	-	-	-	-	-	-
Price of Greek Only	-	-	-	-4.5714	0.3784	0.0000	-	-	-	-	-	-
Price of non-Greek Only	-	-	-	-	-	-	-2.2010	0.2369	0.0000	-	-	-
Price of Greek with non-Greek	-	-	-	-	-	-	-	-	-	-3.6232	0.2447	0.00
Price of non-Greek with Greek	-	-	-	-	-	-	-	-	-	-1.8116	0.1864	0.00
Household income	3.97E-06	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00
Household size	0.1317	0.0079	0.0000	-0.1174	0.0095	0.0000	0.0152	0.0070	0.0300	0.0233	0.0069	0.00
New England	0.2469	0.0355	0.0000	0.1074	0.0393	0.0060	-0.1758	0.0325	0.0000	0.1114	0.0312	0.00
Middle Atlantic	0.1393	0.0254	0.0000	0.0975	0.0306	0.0010	-0.1591	0.0247	0.0000	0.1270	0.0239	0.00
East North Central	0.1241	0.0237	0.0000	-0.0804	0.0296	0.0070	-0.0363	0.0229	0.1130	0.0721	0.0223	0.00
West North Central	0.0584	0.0282	0.0380	-0.0245	0.0351	0.4850	0.0374	0.0272	0.1700	-0.0338	0.0267	0.20
South Atlantic	0.0540	0.0228	0.0180	0.0652	0.0284	0.0220	-0.0668	0.0225	0.0030	0.0630	0.0219	0.00
East South Central	-0.0631	0.0299	0.0350	-0.0365	0.0392	0.3510	0.0299	0.0300	0.3180	-0.0065	0.0294	0.82
Mountain	0.1384	0.0297	0.0000	-0.0398	0.0363	0.2720	-0.1447	0.0284	0.0000	0.1311	0.0275	0.00
Pacific	0.0706	0.0256	0.0060	0.0433	0.0314	0.1680	-0.1041	0.0252	0.0000	0.0678	0.0243	0.00
Black/ African American	-0.3024	0.0189	0.0000	0.0438	0.0250	0.0800	0.2258	0.0198	0.0000	-0.2332	0.0196	0.00
Asian	-0.2122	0.0360	0.0000	-0.0368	0.0437	0.3990	0.1053	0.0341	0.0020	-0.0741	0.0329	0.02
Other	-0.1005	0.0300	0.0010	0.0860	0.0356	0.0160	0.0106	0.0286	0.7120	-0.0534	0.0277	0.05
Education some high school	-0.1378	0.1579	0.3830	-0.3129	0.2027	0.1230	0.3085	0.1721	0.0730	-0.1104	0.1694	0.51
Education high school grad	-0.0072	0.1490	0.9610	-0.3301	0.1862	0.0760	0.2568	0.1616	0.1120	-0.0355	0.1587	0.82
Education some college	0.1073	0.1489	0.4710	-0.2985	0.1859	0.1080	0.1591	0.1614	0.3240	0.0330	0.1585	0.83
Education college grad	0.1476	0.1490	0.3220	-0.2813	0.1860	0.1300	0.0745	0.1614	0.6440	0.0988	0.1585	0.53
Education post college	0.1883	0.1495	0.2080	-0.2729	0.1865	0.1430	-0.0123	0.1619	0.9400	0.1589	0.1589	0.31
Children < 6 years	0.2950	0.0511	0.0000	-0.3884	0.0560	0.0000	0.0164	0.0379	0.6650	0.1694	0.0369	0.00
Children 6- 12 years	0.2498	0.0375	0.0000	-0.3648	0.0438	0.0000	0.0781	0.0298	0.0090	0.1030	0.0291	0.00
Children 13- 17 years	0.1146	0.0315	0.0000	-0.1371	0.0360	0.0000	-0.0266	0.0271	0.3270	0.1100	0.0262	0.00
Children < 6 & 6-12 years	0.2407	0.0602	0.0000	-0.5157	0.0711	0.0000	0.1359	0.0421	0.0010	0.0497	0.0415	0.23
Children < 6 & 13-17 years	0.1596	0.1227	0.1930	-0.2814	0.1467	0.0550	0.1500	0.0889	0.0920	-0.0133	0.0885	0.88
Children 6-12 & 13-17 years	0.0796	0.0468	0.0890	-0.2538	0.0552	0.0000	0.1114	0.0375	0.0030	0.0109	0.0368	0.76
Children < 6 & 6-12 & 13-17 years	-0.0378	0.1052	0.7200	-0.0337	0.1160	0.7710	0.1812	0.0762	0.0170	-0.1337	0.0751	0.07
Age of Household Head 25-29 years	-0.1569	0.1848	0.3960	-0.0302	0.1927	0.8750	0.0349	0.1466	0.8120	-0.0074	0.1438	0.95
Age of Household Head 30-34 years	-0.2152	0.1783	0.2270	0.0017	0.1855	0.9930	0.1218	0.1411	0.3880	-0.0978	0.1386	0.48
Age of household head 35-39 years	-0.3264	0.1769	0.0650	0.0183	0.1843	0.9210	0.0802	0.1403	0.5670	-0.0578	0.1378	0.67
Age of Household Head 40-44 years	-0.4131	0.1764	0.0190	-0.0261	0.1840	0.8870	0.0996	0.1401	0.4770	-0.0650	0.1377	0.63
Age of Household Head 45-49 years	-0.4620	0.1758	0.0090	0.0010	0.1832	0.9950	0.1761	0.1396	0.2070	-0.1419	0.1372	0.30
Age of Household Head 50-54 years	-0.4733	0.1753	0.0070	-0.0266	0.1826	0.8840	0.1489	0.1393	0.2850	-0.1056	0.1369	0.44
Age of Household Head 55-64 years	-0.4823	0.1747	0.0060	-0.0281	0.1818	0.8770	0.1672	0.1386	0.2280	-0.1368	0.1363	0.31
Age of Household Head 65+ years	-0.5166	0.1746	0.0030	-0.0605	0.1818	0.7390	0.2286	0.1386	0.0990	-0.1736	0.1363	0.20
McFadden's R ²	0.0523			0.0313			0.0239			0.0217		
X^2	2,983.79		0.0000	1,145.56		0.0000	1,497.21		0.0000	1,476.51		0.00

Table 9. Empirical Results for the Probit Models for Greek Brands

	Chobani			Fage			Dannon Greek		
	Estimate	Std Error	p-Value	Estimate	Std Error	p-Value	Estimate	Std Error	p-Value
Price of Chobani	-1.8664	0.0538	0.0000	-0.1656	0.0676	0.0140	-0.3595	0.0543	0.0000
Price of Fage	-0.0357	0.0850	0.6740	-2.4915	0.0795	0.0000	0.1043	0.0873	0.2320
Price of Dannon Greek	-0.3010	0.0772	0.0000	0.0921	0.1040	0.3760	-4.0198	0.1040	0.0000
Price of Dannon non-Greek	-0.0389	0.0400	0.3300	0.0738	0.0541	0.1720	-0.0996	0.0408	0.0150
Price of Stonyfield Greek	-0.8180	0.1839	0.0000	-0.2398	0.2028	0.2370	-0.6786	0.1885	0.0000
Price of Stonyfield non-Greek	0.1856	0.0731	0.0110	0.1051	0.0905	0.2460	0.2550	0.0760	0.0010
Price of Yoplait Greek	-0.6060	0.0620	0.0000	0.0696	0.0846	0.4100	-0.4940	0.0641	0.0000
Price of Yoplait non-Greek	0.3338	0.0451	0.0000	0.3963	0.0628	0.0000	0.4001	0.0466	0.0000
Log household income	0.1298	0.0104	0.0000	0.1873	0.0150	0.0000	0.1175	0.0107	0.0000
Household size	-0.0151	0.0073	0.0390	-0.0748	0.0102	0.0000	-0.0085	0.0075	0.2560
New England	0.3181	0.0388	0.0000	0.2600	0.0498	0.0000	0.1742	0.0396	0.0000
Middle Atlantic	0.2243	0.0312	0.0000	0.2627	0.0401	0.0000	0.2560	0.0320	0.0000
East North Central	0.0091	0.0287	0.7520	-0.0988	0.0375	0.0080	0.0417	0.0293	0.1550
West North Central	-0.0310	0.0324	0.3380	-0.1237	0.0428	0.0040	-0.0155	0.0332	0.6410
South Atlantic	0.0891	0.0256	0.0010	0.0100	0.0340	0.7680	0.1343	0.0262	0.0000
East South Central	-0.0507	0.0325	0.1190	-0.2426	0.0456	0.0000	-0.0326	0.0333	0.3280
Mountain	0.1181	0.0303	0.0000	-0.0279	0.0395	0.4790	-0.0042	0.0310	0.8930
Pacific	-0.0318	0.0264	0.2270	0.2224	0.0340	0.0000	-0.0557	0.0268	0.0370
Black/ African American	-0.1924	0.0213	0.0000	-0.1508	0.0299	0.0000	-0.1746	0.0219	0.0000
Asian	-0.0406	0.0344	0.2370	-0.0517	0.0439	0.2390	-0.2339	0.0369	0.0000
Other	-0.0375	0.0293	0.2010	0.0690	0.0378	0.0680	-0.0786	0.0303	0.0100
Education some high school	-0.1076	0.1880	0.5670	-0.0445	0.2878	0.8770	-0.1796	0.1879	0.3390
Education high school grad	-0.0300	0.1755	0.8640	-0.0973	0.2694	0.7180	-0.1337	0.1753	0.4450
Education some college	0.0607	0.1753	0.7290	0.0549	0.2690	0.8380	-0.0640	0.1751	0.7150
Education college grad	0.1525	0.1753	0.3840	0.1502	0.2690	0.5770	-0.0489	0.1751	0.7800
Education post college	0.2388	0.1757	0.1740	0.3310	0.2693	0.2190	-0.0099	0.1755	0.9550
Children < 6 years	0.0777	0.0382	0.0420	-0.0035	0.0508	0.9440	-0.1016	0.0404	0.0120
Children 6- 12 years	-0.0127	0.0306	0.6770	-0.0729	0.0426	0.0870	-0.0755	0.0319	0.0180
Children 13- 17 years	0.0164	0.0275	0.5520	-0.0287	0.0383	0.4540	0.0253	0.0282	0.3700
Children < 6 & 6-12 years	-0.1027	0.0432	0.0170	-0.0810	0.0594	0.1730	-0.1124	0.0451	0.0130
Children < 6 & 13-17 years	-0.0362	0.0929	0.6970	-0.0110	0.1315	0.9330	-0.0799	0.0973	0.4110
Children 6-12 & 13-17 years	-0.0960	0.0386	0.0130	0.0312	0.0525	0.5520	-0.1242	0.0400	0.0020
Children < 6 & 6-12 & 13-17 years	-0.0990	0.0795	0.2130	-0.2264	0.1266	0.0740	-0.1955	0.0846	0.0210
Age of Household Head 25-29 years	-0.1093	0.1438	0.4470	-0.1804	0.1967	0.3590	-0.1900	0.1506	0.2070
Age of Household Head 30-34 years	-0.2376	0.1385	0.0860	-0.1057	0.1887	0.5760	-0.2207	0.1448	0.1280
Age of household head 35-39 years	-0.1875	0.1375	0.1730	-0.1061	0.1876	0.5720	-0.2173	0.1438	0.1310
Age of Household Head 40-44 years	-0.2390	0.1373	0.0820	-0.1206	0.1874	0.5200	-0.1960	0.1436	0.1720
Age of Household Head 45-49 years	-0.2877	0.1369	0.0360	-0.2085	0.1870	0.2650	-0.1629	0.1431	0.2550
Age of Household Head 50-54 years	-0.3079	0.1365	0.0240	-0.2338	0.1865	0.2100	-0.0964	0.1426	0.4990
Age of Household Head 55-64 years	-0.3495	0.1359	0.0100	-0.2304	0.1856	0.2140	-0.1199	0.1420	0.3980
Age of Household Head 65+ years	-0.4506	0.1359	0.0010	-0.2483	0.1856	0.1810	-0.1310	0.1420	0.3560
McFadden's R ²	0.0465			0.0689			0.0531		
X ²	2,832.78		0.0000	2,098.78		0.0000	3,066.67		0.0000

