

**A CASE STUDY OF FOOD SAFETY CULTURE WITHIN A RETAILER
CORPORATE CULTURE**

A Dissertation

by

RODRIGO SANTIBANEZ-RIVERA

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

DOCTOR OF PHILOSOPHY

December 2009

Major Subject: Agricultural Leadership, Education, and Communications

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Approved by:

Chair of Committee,	Kim E. Dooley
Committee Members,	Theresa P. Murphrey
	James R. Lindner
	John R. Giardino
Head of the Department,	John F. Elliot

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ABSTRACT

A Case Study of Food Safety Culture within a Retailer Corporate Culture.

(December 2009)

Rodrigo Santibanez-Rivera, B.S., National Autonomous University of Mexico

Chair of Advisory Committee: Dr. Kim E. Dooley

The retail business has been negatively affected due to the increasing customer concerns about food safety and the recent events related to microbiological and chemical contamination of food products, such as the melamine in infant formula and the multiple cases of produce pathogen contamination. It has been shown that a scientific-based food safety system, such as, Hazard Analysis and Critical Control Points (HACCP), help reduce the likelihood of food safety incidents. Nevertheless, companies with these kinds of systems have too experienced public food safety issues.

Food safety professionals have created instruments to measure food safety based on lagging indicators, such as pathogen presence or food safety incident reduction. Though, they have not created metrics based on leading indicators to measure the behavior driven by the culture of employees who handle the food. The employees who handle food are influenced by cultural values and behave in a company based on the company's cultural influence; hence, food safety should also be measured in cultural terms as a leading indicator.

In order to measure food safety culture of a retail company and understand differences among groups, the researcher used case study methodology to select a USA

based retailer. The researcher described the culture of the retailer, as well as the leadership styles. Based on these descriptions, the food safety culture of the company and the employee constructs were defined and piloted for construct validity and construct reliability. Once validated, a food safety culture survey instrument was implemented in the operations area of this retailer.

The results showed that the employees agreed or strongly agreed that food safety was part of the corporate culture. One of the factors influencing the food safety culture was service to the customer. The results showed that there were differences in food safety culture across the different groups, but with negligible or small effect size.

One of the main contributions of this study was the development of a metric to measure food safety culture in the retail industry. It also suggests that besides food safety audit scores and incident reduction, food safety needs to be measured in terms of the corporate culture of the retailer. In an effort to improve food safety around the world, organizations should consider that culture plays an important role.

DEDICATION

I dedicate this dissertation to Dr. Kim E. Dooley, Dr. Gabriel Carranza and Dr. Rick Giardino for helping me to achieve my dream. Thanks for believing in me.

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CHAPTER I

INTRODUCTION

In this study the researcher used qualitative and quantitative methods to measure and analyzed the food safety culture of a retailer to determine the best educational techniques to promote food safety concepts as a component of the corporate culture of the retailer selected. The researcher created an instrument to analyze the food safety culture of employees at different levels who were in charge of different areas within the retail business. The corporate culture of the selected retailer was also observed and described based on historical data and field observations. Based on these analyses, the researcher described the differences and similarities between different levels of employees, to define the relationship of food safety and corporate culture. With these findings, the researcher demonstrated the strong need for using professional development programs to efficiently create a food safety culture embedded in the corporate culture of the selected retailer.

Literature Review

The recent outbreak of *Salmonella sp* in tomatoes (FDA, 2008) and the thousands of ill children affected by the ingestion of milk tainted with melamine (FDA, 2008) have demonstrated that the food safety systems of the food industry are not working properly. It is true that the food safety systems like Hazard Analysis and Critical Control Points (HACCP) are well defined and tested and could impact the safety of food (Kenneth, Knabel & Mendenhal, 1999).

This dissertation follows the style of *Journal of Agricultural Education*.

Unfortunately, for the consumers, not all contaminated food is detected and recalled. This issue, combined with improper food handling, results in food borne diseases that cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 human deaths in the United States of America (USA) each year (Center for Diseases Control, 2006). The Economic Research Service (ERS) estimated that the economic loss in 2005 as a result of foodborne diseases was greater than US \$6 billion (ERS, 2006). In developing countries, there are no official agencies capable of providing information related to foodborne illness. In addition, much of the food consumed in the USA is produced overseas, sometimes in developing countries, because of minimal labor costs.

Food recalls are a wide spread issue, one food recall per week related with food safety issues occurs in Europe, according to the Food Standard Agency of England (2008). More than one weekly recall related with the same issues occurs in the USA, according to the Food and Drug Administration (2008) and the United States Department of Agriculture (2008).

Retailers have been directly impacted by food safety incidents, having major yearly losses resulted from the relationship between the customer, the potentially contaminated food product, and the retailer. However, the retailers only have control over the safety of the products once they are within the distribution centers or stores. For retailers, the first point of entry of a food supplier is the buyer and/or the product developer who may provide the suppliers with the food safety requirements to ensure that all food safety risks have been considered and are, therefore, reduced early in the retailing chain (before the product reaches the point of sale). Retailer employees need to clearly

understand the importance of food safety in order to avoid overseeing this important condition when dealing directly or indirectly with food. A successful way to ensure that employees are aware of the importance of food safety is to incorporate the food safety concept into the corporate culture of the retailer, thereby creating a food safety culture within the retailer.

To incorporate food safety in the culture of a retailer, employees require food safety education based on adult learning (Knowles, Holton & Swanson , 2005). Adults expect to receive an applicable tool to become self-directed in their learning process (Grow, 1991). Knowles, Holton and Swanson (2005) have mentioned that andragogy principles are effective not only for adult learning but for learning in general.

One of the principles of andragogy is the “need to know”, indicating that adults become engaged in the learning processes through conviction. Part of the professional development programs of a company should be to induce the need to learn about food safety. In this case, these techniques should match the corporate culture of the retailer.

The research described in this paper, was conducted in a global retailer located in the USA and included all the employees that were willing to participate in the study. The culture of the country in which the retailer is located is a factor affecting the professional development programs of the retailer. However, there are cultures indigenous within each company. The factors that drive each culture inside a company are more complex and should be described according to the characteristics of each company. Each cultural change in different circumstances is known as cultural relativism (Rogers, 2003). The circumstances of the companies should be analyzed to understand the cultures within a said culture. According to Northouse (2007), the circumstances inside a group are caused

by its leaders and the different styles of leadership inside the management of the company. The corporate culture of a company should be considered a key factor for the professional development programs and used as a tool to induce the need to learn about food safety.

Theoretical Base

The first theory for this study is andragogy, defined as “any intentional and professionally guided activity that aims at a change in adult persons” (Knowles, Holton & Swanson, 2005, p. 60). Its principles have been at the core of adult learning and have been used as an anchor for psychological theory (Houde, 2006). The principles of andragogy, according to Knowles, Holton and Swanson (2005, pp. 62-63) are:

1. The need to know. Adults have the need to understand why they need to know something before they start learning about it.
2. The learner’s self concept. Adults are responsible for their own lives and are willing to know to become self-directed in the learning and application processes.
3. Learner’s prior experience. When engaging in the learning processes, adults already have previous experience and are expecting to use this as a tool for the learning process.
4. Readiness to learn. When adults decide to engage in a learning process, they know what they want to learn and are ready to get involved; they are also expecting to relate knowledge acquired through real-life situations.
5. Learning orientation. Adults only want to learn things that bring positive outcomes in terms of applicability, personal aspirations and self-esteem.

6. Motivation. In the pursuit of a better position after the learning process, adults are internally motivated to learn.

Brookfield (2001) analyzed the critical theory of adult learning. He compared this theory with several models and theories produced by different authors, including Mezirow, Habermas, Marx, and others. Brookfield (2001) positioned the critical theory as depth principles, which go beyond other learning theories to stimulate the learner to acquire their own concepts about the reality. Brookfield (2001) conceived the critical theory as a model which stimulates the learners to learn in order to be free, and through the freedom, collaborate to improve the society from the human point of view. Brookfield (2001) matched the concept of andragogy established by Knowles, Holton and Swanson (2005), from a philosophical point of view.

The second theory for this study was cultural classification (Hofstede & Hofstede, 2005). These authors defined culture as a set of traditions repeated among large groups of people for many generations. Culture is the core driver of an individual belonging to a cultural group, meaning that culture is the deepest value of any individual. Hence, cultures are difficult to change; instead, the professional development programs to be implemented should be handled according to the cultural traditions of the group in which such program is being implemented. The five cultural dimensions suggested by these authors included:

1. Collectivism vs. individualism refers to the characteristics of some cultures to move as a society, at different levels, individually or in groups (p. 39).
2. Large power vs. short power distance refers to the level in which a culture deals with different authorities within its society (p. 73).

3. Masculinity vs. femininity deals with the key players in the society being men or women (p. 115).
4. Uncertainty of avoidance describes the tolerance to the uncertainty of a culture (p. 163).
5. Short-term vs. long-term oriented refers to the capability of a cultural group to achieve general objectives in different amounts of time, from those being able to accomplish achievements in a short time, to those cultures that are able to be focused on long-term objectives (p. 267).

According to the five cultural dimensions suggested by Hofstede and Hofstede (2005), the US is a country with short power distance. Employees feel that managers are close to them and that decisions of management can be challenged. The USA is considered an individualistic culture in which the decisions are made individually. In this culture, key roles in the society are assigned either to men or women, making it a balanced feminine and masculine culture. In the dimension of uncertainty to avoidance, the USA is considered to have high tolerance of the uncertainty and is considered a long-term oriented culture, capable of achieving results planned for the long-term.

To understand the cultures inside each company, the concept of cultural relativism suggested by Rogers (2003) was considered. Cultural relativism refers to the expression of a culture under particular circumstances.

To understand the relationship between employees and leaders, the leadership classification is used as suggested by Northouse (2007). This classification was made as follows (Northouse, 2007):

1. Trait approach is based on innate characteristics of the leaders (leader centered), with the traits being intelligence, self-confidence, determination, integrity and sociability (p. 15).
2. Skills approach is also leader-centered, but it contemplates the skills of the leaders. These skills are divided into technical and human skills, based on the ability of the leader to relate with the followers and to deal with concepts and abstract ideas (p. 39).
3. Style approach focuses on the behaviors of the leaders based on the reactions of their followers (p. 69).
4. Situational approach is classified from S1 to S4. Each style has two components, directivity and supportiveness that are present at different levels (p. 91), being S1 an extremely directive but less supportive leader, S2 very supportive and directive, S3 highly supportive and less directive, and S4 less focused in both, directivity and supportiveness.

Professional development programs within the retailer were analyzed from the theories mentioned above, including the concept of human resource development. Paprock (2006) stated that human resource development is deeply related to culture. The way in which a company provides human capital with learning opportunities should benefit the company and the employees, according to their culture.

Problem

There is a need to include culture as part of the food safety management systems of retailers. To achieve that need, food safety culture must be measured, and its relations to the culture of the organizations need to be described.

Purpose

The purpose of this study was to measure and describe the food safety culture of a retailer and identify educational, cultural and leadership theories that can be used to help create and maintain the food safety culture of the selected retailer.

