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Safe Quality Food Certification and Producing Safe and Quality Food Products

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Walden University
2017

Abstract

Safe Quality Food Certification and Producing Safe and Quality Food Products

by

Adeniyi Adedayo Odugbemi

MBA, Indiana Wesleyan University, 2011

BS, Purdue University, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Services

Walden University

November 2017

Abstract

The food sector accounts for $1 of every $6 in the U.S. economy, with more than $700 billion in revenue every year. However, incidents of food safety and substandard quality continue to rise. Consumers are beginning to mistrust and have lower confidence in the food supply chain. Food manufacturers need to address this issue to remain profitable. One approach includes the introduction of food policy programs that allow for independent auditing and certifications such as the Safe Quality Food (SQF) certification. The SQF certification was established as a rigorous and credible benchmark for food handlers to enforce food safety and quality standards. The purpose of this qualitative case study research was to evaluate the perceived usefulness of the SQF certification to food manufacturers. Guided by the theory of diffusion of innovation, data collection for this study included 35 stakeholder semistructured interviews, and a review of 5 publicly available documents for triangulation. Thematic analysis of the transcripts was performed to generate answers to the research questions. Study findings revealed that if properly implemented, the SQF certification is a credible and robust GFSI scheme that provides effective guidelines for food production. Findings also revealed 2 opportunities for improvement. Participants noted that training programs for SQF practitioners and auditors should be improved, likewise more commitment and involvement of facility management should be required. The findings may contribute to social change by providing food producers with strategies to minimize food production failures. With the perceived benefits of the SQF certification, other food producers who have not adopted this scheme can benefit from this holistic certification to enhance their food production network.

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Dedication

This dissertation for my PhD degree is dedicated to Jesus Christ, the Head of the Church triumphant, the lifter of my head, and one whom I represent as an Ambassador (II Corinthians 5 vs 20). Likewise, to the memory of my beloved father, the late Mr. Sunday Adetayo Odugbemi, how I wish you were here now. The strife is over, the battle is done, the victory of life is won, and the song of triumph has begun. Alleluia! The powers of death have done their worst, but Christ their legions hath dispersed, let shout of holy joy outburst. Alleluia!

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More than anything, I am eternally grateful to the three ladies who add color to my life: first to my wife Tolu and my daughters Tomilayo and Busayo, thank you for your encouragement and your prayers. Busayo has always longed for the day she will call me "Doctor Daddy." Making the home peaceful and your unconditional love has made this journey very easy. Thanks for your cooperation even as you supported me in my career and through two major relocations across the country in the course of my doctoral study.

To my Mum, Mrs. Esther Omolara Odugbemi, and my siblings, Adebowale, Kolawole, and Adedamola, thanks for believing in me and your support all through the way. The battle is over!

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lingers on with me. Likewise, there is no way I can recount my doctoral study without mentioning Ms. Ming Mary Carson, who suggested my dissertation topic and integrated me into the concept of the Safe Quality Foods certification scheme: I will forever be grateful.

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Chapter 1: Introduction to the Study

In this study, I investigated the perceived usefulness of the Safe Quality Foods (SQF) certification to aid the production of safe and quality foods in the food supply network for human consumption. In 2015, the Global Food Safety Initiative (GFS) recognized the certification process (Surak, 2013), which uses the audit process system to benchmark food supply chain operations from primary producers to retailers. GFSI is a global food network comprising hundreds of food retailers and manufacturers worldwide. The GFSI organization determines which requirements are essential in establishing a viable food safety-management system (Crandall & O'Bryan, 2015).

The GFSI recognizes several food safety standards including the SQF, Food Safety System Certification (FSSC) 22000, British Retail Consortium (BRC), and International Featured Standards (IFS). However, individual food business groups are free to choose which GFSI-recognized standard they will implement. Although the individual facility certificate does not come from GFSI but from the standards body being certified (SQF, FSSC 22000, BRC, IFS, etc.), any of these certifications is acceptable to GFSI when all certifying conditions are met (Crandall & O'Bryan, 2015). In this dissertation, I focus primarily on the SQF standard and its perceived usefulness among food processors who have adopted this particular scheme.

The SQF Institute manages SQF certification, which is a division of the Food Marketing Institute (FMI; Rossignoli & Moruzzo, 2014). An advisory board that provides overall policy advice, guidance, and direction to the SQF Institute manages the FMI, which is a U.S. organization of retailers and wholesalers (Fuchs, Kalfagianni, & Havinga, 2011). FMI membership includes three-quarters of all grocery retail stores in the United

States and 200 food companies from more than 50 countries around the world. With more than 5,000 food companies registered worldwide, GFSI recognized the SQF certification scheme as a food safety and quality benchmark certification process in 2004. Various food manufacturing facilities in Europe, South America, North America, the Middle East, and Asia have received SQF certification since its inception.

Administered by the FMI and recognized by retailers and food service providers around the world, the SQF closes the food production loop by certifying food manufacturing, distribution, and brokers for an effective and robust food safety and quality control program (Surak, 2013). The SQF program encompasses the ongoing consumer feedback system to function above the competition and proactively solve potential food safety issues along the food supply chain before they result in potential failures (Safe Quality Foods Institute [SQFI], 2015). SQF certification is also the only GFSI scheme that provides food safety certification for primary food production, food manufacturing, distribution, and agent/broker management. This distinguishing factor completes the food supply chain network and differentiates SQF from other GFSI schemes (Crandall & O'Bryan, 2015).

Furthermore, GFSI recognizes SQF certification for providing a credible and rigorous certification process from primary production to food manufacturing, packaging, distribution, and brokers (from farm to fork; Surak, 2013). In comparison with other GFSI schemes, SQF certification contains requirements for integrated processes that collaborate to control and minimize food safety hazards involving all stages of food handling. An example is the provision of separate detailed guidelines applicable to a food processor, food retailer, warehouse or storage facility, or a food packaging manufacturer.

This certification process operates through the facility audit that verifies that established food safety and quality practices are in place and are diligently followed at the respective food-handling facility.

The food facility, through the SQF auditing guidelines, proves they are capable of handling food products in compliance with acceptable governmental, industry, and SQF codes (Rossignoli & Moruzzo, 2014). The auditor investigates and ensures that willful actions that disregard established food safety programs are not permitted in the audited facilities. This auditing process has enabled food processors to assure consumers that grocery products processed under the SQF certification system have been produced, processed, packaged, and handled under the highest possible food safety and quality standards available in the food supply chain.

Although ensuring that food safety and quality process are current, the notion of SQF certification is to support food-handling facilities and food-processing companies to produce a safe and quality food for consumers to eat (Hobbs, 2014). The SQF certification program is a leading global food safety and quality certification program and management system designed to meet the needs of buyers and suppliers worldwide (Fuchs et al., 2011). The SQF Institute also maintains a direct relationship with food retailers alongside regulatory enforcement agencies such as the U.S. Food and Drug Administration (FDA), Food Safety and Inspection Service, U.S. Department of Agriculture (USDA), and Agricultural Marketing Service, among other governmental and industry regulatory groups (Rossignoli & Moruzzo, 2014).

Aligning with the aims and objectives, certification of compliance with SQF standard provides an effective means of communicating with stakeholders and other

interested parties on the wholesomeness of food items (Anelich & Swoffer, 2014). SQF certification is an important element in demonstrating food safety commitments under corporate governance, corporate responsibility, and financial reporting requirements (Crandall & O'Bryan, 2015). This certification involves auditing the food operation according to SQF code to verify and validate accurate processing of food products with correct labeling and packaging (Hobbs, 2014) and SQF certification for food processors ensures food safety and quality through the application of several policies and regulations known as the SQF codes (Anelich & Swoffer, 2014). This SQF code defines how food processors can operate and process their respective products to attain safe and quality food delivery.

With improvements in food science or technological applications and the introduction of novel food production applications, food manufacturers have used facility audits to evaluate these new processes (Anelich & Swoffer, 2014). Likewise, consumers have used successful audits ratings from these audits as assurance of the wholeness of grocery items. Even as food production operations continue to rapidly grow, food processors have used certification and audits as an avenue to forestall and eliminate possible food fatalities and provide avenues for continuous improvement (Trienekens & Zuurbier, 2008).

The aim of certification is to identify potential food safety and quality issues during the audit; noncompliance is abated before it becomes a problem with significant effects on society. With concerted efforts to reduce existing and emerging food operation risks, SQF certification aims to provide food manufacturers, stakeholders, and other public and private-sector partners in the food business with the necessary tools to produce

safe food, and to inculcate effective policies to strengthen consumer confidence in the food industry (Surak, 2013). To provide a rigorous system to proactively manage food safety risks and provide safe and quality products for consumers, SQF certification works to promote continuous improvement in the food business to ensure a recognized food safety certification that allows customers to have confidence in the food supply chain (Anelich & Swoffer, 2014).

The certification process provides an avenue for the proof of due diligence that aids the promotion of consumer confidence in the production of food from farm to fork (Anelich & Swoffer, 2014). Consumer confidence advances with favorable outcomes in SQF audits. In addition, food processors use this strategy to meet food safety and quality goals in their respective food operations (Trienekens & Zuurbier, 2008).

Marks of superior inspections usually allay food safety and quality fears of consumers and signify approval for consumption, ensuring consumer confidence that the product they are about to consume is safe, wholesome, and of high quality (Gereffi & lee, 2009). Certification provides verification of a thorough production process with the elimination of inherent food safety risks in the product. With the enumerated benefits of the SQF certification process to enhance the safe food production, this study evaluated how usefully the certification process has conformed to the documented objectives through participant perceptions.

This study examined the perceived usefulness of the SQF certification process for its ability to support the production of safe and quality foods in the United States. I conducted this study using the experience and perceptions of SQF system stakeholders. I qualitatively interviewed certified SQF practitioners, auditors, and stakeholders to engage

their responses and opinions on the usefulness of the scheme. For this study, I sourced nonnumeric data from participants who are employed in SQF certification and are knowledgeable to answer questions about the scheme. First-hand data from major employees about this certification allowed exposure of data, based on direct feedback.

Background

Food is an integral component of the necessities of humanity; therefore, the need to make safe and quality food readily available to consumers is important. The World Bank identified approximately 44 million people who were thrown into poverty in 2008, due to hikes in food prices (Alarcon et al., 2011). The average person requires 2,300 calories per day for a normal body function and to live a healthy life. However, a fair distribution of food has not been globally stable owing to the unavailability of food to certain individuals. Developed nations typically have abundant food, whereas low-income nations struggle to feed their populations. In particular, the world must double food production in the next 4 decades and producers must use efficient food production mechanisms to meet the rising demand in food (Alarcon et al., 2011).

With the global population expected to reach 9 billion people by 2050, many consumers are spending money to buy manufactured or processed foods (Alarcon et al., 2011). This consumer purchase habit is driving up the demand for higher quantities of food products, leading to diminished supplies from manufacturers, and causing food producers to intensify their supply chain efforts to meet those burgeoning demands (Alarcon et al., 2011). Hence, food manufacturers are making significant efforts to increase productivity to meet the rising demand. However, although striving for

production efficiency, safety, and quality of products may be relegated to a lesser priority.

With considerable public health concerns about unsafe food, cases of food safety incidents pose health hazards (e.g., foodborne illnesses) to consumers (Hamilton, 2014). Therefore, food producers should be thoroughly examined to ensure their operating systems are proficient and should be guided toward evaluating and eliminating all possible occurrence of foodborne outbreaks. A need persists for a universal representation of food safety standards across all food processing and manufacturing facilities to boost consumer satisfaction and maximize confidence (Valder, 2009).

Several food products from food manufacturers have been linked to recalls, withdrawals, and outbreaks of foodborne illnesses (Capps, Colin-Castillo, & Hernandez, 2015). The FDA reported that 25 incidents of major recalls and withdrawals of grocery foods in the month of April 2015. Likewise, in a recent development, two top-level officers of a food-manufacturing facility were sentenced to 20- and 5-year jail terms for producing peanut products contaminated with *Salmonella* (Near & Miceli, 2016). Subsequent reports revealed that this *Salmonella* outbreak linked to nine deaths and hundreds of hospitalizations. An estimated $1 billion was calculated as lost revenue owing to this incident. In the same line, this recall attracted bad publicity, damage to the brand of this corporation, and soiled a reputation that cannot be quantified in monetary value. In essence, consumers and producers face high vulnerability to food products owing to the threats and risk inherent in food-processing operations and the food supply chain as a whole (Charlebois, 2011).

Many food safety issues in production facilities resulted from poor employee practices, inadequately designed equipment, poor machine maintenance, cross contamination of ingredients and materials, temperature abuse cases, and ineffective food-manufacturing leaders (Greig, Todd, Bartleson, & Michaels, 2007). This scenario has led to significant health, economic, and legal consequences for food-manufacturing companies and consumers at large. The USDA estimates that approximately $69 billion is expended on cases of foodborne illness yearly, and this number is expected to increase by $10 billion every year (Lopez-Nazario, 2012). In addition, several food manufacturers face a series of lawsuits for producing unwholesome foods linked to outbreaks. FMI also estimates that the average food recall or withdrawal costs approximately $10 million in direct cost, lost sale, damage to the brand, bad press, and customer dissatisfaction.

This SQF certification would ensure that all food production facilities are calibrated to the same standard. Having a uniform examination procedure for all food facilities would ensure that all foods produced, irrespective of location, meet the established criteria and fulfill the requirements of food-processing guidelines (Valder, 2009). To identify the activities that occur in various food processing or manufacturing facilities, examining the scores that food-processing facilities achieve in certification inspections might indicate how such facilities adhere to established food safety and quality guidelines (Zheng, Muth, & Brophy, 2013). One such calibration standard is the SQF certification process recognized by GFSI. The outcomes of such audits indicate the state of operational diligence or the quality of foods produced in such facilities.

As the surge in food safety failures continues to rise, consumer trust and confidence are declining, resulting in increased concerns for strict regulation of the food

industry (PWC, 2015). In addition, 74% of consumers are requiring more information about the source of their food, especially the conditions and environments in which their food products are manufactured. Food processors also adopt measures that target not only regaining consumer trust but also approaches that lead to eliminating risks and threats that hinder the production of safe and quality foods.

Some measures food manufacturers are implementing include participating in certification processes that compare their entire food-manufacturing process to the benchmarked requirements (Swoffer, 2009). Moreover, along with producing safe and quality foods, the need to protect the brand or identity of the food industry is also paramount, leading to a culture of food safety and quality from the respective production floors to eventual consumer homes. Customers are developing heightened concern for the source and content of their food products and beginning to hold producers more responsible for the production of unwholesome foods.

According to PWC (2015), a program based on integrated food safety strategies, in-depth focus on quality management, concern for product integrity, adequate food defense programs, and effective traceable systems is important to achieve the aims of regaining consumer trust and producing safe and quality foods. SQF certification thoroughly symbolizes these characteristics and can deliver these attributes, as I identified previously. Because the quality and safety of food products are critical, a behavioral change should be the pivot of manufacturers to meet the rising demand of consumers (Grzesiak & Manno, 2016). Therefore, behavioral changes and striving for operational excellence through continuous improvement is one pillar of the SQF certification program.