Table 9. Continued

	S	tonyfield Gree	ek	Yoplait Greek				
	Estimate	Std Error	p-Value	Estimate	Std Error	p-Value		
Price of Chobani	-0.2110	0.1100	0.0550	-0.1037	0.0547	0.0580		
Price of Fage	0.1359	0.1866	0.4670	0.3898	0.0915	0.0000		
Price of Dannon Greek	-0.3029	0.1564	0.0530	0.0750	0.0803	0.3500		
Price of Dannon non-Greek	0.0690	0.0894	0.4400	-0.1516	0.0414	0.0000		
Price of Stonyfield Greek	-2.6222	0.1635	0.0000	-0.7713	0.1847	0.0000		
Price of Stonyfield non-Greek	-0.4162	0.1200	0.0010	0.5611	0.0785	0.0000		
Price of Yoplait Greek	-0.2829	0.1289	0.0280	-2.0639	0.0635	0.0000		
Price of Yoplait non-Greek	-0.0283	0.1035	0.7850	0.1986	0.0465	0.0000		
Log household income	0.1157	0.0258	0.0000	0.0663	0.0109	0.0000		
Household size	-0.0070	0.0171	0.6810	0.0042	0.0076	0.5790		
New England	0.3685	0.0731	0.0000	0.1091	0.0407	0.0070		
Middle Atlantic	0.1755	0.0639	0.0060	0.0101	0.0326	0.7570		
East North Central	-0.1786	0.0575	0.0020	0.1083	0.0298	0.0000		
West North Central	-0.2337	0.0837	0.0050	0.0820	0.0333	0.0140		
South Atlantic	0.2437	0.0531	0.0000	0.0999	0.0265	0.0000		
East South Central	-0.0295	0.0712	0.6790	0.1637	0.0335	0.0000		
Mountain	-0.2610	0.0769	0.0010	0.0509	0.0317	0.1090		
Pacific	-0.1351	0.0630	0.0320	-0.1519	0.0275	0.0000		
Black/ African American	-0.1604	0.0518	0.0020	-0.1579	0.0224	0.0000		
Asian	-0.0099	0.0762	0.8970	-0.1956	0.0377	0.0000		
Other	-0.1157	0.0743	0.1190	-0.1397	0.0315	0.0000		
Education some high school	-0.1092	0.4537	0.8100	-0.0516	0.1963	0.7930		
Education high school grad	-0.1820	0.4201	0.6650	0.0528	0.1837	0.7740		
Education some college	-0.0915	0.4193	0.8270	0.0345	0.1835	0.8510		
Education college grad	0.0152	0.4192	0.9710	0.0745	0.1835	0.6850		
Education post college	0.1262	0.4198	0.7640	0.0507	0.1839	0.7830		
Children < 6 years	0.1938	0.0774	0.0120	-0.0322	0.0408	0.4300		
Children 6- 12 years	-0.0554	0.0721	0.4420	0.0139	0.0322	0.6660		
Children 13- 17 years	-0.1171	0.0670	0.0810	0.0770	0.0285	0.0070		
Children < 6 & 6-12 years	0.0036	0.0972	0.9700	-0.0753	0.0458	0.1000		
Children < 6 & 13-17 years	-0.5325	0.3758	0.1560	-0.0154	0.0982	0.8750		
Children 6-12 & 13-17 years	-0.1338	0.0942	0.1550	-0.0355	0.0404	0.3790		
Children < 6 & 6-12 & 13-17 years	-0.0594	0.1972	0.7630	-0.0729	0.0843	0.3880		
Age of Household Head 25-29 years	0.5785	0.5258	0.2710	-0.0776	0.1517	0.6090		
Age of Household Head 30-34 years	0.5681	0.5197	0.2740	-0.1942	0.1462	0.1840		
Age of household head 35-39 years	0.4498	0.5193	0.3860	-0.1510	0.1452	0.2980		
Age of Household Head 40-44 years	0.5057	0.5189	0.3300	-0.1274	0.1449	0.3790		
Age of Household Head 45-49 years	0.5266	0.5182	0.3100	-0.2004	0.1445	0.1660		
Age of Household Head 50-54 years	0.4912	0.5177	0.3430	-0.0868	0.1440	0.5460		
Age of Household Head 55-64 years	0.4616	0.5167	0.3720	-0.1275	0.1433	0.3740		
Age of Household Head 65+ years	0.3895	0.5168	0.4510	-0.2010	0.1434	0.1610		
McFadden's R ²	0.0652			0.0304				
X ²	578.98		0.0000	1,631.86		0.0000		