Research Questions

1. What is the corporate culture of the retailer?
2. What constructs are appropriate to measure food safety culture of the retailer?
3. Is there a food safety culture of the retailer?
4. Are there differences in terms of food safety culture among the various types of employees of the selected retailer?

Methods

For this dissertation, the researcher used the three journal article format.

Article one

Case study analysis based on qualitative research was used to describe the culture of the retailer using Hofstede and Hofstede (2005) cultural dimensions. According to Merriam (1998), a case study is “a single entity, a unit around which there are boundaries” (Merriam, 1998, p 27). To be cataloged as a case study, the number of people involved with the data collection and the case itself must be finite. The case selected for this study was a retailer located in the USA and it was delimited to the operations area, their culture and their food safety awareness. The reasons for choosing this particular retailer were that it had a large number of employees, it was one of the largest food retailers in the world, and it significantly influenced the food business.

The heuristic approach was used for this case study, defined by Merriam (1998) as an approach that illuminates a general problem, suggests what to do in similar situations provides background of the problem and helps to summarize issues surrounding the problem. The findings from this article helped the researcher to define the constructs to measure food safety culture, analyzed in the second and third articles.

According to Dooley (2002), case studies “can be accomplished using quantitative or qualitative research methodologies” (Dooley, 2002, p. 338). The author also mentioned that for case study, different data collection processes can be used such as “participant observation, document analysis, surveys, questionnaires, interviews, Delphi processes, and others” (Dooley, 2002 p. 338). The particular data collection methods for the first article were ethnography and historical.

Ethnography is defined by Denzin and Lincoln (1994) as “a social scientific description of a people and the cultural basis of their people hood” (Peacock, 1986 by Denzin & Lincoln, 1994 p. 3). When using this approach, the researcher observes the group of interest and creates a picture of the problem and its context, decides which data to publish and influences the results of the research. During this study the researcher was engaged and actively participating in the retailer, his experiences and observations were used as a source of data for the cultural description of this retailer.

The other data source used to describe the culture of the retailer was the access to historical documents that described the origins and evolution of the corporate culture of this retailer. The historical technique uses primary source material that helps to understand and describe the changes in an organization over time (Merriam, 1998).

Article two

Using the constructs defined in the first article to measure food safety culture, quantitative research was used to create an instrument. According to Gall, Gall and Borg (2005), a construct is “a structure or process that is inferred from observed phenomena” (Gall, Gall & Borg, 2005 p. 125). According to these authors, the constructs in quantitative research are considered variables. The variable value results from the operational value of the construct, which can be defined by a score (Ary, Jacobs & Sorensen, 2006). To measure the constructs, a survey was designed based on Dillman (2007) survey methodology. Also in the second article the theory of Hofstede and Hofstede (2005) was used, which explains that cultures are defined by individuals and individuals are influenced by cultures. Employees were asked to rate their food safety culture as members of the organization and the food safety culture of the retailer.

The construct validity, defined as how appropriate an instrument is to measure the defined variables, may be assessed by “having some colleagues who are familiar with the purpose of the survey to examine the items” (Ary, Jacobs & Sorensen, 2006, p. 410). A survey instrument was created from discussions with food safety, retail and culture experts, as further described in the article. The reliability of the survey was assessed using a pilot test to determine Cronbach’s alpha, suggested by Field (2006) as one of the most accurate procedures to assess survey reliability in social sciences.

Article three

The final instrument was implemented and distributed to all the employees of the retailer selected for this research; it was available on the internal web page of the retailer where all the surveys of the retailer are posted. The sample for the final study was a

volunteer sample defined by Gall, Gall and Borg (2005), as sample “based on the individuals’ expression of willingness to participate in a research study” (Gall, Gall & Borg, 2005, p 130).

The data received from the survey were analyzed using descriptive research, which involves the collection and analysis of quantitative data in order to describe people’s behavior and/or specific demographics of the study (Gall, Gall & Borg, 2005). The data was also analyzed using causal-comparative research defined by Gall, Gall and Borg (2005) as the examinations of possible effects and interactions caused by a specific characteristic of a group. In causal-comparative research, dependent variables are used to compare differences and/or infer causalities among independent variables. For this study, the constructs were considered the dependent variable and were compared to five independent variables, as further observed in the third article.

All the statistical analysis was conducted using the SPSS software version 16.0 and alpha was set *a priori* at .05.

Assumptions

Employees will voluntarily participate in the survey. Employees will truthfully respond to the survey based on the cultural characteristics of the retailer.

Limitations

A characteristic of case study research is that it is a bounded system; therefore, this study is limited to the operational aspects of the selected retailer.

The conditions and factors described for this study may not apply to other food retailers. In the implementation of a system inside an organization there are many factors

involved. Culture and professional development programs will be analyzed for the case selected in this study and are context-specific.

In food recalls and outbreaks, there are other factors involved, such as consumer hygienic practices, food transportation and food retailing. This study will be limited to the description of the retailer and the theories of andragogy, culture, and leadership styles.

To describe the culture of the company the researcher was the data gathering instrument. As an insider to the culture, the researcher used internal documents from the company which could be biased.

All the research procedures and instruments used for this study were reviewed by different authorities of the company. In order to comply with the internal policies of this retailer, there were some limitations to the type and number of questions asked in the survey instrument. The wording of the questions had to be approved by the legal area of the company and to comply with operation rules. The survey was limited to 15 questions that could be answered by employees in approximately five minutes.

Definitions

Andragogy: “Any intentional and professionally guided activity that aims at a change in adult persons” (Knowles, Holton & Swanson, 2005, p. 60).

Culture: “The collective programming of the mind that distinguishes the members of one group or category of people from another” (Hofstede & Hofstede, 2005, p. 400).

Cultural Relativism: “The viewpoint that each culture should be judged in light of its own specific circumstances and needs” (Rogers, 2003).

Food Safety: Absence of physical, biological and chemical hazards in food products.

Food Safety Systems: Logical sequence of steps applied to food production, which allows producers to reduce, eliminate or avoid food hazards.

HACCP (Hazard Analysis and Critical Control Points): A system to control food safety in the food chain.

Human Resource Development: To provide the human capital in a sustainable way, with different tools that can be used in activities that will result in the increase of some parameters such as production, well-being, economy, etc. The persons to be developed should feel ownership of those tools, and the development must contemplate the personal benefits of the tools provided (Paprock, 2006).

Leadership: “A process whereby an individual influences a group of individuals to achieve a common goal” (Northouse, 2007, p. 3).

Professional Development Programs: Gandolfi (2006) described them as the maintenance provided to employees’ knowledge to enhance their development based on their careers.

Retailer: A company that purchases and commercializes different kinds of products (Walton & Huey, 1993). For the purpose of this study the terms “company” and “retailer” were used interchangeably.

CHAPTER II

DESCRIPTION OF THE CORPORATE CULTURE OF A GLOBAL RETILER

Introduction

During this research, qualitative procedures were used to describe the culture of a retailer. To determine constructs and metrics to measure food safety culture in the retailer and to define which strategies could help to maintain and improve food safety culture, it is necessary to understand the cultural values of this retailer. The researcher used case study to limit the research to the operations of the retailer. The researcher was engaged for a prolonged period of time in the retailer and used ethnography and historical data to describe the culture and leadership. The culture and leadership of the retailer were described using the cultural dimensions suggested by Hofstede and Hofstede (2005) and Northouse (2007). The results from this article were used to define future studies in how to measure food safety culture.

Literature Review

Culture has been defined by Hofstede and Hofstede (2005) as “the collective programming of the mind that distinguishes the members of one group or category of people from another” (Hofstede & Hofstede, 2005, p. 400). Harrison and Huntington also added to the culture definition that the ideas that distinguish one group of people from another must be socially inherited and customary; “and they must actually be constitutive of different ways of life” (Harrison & Huntington, 2000, p. 163). They also mentioned that cultural ideas represent truth and efficiency. Even when those values could be labeled differently in each culture, similar concepts exist across the different cultures. Cultures are not the same across the different regions of the world and the levels of

difference range from basic universal human values common across all the cultures, to very abstract values such as those cultural values unique to a single family (Dresser, 2005). Countries have cultural values, but in each country different cities have different cultural values; within the same city, different neighborhoods have different cultures, but they are all united by common cultural values (Dresser, 2005). For example, cultural practices from Texas may be different from cultural practices in California, but both have the cultural value of celebrating the 4th of July. Dresser (2005) also established the different influences that cultures have on people and vice versa; each culture is tailored by its members and over time, internal and external members influence cultures.

Although there are several factors influencing a culture, some factors are more influential. Common examples of factors that usually shape a culture include religion, behavior, relation with nature, relation with other humans, and traditions. Dresser (2005) reveals how the individual behavior has different cultural influences. For example a French person living in Germany will have influence of cultural values from those two countries as well as others inherited by his/her family or other sources. According to Dresser (2005), when an individual remains in his/her own culture it will be seen as normal, but if the individual migrates to other regions, his cultural values would be influenced and she will influence the culture of others, as well. Harrison and Huntington (2000) wrote about the advantages and disadvantages of people from different cultures interacting, even when their point of view is biased, as people base their multicultural exchange experience in subjective cases. It is true that a culture suffers changes and sometimes is destroyed when it interacts with other cultures and other values (Rogers, 2003).

Each culture and the different cultural groups that belong to a more general culture have their own perspectives; this perspective responds to the specific needs and circumstances of the group. This is known as cultural relativism (Rogers, 2003).

In the same way that regions differ culturally, companies have their own culture, their own set of written and unwritten cultural rules. Beugelsdijk, Koen and Noorderhaven (2009) described organizational culture as the behaviors and practices of an individual that belong to a group. Individuals belonging to a corporation develop behavior and practices according to the culture of the retailer. Mangelsdorf (2009) described corporate culture as being focused on encouraging behaviors, attitudes and practices that are beneficial for the corporation, such as business effectiveness and innovation. The cultural rules of a corporation are designed to make the business successful. According to Svensson, Wood, Shing and Callaghan (2009), corporations pushed the society and the legislatures to accept corporate cultures and even to create regulation around them, but as the companies grew and entered into other markets with different cultures, the corporations were required to change some of their practices. In lieu of becoming more effective as the corporations were growing, some corporations behaved unethically. For example, some retailers were not caring about the social situation of employees from a factory from which they were sourcing. Companies that were not aware that child labor was used in their manufacturing facilities, or that did not create opportunities for women and minorities, were punished by the society and in some cases by the government. As a result, companies integrated business ethics into their corporate culture (Svensson, Wood, Shing & Callaghan, 2009).

Corporate culture is driven by business effectiveness, and corporations change their culture as they enter into a globalized market. Organizational cultures are defined and transmitted by the leaders of a corporation and based on their experiences. The leaders are those responsible for heading cultural changes across the companies and for maintaining a corporate culture that it is reflected in business results (Ardichvili, Mitchel & Jondle, 2008).

The retail business is an example that can be used to explain and understand corporate culture. The retail business usually targets final consumers who have easy access to them; hence the retail business becomes more susceptible to penalization by regulators and customers. Berner (2005) described how retailers that have focused on the customers have succeeded. While describing a case of an executive that took over two companies with financial challenges, Berner (2005) described how focusing on the customer could bring positive results to a retailer. The founder of one of the largest retailers in the world described that the culture of a retailer always needs to be changing to better serve the customer, and that the decisions related to the business must be made thinking of the reaction of the customers (Walton & Huey, 1993). Walton and Huey (1993) described how one of the most successful retailers in the world faced the need of incorporating women and college graduates into their business, not just because the society had their eyes on them, but because doing so would result in a benefit for their business. When women and college graduates were hired, the culture of the retailer had to change.