Problem Statement

Food-related illnesses remain a relevant public health issue in the United States. Consumer concerns about the safety of their food are increasing while the marketplace realities of food safety and quality are compelling. In addition, incidents of food safety and production of poor-quality food products continue to rise. The U.S. Centers for Disease Control and Prevention estimates that one in six Americans becomes sick from foodborne outbreaks, and approximately 3,000 Americans die annually from consuming unsafe foods (Cody & Stretch, 2014). Approximately 72% of all chickens sold in retail food stores in the State of California tested positive for *Campylobacter* in 2014 (Myszka, 2014).

Furthermore, the FDA (2013) recently closed the operations of an ice cream production network for processing ice cream linked to several deaths due to *Listeriosis.* Hence, the safety and quality of the process of manufacturing food products continues to be questioned owing to several failures that have occurred in the food production and food supply chain network (Kher et al., 2013). The mainstream media and the prevalence of social media have also contributed to a back lash against food producers. Food retailers and consumer pressure have driven the need to investigate the food supply chain network.

Heightened with the growing consumer demand for increased food safety and quality assurance standards, following the GFSI standard, the SQF certification scheme, administered by the FMI, was established to address the prevailing problems of food-manufacturing standardization, food safety mishaps, and several improper employee behaviors in the food industry (SQFI, 2015). The Safe Quality Institute has created a

guidance document of key elements known as SQF codes to serve as the pilot in entrenching the certification scheme. These codes rest on the principles of Codex Alimentarius Standards and Guidance. The SQF code ensures food products and manufacturing processes or services comply with regulatory international and scientifically proven standards (SQFI, 2015).

The SQF certification process occurs when participating food facilities are audited against the described SQF codes that have been benchmarked against key elements and requirements of the GFSI guidance document. Audits are conducted to evaluate compliance with SQF guidelines. However, no research exists on pre-SQF and post-SQF changes in the food industry. Thus, further research is warranted to examine the usefulness of the SQF certification to aid in the production of safe and quality foods. In this dissertation, therefore, I determined whether the perceived utility of the SQF certification has been instrumental in the production of safe and quality food products for human consumption, evidenced by the safety and quality food products manufactured for consumers.

Purpose

The purpose of this study was to investigate the perceived usefulness of food producers participating in the SQF certification scheme. This dissertation is a quality assurance/program evaluation study designed to seek participants' perceptions of the value of this certification to their food production process alongside the benefits of meeting customer demands. Following the inception of the SQF codes, no evaluation has been conducted of the usefulness of the SQF certification protocol in or outside the United States for manufactured food operations (Crandall et al., 2012). Therefore,

information on the usefulness of the SQF guidelines on food production standards was

unavailable and necessitated a research study (Trienekens & Zuurbier, 2008).

The aim of food production is to provide food that meets customer expectation

and wholesomeness for human consumption. However, in view of current foodborne

illnesses associated with morbidity and mortality, the rate of producing unwholesome

foods, and the constant recalls and withdrawals, it is important to conduct rigorous

evaluation trials on the usefulness of the SQF guidelines (a program designed to provide

a viable way to successfully produce safe and quality foods) in promoting the production

of safe and quality foods. Furthermore, with the import and export of food products

around the globe, global standards for food safety and quality becomes a necessity and

restrictions should be made mandatory so food producers adhere to global standards of

food production, irrespective of manufacturing facility location (Crandall et al., 2012).

For example, Yao and Wan (2015) reported that China global food exports grew from

$80.48 billion in 2001 to $484.7 in 2012, with an annual growth rate of 17.55%.

In addition, 36% of agricultural food product manufactured in the United States is

exported. The export of food product around the world is rapidly growing and consumers

are concerned about the source of their food and the condition under which food

processors package these food products. Consumers are interested in the various food

facilities meeting the required food safety and quality standards. Hence, the SQF

certification, as a global food safety standard, must be evaluated to investigate the ability

of producers to meet the prescribed standards.

Ideally, adherence to SQF benchmarks will provide an avenue for well-defined

food safety and quality management systems, characterized by a reduction in risks and

threats to food-manufacturing contamination. Certification should help lead to the

production of safer and higher quality food products. Certification should also limit the

incidence of food-related illnesses and associated public health concerns for

manufactured foods. In addition, certification would not only ensure safety of

manufactured foods, but also of packaged and packaging materials and repackaged food

products designed for human consumption.

According to the USDA (2013), effective evaluation should help provide a

comprehensive report of issues that affect the safety of the food supply of the United

States. This research also uncovered possible opportunities in SQF implementation

processes, helping decrease the shipments of unwholesome food that lead to foodborne

illnesses or frequent cases of food withdrawals or recalls.

Inconsistencies in the food-manufacturing and operations system put consumer

safety and food-processing operations or food businesses at risk (Trienekens & Zuurbier,

2008). In essence, this research investigated the usefulness of the SQF certification audits

to reduce the many cases of food-manufacturing risks/threats and promote the production

of safe and quality food products for human consumption. Given the lack of previous

research and limited literature references, this research evaluated the perceived usefulness

of the SQF certification process in reducing risks and threats associated with food

processing and manufacturing operations among food-processing facilities that have

adopted the GFSI scheme for food safety standards in the United States.

Significance

The significance of this study is to assess whether current SQF codes and

guidelines are sufficient to address the prevailing food safety risks occurring in food-

manufacturing facilities. A favorable outcome of this research will help provide more information on the usefulness of the food safety and quality certification process to food production and packaging operations. In addition, this research provides an avenue for food industry professionals to assure consumers on the actions taken to eliminate the risks and threats associated with food-processing operations.

With the various cases of food production operations being compromised, research such as this is important to assure consumers that efforts are in place to address the potential failure points in the food supply chain. Cases of food safety incidents comprise health hazards to consumers and constitute a huge public health concern when they occur (Hamilton, 2014). A need persists for a common representation of food safety policies to enhance consumer satisfaction and encourage consumer confidence (Valder, 2009).

However, establishing a correlation between how food facilities perform on inspections and an audit may not indicate how such food facilities follow established policies are being followed in such food facilities (Cody & Stretch, 2014). This auditing process uncovers the compliance status of the facility to established guidelines and exposes the areas for opportunities as inherent in such a food-processing operation. This study is therefore significant to evaluate whether SQF certification as an intervention program to aid the production of safe and quality foods has been used in the food-manufacturing business. I carried out this study by reviewing the opinions of SQF stakeholders who have adopted the program.

Theoretical Framework

I used innovation-diffusion theory as the theoretical framework. The adoption of the theory of diffusion of innovation in this dissertation provided a framework that is reproducible for consistency and was validated in literature citing its use in similar studies. For example, Abhulimen (2012) used this theory to investigate the importance of adopting the International Standard Organization (ISO 9000) benchmarks in maintaining product quality standards. Williams (2003) also used this theory to evaluate the ISO 9002 certification process for sustained success in various manufacturing operations. Here, I used this theory to study the adoption of SQF as a similar operational scheme in producing safe and quality food.

The theory of innovation of diffusion was developed by E. M. Rogers in 1962. Rogers' purpose was to investigate how an idea, product, service, or innovation enjoys acceptance and spreads in the population and how such innovation performs in realizing desired objectives (Lyytinen & Damsgaard, 2001). In addition, researchers use this theory to determine the usefulness of such novel concepts to the specified population and the ability to fulfill a need useful to the targeted population (Lyytinen & Damsgaard, 2001).

This study used this theory based on the role of SQF certification as a new certification process in the food-manufacturing business to influence the production of safe and quality foods. The aim was to study the adoption of SQF as a novel food safety concept and the perceived benefits using this theory and its relevance to social change. Using this theory, the research questions for this study were crafted to determine user acceptance and the realization of its SQF objectives. Hence, I used this theory in this study to investigate how the new SQF certification was accepted and diffused through the

food industry through time to achieve the production of safe and quality foods. This theoretical lens for this study reflects the adoption of SQF certification by food producers, their successful implementation, and the realization of perceived benefits.

Because this theory of diffusion of innovation explains the rate at which new concepts are accepted and spread through the targeted group, I used this theory to determine the perceived usefulness of SQF certification as a new concept in the food industry. In addition, I used this theory to evaluate how SQF certification has gained prominence in the food industry and how it has been useful. Furthermore, this theoretical lens was used to assess how the adoption of the SQF scheme interacts with the operational activities of food facilities. In the application of the theory of diffusion of innovation in this study, I expected that the adoption of and compliance with SQF guidelines would reveal a significant improvement in the production of safe and quality food.

Scope of the Study

The focus of this research was to evaluate the perceived usefulness of the SQF certification process in promoting the production of safe and quality foods in food-processing facilities. I used a qualitative case-study methodology approach to determine the usefulness of the SQF certification process to food facilities. Creswell (2013) noted that when describing an event(s), seeking explanations, gathering opinions, or reviewing records or performance standards to draw a conclusion for a research question, qualitative methodologies are appropriate.

Qualitative research involves exploring, interpreting, and describing the experiences of participants align with the research questions to obtain an in-depth

understanding of a problem (Merriam, 1998). Furthermore, a qualitative approach suits

this study because it allows researchers to explore complex issues with reasoning and

experiences from the participants (Merriam, 1998). A case study is applicable when the

behaviors or actions of the people involved in the study cannot be manipulated

(Houghton, Casey, Shaw, & Murphy, 2013).

I also adopted a qualitative methodology because it allows for flexibility as I was

not bound to the variables embedded in the research and could probe participants more

deeply to elicit deeper responses. Creswell (2013) discussed that having the flexibility to

elicit deeper responses from respondents prevents researchers from being confined to

establishing defined variables in the study, which can put limitations to responses from

respondents.

I did not select a quantitative method because it would have only provided closed-

ended answers and the responses would have been quantified based on the measurement

of variables and the measurement of relationships between the dependent and

independent variables (Creswell, 2013). I investigated the perceived utility of SQF

certification using the experience and perceptions of SQF stakeholders, thereby

explaining the appropriate use of nonnumeric data (Merriam, 1998). In addition, a

quantitative method is inappropriate when researchers describe events, explain opinions

and perceptions, and evaluate records and processes to draw conclusions. Thus, a

qualitative method that embodies these descriptions was most appropriate for this study

Unlike a quantitative methodology, I had no hypothesis to be examined (aligned

with Merriam, 1998). Because this was a nonexperimental case study, the qualitative

methodology allowed me to elucidate in-depth meanings and gather understanding of

SQF certification and its achieved benefits to the food industry, since its inception. Hence, this methodology provided the avenue to investigate the significance, usefulness, practitioner understanding, and implications of SQF certification to the food supply chain network.

I carried out this dissertation using a purposeful sampling technique to interview participants. Babbie (2010) described purposeful sampling as a nonprobability sampling technique in which the researcher engages personal judgment to select study participants. Purposeful sampling involves identifying and selecting study participants who are experienced on the topic of interests (Palinkas et al., 2015). Because qualitative methods are designed to obtain an in-depth understanding of a topic, purposeful sampling methods are desirable because they provide saturation data, which includes a continuous and comprehensive collection of data on the topic from recruited participants until no new information emerges (Palinkas et al., 2015).

Criterion sampling, which is a form of purposeful sampling, is more appropriate when a particular topic of interest with established criteria for respondents is under research (Cohen & Crabtree, 2006). This method can elicit the best answers to the research questions because the researcher recruits respondents based on their ability to fulfill the criteria and background knowledge on the subject matter (Palinkas et al., 2015). This purposeful method was appropriate for this dissertation because only a limited number of respondents with experience in SQF certification can contribute to the study. Hence the data collection process aimed to realize the perceived usefulness of SQF certification, targeting the identified group of stakeholders in the SQF process and the food industry as a whole (as suggested by Cohen & Crabtree, 2006).

Researchers should provide a set of criteria, then select respondents who fulfill those criteria and have direct experience on the topic under review (Babbie, 2010). This method is easy for data collection purposes because respondents are knowledgeable about the topic and are also experienced enough to provide informative responses about the topic (Palinkas et al., 2015). This method is beneficial to investigate phenomena in the specific set of people who fit the established criteria (Babbie, 2010).

I used a snowball sampling approach to recruit participants. The snowball method is one in which current research participants facilitate the recruitment of other participants for the same research (Emerson, 2015). In using this method, I asked currently recruited participants to refer me to other people in their professional network who might meet the inclusion criteria and were willing to participate in the study. Based on referrals, I approached potential participants with the recruitment letter to secure their consent to participate in the study.

Research Questions

Following are the overarching research questions that I used for this study. Specific interview questions appear in Appendix A. The research questions crafted for this research were undergirded by the theoretical framework selected for this study.

RQ1:   What are the perceptions of food producers about participating in the SQF certification scheme?

RQ2:   What are the differences in food safety practices between SQF-certified facilities and non-SQF-certified facilities?

RQ3:   What are the best practices for adopting and implementing SQF to ensure usefulness in various food-processing facilities?

Nature of the Study

Study Participants

In using a criterion-sampling method of purposeful sampling, I chose to select participants who are experienced and involved with the SQF certification process. Hence, criteria for study participants comprised certified SQF practitioners, SQF auditors, and SQF stakeholders from food facilities and certifying bodies or organizations with interests in the SQF scheme. Study participants must have had at least 2 years of direct experience with SQF certification after their SQF practitioner certification.

All study participants are affiliated with SQFI and have a minimum of 2 years direct work experience with SQF certification in a facility after the initial individual-practitioner certification. Study participants hailed from corporations, organizations, or food systems involved in the adoption and use of the SQF certification process. Because these groups of SQF stakeholders work directly with the SQF process, they understand the strengths and weaknesses of the certification process and are in the best place to offer responses to the interview questions, which form the criteria for this sampling method.

Data Sources

I used two data sources for this dissertation. The first data source was semistructured interview responses from the recruited participants who are directly involved with the SQF certification process (see Appendix A). The second data source was verified documents and publications that describe SQF benchmarks and principles that promote food safety and quality improvements in the food supply chain network. Documents included publicized reports from affiliate websites of SQF-stakeholder

organizations and those in the public domain (see Appendix B for the list of public

website data sources).

A qualitative research methodology is concerned with improvisation and drawing

conclusions based on research data and findings (Merriam, 1998). This dissertation,

therefore, through careful interviews and extensive review of records and publications,

came to conclusions in providing answers to the research questions. With the application

of two data sources, the use of data triangulation (data from multiple sources) became

possible to aid in achieving saturation (Stavros & Westberg, 2009). Triangulation

employs multiple sources to collect data and correlates the data to the research questions

(Denzin, 2009). Single methods may not capture all vital responses to a research

question; however, triangulation of data from multiple sources is an avenue to achieve

data saturation. Triangulation validates the data that was collected by cross-verifying the

same information (Denzin, 2009). With the application of two data collection methods in

this dissertation, data triangulation occurred to answer the research questions.

Triangulation from multiple sources provides verification and validation to

complement similar data and serves as an avenue to eliminate inadequacies that could be

reported in one data source (Denzin, 2009). Researchers use triangulation to combine

data from interviews and document reviews to complement one another and increase the

credibility of results. A more valid result can be realized when both methods produce

results that answer the research questions (Denzin, 2012).

Measuring Instruments

The main measuring instrument in this dissertation was the one-to-one interview.