Table 10. Empirical Results for the Probit Models for Non-Greek Brands

	Dannon Non-Greek			Stonyfield Non-Greek			Yoplait Non-Greek		
	Estimate	Std Error	p-Value	Estimate	Std Error	p-Value	Estimate	Std Error	p-Value
Price of Chobani	0.0442	0.0547	0.4190	-0.0949	0.0815	0.2440	0.2339	0.0535	0.0000
Price of Fage	0.0396	0.0906	0.6620	-0.1962	0.1264	0.1210	0.6308	0.0882	0.0000
Price of Dannon Greek	-0.7572	0.0772	0.0000	-0.1162	0.1228	0.3440	0.1214	0.0780	0.1200
Price of Dannon non-Greek	-1.2398	0.0366	0.0000	-0.0838	0.0636	0.1870	-0.2662	0.0405	0.0000
Price of Stonyfield Greek	-0.0797	0.1812	0.6600	-0.7874	0.1962	0.0000	-0.1178	0.1777	0.5070
Price of Stonyfield non-Greek	-0.0671	0.0759	0.3770	-1.7152	0.0647	0.0000	0.4119	0.0749	0.0000
Price of Yoplait Greek	-0.2375	0.0640	0.0000	-0.2426	0.0981	0.0130	-0.1737	0.0634	0.0060
Price of Yoplait non-Greek	-0.0964	0.0463	0.0380	0.3960	0.0756	0.0000	-2.0955	0.0470	0.0000
Log household income	0.0361	0.0107	0.0010	0.1203	0.0180	0.0000	-0.0269	0.0101	0.0080
Household size	0.0450	0.0075	0.0000	-0.0056	0.0120	0.6410	0.1147	0.0074	0.0000
New England	0.2038	0.0398	0.0000	0.4764	0.0525	0.0000	-0.0412	0.0389	0.2900
Middle Atlantic	0.3759	0.0320	0.0000	0.1928	0.0473	0.0000	-0.1299	0.0312	0.0000
East North Central	0.0836	0.0297	0.0050	-0.2261	0.0441	0.0000	0.1318	0.0284	0.0000
West North Central	-0.1059	0.0345	0.0020	-0.2354	0.0562	0.0000	0.1793	0.0318	0.0000
South Atlantic	0.2168	0.0265	0.0000	0.2668	0.0410	0.0000	-0.0663	0.0252	0.0090
East South Central	0.0235	0.0342	0.4930	-0.2699	0.0578	0.0000	0.1307	0.0320	0.0000
Mountain	-0.1615	0.0329	0.0000	0.0132	0.0534	0.8050	-0.0337	0.0302	0.2650
Pacific	-0.1237	0.0284	0.0000	-0.0727	0.0475	0.1260	0.0092	0.0260	0.7220
Black/ African American	0.0738	0.0214	0.0010	-0.2361	0.0382	0.0000	0.0120	0.0208	0.5650
Asian	0.1712	0.0359	0.0000	0.1178	0.0506	0.0200	-0.1269	0.0349	0.0000
Other	0.0362	0.0308	0.2400	0.0113	0.0473	0.8110	-0.0779	0.0293	0.0080
Education some high school	0.1108	0.1850	0.5490	0.2245	0.4510	0.6190	0.4991	0.1851	0.0070
Education high school grad	0.0001	0.1735	0.9990	0.2028	0.4308	0.6380	0.5148	0.1743	0.0030
Education some college	-0.0034	0.1733	0.9840	0.3684	0.4303	0.3920	0.4245	0.1741	0.0150
Education college grad	-0.0216	0.1734	0.9010	0.5135	0.4302	0.2330	0.3426	0.1741	0.0490
Education post college	-0.0394	0.1738	0.8210	0.6229	0.4305	0.1480	0.2431	0.1745	0.1640
Children < 6 years	-0.0118	0.0409	0.7720	0.4988	0.0517	0.0000	0.5227	0.0389	0.0000
Children 6- 12 years	-0.0288	0.0323	0.3740	0.1981	0.0465	0.0000	0.6787	0.0315	0.0000
Children 13- 17 years	-0.0113	0.0288	0.6950	-0.0812	0.0478	0.0890	0.2308	0.0275	0.0000
Children < 6 & 6-12 years	0.0512	0.0450	0.2560	0.3611	0.0613	0.0000	0.8307	0.0460	0.0000
Children < 6 & 13-17 years	-0.2101	0.1023	0.0400	0.0336	0.1513	0.8240	0.6753	0.0986	0.0000
Children 6-12 & 13-17 years	-0.1156	0.0406	0.0040	0.0267	0.0615	0.6640	0.4760	0.0393	0.0000
Children < 6 & 6-12 & 13-17 years	-0.1402	0.0833	0.0920	0.2312	0.1158	0.0460	0.5657	0.0846	0.0000
Age of Household Head 25-29 years	-0.2366	0.1529	0.1220	0.1579	0.2628	0.5480	-0.1621	0.1450	0.2640
Age of Household Head 30-34 years	-0.2002	0.1464	0.1720	0.2547	0.2554	0.3190	-0.1340	0.1393	0.3360
Age of household head 35-39 years	-0.1837	0.1454	0.2060	0.2893	0.2545	0.2560	-0.1115	0.1384	0.4200
Age of Household Head 40-44 years	-0.2020	0.1452	0.1640	0.2691	0.2545	0.2900	-0.0987	0.1381	0.4750
Age of Household Head 45-49 years	-0.1543	0.1447	0.2860	0.1254	0.2544	0.6220	-0.0898	0.1376	0.5140
Age of Household Head 50-54 years	-0.0917	0.1442	0.5250	0.0932	0.2540	0.7140	-0.1212	0.1370	0.3770
Age of Household Head 55-64 years	-0.0796	0.1435	0.5790	0.0843	0.2530	0.7390	-0.1055	0.1366	0.4400
Age of Household Head 65+ years	0.0466	0.1435	0.7450	0.0062	0.2531	0.9810	-0.1200	0.1366	0.3800
McFadden's R ²	0.0480	0.1.55	0.7.50	0.1045	0.2001	3.7510	0.0872	0.1200	0.0000
X^2	2,635.99		0.0000	2,072.19		0.0000	5,603.34		0.0000

V. 1. 1. Model 1 All Yogurt

The significant variables for households that purchased all yogurt included price of yogurt, household size, income, region, education, race, age and presence of children, and age of household head.

Households in the New England, Middle Atlantic, East North Central, West North Central, South Atlantic, Mountain, and Pacific regions were more likely to purchase yogurt than households located in the West South Central region. The likelihood of these households purchasing yogurt was higher between 1.3 and 6.1 basis points. Households located in the East South Central region were less likely to purchase yogurt by 16 basis points compared to households located in the West South Central region.

Black/ African American households were less likely to purchase yogurt by 7.5 basis points compared to white households. Asian households were less likely to purchase yogurt by 5.2 basis points compared to white households. Other households were less likely to purchase yogurt by 2.5 basis points compared to white households.

Households with children in the categories of under 6, between the ages of 6 and 12, between the ages of 13 and 17, and children under 6 and between the ages of 6 and 12 were more likely to purchase yogurt than households without children by 2.8 and 7.3 basis points.

The older the household head, the less likely households were to purchase yogurt. Households where the household head was 40 years of age and older were less likely to purchase yogurt by 10.2 to 12.8 basis points relative to households less than 25 years of age.

Households with higher levels of education were more likely to purchase yogurt than households with lower levels of education.

V. 1. 2. Model 2 Greek Yogurt

The significant variables for households that purchased Greek yogurt included price of Greek yogurt, income, household size, region, race, and age and presence of children. Education and age of the household head did not play a statistically significant role in the decision to purchase Greek yogurt.

Households located in the New England region were more likely to purchase Greek yogurt by 2 basis points relative to households located in the West South Central region. Households in the Middle Atlantic region were more likely to purchase Greek yogurt by 1.8 basis points relative to households located in the West South Central region. Households in the South Atlantic region were more likely to purchase Greek yogurt by 1.2 basis points compared to households located in the West South Central region. Lastly, households located in the East North Central region were less likely to purchase Greek yogurt by 1.5 basis points relative to households located in the West South Central region.

Other households were more likely to purchase Greek yogurt by 1.6 basis points compared to white households.

Households with children under the age of 6 were less likely to purchase Greek yogurt by 7.3 basis points relative to households without children. Households with children between the ages of 6 and 12 were less likely to purchase Greek yogurt by 6.9 basis points. Households with children between the ages of 13 and 17 were less likely to purchase Greek yogurt by 2.6 basis points compared to households without children. Households with children under the age of 6 and between the ages of 6 and 12 were less likely to purchase Greek yogurt by 9.7 basis points relative to households without children. Households with

children between the ages of 6 and 12 and 13 and 17 were less likely to purchase Greek yogurt by 4.8 basis points compared to households without children.

V. 1. 3. Model 3 Non-Greek Yogurt

The significant variables for households that purchased non-Greek yogurt included price of non-Greek yogurt, income, household size, region, race, age and presence of children, and education of household head.

Households located in the New England region were less likely to purchase non-Greek yogurt by 6.2 basis points compared to households located in the West South Central region. Households located in the Middle Atlantic region were less likely to purchase non-Greek yogurt by 5.6 basis points relative to households located in the West South Central region. Households located in the South Atlantic region were less likely to purchase non-Greek yogurt by 2.4 basis points compared to households located in the West South Central region. Households located in the Mountain region and in the Pacific region were less likely to purchase non-Greek yogurt by 5.1 basis points and 3.7 basis points relative to households located in the West South Central region.

Black/ African American households were more likely to purchase non-Greek yogurt by 8 basis points relative to white households. Asian households were more likely to purchase non-Greek yogurt by 3.7 basis points compared to white households.

Households with children between the ages of 6 and 12 were more likely to purchase non-Greek yogurt by 2.8 basis points compared to households without children. Households with children under 6 and between the ages of 6 and 12 were more likely to purchase non-

Greek yogurt by 4.8 basis points compared to households without children. Households with children between the ages of 6 and 12 and between the ages of 13 and 17 were more likely to purchase non-Greek yogurt by 3.9 basis points compared to households without children. Households with children under 6 and between the ages of 6 and 12 and between the ages of 13 and 17 were more likely to purchase non-Greek yogurt by 6.4 basis points compared to households without children.

Households with lower levels of education were more likely to purchase non-Greek yogurt than households with higher levels of education. Older household heads were more likely to purchase non-Greek yogurt relative to younger household heads.

V. 1. 4. Model 4 Greek and Non-Greek Yogurt

The significant variables for households that purchased Greek and non-Greek yogurt included price of Greek yogurt, price of non-Greek yogurt, income, household size, region, race, age and presence of children as well as education and age of household head.

Households located in the New England region were more likely to purchase both Greek and non-Greek yogurt by 4.4 basis points compared to households located in the West South Central region. Households located in the Middle Atlantic and Mountain regions were more likely to purchase Greek and non-Greek yogurt by 5.0 and 5.2 basis points compared to households located in the West South Central region. Households located in the East North Central, South Atlantic, and Pacific regions were more likely to purchase Greek and non-Greek yogurt by 2.8, 2.5, and 2.7 basis points compared to households located in the West South Central region.

Black/ African American households were less likely to purchase both Greek and non-Greek yogurt by 9.2 basis points compared to white households. Asian households were less likely to purchase Greek and non-Greek yogurt by 2.9 basis points compared to white households. Other households were less likely to purchase both Greek and non-Greek yogurt by 2.1 basis points compared to white households.

Households with children under the age of 6 were more likely to purchase Greek and non-Greek yogurt by 6.7 basis points compared to households without children. Households with children between the ages of 6 and 12 were more likely to purchase Greek and non-Greek yogurt by 4.1 basis points compared to households without children. Households with children between the ages of 13 and 17 were more likely to purchase both Greek and non-Greek yogurt by 4.3 basis points compared to households without children.

Households with higher levels of education were more likely to purchase both Greek and non-Greek yogurt relative to households with lower levels of education.

Households heads with less than 25 years were more likely to purchase both Greek and non- Greek yogurt than any other age category.

V. 1. 5. Model 5 Chobani

The significant variables for households that purchased Chobani included price of Chobani, price of Dannon Greek yogurt, price of Stonyfield Greek yogurt, price of Stonyfield non-Greek yogurt, price of Yoplait Greek yogurt, price of Yoplait non-Greek, income, household size, region, race, education and age of the household head, and age and presence of children.

Households located in the New England region were more likely to purchase Chobani by 11.9 basis points compared to households located in the West South Central region. Households located in the Middle Atlantic region were more likely to purchase Chobani by 8.4 basis points compared to households located in the West South Central region. Households located in the South Atlantic region were more likely to purchase Chobani by 3.3 basis points compared to households located in the West Central region. Lastly, households located in the Mountain region were more likely to purchase Chobani by 4.4 basis points compared to households located in the West South Central region.