The former CEO of a worldwide retailer described how even when the core cultural values remained present in their retailer, the culture of the retailer has changed a

lot over the years (Constance, 2004). Each day, retailers in the United States and other regions of the world face a more concerned and active customer; executives of retailers have admitted and recognized that their customer concerns have changed the retailer culture in order to keep bringing customers to their stores. The culture of the retailers has changed so they can remain successful, which includes changes in several areas, such as product sourcing, store design, logos, and even radical changes in slogans.

Food safety is becoming a more important issue and concern for more and more customers across the world. The food industry and food retailers are in the need of implementing a food safety management system based on the culture of the company (Yiannas, 2008). Retailers are widely affected by food safety issues and consumers usually blame food safety on the retailer without knowing that there are also manufacturers behind these issues. Food retailers that are successful and have a culture based on servicing and caring for the customer need to understand the customer concern for food safety and incorporate this into its culture.

As mentioned before, the leaders are the ones that implement and drive the culture in a company. Northouse (2007) suggested a leadership classification. The classification suggested by Northouse (2007), was used by the researcher to describe leadership behaviors in the business operations area of the selected retailer. The Northouse (2007) classification was made as follows:

1. Trait approach is based on innate characteristics of the leaders (leader centered), with the traits being intelligence, self-confidence, determination, integrity and sociability (p. 15).

2. Skills approach is also leader-centered, but it contemplates skills of the leaders. These skills are divided into technical and human in terms of the capabilities of the leader to relate with the followers and to deal with concepts and abstract ideas (p. 39).
3. Style approach focuses on the behaviors of the leaders based on the reactions of their followers (p. 69).
4. Situational approach classified from S1 to S4. Each style has two components, directivity and supportiveness that are present at different levels (p. 91); being S1 an extremely directive but less supportive leader, S2 very supportive and directive, S3 highly supportive and less directive and S4 less focused in both, directivity and supportiveness.

Purpose and Objectives

The purpose of this study was to describe the corporate culture of the selected retailer and to define possible constructs to measure food safety culture in future studies.

The following research objectives guided this study:

1. Describe the corporate culture of a global food retailer based on Hofstede and Hofstede (2005) cultural dimensions.
2. Describe the leadership style of the leaders of the retailer based on Northouse (2007) classification of leadership.

Methods

Case study analysis using qualitative research procedures were implemented for this research. Case study research has the characteristic that is limited to a specific group of people and/or specific timeline (Merriam, 1998). The operations area of a global

retailer was selected for this study. This retailer operates different business formats, including stores, local markets, wholesale clubs and restaurants. Although the selected retailer operates in several countries, this study was focused on their USA operations. The reasons for choosing this particular retailer were that it had a large number of employees, it was one of the largest food retailers in the world, and it significantly influenced the food business. The operations area of the retailer was selected because it was considered to be driver of the business and the culture of the selected retailer.

The heuristics approach illuminates a problem, provides background, suggests what to do in similar situations and summarizes issues around a problem. “They can bring about the discovery of new meaning, extends reader’s experience, or confirm what is known” (Merriam, 1998, p. 44). For this heuristics study the data gathering instrument was the researcher. The researcher was an insider to the corporate culture and was able to directly experience and observe the culture and the behaviors related to it.

According to Dooley (2002), several methods can be used to gather data for case study research. For this particular study, ethnography was implemented, used to describe people and cultural characteristics through field observations (Denzin & Lincoln, 1994) and historical data, which uses primary source material to understand an organization (Merriam, 1998). The historical data was mainly internal documents and publications about the retailer.

For both objectives, the findings that were derived from field observation were coded as E (Ethnography). All finding that resulted from historical data were coded as H (Historical). The audit trail of the ethnographical and historical documents used in this research are described in Table1.

To address Objective 1, the corporate culture of the retailer was described based on the five cultural dimensions described by Hofstede and Hofstede (2005). For Objective 2 the leadership characteristics of the retailer were compared and described using the leadership theory suggested by Northouse (2007).

The data gathered were analyzed using structural and reflective procedures. Structural processes were defined as those intended to identify patterns (Dooley, 2002). Reflective procedures used in critical science and phenomenology, “involves a decision by the researcher to rely on his or her own intuition and personal judgment to analyze the data” (Dooley, 2002, p. 343).

Table 1
Audit Trail Documents

Code	Source	Date	Description
E1	Ethnographic	May-August 2008	Field notes about corporate culture
E2	Ethnographic	September-November 2009	Field notes about corporate culture
E3	Ethnographic	January-May 2009	Field notes about corporate culture and leadership
E4	Ethnographic	June-July 2009	Field notes about leadership
H1	Historical document	1993	Printed Book about culture and leadership
H2	Historical document	December, 1999	Article printed in a newspaper about culture
H3	Historical document	9-Sep-04	Article printed in a magazine about culture
H4	Historical document	9-Mar-05	Article printed in a newspaper about culture and leadership

Results

Although there are similarities in the cultures of successful retailers, the observations and conclusions from this study pertain strictly to the selected retailer and are limited to the operations side of the business.

The researcher was engaged with the organization and its culture and observed it for over one year. The context and interpretation were based on the researcher's experiences with the culture of the selected retailer and historical data available.

Core cultural values of the selected retailer

The culture of this retailer was based on three basic beliefs (E1 and H1). The first belief is related to human respect inside and outside the company, including both employees and customers. All employees at all levels were required to respect each other; some examples include smiling at a person in close proximity, greeting someone within close proximity, answering requests or informing advances before the day ends, not judging people on his or her physical appearance or personal beliefs, and executives and front line employees being treated as equals (H1 and E4). If an employee breaks the principle of respect, he/she is corrected based on the same principle. According to the founder of this retailer, that strategy helps all the employees keep focused on the real business of this retailer (H1).

The second belief was related to always seeking excellence; always bringing new ideas to improve the business without deviating from the main business objective of the company (H1). At the selected retailer, employees that were excelling were recognized and had significant opportunities to grow (E2). For example, an employee that suggested an idea to attract more customers to increase sales was recognized in front of his or her

workmates (E2). The last belief was related to servicing the customer; all the decisions were made based on attracting more customers. This last belief has helped the retailer to change their culture as the customer characteristics change (E1 and H1). One example is that customers were more concerned with having access to more locally-grown food, so the culture of the retailer focused on sourcing products from each community where they have a business (E4 and H4).

The three main cultural values of this retailer remained the same as the company evolved (H1); the selected retailer has gone through self-critiquing in order to recognize social demands from their customers (H2). Based on their belief of serving the customers, this retailer has incorporated new ideas to protect the environment, hire minorities, improve employee benefits, and to care about the safety of the products they sell.

The three basic beliefs of this retailer are widely practiced in the operations area; the belief related to individual respect has helped the employees of this retailer to stay united and focused in the business. The seeking of excellence keeps employees motivated to innovate and perform their duties in an effective manner. Finally, the customer service belief has helped the retailer to manage the business in a way that is constantly increasing the number of customers visiting a store (E3). The business and the culture of the retailer are driven by the three cultural beliefs described above. This has brought a successful outcome for the retailer reflected in high sales despite difficult economic times (H4).

The culture of the selected retailer according to Hofstede and Hofstede (2005) cultural dimensions

The cultural dimensions suggested by Hofstede and Hofstede (2005) are based on a study of different cultures inside IBM. The five cultural dimensions classified the

cultures of the countries on a scale of 1 to 100 in each cultural dimension. Although this is a generic classification, it was very useful to describe the culture of the retailer selected for this study.

Power distance

This cultural dimension refers to the relationship of a person with the authority figure. In this case, the relationship is centered on the employees of the retailer with their different levels of supervisor. When the retailer was founded in the, it was a small retailer with few stores in the USA. The founder created an atmosphere where the decision makers were viewed as ordinary people that had the same value as any other employee (H1). As the retailer started growing, these traditions remained the same. In this retailer, the authorities were very close to the employees; employees openly and constructively criticize their supervisor without being afraid of retaliation (E4).

There is a short distance between power structures and employees. Another example is that several of the executives at this retailer started as front line employees, unloading trucks at a distribution center or packing foods at the cash register. The leaders and executives were humble, very often understand the work of front line employees and identified with them (E4). When an employee had a personal problem, it is openly shared with the supervisor to solve the issue at hand (E4). Some leaders struggle when they start in a leadership role, because even when they have a lot of experience in the retail business, sometimes they lack the technical knowledge of that leadership role. This retailer has not identified totally which positions can be taken by long-term employees with experience in the retail business, and which position needs a different background with more academic experience (E4). The more respected leaders were usually those that

have had a long tenure in the company. For outside leaders it took a while to adapt and gain respect from their subordinates. Some leaders that came from the outside experienced difficulties when they come from a corporate culture with a large power distance. This retailer does not consider academic education over experience, so an employee with a graduate degree may struggle more as a leader than an employee with no college degree but with long tenure in the company (H1).

Femininity – masculinity

When the retailer started the business it was administered by men, and all decisions were made by men executives (H1). At the time of the study, even when the company was making a large effort to hire more women into leadership positions and promote their women employees (H1), this retailer still had a masculine culture. The majority of executive and management positions were held by men (E3). As the culture changed in this retailer due to external pressures and self-critiquing caused by the need of the customers to see the retailer as an equal opportunity employer, women were promoted to leadership positions (H3). The executives of this retailer had recognized the importance of equally promote employees to leadership positions, especially to address specific requirements for their customers (E3).

Collectivism – individualism

The culture of this retailer was collective. Even when the decisions were being made by the leaders, the business decisions were always made in consensus with all the members of each team. In each department there was at least one weekly meeting (if not a daily meeting), in which all the employees help the leader to make a decision, define a strategy or solve an issue (E3). Employees were very engaged in all the strategies of the

retailer and participation from all employees was welcome in every regard. Some teams within the company operate separately from others and sometimes do not share with other teams, but inside their team they act collectively (E3). The fact that employees had a lot of opportunities for professional growth helps to demonstrate the collectivism of the culture, as employees participated in the strategies and took ownership of their assignments; they were then observed by the leaders and promoted to higher positions (H3). The collectivism of the retailer promoted thinking as the customer would think, from how to show an item in a store, to how to operate in different countries (E2). The culture was also collective with other issues not related with the business. Often the employees made reference to their families while at work when they had some personal issue. When an employee was experiencing some difficulty, the manager immediately talked to the employee and organized other employees to help (E1). Several examples of how employees helped among themselves were observed in the culture of this retailer (E1). For example, when natural disasters occurred, the stores of the affected regions organized to help those in need by providing money, food, housing, clothes, etc. (E1). The culture of the retailer also operated like this within the communities. Since a majority of the employees of the retailer were from the same community as the store location, the employees organized local events for the benefit of the community (H2). When the leaders were invited to participate in a strategy and bought into it, most likely the rest of the company would bought into it as well (E1).