The aim of the interviews was to seek responses from participants and obtain viewpoints

on the success rate of the SQF certification system among facilities that have adopted this scheme. Hence, the interview questions probed participants to express their viewpoints on the state of SQF certification and their overall impressions of the scheme for practitioners and the food industry as a whole. Thus, research data accrued through answers to interview questions provided to respondents.

The benefits of using a semistructured interview included the ability to conduct a flexible and free-flowing conversation characterized by an in-depth discussion, in contrast to a questionnaire or a structured interview (Galvin, 2015). Semistructured and open-ended interview questions also allow for participants to provide details to answer predefined questions. Semistructured interviews allow common themes to develop from the various interview sessions (Galvin, 2015). The interview questions queried apparent attributes in describing usefulness of SQF certification.

As shown Appendix A, I designed the interview questions to generate responses from participants on the usefulness of the SQF certification scheme in contributing to the production of safe and quality foods. In particular, I used metrics such as rate of food safety incidents, market-withdrawal rate, product recall, customer comment, and customer-satisfaction posts, to query SQF implementation in the various food-processing facilities. I submitted the interview questions to the Walden University Institutional Review Board (IRB) for approval before initiating the actual interview process and data collection process.

Data Management of the Interview Method

Having a good data-management process helps ensure the data collected can provide a realistic solution to the research problems under consideration (Friese, 2014).

Data management helped ensure the smooth coherence of the project from data collection

to analysis, and discussion of the results. Suggestions for an accurate data-management

technique in a qualitative study include accurate coding of interview notes, establishing

quality control processes, accurate data transcription, and maintaining a data analysis

process that is devoid of errors (Silverman, 2011).

Data analysis for this dissertation took place with the aid of the NVivo qualitative

data analysis software. I transcribed and examined the interview data for applicable

patterns and themes, which involved identifying and analyzing participant responses to

the interview questions. I then linked the transcribed data and themes to the research

questions with the aid of specific codes assigned to the data. I then examined the patterns

and common themes generated from the responses to provide the deep meaning and

insights necessary to answer the research questions.

Limitations of the Interview Method

Semistructured interviews can be time-consuming and involve many resources.

Another limitation of the interview type of measurement instrument that also threatens

the validity and reliability of the qualitative method is the honesty in respondents'

answers to the questions due to threats to confidentiality (Merriam, 1998). A tendency

also exists that some respondents may not answer the questions correctly for fear of

retribution, especially when they are aware that they are not meeting the regulations of

food safety and are more prone to cases of food danger (Galvin, 2015). When legal or

regulatory violations are prevalent, respondents may not necessarily tell the truth in

interviews.

Respondents may believe that answering the questions truthfully may expose the inadequacies of their food safety or quality program in their respective retail food establishment and may not readily tell the truth, which may hinder the reliability and validity of the generated data, thereby forming a limitation of using the interview method in this study. However, with the assurance of confidentiality and the explanation to participants that each individual participant's answer is kept anonymous, this limitation can be mitigated.

I employed hand-coding to establish the reliability of the interview method of data collection. In hand coding, I selected common themes and commonality of answers to track similarities in answers provided by respondents. I then compared these hand codings with the Computer Assisted Qualitative Data Analysis (CAQDAS) coding application to ensure the reliability of the interview, seeking common answers from which to draw conclusions from participants' responses.

Assumptions of the Study

Assumptions for this study were made based on studies identified in the literature. I assumed study participants possessed adequate knowledge and experience of SQF certification and understood how the certification scheme successfully aids the production of safe and quality food. I also assumed participants' responses were their perceptions and not what they thought I wanted to hear.

I assumed participants answered the questions honestly and truthfully. I assumed that all SQF-certified facilities fully complied with SQF codes, tenaciously following the guidelines outlined in the SQF code. This process involved implementing the SQF

protocol correctly, with adequate training for affected individuals and strict compliance with established SQF codes.

Limitations of the Study

One limitation of the study was respondents' truthfulness in answering the interview questions. The fear that respondents may not truthfully answer interview questions abounds as a limitation. Another limitation of this study was the limited literature and in-depth statistical information about food-facility compliance with SQF. Last, as a qualitative case study, this study was limited to participants' interview responses, due to the lack of availability of success stories and validated testimony on the successful adoption of SQF to aid food production in food facilities.

Delimitations of the Study

Delimitations for this study were factors I controlled. The primary delimitation of this research was that this study excluded food facilities that did not undergo SQF inspection. Only SQF-certified facilities and individuals were included as participants. Therefore, study results may not necessarily apply to all GFSI schemes because the aim of the study was targeted at the SQF scheme. Also, I adopted the use of semistructured interviews and record review, excluding other qualitative methodologies.

Implications for Social Change

The process of evaluating the usefulness of the SQF certification scheme in this dissertation rests on realizing the benefits and potency of undergoing certification by food processors. A positive result will highlight the usefulness of the scheme and encourage more food producers to adopt this scheme. Social change is possible when other food manufacturers embrace this novel food safety standard because of its perceived

usefulness, thereby leading to the production of safe and quality foods. This emphasis on social change contributes to identifying the underlying risks and threats among the food-processing network and the assurance that food manufacturers possess the tools to mitigate failures. Likewise, this study addresses the immediate changes necessary for the production of safe and quality foods, based on feedback from SQF stakeholders on the areas for improvement noted in the SQF system.

The U.S. Centers for Disease Control and Prevention estimated that reducing the rate of foodborne illnesses by 10% can keep 5 million people from getting sick each year (Painter, 2013). In addition, preventing just one fatal incident of *E.coli O157* infection can save an estimated $7 million people per year in health costs. The evaluation of avenues that prevent the production and consumption of unwholesome foods is important. Social change is evident because healthful food contributes to a reduction in healthcare spending. Likewise, the maintenance of good health for consumers through the availability of safe and quality food products will be assured.

Consumers need to trust the nutritional value of the food products they consume (Bildtgård, 2008). It is very important that consumers are satisfied with the type of food they consume and they are assured that the safety and quality of such foods are guaranteed. However, various food scandals that plagued the food-manufacturing process in recent times have increased the risk perception of consumers and decreased trust in the production of safe and quality foods (Chen, 2008). In addition, tension is rising in the global food production chain with the movement of diverse food products across the globe, about which consumers have limited information on their origin and composition (O'Hara & Stagl, 2001).

A positive result from this study can be used to regain the trust and confidence of consumers about the food-manufacturing process. This study can be used to ascertain that successful implementation of the SQF certification program by food-manufacturing plants will ultimately aid in the production of safe and quality foods. Furthermore, this study can help prove to consumers that amid the myriads of colossal failures that tainted the image of the food-manufacturing industry, available standards are applicable to mitigate such failures from recurring. Essentially, this study will help showcase the benefits of the SQF scheme, the success stories, and boost consumer confidence in the food industry.

Operational Definitions

The intent of this study was to evaluate how and if SQF certification aids the elimination of food safety threats and enhances the production of safe and quality foods. In this dissertation, I evaluated how successfully passing SQF certification in food industries measures the elimination of food risks and production of safe and quality foods. Research data accrued through interviews. Interview questions contained questions that are apparent attributes in describing usefulness. Technical terms relating to this dissertation included the following:

Audits. Audits are voluntary evaluations that food handlers perform at the request of buyers. Audits involve an independent review and examination of records and facility activities to assess the adequacy of system controls to ensure compliance with established policies and operational procedures, and to recommend necessary changes in controls, policies, or procedures.

Audit checklist. The list of audit questions is customized by SQF level and audit scope, downloaded for the SQF auditor to use when conducting an SQF audit.

Auditor. An auditor is person registered by SQFI to audit a supplier's SQF system. An auditor must work for a licensed certification body. SQF auditors and SQF subcontracted auditors have the same meaning here.

Benchmarking. Benchmarking involves a procedure in which a particular set of new standards is compared against the original set of standards or guidance. Benchmarking helps determine how the derived standard is performing compared to the established standards and to understand the capabilities for change, growth, and improvement in the new standards.

Codex Alimentarius Commission. This internationally recognized entity guides and promotes the elaboration and establishment of definitions, standards, and requirements for foods, and assists in their harmonization and, in doing so, facilitates international trade. The Commission secretariat comprises staff from the Food and Agriculture Organization and the World Health Organization.

Commerce. Commerce is the business or trade activity of buying and selling food products from one channel to another until the products reach the final consumer. Commerce also involves the transportation and movement of goods from place to place, across a city, state, or national boundaries.

Edible foods. Edible foods are food products that are fit to be eaten or consumed for human nutrition especially by humans. Edible foods are acceptable to human taste and are palatable for consumption.

Food facilities. A food facility is any location or establishment that involves a commercial operation of food service activity designed for human consumption. Food facilities provide processed food for sale or distribution to other business entities.

Food allergen. Food allergens are ingredients about which consumers have reported adverse reactions. Typically, proteins allergens are recognized by allergen-specific immune cells and cause specific immunologic reactions, resulting in characteristic signs and symptoms (National Institute of Allergy and Infectious Diseases, 2011). Eight major allergens of food importance are identified in the United States: milk, eggs, fish, crustacean shell fish, tree nuts, peanuts, wheat, and soy beans.

Foodborne illness. Foodborne illness is caused by consuming contaminated foods or beverages that usually arise from improper handling, preparation, food storage, or bad hygiene by food handlers.

Food safety. Food safety involves the processes of handling, preparing, and storing food in ways that prevent foodborne illness. Food safety includes a number of routines that should be followed to avoid potentially severe health hazards from consuming a food that is not good for human nutrition.

Food quality. Food quality describes the attributes and characteristics of food that are acceptable to consumers.

Food defense. Food defense refers to efforts and activities carried out to prevent intentional contamination or adulteration of food products. Food defense includes efforts to prevent unwholesome food product from getting into commerce.

Food security. Food security occurs when consumers have access to the desired amount of safe, nutritious, and affordable food**.** Food security involves the state of having

reliable access to a sufficient quantity of affordable, nutritious foods required for human existence.

Food supply chain. The food supply chain describes a series and sequence of processes involved in the production and distribution of food products until they reach the final consumer. The chain explains how food moves systematically in domino-like motion from producers to consumers. The supply chain also describes how the money consumers pay for food goes to people who work at various stages along the food supply chain in the reverse direction.

Global Food Safety Initiative (GFSI). The GFSI is a collaboration between the world's leading food safety experts including retailers, manufacturers, and food service providers. GFSI was established to ensure confidence in the delivery of safer food to consumers while continuing to improve food safety throughout the supply chain.

Good manufacturing practices (GMPs). Regulations enforced by the FDA ensure food products are produced and controlled consistently according to quality standards.

Hazard Analysis Critical Control Point (HACCP). The HACCP system is a process control system that identifies where hazards might occur in the food production process and puts into place stringent actions to prevent hazards from occurring.

Inspections. Inspections are assessments of food-processing operations, usually through regulatory enforcement. Inspections indicate that regulatory authorities are checking documents, records, facilities, and other resources to verify established sets of standards. Inspections also involve the act of examining the food facility closely to evaluate compliance with established standards.

International Organization for Standardization (ISO). The ISO established a series of standards to maintain an effective quality assurance system for manufacturing and service industries. ISO certification focuses on meeting customer expectations and delivering customer satisfaction in many manufacturing operations.

Quality assurance. Quality assurance refers to the process used to create deliverables and can be performed by a manager, client, or even a third-party reviewer. Examples of quality assurance include process checklists, project audits, and methodology and standards development.

Quality control. Quality control references quality-related activities associated with the creation of project deliverables. Quality control is used to verify that deliverables are of acceptable quality and are complete and correct. Examples of quality control activities include inspection, deliverable peer reviews, and testing.

Safe Quality Foods (SQF). The SQF certification scheme is a global benchmark standard that provides a rigorous system to manage food safety risks and provide safe products for use by companies in the food industry. Operated by SQFI, retailers and food service providers around the world recognize SQF certification.

SQF practitioners. SQF practitioners are food workers trained and certified under the SQF guidance codes and documents. Each SQF-certified company must designate an SQF practitioner who is responsible for overseeing the development and implementation of the system, as well as the maintenance of the SQF program. Practitioners must be employees of the company and be trained on SQF and HACCP.

SQF stakeholder. The primary SQF-stakeholder group consists of auditors, SQF consultants, training center or certification-body staff.

SQF supplier (advanced). This group consists of SQF practitioners and other food safety and quality professionals in manufacturing plants as well as primary producers who already have an SQF system in place.

Supplier (basic). This group consists of food safety and quality professionals in manufacturing plants and primary producers who do not already have an SQF system in place or are just beginning to implement one.

Suppliers. A supplier is any food business involved in the production, manufacture, processing, transport, storage, distribution, or sale of food, beverage, packaging, or fiber.

Wholesome food. Wholesome food refers to any food product intended for human consumption that meets all quality and labeling standards imposed by federal, state, and local laws and regulations.

Summary

PWC (2015) estimates that food and waterborne diseases will kill 2.2 million people annually. Additionally, PWC estimates that three quarters of all food companies will report at least one disruptive event each year. Clearly, food producers need to evaluate their operation against a standardized benchmark to arrest these alarming food mishaps. Food companies must adopt an approach that includes stringent analysis of not only supply constraints and risks but also areas where food trust issues could arise, creating greater integrity, quality, traceability, and transparency throughout the supply chain to give customers the greatest confidence in their food choice.

Food producers are therefore using the SQF-audit and -certification scheme as an approach to ensure the food safety and quality of their food products. Attaining this

certification ensures the respective food facility meets a higher standard based on the trust they want their brand to engender in the minds of customers.

In the next chapter, I discuss the literature review strategy and findings about third-party food certification used in the food industry. Furthermore, I explore the concept of food safety and quality in the food production network. Chapter 3 presents the methodology used in this study. Chapter 4 elucidates the results from the analysis and Chapter 5 provides a discussion, limitations of the study, conclusions, and recommendations.

Chapter 2: Literature Review

Introduction

Continuing concern abounds about the safety and quality of food items offered for sale as consumers have raised awareness about the public health status of food items found in the grocery aisle (Trienekens & Zuurbier, 2008). As cases of microbial contamination in food products and unabated cases of food recalls and withdrawals increase, consumers continue to lose confidence in the food industry and lower their expectations of food safety and quality. Several factors can lead to the production of unwholesome food, and food manufacturers seem inadequate in promptly addressing these issues (Trienekens & Zuurbier, 2008). Hence, the use of global food safety and quality assurance systems to enforce strict control measures along the food supply chain provides an avenue to address the prevalence of unwholesome food production.

With various food-processing and food-handling facilities operating with different regulations, a common ground for the global network for food quality is necessary; such a standard has been absent (Marler, 2013). Examples include several legal cases following the release of unwholesome food into commerce and absence of a uniform guideline that stipulates acceptable standards, accompanied by a rising number of litigations involving unwholesome foods. The concern has been why food manufacturers continue to release tainted foods into the marketplace.

Trienekens and Zuurbier (2008) suggested that the global application of several quality auditing and certification standards includes the HACCP, ISO, SQF, Technical Barrier Trade (TBT), and BRC, which are plausible avenues to control the rapidly

growing cases of food production complications. One goal is for food processors to remain competitive in the marketplace.