Black/ African American households were less likely to purchase Chobani by 7.2 basis points compared to white households.

Households with children under 6 were more likely to purchase Chobani by 2.9 basis points compared to households without children. Households with children under the age of 6 and between the ages of 6 and 12 were less likely to purchase Chobani by 3.9 basis points compared to households without children. Households with children between the ages of 6 and 12 and between the ages of 13 and 17 were less likely to purchase Chobani by 3.6 basis points compared to households without children.

The household head age groups 45 to 49, 50 to 54, 55 to 64, and 65 plus were significant determinants for the purchase of Chobani. These household heads between the ages of 45 and 65 plus were between 10.8 basis points and 16.9 basis points less likely to purchase Chobani than a household head under the age of 25.

Better-educated household heads were more likely to purchase Chobani than households with lower levels of education.

V. 1. 6. Model 6 Fage

The significant variables for households that purchased Fage included price of Chobani, price of Fage, price of Yoplait non-Greek yogurt, income, household size, region, race, and education, and age of household head. Age and presence of children was not a driver of the decision to purchase Fage.

Households located in the East North Central, West North Central, and East South Central regions were less likely to purchase Fage by 1.6, 2, and 4 basis points compared to households located in the West South Central region. Households located in the New England, Middle Atlantic, and Pacific regions were more likely to purchase Fage by 4.3, 4.3 and 3.7 basis points compared to households located in the West South Central region.

Black/ African American households were less likely to purchase Fage by 2.5 basis points compared to white households.

Better educated households were more likely to purchase Fage, and households with heads less than 25 years of age were more likely to purchase Fage.

V. 1. 7. Model 7 Dannon Greek

The significant variables for households that purchased Dannon Greek yogurt included price of Chobani, price of Dannon Greek yogurt, price of Dannon non-Greek yogurt, price of Stonyfield Greek yogurt, price of Stonyfield non-Greek yogurt, price of Yoplait Greek yogurt, price of Yoplait non-Greek yogurt, income, region, race, education and age of household head, and age and presence of children. Household size as well as

education of the household head were not factors in the decision to purchase Dannon Greek yogurt.

Households located in the New England region were more likely to purchase Dannon Greek yogurt by 6.2 basis points compared to households located in the West South Central region. Households located in the Middle Atlantic region were more likely to purchase Dannon Greek yogurt by 9.1 basis points compared to households located in the West South Central region. Households located in the South Atlantic region were more likely to purchase Dannon Greek yogurt by 4.8 basis points compared to households located in the West South Central region. Households located in the Pacific region were less likely to purchase Dannon Greek yogurt by 2 basis points compared to households located in the West South Central region.

Black/ African American households were less likely to purchase Dannon Greek yogurt by 6.2 basis points compared to white households. Asian households were less likely to purchase Dannon Greek yogurt by 8.3 basis points compared to white households. Other households were less likely to purchase Dannon Greek yogurt by 2.8 basis points compared to white households.

Households with children under the age of 6 were less likely to purchase Dannon Greek yogurt by 3.6 basis points compared to households without children. Households with children between the ages of 6 and 12 were less likely to purchase Dannon Greek yogurt by 2.7 basis points compared to households without children. Households with children under the age of 6 and between the ages of 6 and 12 were less likely to purchase Dannon Greek yogurt by 4.0 basis points compared to households without children. Households with children between the ages of 6 and 12 and between the ages of 13 and 17 were less likely to

purchase Dannon Greek yogurt by 4.4 basis points compared to households without children. Households with children under the age of 6 and between the ages of 6 and 12 and 13 and 17 were less likely to purchase Dannon Greek yogurt by 6.9 basis points compared to households without children.

Households whose heads were less than 25 years of age were more likely to purchase Dannon Greek yogurt.

V. 1. 8. Model 8 Dannon Non-Greek

The significant variables for households that purchased Dannon non-Greek yogurt included price of Dannon Greek yogurt, price of Dannon non-Greek yogurt, price of Yoplait Greek yogurt, price of Yoplait non-Greek yogurt, income, household size, region, race, age of the household head, and age and presence of children. Education of the household head was not a statistically significant factor in the decision to purchase Dannon non-Greek yogurt.

Households located in the New England, Middle Atlantic, East North Central and South Atlantic regions were more likely to purchase Dannon non-Greek yogurt by 6.8, 12.5, 2.8, and 7.2 basis points compared to households located in the West South Central region. Households located in the West North Central, Mountain, and Pacific regions were less likely to purchase Dannon non-Greek yogurt by 3.5, 5.4, and 4.1 basis points compared to households located in the West South Central region.

Black/ African American households were more likely to purchase Dannon non-Greek yogurt by 2.5 basis points compared to white households. Asian households were more likely to purchase Dannon non-Greek yogurt by 5.7 basis points compared to white households.

Households with children under 6 and between the ages of 13 and 17 were less likely to purchase Dannon non-Greek yogurt by 7.0 basis points compared to households without children. Households with children between the ages of 6 and 12 and 13 and 17 were less likely to purchase Dannon non-Greek yogurt by 3.8 basis points compared to households without children.

Elderly households were more likely to purchase Dannon non-Greek yogurt relative to non-elderly households.

V. 1. 9. Model 9 Stonyfield Greek

The significant variables for households that purchased Stonyfield Greek yogurt included price of Dannon Greek yogurt, price of Stonyfield Greek yogurt, price of Stonyfield non-Greek yogurt, price of Yoplait Greek yogurt, income, region, race, age and presence of children, and education. Age of the household head was not a driver in the decision to purchase Stonyfield Greek yogurt.

Households located in the New England, Middle Atlantic and South Atlantic regions were more likely to purchase Stonyfield Greek yogurt by 1.5, .7, and 1 basis points compared to households located in the West South Central region. Households located in the East North Central, West North Central, Mountain, and Pacific regions were less likely to purchase Stonyfield Greek yogurt by .7, 1, 1.1 and .6 basis points compared to households located in the West South Central region.

Black / African American households were less likely to purchase Stonyfield Greek yogurt by .7 basis points compared to white households.

Households with children under the age of 6 were more likely to purchase Stonyfield Greek yogurt by .8 basis points compared to households without children.

Better educated households were more likely to purchase Stonyfield Greek yogurt compared to households with lower levels of education.

V. 1. 10. Model 10 Stonyfield Non-Greek

The significant variables for the households that purchased Stonyfield non-Greek yogurt included price of Stonyfield Greek yogurt, price of Stonyfield non-Greek yogurt, price of Yoplait Greek yogurt, price of Yoplait non-Greek yogurt, income, region, race, education of the household head, and age and presence of children. Age of the household head was not influential statistically in the decision to purchase Stonyfield non-Greek yogurt.

Households located in the New England, Middle Atlantic, and South Atlantic regions were more likely to purchase Stonyfield non-Greek yogurt by .4, 1.8, and 2.5 basis points compared to households located in the West South Central region. Households located in the East North Central, West North Central, and East South Central regions were less likely to purchase Stonyfield non-Greek yogurt by 2.1, 2.2, and 2.5 basis points compared to households located in the West South Central region.

Black/ African American households were less likely to purchase Stonyfield non-Greek yogurt by 2.2 basis points compared to white households. Asian households were more likely to purchase Stonyfield non- Greek yogurt by 1.1 basis points compared to white households.

Households with children under the age of 6 were more likely to purchase Stonyfield non-Greek yogurt by 4.6 basis points compared to households without children. Households with children between the ages of 6 and 12 were more likely to purchase Stonyfield non-Greek yogurt by 1.8 basis points compared to households without children. Households with children under the age of 6 and between the ages of 6 and 12 were more likely to purchase Stonyfield non-Greek yogurt by 3.3 basis points compared to households without children. Households with children under the age of 6 and between the ages of 6 and 12 and 13 and 17 were more likely to purchase Stonyfield non-Greek yogurt by 2.1 basis points compared to households without children.

Households with lower levels of education were more likely to purchase Stonyfield non-Greek yogurt than households with higher levels of education.

V. 1. 11. Model 11 Yoplait Greek

The significant variables for households that purchased Yoplait Greek yogurt included price of Fage, price of Dannon non-Greek yogurt, price for Stonyfield Greek yogurt, price of Stonyfield non-Greek yogurt, price of Yoplait Greek yogurt, price of Yoplait non-Greek yogurt, income, region, race, age and presence of children, and age of the household head. Education of the household head was not a driver in the decision to purchase Yoplait Greek yogurt.

Households located in the New England region were more likely to purchase Yoplait Greek yogurt by 3.6 basis points compared to households located in the West South Central region. Households located in the East North Central region were more likely to purchase Yoplait Greek yogurt by 3.5 basis points compared to households located in the West South Central region. Households located in the West North Central were more likely to purchase Yoplait Greek yogurt by 2.7 basis points compared to households located in the West South Central region. Households located in the South Atlantic region were more likely to purchase Yoplait Greek yogurt by 3.3 basis points compared to households located in the West South Central region. Households located in the East South Central region were more likely to purchase Yoplait Greek yogurt by 5.3 basis points compared to households located in the West South Central region. Lastly, households located in the Pacific region were less likely to purchase Yoplait Greek yogurt by 5.0 basis points compared to households located in the West South Central region.

Black/ African American households were less likely to purchase Yoplait Greek yogurt by 5.1 basis points compared to white households. Asian households were less likely to purchase Yoplait Greek yogurt by 6.4 basis points compared to white households. Other households were less likely to purchase Yoplait Greek yogurt by 4.6 basis points compared to white households.

Households with children between the ages of 13 and 17 were more likely to purchase Yoplait Greek yogurt by 2.5 basis points compared to households without children.