The avoidance of uncertainty

This retailer was very well positioned at the time of the study when the economy was experiencing difficult times (H2). They had not experienced situations of

uncertainty, but the culture of the retailer was tolerant of uncertainty. For example, in the development of a new product, there were several teams involved and there was a timeline to complete the project (E2). The culture was so well organized to meet the timelines that they rarely faced uncertainty. When the culture experienced uncertainty, the teams and the employees dealt effectively with the issue by developing a solution that encouraged business continuity (E2).

Long- and short-term

For this cultural dimension, this retailer ranked in the middle (E3). The leaders knew how to lead long-term projects; they usually understood long-term goals and had a very detailed plan for each step of the project. For long-term projects, leaders and employees developed short term projects that would help them to achieve the long term goal (H1). For example, when the retailer opened a new store format focused on Hispanic markets, small teams work in short term projects for two years; they all worked on regulations for new food displays, marketing techniques, food products, customer experience, etc. (E3).

Leadership

Leadership at this retailer was a combination of trait and situational approaches. Trait approach according to Northouse (2007) is focused on identifying the innate qualities and characteristics possessed by leaders. The majority of these leaders had innate characteristics that match the description of this approach, such as intelligence to understand the retail business and consumer needs, and self-confidence to handle different kind of employees at the stores with different backgrounds. At the store levels it took one employee not doing his/her job well to drive sales down. A leader at this

retailer made sure that everybody was doing their part. Leaders at this retailer had strong determination, which was combined with strong ethical determination (E4). A good example was when the store leaders had to pull an unsafe product from the sales floor even though the product was excelling in sales; the leader withdrew the product, knowing that sales would be affected for that sales period (E4). As mentioned before, a majority of the leaders from this retailer had started at the bottom of the organization and were very sociable to their employees and to the community (E4 and H1).

As to how leaders deal with their employees, the situational approach S2 is the best approach to describe their style. Leaders were highly directive as to how employees needed to perform and which activities needed to be accomplished, but they were also highly supportive of employee capabilities and to personal issues (E4).

Conclusions and Recommendations

The descriptions mentioned in this manuscript pertain only to the operations area of the retailer selected for this study. The conclusions and recommendations established here were specific for this case; the methodology and suggestions followed for this study can serve as a guide for other studies related to food safety culture in the retail industry.

Based on the cultural and leadership patterns identified during this research, the corporate culture of the company has been identified as short power distance, masculine and collective. The fact that the culture was collective and had short power distance helped explain why the retailer was going through a process of becoming less masculine. The retailer ranged in the middle for avoidance to uncertainty and short-long-term. The cultural pattern was useful to understand the economic success of this retailer during difficult economic times (H3). The employees of the company could trust and follow

their leaders, were included in decision making, and felt ownership of the business. The retailer was equipped to handle uncertain situations and projects requiring different timelines. Leadership was present for personal issues as well as work-related issues. The leadership style was congruent with the cultural characteristics of this retailer.

The intention of describing the culture and leadership style of this retailer was also to understand it, such that constructs and metrics could be designed to measure food safety culture. The cultural dimensions suggested by Hofstede and Hofstede (2005) are widely used to describe cultures inside companies. As observed in the book *Cultures and Organizations: Software of the Mind* all cultural dimensions described how individuals interact within groups, and what influence one has on the other. Their theory is that cultures are defined by individuals and individuals are influenced by cultures. The results of this research provided knowledge about how the employees had shaped the culture of this retailer, how the culture influenced them and their interaction. It also provided knowledge regarding the core cultural values that drive the employee-company interaction. This study led the researcher to the conclusion that in order to create constructs to measure food safety culture, the three core cultural beliefs and the employee-company interactions must be considered.

In practice, whenever researchers conduct investigations or want to implement something in an organization, they first need to understand and identify the culture of the organization, and therefore the relationship of the employee as an individual belonging to the culture of an organization. This will help the project to be accepted by the organization (Rogers, 2003). It is also important to understand the core cultural values driving the individual-organization interaction. The cultural description and

understanding should be used by the researcher as the baseline to conduct future research that relates to the organization.

For future research in food safety culture of this retailer, a quantitative instrument that measures food safety culture in the retailer should be created, piloted and applied across the population of the retailer. The survey results and the cultural and leadership characteristics should be used to interpret if there is a food safety culture in the retailer, what factors are driving it and which strategies are needed in order to maintain it.

CHAPTER III

DESIGNING AN INSTRUMENT TO MEASURE FOOD SAFETY CULTURE

Introduction

The conclusions of the previous article indicated that the interaction of an individual with the organization should be considered when describing corporate culture. It also indicated that there are core cultural values driving the cultural relationship individual-organization. Due to the need for an instrument to measure food safety culture, the researcher used findings of a study conducted at a USA based retailer to create constructs. The researcher used Dillman's (2007) guidelines to create and pilot a survey instrument at the retailer where the qualitative study was conducted, and utilized quantitative methods to tests instrument reliability and construct validity.

Literature Review

Several instruments have been designed to measure and describe culture. One of the most transcendent instruments was the one developed by Hofstede and Hofstede (2005) which was primarily conducted at IBM and derived in the five cultural dimensions of collectivism-individualism, masculinity-femininity, power distance, uncertainty of avoidance and short term-long term. Although there are several valid and reliable instruments to measure culture, a specific instrument to measure food safety culture has not been created. According to Yiannas (2008), food safety professionals have created metrics that indicate the consequences of food safety systems such as pathogen presence or outbreak incidence, known as lagging indicators. Food safety professionals, however, have not created metrics to measure the behavior driven by the culture of employees handling food described by Yiannas (2008) as leading indicators. According to his

theory, the employees that handle food are related to cultural values and behave in a company based on its cultural influence; hence, food safety should be also measured in cultural terms as a leading indicator. In order to measure food safety in cultural terms, a valid and reliable instrument needs to be created.

According to Dillman (2007), an instrument must be valid and reliable; this can be achieved by conducting a pilot study before launching the final instrument and analyzing construct validity, defined as how appropriate an instrument is to measure a defined variable (Ary, Jacobs & Sorensen, 2006). To create a valid survey Dillman (2007) indicated that first the constructs to be measured need to be identified. A group of questions must be identified to measure the defined constructs created by a group of subject experts. Since the intension of this instrument was to measure food safety culture by the use of a summated scale, the Likert-type scale was selected.

Likert in 1932 suggested a summated scale to assess respondent attitudes in a survey (Clason & Dormody, 1994). The original Likert-type scale had five response alternatives, from strongly agree to strongly disagree, but nowadays the alternatives are manipulated by the researchers and could be more than five, possibly including a neutral option. Summated scales are commonly used in the agricultural education field (Clason & Domody, 1994) and are an effective means of expressing attitudes towards a concept in quantitative manners, assuming that the value of the scale is established by the researcher could mislead to inaccurate inferences. This scale is helpful when comparing one group to other using statistical tools. Scale scores, such as summated type scales, can be analyzed using parametric statistics (Desselle, 2005), statistical tests such as *t* tests, one-way analyses of variance (ANOVA), and multivariate ANOVA can be used to

measure differences among groups when dealing with data derived from instruments in which summated type scales have been implemented.

There have been some discussions regarding whether summated type scales should be analyzed parametrically or non-parametrically; it is almost impossible to find a definitive trend in the literature. Carifio and Perla (2008) established a comparison of how they can be analyzed both ways, usually having better tools to make inferences by analyzing them parametrically. Carifio and Perla (2008) said “It is perfectly appropriate, therefore, to sum Likert items and analyze the summations parametrically, both univariately and multivariately” (p. 2). The instrument developed during this research will be used later to measure specific constructs that will be quantitatively represented by the average of the summated scale. To further emphasize, Lee (1989) has identified that the accuracy of statistics calculated using summated scales is not compromised and it should contain at least 5 points.

The construct validity, defined as the appropriateness, meaningfulness and usefulness of a construct (Gall, Gall & Borg 2007), needs to be assessed before launching a pilot study to calculate instrument reliability. Construct validity may be assessed by having a group of subject matter experts analyzing them as well as the items that are intended to measure the constructs (Ary, Jacobs & Sorensen, 2006).

Instrument reliability defined as the extent to which another researcher will arrive at similar results by using the same instrument (Gall, Gall & Borg, 2007), is another important factor that needs to be considered at the developmental stages of the instrument. It can be assessed by piloting the instrument with a group of experts and it can be measured using Chronbach’s alpha (Desselle, 2005). The Cronbach’s alpha is

defined as “a measure of internal consistency of a test containing items that are not dichotomously, based on the extent to which test-takers who answer a given test item one way respond to other items in a similar way” (Gall, Gall & Borg, 2007, p. 637).

Field (2006) explained reliability as splitting in half a respondent’s score and analyzing its correlation. A perfect correlation would mean that the way the constructs are being measured is reliable, but there are several options when splitting scores that could lead to misinterpretations. To solve that issue, Cronbach in 1951 came up with a formula that splits data in every possible way with the correlation coefficient being measured for each split. Several authors such as Field (2006) and Desselle (2005) mentioned that a Cronbach’s alpha index of more than .70 indicates that an instrument is reliable.

Besides validity, reliability and the appropriate scale, the instrument also needs to have a clear interface for the respondents (Dillman, 2007), instructions need to be clear, and it should flow in a way that the respondent does not get confused or distracted while answering it. This can be measured at the pilot study of the instrument.

Dillman (2007) mentioned that the pilot study should be made among a group of 100 to 150 respondents attempting to emulate the conditions of the survey. Gall, Gall and Borg (2005), reported that at least 30 participants should be considered in correlational research. There are several ways to select a sample for any kind of study. The participants for the pilot test were selected purposefully because they were food safety expert employees at the selected retailer.

Another consideration when developing a survey instrument for an organization, as the retailer selected for this study, is that the policies of the company must be

followed. According to Rogers (2003), each culture has its own written and unwritten cultural values.

Purpose and Objectives

The purpose of this research was to create a reliable and valid instrument to measure food safety culture.

The following research objectives guided this study:

1. Assess the construct validity of the instrument, using a subject matter experts review process.
2. Assess instrument reliability by conducting a pilot test study of the defined instrument.

Methods

For this study one of the largest food retailers in the world was selected to pilot test the food safety culture instrument. The study was limited to the operational aspects of the selected retailer.

To address Objective One, the constructs were defined based on the qualitative study conducted at this retailer that indicated that culture should be measured from the personal and organizational perspectives, and that organizational culture is driven by core cultural values. The leadership style of the retailer, described as highly supportive and highly directive by the same qualitative study, was also considered. The constructs were analyzed by subject matter experts, a method suggested by Ary, Jacobs and Sorensen (2006), to assess construct validity. The subject matter experts included professors from the Department of Agricultural Leadership Education and Communications from Texas

A&M University, the food safety experts of the selected retailer and a legal expert that adjusted the constructs to the policies of the retailer.