Although food industries rely on applicable food safety and quality programs, an extensive and periodic evaluation process should be required to assess the usefulness and abilities of these standards to control the abounding food safety and quality threats in the food-manufacturing sector (Trienekens & Zuurbier, 2008). This standard is needed to ensure the relevance of the adopted scheme to meet the rising problems of the industry to militate against any pending food safety and quality problems along the production circle.

Consumers can use this standardized and public information to verify the historical safe practices and health inspection records of various food facilities to enhance their choices (Booth, 2014). Using public and standardized food safety programs will ensure that food retailers hold themselves to a higher standard of food safety because their information is always public knowledge (Booth, 2014). Using data from food safety schemes can, therefore, be useful in regaining consumer trust along the fallen food supply chain levels, bringing about increased transparency with the aid of external standardized food safety certifications, inspections, and audits.

In this literature review, I discuss the concept of the SQF certification scheme, the adoption of the scheme in the food industry, and the perceived benefits. Although the literature review exposed limited work on SQF as an individual scheme, the GFSI as a whole has been studied in depth. In essence, in this literature review, I examine the benefits and usefulness of the SQF scheme to the commercial production of foods.

Literature Review Strategy

In conducting this literature review, I reviewed relevant publications that discussed the GFSI food safety program and the SQF scheme. I reviewed a wide range of online search engines and databases alongside printed publication materials. Google Scholar was the primary database that I used, and additional searches included the use of EBSCOhost and ProQuest online sources. The dissertation database through the Walden University Library was useful in reviewing past studies from the Walden dissertation bank. Most important, I reviewed the SQF and GFSI websites and several printed publications of the SQFI relating to my topic.

Key words that I used to search the databases included *GFSI*, *SQF*, *food plant*, *BRC*, *food safety*, *food safety methods*, *food plant inspections*, *food plant auditing*, *food certifications*, *foodborne illness*, *food service*, *food outbreaks*, *food recalls*, *food business*, *theory of diffusion of innovation*, *food processing technology*, and *grocery retail*. I selected the articles used in this review based on their suitability for SQF among other GFSI schemes and the year of publication.

Although I included a few studies that predated the inception of SQF in the review, they were relevant to food plant inspection and auditing. In addition, although I investigated the perceived usefulness of the SQF in the United States, I also employed literature from other countries that are adopting this scheme, owing to the universal adoption of the GFSI.

Food Safety Concerns in Food Production

As the race to banish hunger in society continues to escalate, so too is the race to ensure that food products available for human consumption are edible, safe, and

wholesome. The food industry continues to contribute markedly to the U.S. economy. Of every $6 generated in the U.S. economy, $1 comes from the food business, and this sector generates approximately $700 billion as combined revenue every year (Ribera & Knutson, 2011). As the food-manufacturing business continues to grow, emphasis previously rested on the attempt to meet the rapidly growing food demand and to increase the profit margin (Ribera & Knutson, 2011). However, the safety and quality of products offered for sale should be the priority, a stance often relegated to the background (Henson, Masakure, & Boselie, 2005).

Events of food production mishaps are never accidents; these events are crises that are preventable and can be avoided (Holleran, Bredahl, & Zaibet, 1999). These events are invited actions, due to unmonitored issues in the food facilities (Henson et al., 2005). The FDA (2013) reported that deficient employee training, contamination of raw materials, poor plant and equipment sanitation, poor plant design and construction, and lack of allergen control programs are some of the origins of critical food safety problems occurring in food-processing plants. To overcome these challenges, strict procedures, guidelines, and standards are needed to serve as pilots for the various food facilities (Holleran et al., 1999). In addition, strict adherence to these established guidelines is required to ensure the production of safe and quality foods for consumers (Ribera & Knutson, 2011).

The HACCP is an ancient guideline used in the food industry to address its failure to keep food supplies safe (Kafetzopoulos, Psomas, & Kafetzopoulos, 2013). Wallace (2014) discussed that The HACCP is a risk-management tool specifically designed for the food sector by the Codex Alimentarius Commission, jointly established by the Food

and Agriculture Organization and the World Health Organization (Wallace, 2014). Food

safety hazards described in the HACCP program have consistently been categorized to be

from physical, biological, or chemical sources, which form the pillars of the HACCP

program (Henson et al., 2005).

      The HACCP program has been described as a food-processing control program

designed to identify plausible areas where food hazards might be introduced into

operations and offers stringent solutions that could prevent these hazards from occurring

along food supply chains (Wallace, 2014). Known as the food safety system, the HACCP

has been adopted in the food industry as a tool necessary for the production of safe food

products, due to its preventive approach (Wallace, 2014). The HACCP identifies critical

control points in a food operation and stipulates tolerances or limits for these points

(Kafetzopoulos et al., 2013). Critical control points are points or individual steps in the

food operation that are nonnegotiable; controls are needed to eliminate, prevent, or

reduce problems to acceptable levels in each specific food operation.

      As an internationally recognized food safety system, the HACCP ensures that

potential food hazards are identified and controlled at relevant steps in the food-

processing operation (Wallace, 2014). In conjunction with the establishment of

prerequisite programs, implementing the HACCP system requires a seven-principle

approach to ensure the safety of processed foods (Kafetzopoulos et al., 2013). The

HACCP forms the bedrock of the Food Safety Management Systems Certification

programs in the GFSI benchmark, and the SQF certification scheme for food processing,

packaging, and handling operations (King, 2013).

Another prominent source of food safety incidents in food-processing operations is lack of compliance with GMP of food-processing operations. Enforced by the FDA (2013), GMP regulations aim to assure proper design, monitoring, employee practices, and control of manufacturing processes and facilities. General principles must be observed during the manufacturing process for the product to be considered to be of high quality and will pose no risk to consumers or the general public (Heinz, 2013). Currently regulated under 21 Code of Federal Regulations Part b117 of the United States, GMP is an integral part of the Risk-Based Preventive Controls for Human Food program described in the Food Safety Modernization Act (FSMA).

Some specific elements of a successful GMP program and its importance to food handlers include verification that all food personnel and handlers are qualified and adequately trained to perform their respective job functions (Melethil, 2006). These regulations also include provisions that raw materials and ingredients meet specified food safety and quality standards.

Additionally, GMP dictates that food facilities must have established cleaning and sanitation procedures to prevent cross-contamination. Likewise, appropriate amenities should be available at food-handling facilities and a well-established documentation process should be in place for all food-related activities. Employee health and food-facility conditions are additional components of GMP compliance (Melethil, 2006). Historically, lack of noncompliance with GMP regulations has also been a source of inadequate process performance that can lead to product quality or food safety failure (Heinz, 2013).

Private Food-Auditing Standards

Although strict federal regulations, inspections, and product-category audits have always standardized the food production terrain, the birth of private food safety standards is fast becoming more reliable and acceptable in the food industry (Holleran et al., 1999). Private or voluntary food standards or schemes are being initiated to remedy the flaws and inadequacies of regulations or legislation to attain premium levels of consumer protection (Van Der Meulen, 2011). Standards established by regulations are sometimes not thoroughly enforced; however, these private standards, when effectively managed, have the potential to remediate the risks and liabilities of food operations beyond the traditional limits of food businesses (Van Der Meulen, 2011).

Food retailers are the greater advocates for private or voluntary third-party food regulations (Havinga, 2013). Huge food retailers are applying their economic power to enforce stringent food safety and quality management systems for producers (Havinga, 2013). These stringent and economically favorable standards can only be imposed through private standards and not government or regulatory entities, explaining another reason private food-auditing standards are increasing in the food industry. Stakeholders perceive these private standards or certification schemes promote stricter food safety rules and provide greater opportunities for growth rather than enforcement (Holleran et al., 1999). In usefulness, timeliness, and consistency, private auditors more frequently inspect food facilities than public regulatory inspectors, thereby providing room for ongoing continuous improvements (Van Der Meulen, 2011). These standards are rapidly growing and replacing previously applied inconsistencies. Historically, food suppliers have chosen inconsistent second-party or private auditing or certification programs

primarily through facility preferences or preference of their largest volume customer

(Van Der Meulen, 2011). However, too many such schemes with too many variables

muddy the way forward. Therefore, the movement toward a more uniform set of best

practices in which auditing procedures for every food facility are consistent is desirable.

 According to the FDA (2013), the FSMA was signed into law as a governmental

regulation to strengthen existing laws guiding the process of food manufacturing and

prevention of food mishaps. The goal was to provide stricter laws for food businesses in

the United States. The force of FSMA is to provide an avenue for preventive control for

human foods and hold food handlers responsible for more inspection and authority from

the FDA (Ribera & Knutson, 2011).

 The food supply chain is becoming increasingly competitive across the globe and

consumers are relying more on retailers that can present food products that meet optimum

food safety and quality requirements (Holleran et al., 1999). The desire for continuous

improvement and meeting consumer demand have allowed food processors to adopt

voluntary food safety and quality systems alongside governmental or regulatory

standards. Private standards have the potential to reduce operational barriers and ensure

sellers of products' safety and quality (Holleran et al., 1999).

 Not only have private food safety standards helped the production of safe food

products, they have also helped address the barriers of global food trade (Henson et al.,

2005). The need to ensure global food safety compliance has made these private

standards more acceptable. The ability of these private standards to reward strict

compliance and provide opportunities for development for ailing facilities has aided the

adoption of private schemes (Henson et al., 2005).

These private standards, when globally considered and accepted, can also promote global trade and break world-trade barriers because confidence derives from the notion that the acceptability of the system is globally valid (Holleran et al., 1999). If a food facility in Europe is SQF certified, the assurance to ship products from that facility to the U.S. market can be ensured because of the assurance that the adoption of the private standard that is globally acceptable. The standard provides the room for export and import opportunities in foreign and domestic markets (Havinga, 2013).

The opportunity for international trade with export has made the adoption of SQF more prominent with food producers (Havinga, 2013). The adoption of standards that allow certified operations to be globally acceptable has created room for vertical integration into the global market, thereby making a product produced in one country acceptable in another country, based on the adoption of the same food safety and quality management system (Havinga, 2013). Self-regulation by the food industry has increased and private third-party audits are more expedient to fight cases of food safety and quality failures (Moodie et al., 2013).

Adoption, Scope, and Implementation of SQF Certification

Food firms are willing to consider private standards or certifications if such standards provide value-added benefits to the sale of their products (Seok, Reed, & Saghaian, 2016). The benefits of private food schemes are two-fold: consumers are delighted with their products, and the food businesses experience continuous growth (Fuchs et al., 2011). The implications of private schemes can be positive in establishing a convergent food safety specification (Fuchs et al., 2011). In essence, adopting a private

food safety standard such as the SQF may hold some benefits, including to help reduce

assessment inconsistencies and costs of multiple assessment standards (SQFI, 2015).

SQF is also beneficial because in ensuring food-manufacturer compliance with

food safety regulations in domestic and global markets at all stages of the food supply

chain (SQFI, 2015). Some food firms that have adopted the SQF scheme include food

manufacturers, feed and primary producers, transportation and storage companies,

retailers, food service providers, and those involved in food packaging, cleaning

equipment, cleaning agents, additives, and ingredients in the food supply chain. Moving

the food business from a compliance standpoint but to a competitive advantage, is one

value-added advantage of the SQF certification scheme (SQFI, 2015). Figure 1 depicts

the global growth of SQF certification.
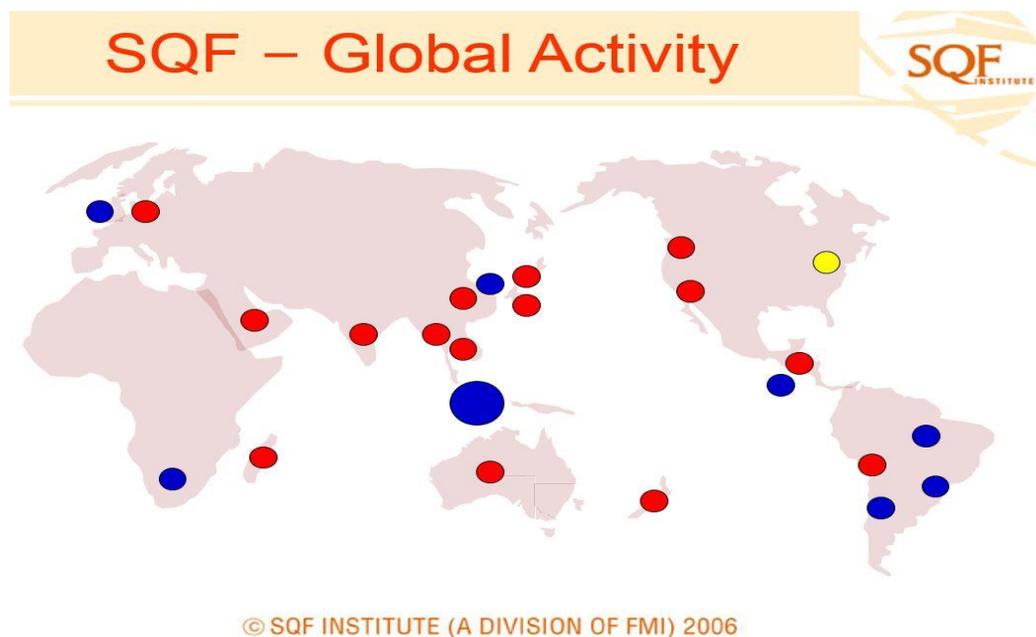
Figure 1. Global activity for Safe Quality Food certification.
Source: *SQF Code—A HACCP-Based Supplier Assurance Code for the Food Industry,*
by Safe Quality Food Institute, 2015, retrieved December 2, 2016, from http://www.sqfi
.com/wp-content/uploads/SQF-Code_Ed-7.2-July.pdf

Based on the principle of the HACCP food safety and quality management system, SQF certification was founded as a food-process and -product-certification standard (Seok, Reed, & Saghaian, 2016). To prevent the distribution of unsafe foods into commerce, the SQF certification scheme uses the HACCP to mitigate biological, chemical, and physical hazards in production processes. The SQF certification scheme is the dominant private-food certification for all GFSI schemes in the United States and a more comprehensive certification than Eurep-GAP and BRC (Seok et al., 2016). Historically, the SQF program originated from the West-Australian Department of Agriculture in 2003 and was later sold to FMI, which is the U.S. body, in 2003 (Fuchs et al., 2011). Figure 2 describes the historical pathway for SQF development since its inception.
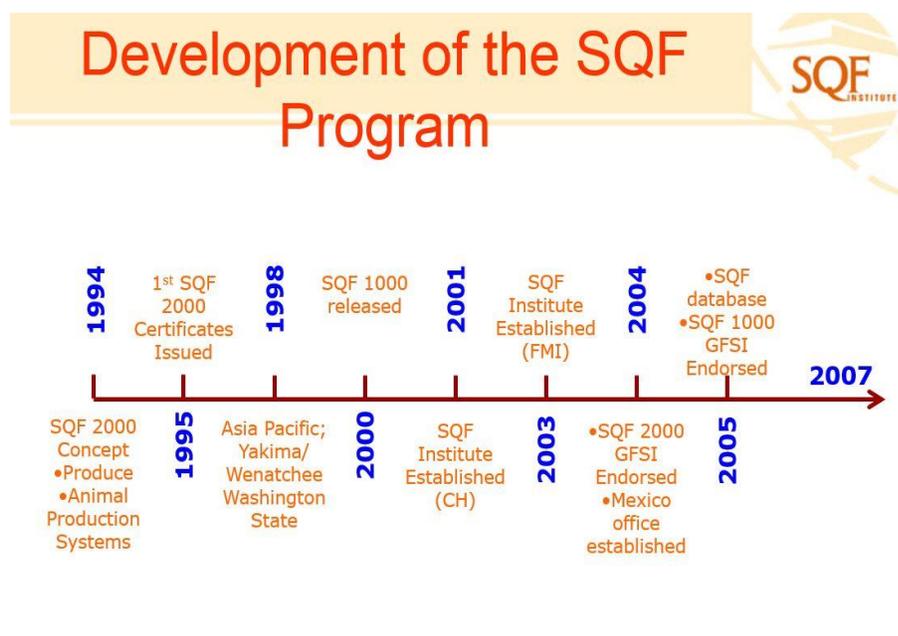
Figure 2. Historical development of the Safe Quality Food.
Source: *SQF Code—A HACCP-Based Supplier Assurance Code for the Food Industry,* by Safe Quality Food Institute, 2015, retrieved December 2, 2016, from http://www.sqfi .com/wp-content/uploads/SQF-Code_Ed-7.2-July.pdf

Categorized into primary production, manufacturing, processing, transport, storage, and distribution or retailing of food products and food-contact packaging, SQF certification has three distinctive levels (Seok et al., 2016). Level 1 is the lowest and basic food safety standard (primarily for low-risk foods), Level 2 is the food safety fundamental standard, and the Level 3 is the highest food safety and quality standard. Upon achieving Level 3 certification, the certified food facility is authorized to use the SQF food quality trademark. SQF is the only scheme to integrate a quality component as well as food safety. According to the mission of SQFI, the SQF certification was developed "to deliver consistent, globally recognized food safety and quality certification programs based on sound scientific principles, consistently applied across all industry sectors, and valued by all stakeholders" (SQFI, 2015, para 4).