Households with heads less than 25 years of age were more likely to purchase Yoplait Greek yogurt than households with heads older than 25 years of age.

V. 1. 12. Model 12 Yoplait Non-Greek

The significant variables for households that purchased Yoplait non-Greek yogurt included price of Chobani, price of Fage, price of Dannon non-Greek yogurt, price of Stonyfield Greek yogurt, price of Yoplait Greek yogurt, price of Yoplait non-Greek yogurt, income, household size, region, race, education of the household head, and age and presence of children. Age of the household head was not influential in the decision to purchase Yoplait non-Greek yogurt.

Households located in the Middle Atlantic region were less likely to purchase Yoplait non-Greek yogurt by 5.2 basis points compared to households located in the West South Central region. Households located in the East North Central region were more likely to purchase Yoplait non-Greek yogurt by 5.3 basis points compared to households located in the West South Central region. Households located in the West North Central region were more likely to purchase Yoplait non-Greek yogurt by 7.2 basis points compared to households located in the West South Central region. Households located in the South Atlantic region were less likely to purchase Yoplait non-Greek yogurt by 2.6 basis points compared to households located in the West South Central region. Households located in the East South Central region were more likely to purchase Yoplait non-Greek yogurt by 5.2 basis points compared to households located in the West South Central region.

Asian households were less likely to purchase Yoplait non-Greek yogurt by 5.1 basis points compared to white households. Other households were less likely to purchase Yoplait non-Greek yogurt by 3.1 basis points compared to white households.

Households where the household head had some high school education was more likely to purchase Yoplait non-Greek yogurt by 19.9 basis points compared to households with the household head having less than a high school education. Households where the household head graduated high school was more likely to purchase Yoplait non-Greek yogurt by 20.5 basis points compared to households with less than a high school education. Households where the head has some college was more likely to purchase Yoplait non-Greek yogurt by 16.9 basis points compared to households with household head having less than a high school education. Households where the head is a college graduate was more likely to purchase Yoplait non-Greek yogurt by 13.7 basis points compared to households where the head has less than a high school education.

Households with children under the age of 6 were more likely to purchase Yoplait non-Greek yogurt by 20.9 basis points compared to households without children. Households with children between the ages of 6 and 12 were more likely to purchase Yoplait non-Greek yogurt by 27.1 basis points compared to households without children. Households with children between the ages of 13 and 17 were more likely to purchase Yoplait non-Greek yogurt by 9.2 basis points compared to households without children. Households with children under the age of 6 and between the ages of 6 and 12 were more likely to purchase Yoplait non-Greek yogurt by 33.1 points compared to households without children. Households with children under the age of 6 and between the ages of 13 and 17 were more likely to purchase Yoplait non-Greek yogurt by 27 basis points compared to households without children. Households with children between the ages of 6 and 12 and 13 and 17 were more likely to purchase Yoplait non-Greek yogurt by 19.0 basis points compared to households without children. Households under the age of 6 and between the

ages of 6 and 12 and 13 and 17 were more likely to purchase Yoplait non-Greek yogurt by 22.6 basis points compared to households without children.

Table 11. Marginal Effects Associated with the Probit Models for All Yogurt, Including Greek and Non-Greek

			Non-Greek	Greek & Non-
	All Yogurt	Greek Only	Only	Greek
Price of All Yogurt	-0.2274	-	-	-
Price of Greek Only	-	-0.8605	-	-
Price of non-Greek Only	-	-	-0.7781	-
Price of Greek with non-Greek	-	-	-	-1.4313
Price of non-Greek with Greek	-	-	-	-0.7157
Household income	0.0326	-0.0221	0.0054	0.0092
Household size	0.0000	0.0000	0.0000	0.0000
New England	0.0611	0.0202	-0.0621	0.0440
Middle Atlantic	0.0345	0.0184	-0.0562	0.0502
East North Central	0.0307	-0.0151	-0.0128	0.0285
West North Central	0.0144	-0.0046	0.0132	-0.0133
South Atlantic	0.0134	0.0123	-0.0236	0.0249
East South Central	-0.0156	-0.0069	0.0106	-0.0026
Mountain	0.0342	-0.0075	-0.0511	0.0518
Pacific	0.0175	0.0081	-0.0368	0.0268
Black/ African American	-0.0748	0.0082	0.0798	-0.0921
Asian	-0.0525	-0.0069	0.0372	-0.0293
Other	-0.0249	0.0162	0.0037	-0.0211
Education some high school	-0.0341	-0.0589	0.1091	-0.0436
Education high school grad	-0.0018	-0.0621	0.0908	-0.0140
Education some college	0.0265	-0.0562	0.0563	0.0130
Education college grad	0.0365	-0.0530	0.0263	0.0390
Education post college	0.0466	-0.0514	-0.0043	0.0628
Children < 6 years	0.0730	-0.0731	0.0058	0.0669
Children 6- 12 years	0.0618	-0.0687	0.0276	0.0407
Children 13- 17 years	0.0283	-0.0258	-0.0094	0.0435
Children < 6 & 6-12 years	0.0595	-0.0971	0.0481	0.0196
Children < 6 & 13-17 years	0.0395	-0.0530	0.0530	-0.0053
Children 6-12 & 13-17 years	0.0197	-0.0478	0.0394	0.0043
Children < 6 & 6-12 & 13-17 years	-0.0093	-0.0063	0.0641	-0.0528
Age of Household Head 25-29 years	-0.0388	-0.0057	0.0123	-0.0029
Age of Household Head 30-34 years	-0.0532	0.0003	0.0431	-0.0386
Age of Household Head 35-39 years	-0.0807	0.0034	0.0284	-0.0228
Age of Household Head 40-44 years	-0.1022	-0.0049	0.0352	-0.0257
Age of Household Head 45-49 years	-0.1143	0.0002	0.0623	-0.0560
Age of Household Head 50-54 years	-0.1171	-0.0050	0.0526	-0.0417
Age of Household Head 55-64 years	-0.1193	-0.0053	0.0591	-0.0541
Age of Household Head 65+ years	-0.1278	-0.0114	0.0808	-0.0686

Note: numbers in bold are significant at p-value 0.05

Table 12. Marginal Effects Associated with the Probit Models for Brands

				Dannon	Stonyfield	Stonyfield		Yoplait
Variable	Chobani	Fage	Dannon Greek	Non-Greek	Greek	Non-Greek	Yoplait Greek	Non-Greek
Price of Chobani	-0.7007	-0.0273	-0.1277	0.0147	-0.0086	-0.0088	-0.0338	0.0933
Price of Fage	-0.0134	-0.4111	0.0370	0.0132	0.0055	-0.0182	0.1270	0.2516
Price of Dannon Greek	-0.1130	0.0152	-1.4280	-0.2518	-0.0124	-0.0108	0.0244	0.0484
Price of Dannon Non-Greek	-0.0146	0.0122	-0.0354	-0.4123	0.0028	-0.0078	-0.0494	-0.1062
Price of Stonyfield Greek	-0.3071	-0.0396	-0.2411	-0.0265	-0.1070	-0.0729	-0.2514	-0.0470
Price of Stonyfield Non-Greek	0.0697	0.0173	0.0906	-0.0223	-0.0170	-0.1589	0.1829	0.1643
Price of Yoplait Greek	-0.2275	0.0115	-0.1755	-0.0790	-0.0115	-0.0225	-0.6727	-0.0693
Price of Yoplait Non-Greek	0.1253	0.0654	0.1421	-0.0320	-0.0012	0.0367	0.0647	-0.8360
Log Household Income	0.0487	0.0309	0.0417	0.0120	0.0047	0.0111	0.0216	-0.0107
Household Size	-0.0057	-0.0123	-0.0030	0.0150	-0.0003	-0.0005	0.0014	0.0458
New England	0.1194	0.0429	0.0619	0.0678	0.0150	0.0441	0.0356	-0.0164
Middle Atlantic	0.0842	0.0433	0.0910	0.1250	0.0072	0.0179	0.0033	-0.0518
East North Central	0.0034	-0.0163	0.0148	0.0278	-0.0073	-0.0209	0.0353	0.0526
West North Central	-0.0116	-0.0204	-0.0055	-0.0352	-0.0095	-0.0218	0.0267	0.0715
South Atlantic	0.0334	0.0017	0.0477	0.0721	0.0099	0.0247	0.0326	-0.0264
East South Central	-0.0190	-0.0400	-0.0116	0.0078	-0.0012	-0.0250	0.0533	0.0521
Mountain	0.0443	-0.0046	-0.0015	-0.0537	-0.0107	0.0012	0.0166	-0.0134
Pacific	-0.0120	0.0367	-0.0198	-0.0411	-0.0055	-0.0067	-0.0495	0.0037
Black/ Africa American	-0.0722	-0.0249	-0.0620	0.0245	-0.0065	-0.0219	-0.0515	0.0048
Asian	-0.0153	-0.0085	-0.0831	0.0569	-0.0004	0.0109	-0.0638	-0.0506
Other	-0.0141	0.0114	-0.0279	0.0120	-0.0047	0.0010	-0.0455	-0.0311
Education Some High School	-0.0404	-0.0073	-0.0638	0.0368	-0.0045	0.0208	-0.0168	0.1991
Education High School Grad	-0.0113	-0.0161	-0.0475	0.0000	-0.0074	0.0188	0.0172	0.2054
Education Some College	0.0228	0.0091	-0.0227	-0.0011	-0.0037	0.0341	0.0112	0.1694
Education College Grad	0.0573	0.0248	-0.0174	-0.0072	0.0006	0.0476	0.0243	0.1367
Education Post College	0.0897	0.0546	-0.0035	-0.0131	0.0051	0.0577	0.0165	0.0970
Children < 6 years	0.0292	-0.0006	-0.0361	-0.0039	0.0079	0.0462	-0.0105	0.2085
Children 6- 12 years	-0.0048	-0.0120	-0.0268	-0.0096	-0.0023	0.0184	0.0045	0.2708
Children 13- 17 years	0.0061	-0.0047	0.0090	-0.0037	-0.0048	-0.0075	0.0251	0.0921
Children < 6 & 6-12 years	-0.0386	-0.0134	-0.0399	0.0170	0.0001	0.0334	-0.0246	0.3314
Children < 6 & 13-17 years	-0.0136	-0.0018	-0.0284	-0.0699	-0.0217	0.0031	-0.0050	0.2694
Children 6-12 & 13-17 years	-0.0360	0.0051	-0.0441	-0.0384	-0.0055	0.0025	-0.0116	0.1899
Children < 6 & 6-12 & 13-17 years	-0.0372	-0.0374	-0.0695	-0.0466	-0.0024	0.0214	-0.0238	0.2257
Age of Household Head 25-29 years	-0.0410	-0.0298	-0.0675	-0.0787	0.0236	0.0146	-0.0253	-0.0647
Age of Household Head 30-34 years	-0.0892	-0.0174	-0.0784	-0.0666	0.0232	0.0236	-0.0633	-0.0534
Age of Household Head 35-39 years	-0.0704	-0.0175	-0.0772	-0.0611	0.0184	0.0268	-0.0492	-0.0445
Age of Household Head 40-44 years	-0.0897	-0.0199	-0.0696	-0.0672	0.0206	0.0249	-0.0415	-0.0394
Age of Household Head 45-49 years	-0.1080	-0.0344	-0.0579	-0.0513	0.0215	0.0116	-0.0653	-0.0358
Age of Household Head 50-54 years	-0.1156	-0.0386	-0.0342	-0.0305	0.0200	0.0086	-0.0283	-0.0484
Age of Household Head 55-64 years	-0.1312	-0.0380	-0.0426	-0.0265	0.0188	0.0078	-0.0415	-0.0421
Age of Household Head 65+ years	-0.1692	-0.0410	-0.0466	0.0155	0.0159	0.0006	-0.0655	-0.0479