For Objective Two, statements were created to measure the constructs defined, and were reviewed by subject matter experts. To assess reliability, a survey instrument was created using a summated scale of five points: strongly agree= 5; agree=4; neither agree nor disagree=3; disagree=2; and strongly disagree=1. The survey was piloted with a group of food safety experts within the context of the selected retailer ($n=30$) that participated voluntarily, for the pilot test instrument see appendix A. The survey was sent to the employees by e-mail; subjects were given three weeks to submit the answers either printed or by e-mail. The survey was confidential and the answers could not be tracked back to each respondent. In order to define which statements were more appropriate to measure the constructs defined, the results were analyzed using Cronbach's alpha. The statements that provided a higher Cronbach's alpha for the instrument and that were in compliance with the policies of the retailer were included in the final instrument. The Cronbach's alpha was analyzed using SPSS version 16.0.

Results

The main objective of this research was to create an instrument to measure food safety culture and to understand its validity and reliability. This study was not intended to describe the population of the selected retailer and/or make inferences on the population of the company regarding food safety culture.

Construct validity to measure food safety culture

As mentioned before, the conclusions of a qualitative study conducted in this retailer, indicated that culture must be measured in terms of individuals, organizations, its

relationship and the cultural values driving it. The study also suggested that leadership needed to be considered. Based on these results and meetings with subject matter experts it was defined that food safety culture should be analyzed considering the perception of the employee about the food safety culture of the company and the perception of their food safety culture as members of the organization. The qualitative study previously conducted at the retailer indicated that there was short power distance and a collective culture; therefore, all employees participated in decision making. Leadership was included in the measurement of the food safety culture of the company and the food safety culture of the employee. Finally, the three core cultural values of the retailer, individual respect, excellence and customer service, were also considered for the construct definition.

The two constructs defined and validated by the subject matter experts were food safety culture-company and food safety culture-employee. The factors considered to measure each construct were the organization, the employee, leadership and the core cultural values of the retailer.

Instrument reliability

In order to identify the items that yielded a higher Cronbach's alpha, the statements were similar but used different words and different approaches. It was decided by the researcher and the authorities of the selected retailer that the final instruments should not have more than five questions per construct so the employees did not take more than 5 minutes to answer it, which is the average time that employees of the operations area of this retailer are typically given to answer surveys.

For the construct food safety culture-company, the items that yielded a higher Cronbach's alpha ($\alpha=.83$) (for a complete statistical analysis of the Cronbach's alpha for each item see appendix B) were:

Q1. Selling safe food at our stores and clubs is part of the good service we provide to our customers. This item included the perception of the company by the employee in relation to one of the core cultural values of the retailer, service to the customers.

Q2. We require our suppliers to be committed to food safety. This statement considered the employees' perception of the retailer when sourcing food products to be sold at the stores.

Q3. My company has a strong commitment to food safety. This statement considered the employee perception of the leadership at the company in relation to the commitment with food safety.

Q4. My company's food safety policies protect our customers. This statement described the employees' perception of the company's policies regarding food safety, created and enforced by leaders, and executed by the employees.

Q5. My company has a good reputation for selling safe food. This statement reflected how the employee perceived the customers' image of the company in regard to food safety which is linked to the core cultural value of servicing the customers.

For the construct food safety culture-employee the items that yielded a higher Cronbach's alpha ($\alpha=.83$) (for a complete statistical analysis of the Cronbach's alpha for each item see Appendix B) were:

Q6. I clearly understand how my position impacts food safety. This statement indicated how the employees positioned themselves in the organization and whether the corporate culture allowed them to understand the direct impact of their duties with food safety.

Q7. We respect the individual, so we care about their safety. This statement linked the employee as an individual in the organization with the first core cultural value of the company, respect for the individual. It also reflected how leaders perceived food safety within the culture of the organization.

Q8. We serve our customers, and we do it safely. This statement linked the employee as an individual in the organization with the one of core cultural value of the company, service to the customers.

Q9. We strive for excellence, by starting with safety. This statement linked the employee as an individual in the organization with one of the core cultural values of the company, strive for excellence. It also described leadership in terms of food safety, according to the company's culture.

Q10. My workmates have a strong commitment to food safety. This statement indicated how the employees perceived themselves and their workmates, including leaders and subordinates, in the corporate culture regarding food safety.

Final instrument

The final survey instrument included the ten questions described previously and was intended to measure two constructs: the food safety culture-company and the food safety culture-employee. In order to be able to measure differences between different

groups of employees, it was decided to include five questions relating to the demographics of the company. The additional questions were:

Q11. Is your work at the company related to food? (e.g. handling, transporting, buying, etc.). This question will help to analyze if there are differences between employees related to food and non-related to food.

Q12. How long have you worked at the company? This question was intended, to analyze differences of food safety culture-employee and food safety culture-company relate to employee tenure at the company.

Q13. Are you salaried or hourly employee? This question will help future research to understand if the payment method implicates differences in terms of food safety culture-company and food safety culture-employee.

Q14. Are you member of management? The intention of this question is to identify in future research differences between leadership and employees regarding food safety culture.

Q15. Which operation do you support? In future research this question will help to identify if there are differences between the food safety culture-company and the food safety culture-employee, depending on the business unit.

Conclusions and Recommendations

This instrument was specifically tailored for a food retailer to measure food safety culture. The instrument was piloted in the company and was intended to be used in this company. The major contribution of this study was the design of an instrument to measure food safety culture. After reviewing literature, the researcher determined that a validated instrument to quantitatively measure food safety culture was not available.

During this research, all internal policies from the company were followed; verbiage and language used in the survey instrument were aligned with the cultural characteristics of the company, as well as language regularly used in the retail industry. According to Rogers (2003), each organization has its own written and unwritten cultural values. In order to use this instrument with other food companies or food retailers, it would be necessary to adapt it to its culture and company-specific jargon.

On a larger scale, the application of this survey instrument in the selected company for this study could have a considerable impact in the food retailing industry. The results of the survey will help to understand if food safety culture is present and which strategies are needed to develop, improve, or maintain it. Other companies may use versions of this instrument to assess food safety culture and create specific strategies for their companies.

CHAPTER IV

**MEASURING FOOD SAFETY AS PART OF THE CULTURE OF A GLOBAL
RETAILER**

Introduction

In the previous article a survey instrument to measure food safety culture based on the interaction employee-organization was created. During this study, the researcher implemented the survey at the USA based retailer selected. Based on the results, the researcher described the scores of food safety culture-company and food safety culture-employee and analyzed if there were statistically significant differences across groups of the company previously defined in the second article. The research conducted in this study identified if food safety culture was present at the selected retailer.

Literature Review

Culture has been defined by Hofstede and Hofstede (2005) as “the collective programming of the mind that distinguishes the members of one group or category of people from another” (p. 400). Harrison and Huntington also added to the culture definition that the ideas that distinguished one group of people from another must be socially inherited and customary, “and they must actually be constitutive of different ways of life” (Harrison & Huntington, 2000, p. 163). Cultures are different across the different regions of the world and the levels of difference range from basic universal human values, common across all the cultures, to very abstract values such as those values unique to a single family (Dresser, 2005). Countries have cultural values, but in each country, different cities have different cultural values, within the same city different neighborhoods have different cultures, but they are all united by common values

(Dresser, 2005). Dresser (2005) established the different influences that cultures have on people. In her book *Multicultural Manners*, Dresser 2005, portrayed how the individual behavior reveals different cultural influences. For example, a French person living in Germany will have influence of cultural values from those two countries as well as others inherited by his family or other sources.

The recent outbreak of *Salmonella sp* in tomatoes (FDA, 2008) and the thousands of ill children, affected by the ingestion of milk tainted with melamine (FDA, 2008) have demonstrated that the food safety systems of the food industry are not working properly.

Recent data indicated that food borne diseases caused approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths in the USA each year (Center for Diseases Control, 2006). The Economic Research Service (ERS) estimated that the economic loss in 2005 due to food borne diseases was more than US \$6 billion (ERS, 2006). One food recall per week related with food safety issues occurs in Europe according to the Food Standard Agency of England (2008). More than one weekly recall related to the same issues occurs in the USA, according to the Food and Drug Administration (2008) and the United States Department of Agriculture (2008).

Retailers are widely affected by food safety issues and consumers usually blame it on them without knowing that there are manufactures behind these issues. In 2000, the largest retail association identified that food safety was one of the main concerns of the customers (Global Food Safety Initiative, 2009). This led the retailers to look for different ways to prevent food safety issues and different metrics to measure success. According to Yiannas (2008), food safety professionals have created metrics that indicate the consequences of food safety systems such as pathogen presence or outbreak

incidence, known as lagging indicators. Food safety professionals, however, have not created metrics to measure the behavior driven by the culture of employees handling food, described by Yiannas (2008) as leading indicators.

Culture has been measured in different ways, but according to the conclusions of the previous two articles of this case study, food safety culture has never been measured. The implementation of the survey defined in the second article of this study will help to identify if food safety culture is present and to define which strategies are needed to maintain it or improve it.

Purpose and Objectives

The purpose of this study was to identify if food safety culture was present in the selected company and if differences existed across various demographic dimensions.

Methods

The retailer for this study was purposefully selected; this retailer operates different retail business formats across the world, has more than 3000 units in the USA, and has approximately 1.2 millions of employees. According to Merriam (1998) a case study is delimited to a group of people in a specific period of time. For this case study the research was limited to the business operations of this retailer in the USA.

Population

The survey was available to all employees of the company on a web site that hosted on-line company surveys. After two weeks of being posted approximately 20,000 employees ($n=20214$) responded and submitted the survey.

Instrument

The instrument had ten statements to be rated by the respondents using a summated scale of five points: strongly agree= 5; agree=4; neither agree nor disagree=3; disagree=2; and strongly disagree=1. The instrument also had five questions with predetermined demographic answers to be chosen by the respondents. A copy of the questionnaire may be found in Appendix C.

The instrument was previously piloted to determine its reliability and validity. Based on the findings of the previous article, the two constructs being measured were food safety culture-company and food safety culture-employee. The reliability index using Chronbach's alpha for the food safety culture-company construct was .83. The reliability index for the second construct, food safety culture-employee, using the same test was .83. During the pilot test 30 ($n=30$) employees voluntarily participated.

Posting the questionnaire

In order to gather data in an effective manner, the survey instrument was posted where all the surveys for the company are hosted. To access the survey, each employee needed to sign on to their account, and then click the link to the questionnaire. Once the survey was completed, the employee was not able to access it again. A message was sent to all the employees indicating that the survey was available and that all data was confidential. A copy of the electronic message is available in Appendix D. The questionnaire was available for 16 days.

Data analysis

The main objectives were to measure food safety culture in this company by measuring food safety culture-employee and food safety culture-company, and to

compare differences between different groups of the company defined by the independent variables.

The data received from the survey was analyzed using descriptive research, which involves the collection and analysis of quantitative data in order to describe a sample's behavior and/or specific demographics of the study (Gall, Gall & Borg, 2005). The data was also analyzed using causal-comparative research defined by Gall, Gall and Borg (2005) as the examinations of possible effects and interactions caused by a specific characteristic of a group. In causal-comparative research dependent variables are used to compare differences and/or infer causalities among independent variables.

The independent variables for this study were determined by the answers of questions eleven to fifteen. The independent variables were:

Work related to food. For this variable the employees were divided in two groups, one related to food and the other non-related to food.

Number of years working in the company. For this variable the employees were classified in five groups: less than one year; from one to five years; from six to ten years; from eleven to fifteen years; and more than fifteen years.