With growing concern for food safety, consumers might not purchase food products they do not believe is safe for human consumption (Grzesiak & Manno, 2016). Food manufacturers are now using the SQF certification scheme to implement a robust food safety control system into their operations. With just SQF certification, manufacturers no longer have to address inconsistencies and resources for multiple assessment audits; rather, they can rely solely on SQF to provide the rigorous and credible food safety and quality management portal. Some strategies of SQF certification include improving the process management of food production by helping to proactively identify and manage inherent operational risks to avoid product recalls, withdrawals, or product loss (Grzesiak & Manno, 2016).

Another strategy is the provision of due diligence in the auditing structure, which promotes confidence in food safety, quality, and legality of the food product (Grzesiak &

Manno, 2016). By becoming SQF certified, a food producer signals they are operating under the highest industry food safety and quality standards. Although regulatory and mandatory audits are still required, becoming SQF certified as a third-party voluntary certification provides the facility the probability of avoiding numerous random audits, as just one SQF certification may be sufficient (Grzesiak & Manno, 2016).

The SQF audit process has two stages: the document review/desktop audit and the onsite facilities audit. The first part involves the submission of the facility's SQF program to a desktop audit evaluation. A registered SQF auditor appointed by the certification body conducts the desk audit. This desktop evaluation comprises review of all food safety and operations documents, assessing the facility's written food safety/quality programs. After the documentation review, all nonconformance must be addressed and closed, prior to the site audit (Grzesiak & Manno, 2016).

The facility audit must include a review of the entire facility including the perimeter of the facility—the inside and outside conditions of the building—regardless of the scope of certification. The assessment of the building and grounds is important to determine how suitable the location is to package safe foods. The facility audit determines if the SQF system regarding building and grounds is effectively implemented as documented. The audit establishes and verifies the usefulness of the SQF system in its entirety: food safety hazards (Level 2) and food quality hazards (Level 3) are effectively identified and controlled (SQFI, 2015). After the close of the audit, SQF requires the closure of corrective actions within 28–30 days, allowing deficiencies to be upgraded in a timely manner before they degenerate larger problems.

Comparing SQF With Other Certification Schemes

Despite the abundance of several third-party certifications—ISO, TBT, BRC, The Global Aquaculture Alliance, FSSC 22000, and IFS Food—SQF has been found to be different. Some distinguishing differences are that SQF is the only standard that applies to the entire food supply chain network. SQF covers primary food production through manufacturing, distribution, packaging, and retail (SQFI, 2015). SQF is also the only food-certification scheme that uses HACCP methodology to identify and control food safety and quality hazards.

Additionally, SQF is the only standard that requires a dedicated SQF practitioner on site for each certified facility. These dedicated SQF practitioners are responsible for the implementation, monitoring, and maintenance of the SQF system at each facility. The SQF practitioner must have completed the HACCP training course and understand the SQF code and requirements. The designated practitioner must have also passed the SQF 2000 systems training course and accompanying examination. The practitioner will be responsible for managing the SQF system at that location and reviews the food safety and quality policies as needed or at least annually.

Furthermore, SQF is the only standard with a separate level to evaluate food safety and quality. Food safety is assessed at Level 2 and the Level 3 standard is used to evaluate food quality. Attaining a Level 3 allows the certified facility to display the SQF shield on the product and marketing labels. Also, SQF is the only GFSI scheme that has a mandatory annual, onsite audit for recertification; all other schemes are voluntary (SQFI, 2015).

Another major distinguishing factor of SQF is that SQF is the only scheme that requires minimum and mandatory accreditation/requirements for certifying auditors. Other schemes accept online or other substituted training for audits and consultants. With concerted efforts to ensure experienced auditors perform SQF audits, SQF licenses, trains, and calibrates all auditors to the same standard. Thus, SQF possesses the largest pool of auditors of any GFSI scheme. SQF also provides periodic online and in-class training classes for SQF practitioners, consultants and other stakeholders.

SQF auditors can only conduct certification audits in food industry sectors for which they have been registered, trained, and deemed proficient. Auditors conduct certification audits on facilities based on their expertise and extensive experience. Unlike other schemes in which auditors can audit any food facility, SQF auditors only audit facilities based on their competence and the food-sector category that best fits their experience. This job specialization allows auditors to be effective and efficient in the auditing process.

Having skilled auditors who are trained and proficient in individual food-sector categories ensures the auditing process is carried out productively, eliminating the possibilities of strategic vulnerability. Although having mastery and specialized knowledge may get monotonous and limit auditors to a handful of skills, that specialization of skill helps save time, provides the opportunity for growth, and aids accuracy (Hansen & Canary, 2015). Specialization improves organizational practices by using each individual's unique abilities on a team to resolve specific issues, making each person an expert in particular fields of operation (Hansen & Canary, 2015).

SQF Audit Strategy

To achieve SQF certification, a food facility must appropriately document and implement relevant modules of the SQF code particular to the product being certified. SQFI (2015) established that SQF certification works on the principle of "say what you do," "do what you say," and "prove it." With this philosophy, food manufacturers are expected to adopt the SQF food-sector category codes pertaining to their respective products. The facility is expected to develop policies, procedures, and specific work instructions necessary to facilitate the acceptance of their product module. Subsequently, the facility must show proof with verification and validation activities that such adoptions are sufficient to ensure the delivery of wholesome food products. Execution of this exercise with appropriate documentation qualifies the facility for a score in the audit. After the initial audit certification, each facility is subjected to an ongoing surveillance and recertification of compliance with food safety-management systems (Grzesiak & Manno, 2016).

During the certification audit at the facility, auditors observe employees or food handlers at the facility and invite employees to interviews to verify employee behaviors are consistent with the provision of the SQF codes. Auditors will perform a physical inspection of the entire facility (Grzesiak & Manno, 2016). This part of the audit ensures the premises, building amenities, and equipment are appropriately located, designed, and constructed to facilitate proper manufacture, handling, storage, and delivery of safe food. This process is critical to ensure measures are in place to control physical contaminants and foreign-material prevention in the food-handling operation. The auditing scope also

verifies that companies attain product-safety and quality standards and maintain efforts for continuous improvement through operating channels.

During the facility audit, the auditor verifies that the facility management has committed to SQF with employees. The purpose of the commitment is to empower all employees to take necessary actions to mitigate food safety and quality compromise. With this commitment, all employees must immediately report any food safety concerns to their supervisor or plant manager. All employees must be trained to stop production whenever they observe that food safety or quality is at risk (Grzesiak & Manno, 2016). Employees must then notify their supervisor or plant manager who must make adequate corrections and corrective actions to the impending compromise in food safety or quality.

SQF certification uses three distinctive scoring landmarks to grade audited facilities. Minor ratings are awarded if minor nonconformities are fixed within 30 days of the facility audit, then they are "closed out." Major nonconformities should be corrected within 14 days of a facility audit. A critical nonconformity will result in an immediately failed facility audit.

An important component of the SQF audit is the SQF verification and validation process. The verification step involves asking whether food safety controls are implemented according to the plan. This component includes asking, "Do you do what you say you're going to do?" Are equipment and machinery calibrations done properly? Are there internal auditing procedures? Are SQF systems review processes in place? Auditors must verify these and many other prerequisite programs. The validation step involves asking if the hazard analysis was complete and if control measures were effective. This includes asking, "Are you doing the right thing effectively?" This step

evaluates if critical limits of the critical control point control the inherent hazards present in the operations (examples of validation activities are scientific studies, microbial-challenge studies, and shelf life studies).

The Food Industry

Despite the overall increase in legislation and stringent food service-industry standards, food safety compromise is on the rise Pawlak (2016). These compromises do not only affect food-processing facilities; other food service establishments impacted include raw-material manufacturers. With the rising concern about food supply, a huge 46% of the aging population are concerned about health, nutrition, composition, and labeling of their food items. Also, just as technology and improvement in science dominate the food production channel, consumers are becoming increasingly concerned about components of food, retail environments, and the ethical sourcing of their grocery items. Consumers are taking note of governmental and political implications with emphasis on understanding how governmental activities maintain direct impact on food production and associated policies (Pawlak, 2016).

Of aging consumers, 77% demand specialized food industry focus on nutritional foods such as gluten-free and non-genetically-modified-organism products (Pawlak, 2016). Of millennials, 69% have primary concerns about food safety and 92% of total respondents in a study preferred increased regulation for the food industry to ensure adequate food safety protection. Of consumers 38% were optimistic that increased regulation can help food producers produce wholesome foods that help protect the public health of consumers (Pawlak, 2016).

Furthermore, 66% of consumers believe food producers are not transparent about how food is produced at their facilities (Sevenich et al., 2014). Study respondents believed that food processors are not sincere about the ingredients contained in their products. Therefore, the accompanying labeling of such foods are sometimes inaccurate. Also, 34% of consumers agreed that food processors are not transparent about regulations and industry standards in producing food items for consumers. An integrated food production system that ensures consumer transparency is an urgent need in the food industry (Sevenich et al, 2014).

Of particular mention, the generational demand for food is creating a paradigm shift in the quest for producers to meet the rising food demand (Lempert, 2017). In a study, millennials were open and willing to try or explore new trends, whereas Generation Z members were more likely to eat fresh home-cooked meals than quick-service restaurant meals, and think cooking is fashionable and enjoyable. Additionally, members of Generation Z are more willing to adopt stovetop to microwave cooking and are more in tune with cooked meals. Furthermore, ethnic foods, historically for a smaller market, are now trending, evolving the thirst for producers to offer several food choices from diverse origins and ethnicity to consumers. The idea that certain food types are peculiar to a certain ethnic group is now being eroded with the availability of different types of food to consumers willing to try and accept such new foods (Lempert, 2017).

Consumers are becoming curious about the source and location of their food package (Troller, 2012). Most importantly, consumers are concerned because they want to ensure the safety and quality of such food (Troller, 2012). Public health officials have been slow in responding to consumer knowledge about sources of their products. Hence

consumers are individually researching the origins of their food (Stuckler & Nestle, 2012).

To understand who is responsible for manufacturing grocery items, food-manufacturing processes typically exist in large-scale operations, mass producing foods in various sections operating under one umbrella (Troller, 2012). Most U.S. food manufacturers operate in conglomerates with various subsidiaries (Robertson, 2010). Overall, food, beverage, and tobacco companies account for 77 of companies on the Global 2000 list with a combined profit of $87 billion yearly (Robertson, 2010).

Names of some of the biggest Top 100 food-processing companies include Nestle, Anheuser-Busch InBev, Coca-Cola, Kellogg's, Kraft's, Tyson, Saputo, General Mills, Pilgrim's pride, Kroger Manufacturing, Weston Foods, Wayne Farms, and Pinnacles (Robertson, 2010). Pepsi Co is one of the many conglomerates that have several subsidiaries including Frito-Lay, which in turn produces various snack foods under the brands of Ruffles, Lay's, Tostitos, and Fritos: an example of a food-network cluster. Hence, consciously or not, eating in or dining out, Americans patronize grocery products from these large conglomerates daily.

With the enormous mass production of foods from these conglomerates, it is imperative that proper food safety and quality measures be in place (Stuckler & Nestle, 2012). A huge volume of food items is shipped from these corporations and equally huge consequences could result from a food-processing failure. In addition, Stuckler and Nestle suggested that the race to improve food safety and quality should begin with the big food industries because they hold the larger market of food items. Aligning these conglomerates with the necessary food safety initiatives and programs is critical to

eliminating production of unwholesome foods for human consumption (Stuckler &

nestle, 2012). Although food industries may have excelled in reducing waste, eliminating

ingredients with artificial colors and additives, and improving their overall productivity

or yield (an operational component that increases profitability and market share), food

safety and quality reports persist as a major topic that attracts concerns from consumers

and captures the attention of grocery shoppers (Lempert, 2017).

Despite existing improvement programs, no evidence supports the usefulness of

internal food safety programs in the food industry (Moodie et al., 2013). Reliance on

industry self-regulation and public–private partnerships have not proved sufficient to

prevent dangers induced by the production of unwholesome food commodities from food

facilities (Moodie et al, 2013). With the introduction of private food safety standards, the

food industry often undertakes self-regulatory actions due to threats from possible

government regulatory activity and plausible loss of consumers rather than genuine

concern for public welfare (Sharma, Teret, & Brownell, 2010).

The introduction of private third-party certification standards holds enormous

potential to improve the production of safe and quality foods (Moodie et al., 2013).

Activities that put the consumers' perspectives at the forefront have marked success in

preventing unwholesome foods from entering the market (Sharma et al., 2010). Private

standards also help hold manufacturers of unwholesome foods accountable and prevent

the sale of fewer unhealthy food items. With the preservation of public health through

safe food as paramount, these standards support continuous-improvement programs in

food facilities, leading to better productivity and profitability (Sharma et al., 2010).

Food Safety and Quality Concerns Identified by SQF Inspection

As previously discussed, food safety hazards reference possible hazards in food products—physical, chemical, or biology—that have the potential to induce adverse health consequences. Food quality describes the attributes the consumer appreciates and expects in a food product. Food quality involves ensuring food is pure, wholesome, unadulterated, and presented with typical or normal characteristics. Some concerns for food recall have been adulteration and presence of foreign objects in food.