V. 2. Classification of Probabilities Based on Expectation-Prediction Success Tables

Market penetration values for each of the dependent variables were used as cut-off values for the expectation-prediction success tables. The empirical results associated with the twelve probit models are summarized as follows.

V. 2.1. All Yogurt

The market penetration for yogurt for the households studied is 82.14%. Overall, this model correctly predicts 57.97% of the choices for the purchase of yogurt. The model correctly predicts 55.73% of the choices to purchase yogurt, the sensitivity value. The model correctly predicts 68.30% of the choices to not purchase yogurt, the specificity value.

V. 2. 2. Greek Yogurt

The market penetration for Greek yogurt is 11.78%. Overall, this model correctly predicts 48.87% of the choices for the purchase of Greek yogurt. The model correctly predicts 67.06% of the choices to purchase Greek yogurt, the sensitivity value. The model correctly predicts 46.44% of the choices to not purchase Greek yogurt, the specificity value.

V. 2. 3. Non-Greek Yogurt

The market penetration for non-Greek yogurt is 31.56%. Overall, this model correctly predicts 57.40% of the choices for the purchase of non-Greek yogurt. The model correctly predicts 58.83% of the choices to purchase non-Greek yogurt, the sensitivity value. The model correctly predicts 56.73% of the choices to not purchase non-Greek yogurt, the specificity value.

V. 2. 4. Greek and Non-Greek Yogurt

The market penetration for both Greek and non-Greek is 55.37%. Overall, this model predicts over half of the variables, 57.31% of the choices for the purchase of both Greek and non-Greek yogurt. The model correctly predicts 56.83% of the choices to purchase both Greek and non-Greek yogurt, the sensitivity value. The model correctly predicts 57.92% of the choices to not purchase Greek and non-Greek yogurt, the specificity value.

V. 2. 5. Chobani

The market penetration for Chobani is 36.58%. Overall, the model correctly predicts 60.44% of the choices to purchase Chobani. The model correctly predicts 59.38% of the choices to purchase Chobani, the value for sensitivity. The model correctly predicts 61.04% of the choices to not purchase Chobani, the value for specificity.

V. 2. 6. Fage

The market penetration for Fage of 10.16% is low compared to Chobani, the market leader. Overall, this model correctly predicts 62.18% of the choices to purchase Fage. The model correctly predicts 60.61% of the choices to purchase Fage, the sensitivity value. The model correctly predicts 62.35% of the choices to not purchase Fage, the specificity value.

V. 2. 7. Dannon Greek

The market penetration for Dannon Greek yogurt is 31.50%. Overall, this model correctly predicts 59.10% of the choices to purchase Dannon Greek yogurt. The model correctly predicts 48.72% of the choices to purchase Dannon Greek yogurt, the sensitivity value. The model correctly predicts 63.88% of the choices not to purchase Dannon Greek yogurt, the specificity value.

V. 2. 8. Dannon Non-Greek

The market penetration for Dannon non-Greek yogurt is 27.91%. Overall, this model correctly predicts 60.28% of the choices to purchase Dannon non-Greek yogurt. The model correctly predicts 61.85% of the choices to purchase Dannon non-Greek yogurt, the sensitivity value. The model correctly predicts 59.76% of the choices to not purchase Dannon non-Greek yogurt.

V. 2. 9. Stonyfield Greek

Stonyfield Greek yogurt has the lowest market penetration of 1.94%. Overall, this model correctly predicts 61.03% of the purchases for Stonyfield Greek yogurt. This model correctly predicts 59.71% of the choices to purchase Stonyfield Greek yogurt, the sensitivity value. The model correctly predicts 61.05% of the choices not to purchase Stonyfield Greek yogurt, the specificity value.

V. 2. 10. Stonyfield Non-Greek

Stonyfield non-Greek yogurt also has a low market penetration value of 5.53%. Overall, the model correctly predicts 68.69% of the choices to purchase Stonyfield non-Greek yogurt. The model correctly predicts 67.36%. of the choices to purchase Stonyfield non-Greek yogurt, the sensitivity value. The model correctly predicts 68.76% of the choices not to purchase Stonyfield non-Greek yogurt, the specificity value.

V. 2. 11. Yoplait Greek

The market penetration for Yoplait Greek yogurt is 26.48%. Overall, this model correctly predicts 59.83% of the choices to purchase Yoplait Greek yogurt. The model correctly predicts 61.34% of the choices to purchase Yoplait Greek yogurt, the sensitivity value. The model correctly predicts 59.29% of the choices not to purchase Yoplait Greek yogurt, the specificity value.

V. 2. 12. Yoplait Non-Greek

The market penetration for Yoplait non-Greek yogurt is 49.36%. Overall, this model correctly predicts 69.40% of the choices to purchase Yoplait non-Greek yogurt. The model correctly predicts 63.43% of the purchases for Yoplait non-Greek yogurt, the sensitivity value. The model correctly predicts 75.21% of the choices not to purchase Yoplait non-Greek yogurt, the specificity value.

The overall ability of the respective models to correctly classify outcomes along with their sensitivity and specificity values is summarized in Table 13. The success of the respective models to classify decisions ranged from 0.4887 (Greek only) to 0.6940 (Yoplait non-Greek).

Table 13. Sensitivity and Specificity Values

Variables	Overall	Sensitivity	Specificity
All Yogurt	57.97%	55.73%	68.30%
Greek Only	48.87%	67.06%	46.44%
Non-Greek Only	57.40%	58.83%	56.73%
Greek + Non-Greek	57.31%	56.83%	57.92%
Chobani	60.44%	59.38%	61.04%
Fage	62.18%	60.61%	62.35%
Dannon Greek	59.10%	48.72%	63.88%
Dannon Non-Greek	60.28%	61.85%	59.67%
Stonyfield Greek	61.03%	59.71%	61.05%
Stonyfield Non-Greek	68.69%	67.36%	68.76%
Yoplait Greek	59.83%	61.34%	59.29%
Yoplait Non-Greek	69.40%	63.43%	75.21%

V. 3. Classification of Probabilities Based on Resolution Graphs

Resolution graphs were subsequently generated for probabilities resulted from each model. Resolution is a metric of goodness of sorting power (Dharmasena, Bessler, Capps, 2016). The resolution graphs, shown in Figures 2 through 13, represent the ability of the model to sort the brands into purchase and non-purchase. An intercept of 0 and slope of 1 are desired, which constitutes perfect sorting. A 45-degree, upward sloping line is associated with perfect sorting. Table 14 displays the intercept and slope values for each resolution graph.

Overall, all resolution graphs for the respective models are upward sloping. That said, however, perfect sorting was not evident based on the results of the joint F-tests exhibited in Table 15.

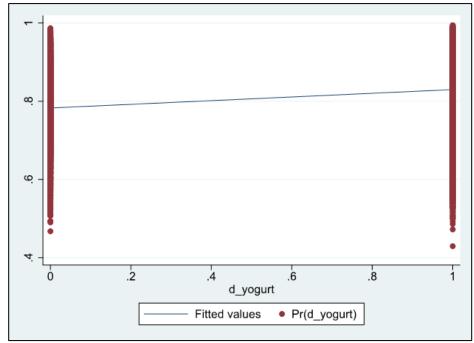


Figure 2. Resolution Graph for All Yogurt

Figure 3. Resolution Graph for Greek Yogurt

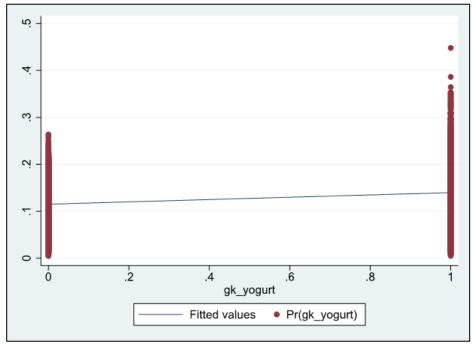


Figure 4. Resolution Graph for Non-Greek Yogurt

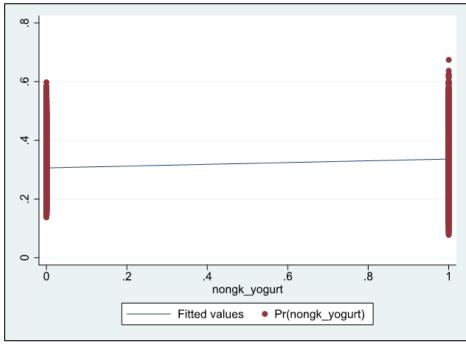


Figure 5. Resolution Graph for Greek Yogurt + Non-Greek Yogurt

Fitted values

nongkgk_q

6.