Payment method. For this variable the employees were divided in two groups, pay by the hour and salaried.

Leadership role. For this variable the employees were divided in two groups, members of management and non-members of management.

Business operation unit. The seven business operation units from this company were considered for this variable.

Food safety culture-company was calculated by taking the average score of the ratings for the first five items in the instrument per participant in each group. Food safety culture-employee was calculated considering the average score of the ratings of items six to ten of the instrument. The average score of the respondents ($n=20214$) was calculated using the SPSS software version 16.0.

For the purpose of this study scores between 4 and 4.50 were considered agree and scores above 4.51 were considered strongly agree.

Field (2006) defined the independent t-test as a model used to identify differences between two different groups of individuals. To determine if statistically significant differences existed between the independent variables with two groups, the food safety culture-company and employee scores were compared using the independent t-test.

According to Field (2006) Analysis of Variance (ANOVA) is used when there are independent variables with more than two groups. The independent variables that had more than two groups were compared using ANOVA.

Since the groups were not represented equally (unbalanced groups), the Type III sums of squares from SPSS version 16.0 was used for the ANOVA. This type of sums of square is recommended by Field (2006) when dealing with unbalanced groups. The SPSS default homogeneity test (Lavene's test for homogeneity) was also conducted for the interpretation of the *post-hoc* tests. The procedures for the *post-hoc* tests conducted for this study were needed to be robust enough for unbalanced groups. Field (2006) suggested that Hochberg's GT2 and Gabriel's procedures were appropriate *post-hoc* tests for unbalanced groups when equal variances assumed. According to Field (2006) studies have reported that Gabriel's could be liberal when sample sizes are very different

(unbalanced groups) so Hochberg's GT2 was used as a comparison point. For equal variances not assumed and when dealing with unbalanced groups, Field (2006) suggested Games-Howell, a powerful but liberal procedure and Dunnett's T3 and C a procedure that keeps tight control over of Type error I, defined as the error that occurs when it is assumed that that a genuine effect exists, when in fact it does not exist (Field, 2006). For this study both of these procedures were followed (equal variances not assumed).

To establish causality, importance, and meaningfulness, the effect size was calculated (Field, 2006). There are several models to calculate the effect size. The one used in this study for the independent variables with two groups was Cohen's d (Cohen, 1988). Cohen suggested that an effect size smaller than .20 was negligible; between .21 and .49 was small; between .5 and .79 was medium; and greater than .8 was large. The author also mentioned that is relatively common to find small effect size in social sciences. The Cohen's d (d) effect size is calculated by subtracting the standard deviation (SD) of group two from the standard deviation of group 1 and dividing it by the pooled standard deviation.

Formula for Cohen's d

$$d = (SD_1 - SD_2) / \text{Pooled } SD$$

The model suggested to calculate the effect size for ANOVA is omega squared (ω^2) (Field, 2006). The omega squared is calculated by dividing the variance of the main effect or the interaction between the total variance.

Formula for omega squared

$$\omega^2 = \frac{\sigma^2_{\text{effect}}}{\sigma^2_{\text{total}}}$$

Results

Descriptive research results

As portrayed in Table 2, the majority of the respondents were related to food ($n=17167$) and scored 4.72 for food safety culture company, which indicates that the employees associated to food strongly agreed that the company had food safety culture. The employees not related to food ($n=3047$) also strongly agreed that the company had a food safety culture and gave it a score of 4.64. Table 1 also portrays the food safety culture of the employees related to food ($n=17167$). With a score of 4.65 employees related to food strongly agreed that they have a food safety culture. Employees not related to food agreed that they had a food safety culture scoring 4.5.

Table 2

Food Safety Culture-company and Employee Food vs. Non-food Related (n=20214)

Group	Number of respondents (n)	Score Food safety culture - company	Standard Deviation	Score Food safety culture - employee	Standard Deviation
Related to food	17167	4.72	0.45	4.65	0.49
Non-related to food	3047	4.64	0.53	4.50	0.62

Mean score summated scale strongly agree=5; agree=4; neither agree nor disagree=3; disagree=2; and strongly disagree=1.

Table 3 shows that the majority of the respondents have been working in the company between 1 and 5 years ($n=9117$). These employees strongly agreed that the company had a food safety culture scoring it at 4.68. They also strongly agreed that they had a food safety culture with a score of 4.61. Table 2 also portrays the food safety culture-company and employee scores for the different levels considered in this independent variable.

Table 3
Food Safety Culture-company and Employee Based on Number of Years Working in the Retailer (n=20214)

Group	Number of respondents (n)	Score Food safety culture - company	Standard Deviation	Score Food safety culture -employee	Standard Deviation
less than one year working for the company	3430	4.75	0.42	4.69	0.46
From 1 to 5 years working in the company	9117	4.68	0.49	4.61	0.53
From 6 to 10 years working in the company	4262	4.69	0.49	4.60	0.54
From 11 to 15 years working in the company	1829	4.74	0.43	4.65	0.49
More than 15 years working in the company	1559	4.77	0.41	4.68	0.49

Mean score summated scale strongly agree=5; agree=4; neither agree nor disagree=3; disagree=2; and strongly disagree=1.

In Table 4 it can be observed that the majority of the survey takers were paid by the hour ($n=16930$). The hourly employees strongly agreed that the company and they had a food safety culture scoring 4.68 and 4.60, respectively. Salaried employees ($n=3284$) also strongly agreed that the company had a food safety culture with a score of 4.82 and consider that they, as employees, also have a food safety culture scoring 4.76.

Table 4
Food Safety Culture-company and Employee Hourly vs. Salaried (n=20214)

Group	Number of respondents (n)	Score Food safety culture - company	Standard Deviation	Score Food safety culture -employee	Standard Deviation
Hourly	16930	4.68	0.48	4.60	0.53
Salaried	3284	4.82	0.39	4.76	0.41

Mean score summated scale strongly agree=5; agree=4; neither agree nor disagree=3; disagree=2; and strongly disagree=1.

Table 5 portrays the scores for food safety culture-company and employee of management employees ($n=4734$) and non-management employees ($n=15480$). The scores shown on Table 4 indicate that these two groups strongly agreed that the company and the employees had a food safety culture.

Table 5
Food Safety Culture-company and Employee Management vs. Non-management (n=20214)

Group	Number of respondents (n)	Score Food safety culture - company	Standard Deviation	Score Food safety culture -employee	Standard Deviation
Management	4734	4.82	0.36	4.75	0.41
Non-management	15480	4.67	0.49	4.59	0.54

Mean score summated scale strongly agree=5; agree=4; neither agree nor disagree=3; disagree=2; and strongly disagree=1.

Table 6 shows the perceptions of the employees of different business units in terms of the food safety culture-company and employee. It is important to notice that the store format was the one that participated more ($n=17643$).

Table 6
Food Safety Culture-company and Employee According to Business of Operation Unit (n=20214)

Group	Number of respondents (n)	Score Food safety culture - company	Standard Deviation	Score Food safety culture -employee	Standard Deviation
Store	17643	4.71	0.47	4.63	0.51
Club	1477	4.73	0.45	4.62	0.52
Local market 1	432	4.69	0.53	4.60	0.54
Local market 2	140	4.67	0.41	4.60	0.49
Hispanic market 1	421	4.70	0.46	4.60	0.53
Hispanic market 2	42	4.62	0.46	4.45	0.60
Corporate office	59	4.67	0.57	4.52	0.66

Mean score summated scale strongly agree=5; agree=4; neither agree nor disagree=3; disagree=2; and strongly disagree=1.

Causal comparative research results

As mentioned in the methods section to define if there were statistically significant differences in food safety culture-company or employee for the independent variables that had two groups an independent t-test was calculated.

The results portrayed in Table 7 indicate that there are statistically significant differences ($p < .0001$) in food safety culture-company and employee between employees that are related to food and employees that are not related to food. However, the effect size was negligible.

Table 7
Independent t-test Food vs. Non-food Related (n=20214)

Construct	T	Df	Significance	Effect size
Food safety culture-company	8.230	20212	0.000	0.17
Food safety culture-employee	14.900	20212	0.000	0.06

The scores of hourly employees and salaried employees also showed significant differences ($p < .0001$), as portrayed in Table 8. The effect size in this case was small and causality cannot be assumed.

Table 8
Independent t-test Hourly vs. Salaried (n=20214)

Construct	T	Df	Significance	Effect size
Food safety culture-company	-15.77	20212	0.000	0.26
Food safety culture-employee	-15.74	20212	0.000	0.23

As shown in Table 9, the scores for food safety culture-company and employee for management employees and non-management employees was also significantly different ($p < .0001$), but there was a small effect size.

Table 9
Independent t-test Management vs. Non-management (n=20214)

Construct	T	Df	Significance	Effect size
Food safety culture-company	18.77	20212	0.000	0.28
Food safety culture-employee	18.56	20212	0.000	0.25

As mentioned in the methods for the independent variables with more than one group ANOVA was calculated.

As portrayed in Table 10 there were significant differences ($p < .0001$) depending on the number of years that the employees have worked at this retailer. However the effect size was negligible and the differences were not meaningful.

Table 10
ANOVA Years Working in the Company (n=20214)

Construct		Sum of Squares	df	Sig.	Effect size
Food safety culture-company	Between Groups	22.74	4	0.000	0.070
	Within Groups	4483.52	20192		
	Total	4506.27	20196		
Food safety culture-employee	Between Groups	26.60	4	0.000	0.069
	Within Groups	5429.14	20192		
	Total	5455.74	20196		

As shown in Table 11 there were not significant differences between the different business units for food safety culture-company. There were significant differences for food safety culture-employee ($p = .043$), but the effect size was negligible.

Table 11
ANOVA Business Operations Unit (n=20214)

		Sum of Squares	df	Sig.	Effect size
Food safety culture-company	Between Groups	1.43	6	0.37	0.03
	Within Groups	4518.18	20207		
	Total	4519.62	20213		
Food safety culture-employee	Between Groups	3.51	6	0.043	0.02
	Within Groups	5465.50	20207		
	Total	5469.01	20213		

Conclusions and Recommendations

The results obtained from this investigation indicated that the retailer selected, according to the employees that voluntarily submitted the survey, agreed or strongly agreed that food safety was part of the culture of the company and that the employees have a food safety culture.

This study also revealed that there were statistically significant differences regarding food safety culture-company and employee across the different groups that participated in the survey, but effect size were negligible or small, which indicates that causality cannot be assumed for the differences.

For this case it was not possible to conduct representative sampling because of company policies. The policy of the company was to give access to the same surveys to everybody at the same levels; the company handles all the surveys as voluntary.

In the future other retailers could use this instrument to measure food safety culture. Future research in other companies should consider representative samples of the

different groups, in order to claim stronger inferences. Other independent variables of interest, such as access to food safety training, food safety training method, etc. could be included in future implementations of this survey instrument.

The findings indicated that food safety is already part of the culture. This could be attributed to the fact that the corporate culture of the company is centered on the customer, and that employees at all levels are required to think as customers. As customers, the employees of this company are very aware of the food safety weaknesses around the food industry. A similar study should be conducted in companies in which customer service is not part of their core corporate culture, or for companies that do not assume their responsibilities as a potential customer of the product they are handling. An example is the manufacturing industry in which line workers do not realize the danger involved in the mishandling a food product from the safety perspective. Food manufacturer employees could be under pressure for production goals and may not see the potential consequences as something that could affect their families.