The rate of food contamination and widespread recalls of food products due to lack of food safety or poor quality have drawn consumers' attention in recent times (Taylor, Klaiber, & Kuchler, 2016). Furthermore, lack of food safety and quality events continue to gather media attention, necessitating greater controls in the food chain (Taylor et al., 2016). Chief among the biggest food safety concerns is the potential for foodborne outbreaks or public health illness outbreaks (Soon, Manning, & Wallace, 2016). Foodborne illness remains the most prevalent public health risk associated with food production (Ates & Lusk, 2016) as food can be contaminated at any point from production to the consumer. Furthermore, the majority of people will encounter an incident of foodborne disease at some point in their lives (Soon et al., 2016).

Major compliance activities include recalls and important nonconformities identified by the SQF in 2016. Recalls involving SQF-certified suppliers in 2016 can be categorized into biological, chemical, physical, or other (Chuboff, 2017). Although physical, chemical, and biological categories usually relate to food safety, other issues usually relate to quality or nonconforming products (not meeting consumer expectations).

Figure 3 delineates SQF-notified food-product recalls recorded in 2016 (Chuboff, 2017).

Chemical issues were most prominent in recalls identified by SQF in 2016.
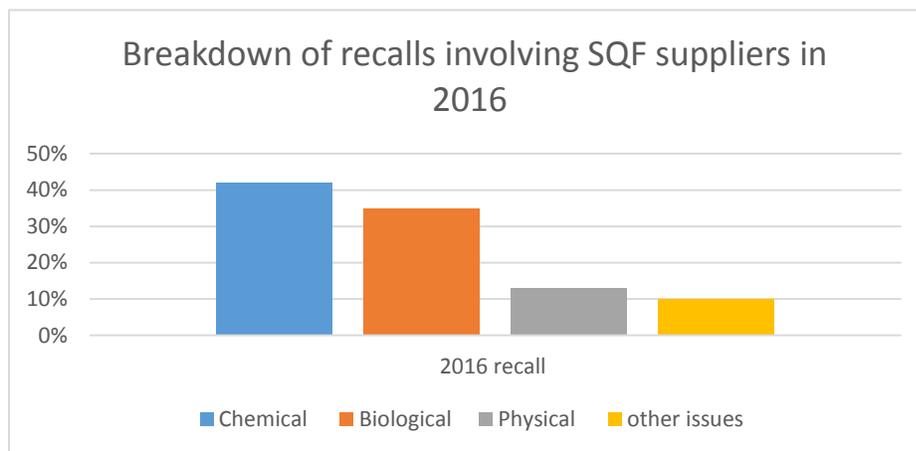
Figure 3. Delineation of recall notices reported to Safe Quality Food in 2016.
Source: *SQF in 2016: A Recap of Recall Stats and How to Move Forward in 2017,* by L. Chuboff, 2017, retrieved from https://www.tracegains.com/blog/sqf-in-2016-a-recap-of-recall-stats-and-how-to-move-forward-in-2017

Allergen-related issues are the biggest portion of the chemical category. The "Big

Eight" allergens in the United States include wheat, crustacean shellfish (e.g. shrimp,

crab, and lobster), eggs, fish, peanuts, milk, tree nuts, and soybeans (Atkins & Bock,

2009). These eight allergens account for approximately 90% of all food allergy reactions.

The inability of food producers to clearly declare and label allergen-containing products

correctly or use the wrong packaging materials are the root causes of this issue. Four of

every 100 children have a food allergy, and an estimated 29,000 cases of anaphylaxis

from food allergens occur in the United States every year. The rate of food allergen

incidents involving public health increased by 18% between 1997 and 2007. Likewise,

the rate of recalls involving undeclared allergens and ingredients increased from 13% in

2008 to 35% in 2008 (Atkins & Bock, 2009). Hence, controlling allergen related

incidents is a vital aspect of preserving food safety for consumers.

Producers need to confirm correct labels with accurate information on food packaging (Chuboff, 2017). Food producers must engage a transparency process that involves maintaining correct ingredient statements for all products. Likewise, raw materials containing an allergen must be clearly stated and declared on food-packaging materials by food producers as an important step in food production (Chuboff, 2017). Despite the lack of a medical cure for severe allergenic reactions, food producers must provide guidance on reviewing allergen-label claims and appropriate consumer education for any products that contain any of these eight allergens (Atkins & Bock, 2009).

Food contamination that leads to foodborne outbreaks can originate from harmful bacteria, parasites, viruses, toxins, foreign objects, or chemicals (Soon et al., 2016). Of foodborne outbreaks, 79% stem from microbial origin (Andrew, 2016). Better practices limiting microbial activity on food products should be developed to mitigate this problem. Of recalls in this category, 71% come from *Listeria monocytogenes*, whereas 22% come from *Salmonella* (Chuboff, 2017). These two microorganisms account for 90% of all microbial issues necessitating a food recall. The introduction of these microorganisms is largely due to environmental breakdowns. Avenues to mitigate microbial issues in factories involves separating raw products from cooked/ready-to-eat products, facility maintenance, and sanitation, including controlling temperature and moisture levels in food facilities. Furthermore, food producers should have an approved supplier program in place to ensure raw materials and ingredients are sourced from properly managed vendors (Chuboff, 2017).

Theoretical Framework

I used the theory of diffusion of innovation to evaluate the perceived usefulness of SQF certification as the standard auditing system in the food-manufacturing business. The theory facilitated discerning the benefits that could be derived when food companies seek this certification. Objectively, this framework examines how adopting and using SQF benchmarks relate to performance and the benefits that can be realized.

Williams (2003) used this theory to perform a similar evaluation of the ISO 9002 certification process. ISO 9002 is an international standard used to model quality assurance in general production and manufacturing environments. Auditors use ISO 9002, which is similar to SQF, to audit the activities of manufacturing operations to ascertain continuous improvement and quality assurance over time. Williams used the theory of diffusion of innovation to evaluate the ISO 9002-certification process for sustained success. This dissertation attempts to mirror Williams by applying the same theory to evaluate the SQF certification process for usefulness.

According to Rogers (2003), successful use of this theory allows researchers to determine implementation or acceptance of new concepts introduced to the population. SQF certification was introduced to the U.S. food manufacturing network in 2007 (Valder, 2009), rendering SQF relatively new in the United States. SQF was developed to address the prevalent issues of food insecurity, poor quality foods, and numerous issues in the food industry that result in the production of unwholesome food (Valder, 2009). Individuals are prone to adopt innovations when the positive results of the innovation are visible and the benefits are certain. Furthermore, the success of innovations depends on how well they meet the needs and convenience of use of users (Rogers, 2003).

Hence, innovation diffusion theory seems sufficiently efficient to investigate the launch of the SQF program to food processors to discern if it became a better fit for the operational needs of the food industry as efforts continue to produce wholesome foods. Diffusion innovative theory does not change people or intend to change people; rather, it offers innovations and novel concepts to enhance a new idea, product, or practice (Rogers, 2003). Hence, I used this theory to determine if an operational change emerged in the food industry that contributed to the production of safer and better-quality foods.

Furthermore, using this theory enabled the opportunity to identify how stakeholders in the food industry received this initiative and evaluate the extent of their compliance with the program. In Figure 4, Lewandowski and Faaij (2006) described steps in the development of the SQF certification scheme toward the production of safe and quality foods. From the model shown in Figure 4, the usefulness of SQF certification to aid in the production of safe and quality foods was measured at the output state. This dissertation evaluated the output levels of the food-processing facility that uses the SQF certification model as their food safety and quality scheme.

Innovation diffusion theory is useful in evaluating how this novel concept diffuses through food-handling facilities and can aid in the production of safe and quality food products for consumers. Using this theory aids in the investigations of the level of support to accept or reject SQF codes. Most importantly, the theory helps determine the efficiency of the SQF program to ameliorate food safety and quality risks in food-processing plants as a new concept. The goal was to determine if the safety of foods is ensured and the qualities boosted with this certification scheme.

Input		Process		Output
Adopting the SQF certification scheme	→→	Passing the SQF certification audit	→→	The production of safe and quality foods
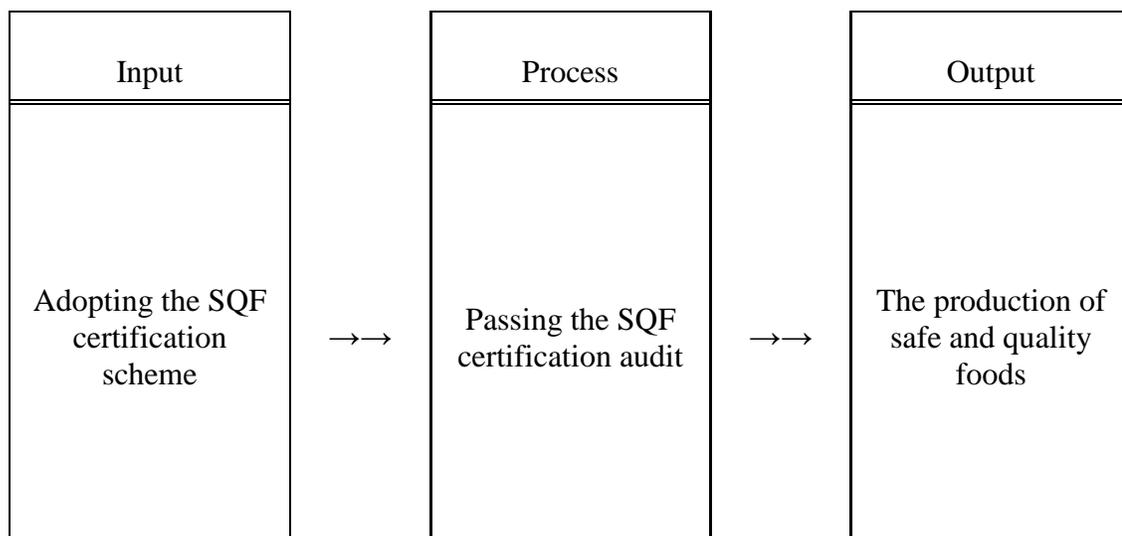
Figure 4. Steps towards the development of the Safe Quality Food certification process. Source: "Steps Towards the Development of a Certification System for Sustainable Bio-Energy Trade," by I. Lewandowski & A. P. Faaij, 2006, *Biomass and Bioenergy,* 30, p. 18

Summary

In this chapter I reviewed literature about food safety and quality in food production facilities, the use of third-party food audits, and certifications. Studies showed that food producers are using private-auditing schemes primarily as a robust food safety management system and a pathway to establish credibility for their operations. The next chapter presents the methodology and procedures for data processes in this study. These processes includes the recruitment strategy, data collection, and data analysis.

Chapter 3: Research Method

Introduction

My aim in this study was to evaluate the perceived usefulness of SQF certification to support the production of safe and quality foods for human consumption. Through a qualitative case study approach, I examined the perceived usefulness of the SQF certification process for food manufacturers in the United States. In this chapter, I will present the qualitative research methodology of this dissertation. The chapter includes the research design, instrumentation, data collection, data measurement, data analysis, and rationale, with justification for sample size.

Although SQF certification has continued to promote continuous improvement in the food business to ensure the provision of safe and quality foods to consumers, scientific studies such as this are needed to evaluate user perceptions. This study involved examining the perceptions of personnel involved in the certification scheme. The aim is to enhance the ability to produce safe and quality food products for human consumption.

Research Design and Approach

The overall design of this dissertation was a qualitative case study approach. A qualitative case study approach involves using an in-depth analysis and formal systematic process through which data are used to narrow a broad topic and answer the research questions (Hancock & Algozzine, 2016). This method helped me study the complex concept of the SQF certification scheme using user perceptions.

The research questions crafted for this dissertation are as follows:

RQ1.   What are the perceptions of food producers about participating in the SQF certification scheme?

RQ2.   What are the differences in food safety practices between SQF-certified

facilities and non-SQF-certified facilities?

RQ3.   What are the best practices for adopting and implementing SQF to ensure

usefulness in various food-processing facilities?

I used two data sources for this dissertation. The first data source involved

semistructured interview responses from recruited participants who are directly involved

with the SQF certification process. These participants met the inclusion criteria. The

second data source was verified documents and publications that describe SQF

benchmarks and principles that promote food safety and quality improvements in the

food supply chain network. These included publicized reports from affiliate websites of

SQF stakeholder organizations.

Role of the Researcher

As the sole researcher, I was the data collection instrument for this qualitative

case study. As a certified SQF practitioner with more than 10 years' experience in the

food industry, I am familiar with the food safety and quality certifications that guided me

through this study. I am also familiar with the auditing process in the food industry. I

used these experiences to interview participants in answering the research questions.

Interviews were useful as I asked probing questions and sought further clarification from

participants during interviews. My experience with the SQF also guided me in the

selection of websites used in the data collection process.

As the sole researcher, I remained unbiased by maintaining a neutral tone in my

voice and refraining from influencing participants' responses during the interviews. In

addition, I managed bias by avoiding avenues that my personal beliefs and expectations

could introduce. I avoided judgment in confirming or denying respondents' answers and accepted all participants' responses in an open and receptive manner.

I also guided myself to refrain from discussing my personal opinion of the certification scheme when interviewing participants. My goal was to prevent steering them to preconceived notions. Furthermore, I demonstrated my interviewing and probing skills to elicit comprehensive responses from respondents through practice interview sessions.

I also avoided divulging my personal opinions, judgments, and stereotyping of other food safety certification schemes when interviewing participants. I ensured this study did not include participants located in my work environment, to prevent a conflict of interest and power differentials. Although research practices have allowed incentives and gratification to participants to encourage a response rate (Maxwell, 2013), I did not compensate participants in this study in any way, nor were they rewarded for their participation.

Participants received a one- to two-page summary of the results through postal mail or e-mail. Furthermore, I was careful to gain accurate recording of all responses from participants to avoid missing vital responses. With the use of Audacity, all vital information was accurately captured through recording for transcription. The Audacity application is an easy-to-use, multitrack audio editor and recorder that has the capability to translate audio recordings into many languages for reading. I conducted the interviews in the English language. Afterward, I used the raw audio-to-text conversion to transcribe the discussion into Word documents for later analysis with the NVivo (CAQDAS) application selected for this qualitative case study.

Reliability and Validity

Interviews are one of the instruments researchers use for data collection in a qualitative study (Starks & Trinidad, 2007). The researcher makes decisions for coding, generating themes, decontextualizing, recontextualizing, transcribing, and reporting of participants' experiences in the interview, drawing conclusions based on the research data. Hence, based on the subjectivity of a qualitative study, I maintained transparency and diligence to assure true reliability and validity of the research data. All issues of trustworthiness were upheld and ethical violations were avoided.

I adopted activities that aided in eliminating bias and avoiding conflicts of interest. External validity, which involves the ability to make generalizations and causal inferences, was key in this research (aligned with Patton, 1990). The assumption that respondents hold adequate knowledge of SQF certification and accurately implement the codes was vital. This information may be useful in conjunction with other studies to validate the influence of SQF certification on food manufacturing. The results can be used to understand user perceptions and opportunities for improvement.