Pr(nongkgk_q)

8.

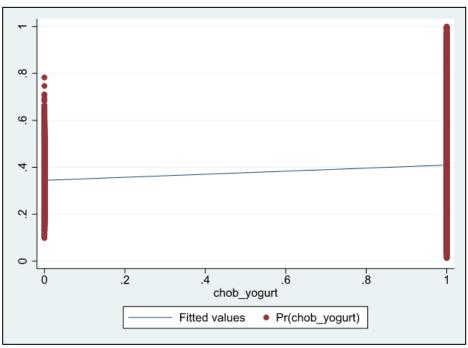


Figure 6. Resolution Graph for Chobani

.2

Figure 7. Resolution Graph for Fage

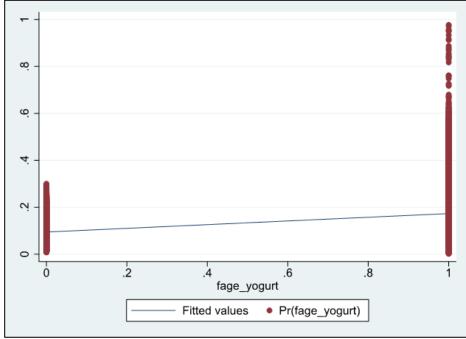


Figure 8. Resolution Graph for Dannon Greek Yogurt

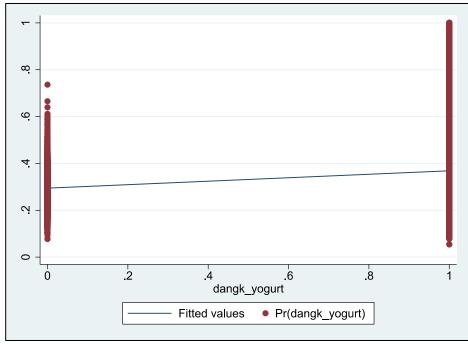


Figure 9. Resolution Graph for Dannon Non-Greek Yogurt

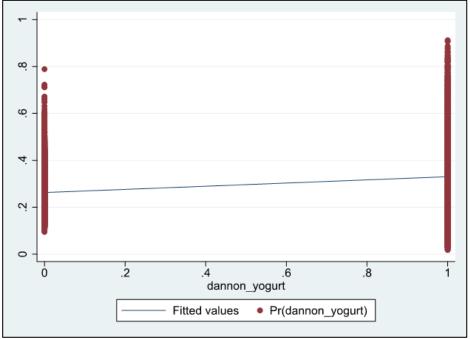


Figure 10. Resolution Graph for Stonyfield Greek Yogurt

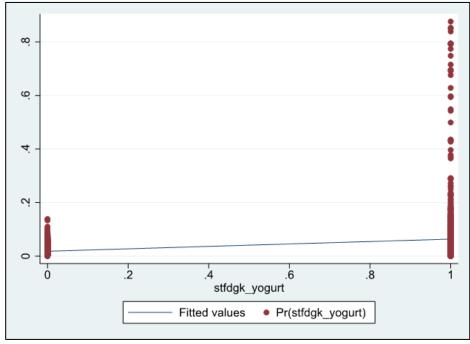


Figure 11. Resolution Graph for Stonyfield Non-Greek Yogurt

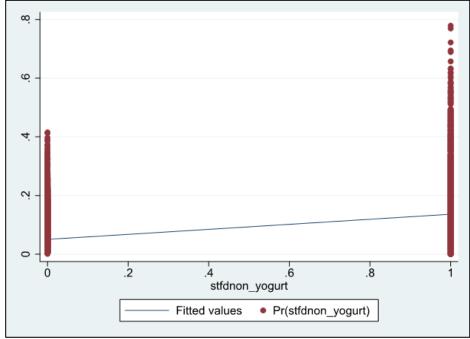
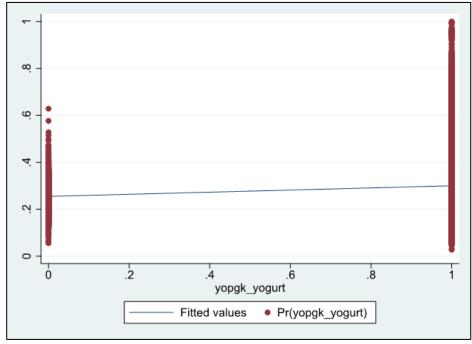


Figure 12. Resolution Graph for Yoplait Greek Yogurt



8. - 4. - 6. .8 1 yopnon_yogurt — Fitted values • Pr(yopnon_yogurt)

Figure 13. Resolution Graph for Yoplait Non-Greek Yogurt

Table 14. Regression of Forecast Probabilities on Outcome Indices for the Respective Probit Models

	T 4	CI
	Intercept	Slope
All Yogurt	0.7827	0.0471
Greek Only	0.1150	0.0247
Non-Greek Only	0.3062	0.0302
Greek + Non-Greek	0.5384	0.0289
Chobani	0.3445	0.0651
Fage	0.0944	0.0788
Dannon Greek	0.2945	0.0740
Dannon Non-Greek	0.2626	0.0676
Stonyfield Greek	0.0184	0.0455
Stonyfield Non-Greek	0.0505	0.0857
Yoplait Greek	0.2547	0.0454
Yoplait Non-Greek	0.4393	0.1156

Table 15. F Tests and p-Values Associated with the Resolution of the Respective Probit Models

	F Test: Intercept = 0; Slope = 1
All Voquet	F(2, 60,832) = 6.2e+05
All Yogurt	Prob > $F = 0.0000$
Cuash Only	F(2, 50,438) = 1.3e+06
Greek Only	Prob > $F = 0.0000$
Non Casalt Only	F(2, 50,334) = 8.4e+05
Non-Greek Only	Prob > F = 0.0000
Corela Non Corela	F(2, 49,467) = 8.1e+05
Greek + Non-Greek	Prob > $F = 0.0000$
Chobani	F(2, 46,363) = 3.9e+05
Chobani	Prob > $F = 0.0000$
Eage	F(2, 46,363) = 4.9e+05
Fage	Prob > $F = 0.0000$
Dannon Greek	F(2, 46,363) = 3.3e+05
Dannon Greek	Prob > $F = 0.0000$
Dannon Non-Greek	F(2, 46,363) = 4.3e+05
Daniion Non-Greek	Prob > $F = 0.0000$
Stonyfield Greek	F(2, 46,363) = 1.1e+06
Stollyfield Greek	Prob > $F = 0.0000$
Stonyfield Non-Greek	F(2, 46,363) = 4.4e+05
Stollyfield Noil-Greek	Prob > $F = 0.0000$
Vonlait Greek	F(2, 46363) = 7.0e + 05
Yoplait Greek	Prob > $F = 0.0000$
Yoplait Non-Greek	F(2, 46363) = 1.9e+05
1 opiait Noil-Oleek	Prob > $F = 0.0000$

CHAPTER VI

CONCLUDING REMARKS AND IMPLICATIONS

With the increase in health awareness among Americans comes an increase in demand for healthy food choices. One such choice concerns the purchase of non-Greek and/ or Greek yogurt. This study provided an in-depth analysis of the yogurt industry and the economic and socio-demographic factors associated with the purchase of non-Greek and Greek yogurt with and without reference to brands. To achieve these objectives, a dichotomous choice model, the probit model was used. The Nielsen Homescan Panel for calendar year 2015 was the data source for this analysis.

This study consisted of twelve probit models, comprising of brand specific (Chobani, Fage, Dannon, Stonyfield, and Yoplait) and non-specific (all yogurt, Greek yogurt only, non-Greek yogurt, Greek + non-Greek yogurt).

Income had an effect on every profile for the purchase of any type of yogurt. Price of all yogurt, region, race, age and presence of children, and age of household head were all significant factors for households that purchased all yogurt. Price of Greek yogurt, region, race, and age and presence of children were all significant factors for households that purchased Greek yogurt only. Price of non-Greek yogurt, region, race, age and presence of children were all significant factors for households that purchased non-Greek yogurt only. Price of Greek and non-Greek yogurt, region, race, and age and presence of children were significant factors for households that purchased Greek and non-Greek yogurt.

Price of Chobani, price of Dannon Greek, price of Stonyfield Greek, price of Stonyfield non-Greek, price of Yoplait Greek, price of Yoplait non-Greek, region, race, age

and presence of children, and age of household head were all significant factors for households that purchased Chobani. Price of Chobani, price of Fage, region and race were significant factors for households that purchased Fage. Price of Chobani, price of Dannon Greek, price of Dannon non-Greek, price of Stonyfield Greek, price of Stonyfield non-Greek, price of Yoplait Greek, price of Yoplait non-Greek, region, race, and age and presence of children were all significant factors for households that purchased Dannon Greek yogurt. Price of Dannon Greek, price of Dannon non-Greek, price of Yoplait Greek, price of Yoplait non-Greek, income, region, race, age and presence of children were all significant factors for households that purchased Dannon non-Greek. Price of Dannon Greek, price of Stonyfield Greek, price of non-Greek, price of Yoplait Greek, income, size, region, race, age and presence of children were all significant factors for households that purchased Stonyfield Greek. Price of Stonyfield Greek, price of Stonyfield non-Greek, price of Yoplait Greek, price of Yoplait non-Greek, income, region, race, age and presence of children were all significant factors for Stonyfield non-Greek. Price of Fage, price of Dannon non-Greek, price of Stonyfield Greek, price of Stonyfield non-Greek, price of Yoplait Greek, price of Yoplait non-Greek, income, region, race, age and presence of child were all significant factors for households that purchased Yoplait Greek. Price of Chobani, price of Fage, price of Dannon non-Greek, price of Stonyfield Greek, price of Stonyfield non-Greek, price of Yoplait Greek, price of Yoplait non-Greek, income, size, region, race, education, age and presence of children were all significant factors for households that purchased Yoplait non-Greek.