The most important contribution of this study is the first quantitative measure of food safety based on leading indicators, defined by Yiannas (2008) as those that affect the behavior and are reflected in better food safety practices. To understand the relationship of food safety culture with food safety incident reduction, this metric can be combined and correlated in future studies with other food safety metrics, such as pathogen reduction or outbreak incidence.

Employees at this company agreed that the company had a food safety culture, and that they were part of that culture. Even though food safety culture was present in this retailer, it is important to create strategies to maintain and adapt food safety culture

according to customer needs. The andragogy theory suggested by Knowles, Holton and Swanson (2005) indicated that adults have the need to know, and are willing to acquire new knowledge based on their needs. Hence the company needs to create educational and training curricula that will direct the employees to learn about food safety. An educational strategy based in andragogy will help the employees of this company to become self-directed food safety learners. According to Grow (1991), this will result in positive outcomes in terms of food safety knowledge and strengthen the employee-company relationship for a food safety culture of the company.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The increasing customer concern about food safety and the recent events related to microbiological and chemical contamination of food products, such as the melamine in infant formula and the multiple cases of produce pathogen contamination, has negatively affected the retail industry. When food safety incidents occur, the customers usually blame it on the retailer without knowing that there are manufacturers behind these issues. As guidelines for food safety are developed in the food industry, it has been proven that a solid food safety system based on programs like Hazard Analysis and Critical Control Points (HACCP) could help to reduce the likelihood of a food safety incident. Nevertheless, companies with such systems have experienced public food safety issues. In order to address their customers' concerns, retailers need to identify different ways to prevent food safety issues and alternative metrics to measure the effectiveness of the food safety systems.

According to Yiannas (2008), food safety professionals have created metrics that indicate the consequences of food safety systems such as pathogen presence or outbreak incidence, known as lagging indicators (Yiannas, 2008). Food safety professionals, however, have not created metrics to measure the behavior driven by the culture of employees handling food, described by Yiannas (2008) as leading indicators. According to his theory, the employees that handle food are related to cultural values and behave in a company based on its cultural influence; hence, food safety should be also measured in cultural terms as a leading indicator.

According to the literature review, food safety has never been measured in terms of culture; hence, strategies that can help to implement, improve, or maintain it, are not well identified. In order to create an instrument to measure food safety culture and apply it in a company, the researcher selected a retailer using case study methodology.

The research was conducted in three stages, and reported in this dissertation in three different articles. During the first stage, the researcher used qualitative methods, such as ethnography to gather data about the culture and leadership of the company. During the second stage, the researcher used the findings of the first part of the research to define food safety culture constructs and to create a valid and reliable food safety survey instrument. In the last part of this study the researcher implemented the instrument in the selected retailer and analyzed the data using quantitative methods to determine if food safety culture was present and what differences existed across several groups of employees.

The theories used for this research were, andragogy, defined as “any intentional and professionally guided activity that aims at a change in adult persons” (Knowles, Holton & Swanson, 2005, p. 60). Its principles have been at the core of adult learning and have been used as an anchor for psychological theory (Houde, 2006). The second theory for this study was cultural classification (Hofstede & Hofstede, 2005). These authors defined culture as a set of traditions repeated among large groups of people for many generations. Culture is the core driver of an individual belonging to a cultural group, meaning that culture is the deepest value of any individual; hence, cultures are difficult to change. Instead, the professional development programs to be implemented should be handled according to the cultural traditions of the group in which such program is being

implemented. To understand the cultures inside each company, the concept of cultural relativism suggested by Rogers (2003), was considered. Cultural relativism refers to the expression of a culture under particular circumstances.

To understand the relationship between employees and leaders, the leadership classification is used as suggested by Northouse (2007). This classification was made as follows (Northouse, 2007):

1. Trait approach is based on innate characteristics of the leaders (leader centered), with the traits being intelligence, self-confidence, determination, integrity and sociability (p. 15).
2. Skills approach is also leader-centered, but it contemplates the skills of the leaders. These skills are divided into technical and human skills based on the ability of the leader to relate with the followers and to deal with concepts and abstract ideas (p. 39).
3. Style approach focuses on the behaviors of the leaders based on the reactions of their followers (p. 69).
4. Situational approach is classified from S1 to S4. Each style has two components, directivity and supportiveness, that are present at different levels (p. 9), being S1 an extremely directive but less supportive leader, S2 very supportive and directive, S3 highly supportive and less directive and S4 less focused in both directivity and supportiveness.

Description of the Corporate Culture of a Global Retailer

The objective of this article was to describe the culture and leadership of the company.

What is the corporate culture of the company?

To answer this questions the researcher selected a USA based retailer using case study methodology, defined by Merriam (1998), as the study limited to a specific group of people in a defined timeline. The study was delimited to the operations area of the company and to the timeline in which the researcher was engaged observing the culture of the company. Qualitative techniques based in heuristics were used to describe the culture and the leadership of the company. Ethnography and historical documents were used to gather data. Culture was described based on the five cultural dimensions suggested by Hofsetde and Hofstede (2005): power distance; femininity vs. masculinity; collectivism vs. individualism; avoidance to uncertainty; and short vs. long term. The leadership was described using approaches described by Northouse (2007); trait approach; skills approach; style approach; and situational approach.

The results indicated that the culture of the company was driven by three core cultural values: service to the customer, excellence and respect for the individual. According to the cultural dimensions described by Hofstede and Hofstede (2005), the selected company had a short power distance which was collective and masculine. The company ranked in the middle of the scale for uncertainty avoidance and short vs. long term. The leadership of the company was described as highly directive and highly supportive, which fits the description of the style approach suggested by Northouse (2007). Leaders of the company were also considered innate and charismatic, which fits the description for the trait approach suggested by Northouse (2007).

Based on the theory of Hofstede and Hofstede (2005), which indicates that cultures are defined by individuals and individuals are influenced by cultures. The results

of this research provided knowledge about how the employees had shaped the culture of this company, how the culture influenced them and what their interaction would be. It also provided knowledge about what are the core cultural values driving the interaction employee-company. This study led the researcher to the conclusion that, in order to create constructs to measure food safety culture, the three core cultural beliefs and the interactions employee-company must be considered.

In the practice, whenever researchers conduct investigation or want to implement something in an organization, they first need to understand and identify the culture of the organization, and therefore the relationship of the employee as an individual belonging to the culture of an organization. It is also important to understand the core cultural values driving the interaction individual-organization. The cultural description and understanding should be used by the researcher as the baseline to conduct future research that relates to the organization.

For future research in food safety culture of this retailer, a quantitative instrument that measures food safety culture in the company should be created, piloted and applied across the population of the company. The survey results and the cultural and leadership characteristics should be used to interpret if there is a food safety culture in the company, what factors are driving it, and which strategies are needed to maintain it.

Designing an Instrument to Measure Food Safety Culture

The objective of this study was to define constructs to measure food safety culture and create a valid and reliable instrument to measure them.

What constructs are appropriate to measure food safety culture of the company?

To answer this question, the researcher conducted construct validity, defined as the appropriateness, meaningfulness and usefulness of a construct (Gall, Gall & Borg 2007). Construct validity can be assessed by having a group of subject matter experts analyzing them as well as the items that are intended to measure the constructs (Ary, Jacobs & Sorensen, 2006). The researcher also conducted instrument reliability, defined as the extent to which another researcher will arrive at similar results by using the same instrument (Gall, Gall & Borg, 2007) by measuring Chronbach's alpha (Desselle, 2005). The Cronbach's alpha is defined as "a measure of internal consistency of a test containing items that are not dichotomously, based on the extent to which test-takers who answer a given test item one way respond to other items in a similar way" (Gall, Gall & Borg, 2007, p. 637).

The validity of the suggested constructs was assessed by reviewing them with experts in food safety; culture and survey design from the company, as well as the Department of Agricultural Leadership, Education and Communications from Texas A&M University. The reliability of the instrument intended to measure the defined constructs was assessed conducting a pilot test with 30 food safety experts from the company. In order to identify the statements that were more reliable, the results from the pilot test were analyzed through Cronbach's alpha, an index for reliability, using SPSS version 16.0. The instrument was created using a five point summated scale: strongly agree= 5; agree=4; neither agree nor disagree=3; disagree=2; and strongly disagree=1.

The results indicated that the best constructs to be measured were food safety culture-company and food safety culture-employee. An instrument based on these

constructs was created considering the organization, the employee, leadership and the core cultural values of the company. After the pilot test, 10 items were selected for the final instrument. To measure food safety culture-company, five questions were included in the instrument; these questions yielded a Cronbach's alpha of .83. The five questions selected to measure food safety culture-employee yielded a Cronbach's alpha of .83. In order to define independent variables, other five questions were added to the final instrument.

The major contribution of this study was the design of an instrument to measure food safety culture. After reviewing literature, the researcher determined that a validated instrument to quantitatively measure food safety culture was not available. During this research, all internal policies from the company were followed; verbiage and language used in the survey instrument were aligned with the cultural characteristics of the company.

On a larger scale, the application of this survey instrument in the selected company for this study could have a considerable impact in the food retailing industry. The results of the survey will help to understand if food safety culture is present and which strategies are needed to develop, improve, or maintain it. Other companies may use versions of this instrument to assess food safety culture.

Measuring Food Safety as Part of the Culture of a Global Retailer

The objective of this study was to measure if food safety culture was present at this company and identify if differences existed across other groups of the company.

Is there a food safety culture in the company?

To answer this question, an instrument survey was implemented in a selected retailer. According to the company's policies it was made available for all the employees that were voluntarily willing to participate. After being posted for 16 days over 20,000 employees responded and submitted the survey ($n=20214$). The data gathered was analyzed using descriptive analysis, which involves the collection and analysis of quantitative data in order to describe a sample's behavior and/or specific demographics of the study (Gall, Gall & Borg, 2005). Food safety culture-company was calculated by taking the average score of the summated scale for the first five items in the instrument per participant in each group. Food safety culture-employee was calculated considering the average score of the summated scale of items six to ten of the instrument.

Are there differences in terms of food safety culture among various types of employees of the selected company?

To answer this question, causal-comparative research was used. This type of research was defined by Gall, Gall and Borg (2005) as the examinations of possible effects and interactions caused by a specific characteristic of a group. In causal-comparative research, dependent variables are used to compare differences and/or infer causalities among independent variables.

To determine if statistically significant differences between the groups existed across the independent variables, the food safety culture-company and employee scores were compared using t-test, for variables with two factors and ANOVA for variables with more than two factors. For both cases the effect size was calculated.

The results of the descriptive analysis indicated that all groups of the company agreed and strongly agreed that food safety culture was present in the company and employees with scores above 4.5 and 4.4 respectively. The results of the causal comparative analysis indicated that there were some statistically significant differences but with negligible or small effect sizes.

For this case, it was not possible to conduct representative sampling because of company policies. The policy of the company was to give access to the same surveys to everybody at the same levels; the company handles all the surveys as voluntary.