Sampling Strategy: Purposeful Sampling

The purposeful sampling strategy is an approach in qualitative research that helps researchers decide who to select as participants, identify the type of sampling strategy, and ensure the appropriate sample size (Creswell, 2013). Researchers of qualitative studies have applied purposeful sampling to access adequate information and research data on the topic of interest (Palinkas et al., 2015). Sample size is an important component of the sampling strategy, enabling the researcher to ensure the study has an

adequate number of participants (Creswell, 2013). Sample size and choice are essential elements in ensuring appropriate participants are included in the study.

For this dissertation, I used the criterion-sampling strategy. Suri (2011) defined the criterion-sampling strategy as one that is useful for quality assurance, dwelling on selecting participants based on an established set of criteria. Criterion sampling includes involving participants or individuals who fall into the established predetermined criteria as participants in the study. Criterion sampling is quite useful to establish systems' weaknesses, which can lead to focus points or opportunities for improvement through an information-rich approach in an organization (Mertens, 2014).

This qualitative study involved evaluating the perceived usefulness of SQF certification to food processors. I used the case-study approach for the study. The criterion-sampling strategy was beneficial in helping me select a sample size that fell within the established predetermined criteria.

Inclusion Criteria

Participants recruited for this study were respondents identified to be best suited to answer the research questions, based on established criteria. Potential participants included personnel who met one of the following criteria:

- Certified SQF practitioners.

- Certified SQF auditors.

- SQF stakeholders from food facilities and certifying bodies or organizations.

- Quality assurance managers who also work as SQF practitioners or back-up practitioners.

- Participants with a minimum of 2 years' direct work experience with the SQF scheme after initial certification.

The criteria were required to ensure participants possessed adequate knowledge, skills, and abilities to provide detailed information and answer questions on the SQF scheme, based on their work experience. Furthermore, these criteria ensured recruited participants had a cognitive understanding of the certification because they were people who had spent sufficient time with the scheme.

Exclusion Criteria

Potential participants excluded from this study included people who met any of these exclusion criteria:

- Direct SQFI staff and workers who could not protect the research from bias and undue influence.

- Food processors without an SQF practitioners' certification.

- Food processors with no direct job duties with SQF certification.

- People in my job locality, clients, potential clients, or my subordinates.

- People who did not agree to the informed consent.

- People who had not taken part in any SQF certification audit.

- People who did not have 2 years' direct work experience with the SQF scheme after the initial certification.

Recruitment Strategy

Participants for this study met the inclusion criteria. The Walden University IRB granted permission for me to embark on this study and granted approval on June 19, 2017

(Approval Number 06-19-17-0540689). IRB approval was projected to expire on June 18, 2018.

To commence the recruitment exercise, I sent e-mails to known people outside of my establishment who were colleagues in the food industry, asking for referrals to eligible participants interested in the study and asking if they were personally willing to participate. I had several business cards and I contacted those individuals, including people I had met at conferences, networking sessions, or professional groups, and former classmates or colleagues with whom I had previously shared contact information. I excluded people with whom I work, customers, or people with whom I had direct business transactions. I also excluded clients, future clients, or subordinates to prevent conflicts of interest. The e-mails included an informed-consent form as an attachment alongside IRB approval.

The recruitment letter (Appendix C) clearly stated a recruitment advertisement for a voluntary research study. This letter explained the purpose and procedures of the study. The letter requested prospective participants to call or e-mail me for additional information or to arrange an interview. I introduced the letter to potential participants, allowing them ample time to consider their participation with no undue pressure or coercion. The letter also informed the recipient that I might ask them to voluntarily provide the names of other potential recruits in their professional network who may be interested in the study. Although I asked for this information, they had the option to decline to provide any names. Based on referrals from the snowball process, I approached potential participants with my recruitment letter to get their consent to participate in the study.

I was careful to prevent undue influence and coercion toward potential participants. Accordingly, I approached each referral to get their consent because individuals might have difficulty saying no to referrals from an authority figure. I scheduled all interview sessions at a time most convenient for participants to be audio recorded. I conducted all interviews by phone, digitally recorded after receiving oral consent from prospective participants. I transcribed these discussion recordings using the raw audio-to-text conversion.

Sample Size

Data cannot be collected from everybody or the entire given population for a research study (Pickard, 2012). However, researchers can collect data from a representative sample, also referenced as a subset of the population. Marshall, Cardon, Poddar, and Fontenot (2013) noted that ensuring the availability of sufficient numbers and representative data for analysis is one of the fundamental requirements of a credible and valid research study.

Qualitative researchers do not have a convention on the exact sample size that is appropriate for a study (Marshall et al., 2013: Patton, 1990). Rather, the number depends on what the researcher is attempting to study, what will be useful for the study, what will provide credibility for the study, and what can be done with the available time and resources allotted for the study. In addition, in a qualitative study, several factors decide the number of participants that are appropriate for a research study (Marshall et al., 2013). Researchers have varying requirements for an appropriate sample size for each of the five approaches to a qualitative study (Creswell, 2013). Having a sufficient sample

size that is representative is crucial to the reliability of the generated data (Creswell, 2013).

In choosing a sample size for a research study, four major factors need to be carefully selected and studied before the appropriate sample strategy and size can be identified (Denscombe, 2014). The factors include the purpose of the study, the research questions being asked, the context of the study, and identifying the existing resources available for the study. Correctly analyzing these factors can help researchers select and use the appropriate sample strategy and sample size for the research of choice (Denscombe, 2014).

Because no specific rules exist to determine an appropriate sample size in qualitative research (Creswell, 2013), Morse (2000) suggested anywhere from five to 50 participant interviews are adequate in a qualitative study. Further, taking all perspectives into consideration in resources, objectives of the study, interview questions, and the clarity of the interview process, 25 to 30 participants are the minimum number of interviews to reach saturation to gain in-depth interview data (Morse, 2000). Based on literature from Morse (2000), I estimated a need for 35 participants for this study to attain saturation. Because food facilities are of varied nature, the NVivo application analysis will perform better if it has more keywords to operate. Additionally, a larger sample size will enable better representation of the diverse food operation participants who certify under the SQF scheme. In considering the selection of 35 participants for this study, the first factor was to use criterion sampling to ensure the homogeneity of participants (Patton, 1990). I recruited homogenous participants meeting established criteria for the

data collection process. The second factor was to interview participants as the available time and resources permitted (Baker & Edwards, 2012).

The third factor was to ensure the adequacy of potential participants to address the research questions to attain saturation. Data saturation was achieved when no new additional responses were attained or when no new themes or codes emerged from the data collection process (Baker & Edwards, 2012). Failure to achieve data saturation can negatively impact data quality and reduce validity (Patton, 1990). However, a sample size that reached saturation and avoided redundancy was the rule of thumb for a research study of this nature. Such sample sizes would ascertain that the data were appropriate in quality and quantity (Patton, 1990). Hence, for this third factor, I continued interviewing until participants provided no new leads or no new themes emerged and saturation was supported.

Data collection Process

Data collection for this dissertation involved two stages: document review of existing public documents and semistructured interviews conducted over the phone and audio recorded. The semistructured interviews involved 35 SQF stakeholders with a minimum of 2 years' experience participating in SQF certification (Morse, 2000). The online document review involved five public websites, carefully selected to contain information about SQF certification. These 35 interview participants and five public websites formed the criterion sampling designed for this study. I conducted all interviews through phone conversations that were audio recorded and later transcribed using the voice-to-word application.

I asked each participant three main questions with four subquestions in each category. I occasionally probed to generate additional information and used reflective narration to establish participants' responses. Over the phone, I maintained appropriate attention and concentration with each participant and all discussions were in the English language. I conducted interviews over 11 days: the first was on June 19, 2017 and the last on June 30, 2017. Interviews followed the interview-protocol method outlined in Appendix D. Each session lasted between 30 and 35 minutes. Participants chose the date and time of the phone interview, based on their convenience. I advised participants to select a quiet and conducive area for the phone conversation to avoid distraction or obstruction

Before commencing interviews, I read the informed-consent form (see Appendix E) aloud to each participant over the phone and obtained verbal consent. All participants provided verbal consent and no participant declined to provide verbal consent. Subsequently, I assured each participant of their privacy and confidentiality. I also assured each participant that I would provide a summary page of the research findings to them upon conclusion of the study. I assigned each participant a number, based on the sequence of interviews. The first interview was Participant 1 and the last interview was Participant 35.

I stored transcripts of each interview in an individual file folder that was always under lock and key when not in use. As formulated, I presented the interview questions to participants in a way that elicited their true perceptions of SQF certification. I conducted an average of four interview sessions per day; allowing time for immediate transcription of each participant's interview notes. I also took handwritten notes during the interview

session to capture unique participant responses. I secured the handwritten notes under lock and key when not in use.

Transcription

I recorded and later transcribed all semistructured interviews using the voice-to-word application. I used the Audacity® application to record interview: a free, audio editor and recorder. Afterward, I used the raw audio-to-text conversion. While the recorded sessions were opened in Audacity®, I opened the Microsoft Word program next to it. After starting the audio file in Audacity®, I flipped over to the Microsoft Word editing program. I turned on dictation by pressing the function key twice and choose Edit > Start Dictation.

I repeated these steps to convert each interview discussion from the audio recordings to Word documents; I converted all digitally recorded interview sessions to Word documents using this format. I then saved all the converted transcripts to a password-protected thumb drive and printed them for review. I used the printed copies during manual coding and stored the printed copies and thumb drive under lock and key when not in use. Afterward, I imported the Word documents to NVivo 11 for analysis.

Issues of Trustworthiness

Researchers often face situations that can compromise the quality of their studies (Schreier, 2012). Researchers must prove, with evidence to the readers, that the research was credible. One major requirement is to ensure quality, trustworthiness, and credibility. Researcher should totally avoid biases, personal opinions, and harmful individual habits in conducting the research. Research papers that contain credible and trustworthy information enjoy the trust and confidence of readers (E. Thomas & Magilvy, 2011).

In a qualitative case study such as this, trustworthiness of the research data largely depended on responses and perceptions of respondents (Creswell, 2013). Therefore, the honesty and accuracy of participants' responses became vital to maintain credibility, reliability, and validity of this study. I adopted appropriate interviewing skills to provide a medium that could generate sincere responses from respondents (Polit & Beck, 2013). As the researcher, I observed reflexivity—the ability to have self-discipline and adopt a position of neutrality —to ensure trustworthiness (Creswell, 2013). Subsequently, maintaining a data collection and data analysis process devoid of errors was critical to maintaining trustworthiness (Meeker & Escobar, 2014).

I audio recorded and transcribed the interview sessions verbatim using voice-recognition software. I ensured the transcripts were thoroughly transcribed to ensure no data were missing or incorrectly translated. I reviewed the transcripts several times to ascertain the transcript accurately contained respondents' responses. I compared the transcripts to the handwritten notes for verification and validation purposes and to ensure the transcripts accurately depicted participants' responses.

Having proper interviewing skills ensures the researcher receives accurate and adequate answers during the interview session (Schreier, 2012). I expected adequate responses from respondents in the study because the interview sessions were characterized by thoroughness and simplicity. This interviewing skill provided the desired medium that elucidated sincere answers from respondents. I observed issues of trustworthiness related to integrity, credibility, transferability, dependability, and confirmability (Creswell, 2013), providing an avenue for maintaining a data analysis process devoid of errors and to preserve study integrity.

Transferability

This study can be replicated if researchers use the same method of data collection to achieve a comparable result. With transferability standards, the process of data collection should be suitable for replication in similar studies (Bloomberg & Volpe, 2012). A major threat to internal validity of this study was that I am a certified SQF practitioner and auditor. Hence, issues relating to my judgment were critical, posing a threat to the credibility, reliability, and validity of the study.

However, as a stakeholder in the SQF scheme, I avoided bias, conflicts of interests, and ethical violations through bracketing. Bracketing involves a researcher who is nonjudgmental (Fischer, 2009). Bracketing involves temporarily setting aside the researcher's assumptions or judgments about the research study, instead allowing the researcher to focus on the integral analysis of the study to attain qualitative rigor. This process allows for careful development and presentation of findings in a way that shows credibility on the part of the researcher.

Dependability and Confirmability

For this study, common themes that emerged from the 35 participant interviews were generated in the context of the interview questions. Most importantly, I thoroughly examined the data collection and data analysis processes to ascertain that I did not omit relevant pieces of information. I confirmed participants' responses by verifying the interview transcripts. I compared the transcripts from the recordings and validated them with the handwritten notes. I dutifully avoided variations in the data collection process to maintain consistency with each participant in following the interview protocol (see Appendix D).

I carried out the data collection, data analysis, coding, and evaluation steps in a manner that allowed for reproducibility so subsequent researchers can apply the same protocol (as suggested by Patton, 1990). In addition, these processes of data collection and data analysis were not subject to my undue influence. Every step of the process was tactically carried out to be thorough and accurate. I performed all activities to confirm the study achieved dependability and confirmability.

Triangulation and Data Saturation

With the application of two data sources, the use of data triangulation (data from multiple sources) became apparent to achieve saturation (Stavros & Westberg, 2009). Triangulation employs multiple sources to collect data and correlates the data to the research questions (Denzin, 2009). Triangulation is important when single methods may not capture all vital responses to a research question. Hence, triangulation of data from multiple sources is an avenue to achieve data saturation.

I used two data sources for this dissertation. The first data source was semistructured interview responses from recruited participants who were directly involved with the SQF certification process (see Appendix A for the interview questions). The second data source was verified documents and publications that described the SQF benchmarks and principles that promote food safety and quality improvements in the food supply chain network (see Appendix B for list of website sources). This second source included publicized reports from affiliate websites of SQF-stakeholder organizations and public domains. I sourced all documents from pubic websites and added or reviewed no confidential or private documents as part of the data collection for this study.

The study involved 35 participant interviews and a review of five public online websites that contain documents pertaining to population perceptions on the SQF scheme. Although I interviewed 35 participants, saturation occurred after the interview with Participant 31. Participants 4, 26, and 22 had divergent opinions; however, those participants had limited experience working with SQF certification. In these cases, participants had less than 5 years working with the scheme.

Online Document Review

I reviewed five public online websites for this study. These public online documents had information on user perceptions of the SQF scheme and the impact of implementing certification as a whole. I extracted related documents from these five websites as applicable to the research questions. These documents were statements of fact pertaining to SQF certification published on these websites. These documents assisted in answering the research questions. I combined the two data sources for analysis. Final results include themes generated from the combination of data sources.

Data Analysis Process

I employed an inductive approach for qualitative data analysis in this dissertation. An inductive approach uses raw data that captures key themes and major information important for analysis (D. R. Thomas, 2006). With an inductive approach, the research questions and interview guides narrowed the scope of the study. Hence in this study, codes emerged based on collected data from the two data sources. This process allowed the opportunity to detect patterns, similarities, and regularities in the generated data that I then explored and analyzed to eventually develop answers to the research questions and reach a conclusion.