Overall, each of the twelve models showed reasonable goodness-of-fit measures, based on the McFadden's \mathbb{R}^2 metric and expectation prediction-success tables. The models

provided some degree of goodness of sorting though not perfect sorting. Although the resolution graphs were relatively flat compared to the 45-degree line of perfect sorting, all resolution graphs were upward sloping, hence some degree of sorting. However, for all models the joint null hypothesis that the slope was equal to 1 and the intercept was equal to 0 (condition for perfect sorting) was rejected.

By better understanding profiles of purchasers for yogurt and/ or Greek yogurt, manufacturers and retailers have the opportunity to identify current purchasers of yogurt/ Greek yogurt, so as to entice these households to purchase more. This study also allows manufacturers and retailers the opportunity to reach households not yet purchasing yogurt/ Greek yogurt.

Further research could include examination of purchases / non-purchases of drinkable yogurt. As well, additional factors such as ethnicity and the impact of advertising merit consideration. Out-of-sample validation of prediction-success also warrants attention. Finally, next steps should include the use of Tobit models or Heckman sample selection models to discern conditional and unconditional drivers of the quantities purchased, along with their associated conditional and unconditional marginal effects and demand elasticities.

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APPENDIX

Appendix Table 1. Price Imputation Regression Results

	All Yogurt				Greek Yogurt				Non-Greek Yogurt			
Variable	Parameter Estimate	Standard Error	t Value	Pr > t	Parameter Estimate	Standard Error	t Value	Pr > t	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	0.1328	0.0012	113.2800	<.0001	0.1885	0.0046	40.7700	<.0001	0.1020	0.0021	47.9500	<.0001
income	0.0000	0.0000	21.5600	<.0001	-0.0000	0.0000	-0.1000	0.9226	0.0000	0.0000	4.7200	<.0001
household_size	-0.0043	0.0002	-19.1400	<.0001	-0.0010	0.0011	-0.8900	0.3716	-0.0014	0.0004	-3.2600	0.0011
NewEng	0.0084	0.0016	5.3100	<.0001	0.0007	0.0059	0.1200	0.9046	0.0033	0.0031	1.0600	0.2884
MidAtl	0.0096	0.0012	7.9700	<.0001	0.0069	0.0046	1.4900	0.1367	0.0061	0.0023	2.6400	0.0083
EaNCen	-0.0016	0.0011	-1.3700	0.1699	0.0004	0.0046	0.0900	0.9280	-0.0004	0.0021	-0.1800	0.8599
WeNCen	-0.0027	0.0014	-1.9900	0.0464	0.0000	0.0054	-0.0100	0.9957	-0.0024	0.0025	-0.9700	0.3335
SouAtl	0.0054	0.0011	4.8700	<.0001	0.0051	0.0043	1.1800	0.2392	0.0042	0.0021	2.0600	0.0398
EaSCen	-0.0020	0.0015	-1.3000	0.1926	-0.0008	0.0061	-0.1300	0.8973	0.0017	0.0027	0.6400	0.5245
Mount	-0.0008	0.0014	-0.5400	0.5887	0.0017	0.0056	0.3100	0.7591	0.0004	0.0027	0.1300	0.8950
Pacif	0.0059	0.0012	4.7600	<.0001	0.0031	0.0047	0.6500	0.5182	0.0127	0.0023	5.4600	<.0001
R^2	0.0184				0.001				0.0057			

Appendix Table 1. Continued

	Chobani				Fage				Dannon Greek			
	Parameter	Standard			Parameter	Standard			Parameter	Standard		
Variable	Estimate	Error	t Value	Pr > t	Estimate	Error	t Value	Pr > t	Estimate	Error	t Value	Pr > t
Intercept	0.2061	0.0028	74.9900	<.0001	0.2103	0.0034	62.2800	<.0001	0.1789	0.0012	153.9200	<.0001
income	-0.0000	0.0000	-1.6800	0.0934	-0.0000	0.0000	0.0400	0.9664	-0.0000	0.0000	-1.0100	0.3126
household_size	-0.0004	0.0005	-0.8200	0.4096	-0.0010	0.0006	-1.6200	0.1051	-0.0006	0.0002	-2.8200	0.0048
NewEng	-0.0030	0.0034	-0.9000	0.3692	0.0131	0.0041	3.2000	0.0014	0.0007	0.0015	0.4800	0.6277
MidAtl	-0.0015	0.0027	-0.5400	0.5890	0.0232	0.0033	7.0800	<.0001	0.0092	0.0011	8.0700	<.0001
EaNCen	-0.0039	0.0026	-1.4800	0.1400	-0.0076	0.0032	-2.3600	0.0184	0.0018	0.0011	1.6700	0.0949
WeNCen	-0.0044	0.0032	-1.3800	0.1666	-0.0092	0.0039	-2.3500	0.0189	0.0019	0.0013	1.4200	0.1555
SouAtl	-0.0017	0.0026	-0.6800	0.4954	0.0015	0.0031	0.4800	0.6335	0.0073	0.0011	6.7900	<.0001
EaSCen	-0.0046	0.0035	-1.3100	0.1912	-0.0121	0.0047	-2.6000	0.0094	0.0021	0.0015	1.3900	0.1655
Mount	0.0002	0.0031	0.0700	0.9446	-0.0149	0.0037	-4.0400	<.0001	-0.0002	0.0014	-0.1500	0.8813
Pacif	0.0037	0.0028	1.3100	0.1892	-0.0025	0.0032	-0.8000	0.4225	-0.0013	0.0012	-1.1100	0.2660
R^2	0.0009				0.0383				0.0111			_

		Stonyfield	Greek	Yoplait Greek				
Variable	Parameter Estimate	Standard Error	t Value	Pr > t	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	0.2496	0.0091	27.4100	<.0001	0.2031	0.0021	96.4000	<.0001
income	0.0000	0.0000	0.8400	0.4030	-0.0000	0.0000	-2.6600	0.0079
household_size	0.0005	0.0018	0.2800	0.7831	0.0000	0.0004	0.0300	0.9767
NewEng	0.0250	0.0099	2.5200	0.0119	0.0046	0.0028	1.6600	0.0966
MidAtl	0.0193	0.0086	2.2400	0.0250	0.0032	0.0021	1.5200	0.1280
EaNCen	-0.0161	0.0084	-1.9100	0.0562	0.0037	0.0020	1.8900	0.0593
WeNCen	0.0196	0.0133	1.4800	0.1396	-0.0055	0.0023	-2.3500	0.0189
SouAtl	0.0140	0.0080	1.7400	0.0818	0.0071	0.0020	3.6400	0.0003
EaSCen	-0.0034	0.0113	-0.3000	0.7633	0.0027	0.0026	1.0500	0.2931
Mount	-0.0062	0.0127	-0.4900	0.6247	0.0044	0.0024	1.8200	0.0690
Pacif	0.0026	0.0095	0.2700	0.7837	-0.0091	0.0022	-4.1700	<.0001
R^2	0.0375		-	·	0.0079	_		

Appendix Table 1. Continued

		Dannon No	n-Greek	Stonyfield Non-Greek				Yoplait Non-Greek				
	Parameter	Standard			Parameter	Standard			Parameter	Standard		
Variable	Estimate	Error	t Value	Pr > t	Estimate	Error	t Value	Pr > t	Estimate	Error	t Value	Pr > t
Intercept	0.1286	0.0019	69.5100	<.0001	0.1767	0.0056	31.7200	<.0001	0.0955	0.0006	148.5400	<.0001
income	-0.0000	0.0000	-2.2200	0.0267	0.0000	0.0000	2.3800	0.0174	0.0000	0.0000	0.5400	0.5865
household_size	-0.0011	0.0003	-3.2200	0.0013	0.0005	0.0009	0.5500	0.5790	0.0014	0.0001	12.2400	<.0001
NewEng	-0.0140	0.0022	-6.2600	<.0001	-0.0212	0.0055	-3.8300	0.0001	0.0094	0.0009	10.3700	<.0001
MidAtl	-0.0103	0.0018	-5.8600	<.0001	-0.0127	0.0052	-2.4700	0.0135	0.0141	0.0007	20.4700	<.0001
EaNCen	-0.0122	0.0018	-6.9600	<.0001	-0.0246	0.0053	-4.6800	<.0001	0.0013	0.0006	2.0500	0.0400
WeNCen	0.0015	0.0023	0.6400	0.5227	-0.0113	0.0072	-1.5700	0.1174	0.0014	0.0007	1.8700	0.0609
SouAtl	-0.0057	0.0017	-3.2900	0.0010	0.0008	0.0049	0.1700	0.8659	0.0066	0.0006	10.6400	<.0001
EaSCen	-0.0027	0.0024	-1.1100	0.2663	-0.0167	0.0075	-2.2300	0.0260	0.0017	0.0008	2.1600	0.0305
Mount	-0.0071	0.0024	-3.0100	0.0026	0.0123	0.0069	1.7900	0.0738	-0.0061	0.0007	-8.1900	<.0001
Pacif	0.0023	0.0021	1.1200	0.2647	0.0090	0.0060	1.5000	0.1337	0.0006	0.0007	0.8800	0.3787
R^2	0.0117				0.0337				0.0459			