The fact that food safety is already part of the culture could be attributed to the corporate culture of the company, which is centered on the customer.

The most important contribution of this study is the first quantitative measure of food safety based on leading indicators. In order to understand the relationship of food safety culture with food safety incident reduction, this metric can be combined and correlated in future studies with other food safety metrics, such as pathogen reduction or outbreak incidence.

The results also helped to suggest strategies to maintain and adapt food safety culture according to customer needs. The andragogy theory suggested by Knowles, Holton and Swanson (2005) indicated that adults have the need to know, and are willing to acquire new knowledge based on their needs; hence, the company needs to create educational and training curricula that will direct the employees to learn about food safety. An educational strategy based in andragogy will help the employees of this company to become self-directed food safety learners. According to Grow (1991) this

will result in positive outcomes in terms of food safety knowledge and strengthen the employee-company relationship for a food safety culture of the company.

For future research, a similar study should be conducted in companies in which customer service is not part of their core corporate culture, or that do not assume their responsibilities as a potential customer of the product they are handling. An example is the manufacturing industry in which line workers do not realize the danger that involves mishandling a food product from the safety perspective. Food manufacturer employees could be under pressure for production goals and may not see the potential consequences as something that could affect their families.

Overall Conclusions and Recommendations

The findings of the first stage of this research study indicated that the core cultural beliefs (respect for the individual, service to the customer, and strive of excellence) are embedded in the corporate culture. The employees are highly engaged with culture of the company. The core cultural beliefs have made the employees aware of their customers' concerns, such as food safety. The cultural characteristics of this retailer help explain that the employees in the operations area agree or strongly agree that food safety culture is present in the company and with the employees.

The conclusions of this research determined that the employees of the selected retailer were receptive to food safety education. Employee awareness of the food safety concerns of the customers and their agreement with food safety culture being present in the company indicate receptiveness for food safety education. It is important that the company considers andragogy as an educational theory to create food safety training. The

employees appear to be ready to learn about food safety and to develop positive behaviors that could be reflected in better food safety practices.

This study concludes that current food safety system metrics need to be complemented with metrics based on leading indicators. It is important to keep measuring food safety in terms of lagging indicators, such as one-shot food safety audit scores, reduction of food safety incidents, reduction of recalls, etc. But leading indicators, such as food safety culture should be considered. Just as food producers are measured in terms of food safety non-conformities, the companies also need to be measured in terms of their culture, how well their employees are engaged with it, and how much the corporate culture promotes positive behaviors for food safety.

Resources from the organizations dedicated to promote food safety, should be designated to analyze the food safety culture of the food industry and promote educational techniques to impact the cultures of the companies so food safety can become part of their culture.

For future studies, this research should be applied to representative samples. That will help to make better statistical inferences and adjust the instrument. Other retailers may use the food safety culture instrument developed in this study to measure their own food safety culture.

This study should also be applied in the food manufacturing industry. It is probable that employees in the manufacturing industry do not understand the relationship between the products they are handling and the consumers. Because of manufacturing high production demands, the cultures of these companies could be focused on producing more in less time and cutting expenses. A measurement of the food safety culture of food

manufacturers could help to understand the food safety awareness of the company and define strategies to maintain, develop or create a food safety culture for the food industry.

Food safety professionals around the world should consider this study as a baseline to continue developing more measurement tools for food safety culture and to create a strategy for implementation. Future studies can help to correlate food safety culture with food safety incident reduction, expecting that a company with food safety culture and the right food safety systems in place will be less likely to be involved in a food safety incident.

One of the major contributions of this study is a valid and reliable instrument to measure food safety culture which provides support to the theory of behavior-based food safety management systems (Yiannas, 2008). Another contribution is the first score (benchmark) of food safety culture from one of the largest retailers of the world. This study sets the foundation for other research projects to create a food safety culture.

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APPENDIX A

INSTRUMENT USED FOR PILOT STUDY

Food Safety as a Part of our Corporate Culture

Please select the option which best describes your opinion about each statement. The options are:

5 strongly agree

4 Agree

3 Neither agrees nor disagrees

2 Disagree

1 Strongly disagree

	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>agree</i>	<i>Strongly agree</i>
<i>Statements</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Company					
1. Selling safe food at our stores and clubs is part of the good service we provide to our customers.					
2. Food safety is an important attribute of my company					
3. We require our suppliers to be committed to food safety.					
4. Food safety contributes to the success of the company.					
5. My company has a strong commitment to food safety.					
6. My company's food safety policies protect our customers.					
7. My company is responsible for the safety of the foods we sell.					
8. Safe food is good for our business.					
9. My company has a good reputation for selling safe food.					
10. My company is leading global efforts to improve food safety.					
11. My company could be impacted by food safety incidents more than other retailers.					
12. The food safety policies of my company are a good example to other retailers.					
Employee					
13. Safe food is important to protect the health of our customers.					
14. Our customers expect safe food.					
15. I clearly understand the importance of food safety for my company.					
16. I clearly understand how my position impacts food safety.					
17. My manager talks about food safety					
18. My manager holds me accountable to following food safety.					
19. Food safety is an important factor to consider when selling food.					
20. Food safety is often discussed in team meetings					
21. My opinion is considered when creating food safety procedures and policies.					
22. We respect the individual, so we care about their safety					

23. We serve our customers, and we do it safely.					
24. We strive for excellence, by starting with safety.					
25. My workmates have a strong commitment to food safety.					
26. Safe food helps people live better.					
27. I feel responsible for the safety of the foods we sell.					
28. I can contribute to food safety from my position.					
29. I am committed to comply with all food safety requirements required by law.					

Please provide other statements you think could be included in the questionnaire.

Please provide the numbers of statements you do not think should be in the questionnaire.

Feel free to provide other comments and/or suggestions

APPENDIX B

CRONBACH'S ALPHA FOR RELIABILITY TEST IN PILOT STUDY

Cronbach's alpha if item deleted food safety culture-company (n=30)

Question	Cronbach's Alpha if Item Deleted
q1	0.778
q2	0.767
q3	0.776
q4	0.810
q5	0.765
q6	0.771
q7	0.809
q8	0.810
q9	0.781
q10	0.775
q11	0.812
q12	0.788

Cronbach's alpha if item deleted food safety culture-employee (n=30)

Question	Cronbach's Alpha if Item Deleted
q13	0.804
q14	0.807
q15	0.796
q16	0.808
q17	0.803
q18	0.805
q19	0.811
q20	0.794
q21	0.786
q22	0.806
q23	0.808
q24	0.809
q25	0.797
q26	0.806
q27	0.809
q28	0.793
q29	0.804

APPENDIX C

WEB BASED FINAL INSTRUMENT

Food Safety Survey

Survey will be available until Aug 21, 2009

Form Instructions:

In an effort to provide safe and wholesome food, so people can live better, we need your help in completing this questionnaire.

Please be assured that your responses to the survey will be kept completely confidential. Your answers will not be linked back to you.

Please select the option which best describes your opinion and not how you believe your fellow associates think about each statement. The options are:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

- | | | |
|-----|--|--------------------------|
| 1. | Selling safe food at our stores and clubs is part of the good service we provide to our customers. | <input type="checkbox"/> |
| 2. | We require our suppliers to be committed to food safety. | <input type="checkbox"/> |
| 3. | My company has a strong commitment to food safety. | <input type="checkbox"/> |
| 4. | My company's food safety policies protect our customers. | <input type="checkbox"/> |
| 5. | My company has a good reputation for selling safe food. | <input type="checkbox"/> |
| 6. | I clearly understand how my position impacts food safety. | <input type="checkbox"/> |
| 7. | We respect the individual, so we care about their safety | <input type="checkbox"/> |
| 8. | We serve our customers, and we do it safely. | <input type="checkbox"/> |
| 9. | We strive for excellence, by starting with safety. | <input type="checkbox"/> |
| 10. | My workmates have a strong commitment to food safety. | <input type="checkbox"/> |

Please answer the following questions by choosing the option that applies

- | | | |
|-----|--|--------------------------|
| 11. | Is your work at _____ related to food? (e.g. handling, transporting, buying, etc.) | <input type="checkbox"/> |
| 12. | How long have you worked at ? | <input type="checkbox"/> |
| 13. | Are you salaried or hourly associate? | <input type="checkbox"/> |
| 14. | Are you a member of management? | <input type="checkbox"/> |
| 15. | Which of the following areas do you work in? | <input type="checkbox"/> |

THIS QUESTIONNAIRE IS PRIVILEGED AND CONFIDENTIAL. IT HAS BEEN PREPARED AT THE DIRECTION OF LEGAL COUNSEL. IT MAY NOT BE COPIED, REPRODUCED OR FORWARDED

APPENDIX D

MESSAGE TO EMPLOYEES FOR FINAL STUDY

Page 1 of 1

Food Safety Survey

To: Store Management
From: Food Safety and Health Team
Date: August 7, 2009
Subject: Food Safety Survey

- A Food Safety Survey is posted on the Teamwork tab of the , asking for our opinion of our food safety practices.
- The brief survey is completely anonymous. No responses will be attached to any individual nor to any facility.
- We need responses across a wide spectrum of associates to gauge our associate's perceptions of our food safety practices.
- Your encouragement to your associates to complete the survey will be helpful in gaining valuable feedback from the field.
- The short survey can be completed in 2 minutes.

- The survey is also posted on the Food Safety page
- All Food Service associates are particularly encouraged to complete the survey.
- All survey responses are completely anonymous.
- The survey will be available thru Aug 21st.

VITA

Name:

Rodrigo Santibanez-Rivera

Address:

223 Scoates Hall
2116 TAMU
College Station, TX 77843-2116

Education:

2009 Ph.D. in Agricultural Leadership, Education and Communications, College of Agriculture and Life Sciences, Texas A&M University.

2006 B.S. in Veterinary Medicine, College of Veterinary Medicine, Universidad Nacional Autónoma de México.

Work Experience:

2008-2009 Global Food Safety Manager of a food retailer.
2003-2009 Food Safety and Quality Auditor of Global Food Retailers suppliers.
2006-2007 Food Safety Program Coordinator at Texas A&M University for Latin America.
2002-2007 Instructor of HACCP courses at Texas A&M University Center in Mexico.
2005-2006 Lead Auditor food safety and quality systems Intertek Labtest, Mexico
2003 -2006 Food Safety Program Coordinator at Texas A&M University Center in Mexico.
2002-2003 Student Worker at Texas A&M University Center in Mexico City
2000-2006 Assistant Professor “B” of the Department of Genetics and Statistics, CVM-UNAM.

Certificates:

2006 SQF Certificate Train the Trainer #7458, SQF Institute
2007 Certified HACCP Instructor, International HACCP Alliance
2006 Food Safety Auditor certified by SQFI categories 1, 7, 8, 10, 16, 30 #1361
2005 SQF Certificate #5676 AVQ Consultoría Integral, SQF Institute
2004 HACCP Train the Trainers Certificate, International HACCP Alliance and Food Processors Institute, Washington D.C.
2004 HACCP Advanced Certificate, UC Davis, Food Processors Institute and International HACCP Alliance
2002 HACCP Certificate, International HACCP Alliance and Texas A&M Center in Mexico City