When using the inductive approach in a qualitative study, raw data are condensed into a succinct format with key themes and common responses extracted in the same pattern (D. R. Thomas, 2006). With this method, frequent, repeating, and significant themes embedded in the raw data emerged. Therefore, this process was useful to establish a connection between the research questions and the summary of finding obtained in the raw data for this study. To make this process easier, Bringer, Johnston, and Brackenridge (2006) suggested CAQDAS applications as viable electronic application. These authors then suggested NVivo 11 as a qualitative data analysis tool, capable of organizing, exploring, and analyzing the research data easily and quickly. This dissertation used NVivo 11 software for data analysis.

In the data analysis process, an *a priori* code was developed. *A priori* codes are predetermined codes based on key concepts or theoretical constructs of the study (Stuckey, 2015). With *a priori* codes, researchers develop broad codes, sentences, and labels involved in a data set anticipated to emerge based on literature. I created the *a priori* codes based on responses anticipated from the interview guide to answer the research questions. This *a priori* code formed the parent codes derived from the broad themes of the generated data. The codebook generated also involved subcodes associated with parent codes. I matched and grouped participants' responses based on these *a priori* codes. I then partitioned data from both data sources into discreet parts comprising words, phrases, and short sentences.

I completed this grouping of the raw data based on similarities, synonyms, and differences to form emerging concepts. I employed heading-style coding such that responses for each question were gathered into one place for easier analysis. These

included the overarching question and the four subquestions associated with each

research question. This allowed me to group responses to each question into a separate

heading. The next step was to organize nodes for the emergence of themes. I then

analyzed connections between the emerged themes to answer the research questions. In

exploring this approach, I used several questions, word searches, and visualization aids to

make connections from the emerged themes to draw conclusions from the collected data.

Subsequently, I performed open coding: I uploaded responses from both data

sources into NVivo 11 and assigned labels from the codebook to portions of the text. I

continuously revised and updated the codebook with new ideas that were not captured in

the initial *a priori* codebook. In certain instances, I assigned more than one label assigned

to text segments to appropriately capture the ideas expressed by participants. Thereafter I

deduced the major emerging themes demonstrated by the essential findings from the

research. I described the emerging themes in terms of participants' perceptions, verified

by the hand notes to ensure I represented the overall impression of participants in the

final data.

Ethical Concerns

Merriam (1998) encouraged researchers to be mindful of ethical practices,

truthfully reporting observed incidences to ensure the validity and reliability of the

research data. An important ethical concern for this study was the avoidance of bias:

researcher bias and respondents' bias in providing truthful answers. The subject of this

research carried much subjectivity and could be viewed or transcribed in different

directions. However, having a clear and concise mind with honesty provided a marked

advantage to ensure the ethical integrity of this study and the elimination of bias.

In addition, the effective use of the measuring instrument was important to ensure accurate reporting that truly depicts the outcome of the study. The content of the interview process used in research studies should be robust enough to ensure the interview questions are comprehensive and address all the information particular to this study (Polit & Beck, 2013), thereby upholding the content validity of the study. All aspects of the study needed to be analyzed to ensure an all-encompassing interview process and to gather as much information as possible.

Similarly, I avoided conflicts of interest as an ethical concern in this study. I ensured I did not make inappropriate influences, especially for those who provided outlying responses. I addressed all forms of personal inadequacies and professional shortcomings to provide a level field and execute a scholarly research study. To ensure ethical concerns, researchers should avoid relying on other kinds of unfounded reports, guess statement, or assumptions; observation help researchers verify and record the evaluated concept with credibility in real time (Meeker & Escobar, 2014).

Summary

This methodology section provided a summary of the data collection and analysis for this dissertation. I audio recorded all interview data using the Audacity® recording software to preserve the verbal parts of interviews for later transcription and analysis. I transcribed data verbatim into a Microsoft Word document using the raw audio-to-text conversion. I reviewed all available reference documents and reports and extracted emerging themes. I then uploaded the raw data in the Microsoft Word document to NVivo for analysis to gain understanding of each significant statement. I then aggregated all emerged common themes. The NVivo application created a visual picture that

included data, figures, graphs, and diagrams of common themes from the collected data.

The NVivo coding partitioned the data in a manner that was easy to understand and

engage my mind.

Chapter 4: Results

Introduction

In this chapter, I present the results of the data analysis process that I designed to answer the research questions. The purpose of this study was to investigate the perceived usefulness of participating in the SQF certification scheme by food producers. This dissertation was a quality-assurance/program-evaluation study designed to seek participants' perceptions of the value of this certification to their food production process alongside the evaluation of the benefits of this scheme toward meeting customer expectations. This qualitative case study rested on the perceptions of participants who have adopted or participated in this scheme.

Research Setting

Interviews for this research commenced on June 19, 2017, after the Walden University IRB granted an approval to embark on this study. Thereafter, I sent recruitment letters to prospective participants through invitation e-mails, attaching a copy of the informed consent form (see Appendix A). The recruitment letter requested volunteers willing to participate in interviews or referrals of other people who might meet the inclusion criteria. Willing participants responded either by phone or e-mail, indicating their willingness to participate in the study. Of the 112 invitation e-mails that I sent, I initially e-mailed 58 participants; subsequently, 54 e-mail invitations went to snowball sampling referrals.

Overall, the response rate was 31.25%; of that percentage, 21 participants responded from initial contacts and 14 through the snowball approach. However, I excluded 12 potential participants because they did not meet the inclusion criteria. I

stopped recruitment after 35 participant interviews. Although I interviewed 35 participants, saturation occurred after the interview with Participant 31.

Participant Demographics

For this study, I interviewed 35 participants with key involvement in SQF certifications through a digitally recorded phone interview. Table 1 details participants' demographic characteristics. Five of the 35 participants were SQF auditors and the remaining 30 participants were SQF practitioners. In the population, the average years of experience in the food industry was 16, whereas the average years of experience with SQF certification was 6. The population for this study comprised participants who had been involved in SQF certification and has experience implementing or auditing the scheme in a food facility. The 35 participants came from different food sector categories and have responsibilities for maintaining the ongoing program at a location. All 35 participants had taken the SQF practitioner or auditing training, with the accompanying examination.

Four distinct demographic groups emerged in the interviews: years of experience in the food industry, years of experience with SQF certification, highest educational achievement, and role in SQF schemes. In highest educational achievement, 60% of participants had an undergraduate degree. Of participants, 86% were SQF practitioners. The majority (54%) of participants had more than 10 years of experience in the industry. Almost half (46%) had between 6 and 10 years of SQF experience.

Table 1

Demographic Profile of Participants

Characteristic	*n*	%
Education level		
High school	3	9
Undergraduate degree	21	60
Graduate degree	11	31
Food industry experience		
<5 years	7	20
5–10 years	9	26
>10 years	19	54
SQF certification experience		
Less than 5 years	14	40
5–10 years	16	46
>10 years	5	14
Roles of participants		
SQF practitioners	30	86
SQF auditors	5	14

Note. N = 35, SQF = Safe Quality Foods.

Results Presentation

The theory of diffusion of innovations the theoretical framework for this

dissertation. I applied the theory to investigate the acceptability and perception of users

about SQF certification. This theory aided in designing the interview questions used to

pilot the data collection process. Based on this theory, interview questions helped in

understanding participants' perception of the adoption and implementation of SQF

certification in food production facilities. The criterion sampling method ensured

knowledgeable participants participated in interviews to elicit answers to the interview

questions. Participants provided responses to the interview questions based on their

perceptions and adoption of the SQF scheme.

The online document review also provided cogent information that described the

users' acceptance of SQF certification. The online records provided information

published in the public domain from various authors, based on their experience and

knowledge of SQF certification applicable to the food production process. These two data

sources provided several themes relevant for this study.

Responses to Research Questions

Of the three main research questions crafted for this study, each question had an

additional four subquestions. Responses to these research questions include data from

participant interviews and online reviews of selected publications. I identified common

responses and synonyms (syntax) provided by data sources using NVivo 11, organized in

a nonhierarchical order to deduce patterns, sentences, and constructs that created themes

to address the research questions. The analyzed data showed responses were prominent,

consistent, and uniform across all data sources for each question. I analyzed the

frequency of common responses obtained in the data collection process and present the

emerged responses to each question. These responses represent the number of times these

major statements and synonyms were mentioned in the data collection process. I then

generated Table 2 to show the frequency of responses provided to each question.

Research Question 1

The results for Research Question 1 build on responses generated from the data

collection process. This question aimed at understanding the perceptions and opinions of

participant about SQF certification. I collated one overarching question and four sub

questions to answer this question and highlighted responses in Table 2.

RQ1:   What are the perceptions of food producers about participating in the SQF

certification scheme?

Table 2

Common Responses to Research Question 1

Perceptions of Question 1	Number	%
A good roadmap to meeting customer or retailer requirement of safe foods	28	80.00
Provides credible food safety and quality guidelines	30	85.71
A robust GFSI certification that helps food producers go beyond compliance	27	77.14
SQF certification provides ways to eliminate risks in food production	32	91.43
Passing SQF certification provides trust in the food manufacturing process	34	97.14
Useful certification for continuous improvement with consistency and uniformity	33	94.29
Sometimes overrates because emphasis is focused on just passing the audit	3	8.57

Note. GFSI = Global Food Safety Initiative, SQF = Safe Quality Food.

The vast majority of participants had a positive perception of the value SQF

provides to improving the overall safety and quality of food products. The majority of

respondents demonstrated this viewpoint by identifying SQF as a framework for meeting

customer expectation and requirements:

A food producer will pursue SQF certification to meet customer requirements and

to obtain new customers. (Participant 1)

A food safety certification system needed basically by customers as a proof of due

diligence to produce safe and quality foods. (Participant 14)

Furthermore, most respondents described the SQF certification as a credible and robust GFSI scheme that provides effective guidelines for food production. The majority of respondents also noted that SQF has been used to identify and provide ways to eliminate the inherent risks in the food production process:

SQF is robust food safety management system that minimize food safety related risks. (Participant 8)

A good GFSI scheme that has helped to convince costumers that food facilities are doing what they are supposed to be doing. (Participant 31)

Although participants noted that GFSI schemes are largely driven by the big food retail companies, the research data showed that SQF schemes had not only provided room for uniformity in food plant inspection or auditing but had also created opportunities for continuous improvement;

In the past, we used to have several customer audits with several inconsistent standards, but SQF has limited the numerous individual audits. (Participant 4)

If implemented correctly, SQF is how business should be conducted in food processing plants. (Participant 7)

It is driven by the big names such as Kroger, Walmart etc. to ensure good food for consumers. (Participant 24)

However, three participants noted that SQF can sometimes be overrated because food producers place great emphasis on passing the certification audit rather than

appropriately implementing the food safety and quality programs in their facilities. Although some plants may pass the certification audit, they still have poor food safety and quality practices:

> Plants sometimes place undue emphasis on passing the audit rather than implementing the program correctly. (Participants 4)

> Sometimes overrated but definitely it has the benefits to boost consumer confidence in the food manufacturing steps. (Participant 26)

> We have had 5 supplier related recalls in the last 18 months and all those suppliers were SQF certified. As a result of this, our Quality and Food Safety Leaders are tasked with evaluating how suppliers are implementing SQF in their facilities. (Participant 35)

> Culture, leadership, and training and implementation of SQF in SQF facilities needed to be evaluated because one of the aims of the GFSI schemes was to reduce the number of individual supplier audits but retailers are now going back to facility audits because passing the SQF certification audit is no longer a proof of the production of safe and quality products. (Participant 35)

A complete breakdown of respondents' perceptions based on the categorization of codes to answer Research Question 1 appears in Table 2.

Research Question 2

The results for Research Question 2 build on responses generated from the data

collection process. This question aimed at understanding what users perceived as

differences in SQF certification and other third-party schemes. Likewise, questions

investigated the impressions of participants about the process of attaining certification.

Responses for this question appear in Table 3.

RQ2:   What are the differences in food safety practices between SQF-certified

facilities and non-SQF-certified facilities?

Table 3

Common Responses to Research Question 2

Perceptions of Question 2	Number	%
I only have experience with SQF	25	71.43
Paperwork and documentation are better with SQF	30	85.71
It is management's decision to adopt SQF	17	48.57
Big customers/retailers demand SQF. SQF has better industry recognition	30	85.71
Food safety practices are robust and much better with SQF	25	71.43

Note. SQF = Safe Quality Food.

The responses generated for this question showed that many participants who

adopt SQF certification only limit their understanding of the GFSI schemes to the SQF.

Hence, many participants in this study are only familiar with SQF certification:

I have only worked in SQF certified facilities. (Participant 33)

All schemes have to meet GFSI benchmark standards. I do not think the schemes

are driving huge differences. (Participant 22)

However, participants could distinguish the multilevel position of SQF involving separate food safety and quality certifications, providing a major difference from other GFSI certification schemes. In addition, respondents noted the requirements for dedicated practitioners in facilities as a difference of this scheme from other GFSI schemes:

I think most of the GFSI are similar but the SQF is different depending on whether you are level 1, 2 or 3. (Participant 24)

SQF requires that a practitioner is on site to help comply with the regulations set forth by the certification body, having this extra set of eyes on staff brings more attention to the details that can easily overwhelm other staff. (Participant 3)

One response to this question showed that participants recognized the impact of implementing the SQF program to their food operation. In particular, Participant 34 compared the days before SQF certification and the days after the implementation and concluded that SQF has clearly increased efficacy in producing wholesome foods for consumers:

The focus before SQF was more on the line of production first. We wanted to fill orders and have our products on the shelves with moderate food safety standards. Now that SQF is a part of our daily function, we cannot make products without first looking at the food safety implications and holding ourselves to a higher standard. (Participant 34)

Responses to this question also showed that most participants using SQF schemes attributed the adoption of this scheme in facilities purely as a management decision. This was a new finding. However, they understand that the emphasis on paper work or documentation of food processes, policies, and programs was a huge component of SQF certification. Participants also mentioned that SQF has more programs and guidelines for food safety compliance in general than other schemes:

Non-SQF facilities tend to struggle to provide information about food safety and quality programs, but SQF facilities do not struggle because SQF is huge on paper work. (Participant 25)

It is in the amount of paper work and documentation. SQF seems to have more requirement for documentation than other schemes. (Participant 4)

Our facility has found out that documentation is the most important factor in passing SQF audits. Say what you do, do what you say, and prove it. (Participant 5)

Furthermore, the data revealed that most facilities adopt SQF certification because their facility management believes it is a robust program that can pilot the production of safe and quality foods:

SQF was adopted as a corporate management decision for all of our production locations. (Participant 11)

Management adopted SQF because it was viewed as best of all GFSI schemes.

(Participant 19)

A complete partition of respondents' perceptions based on the categorization of codes to answer Research Question 2 appears in Table 3.

Research Question 3

The results for Research Question 3 emerged from responses generated in the data collection process. This question aimed at understanding the steps needed to adopt and fully implement SQF certification in food facilities to gain effectiveness. Responses to this question appear in Table 4. This question aimed to identify gaps that might exist in the scheme or factors that hinder the successful implementation of the scheme in food facilities.

RQ3: What are the best practices for adopting and implementing SQF to ensure usefulness in various food-processing facilities?

Table 4

Common Responses to Research Question 3

Perceptions of Question 3	Number	%
Good training program	35	100.00
Upper facility management should have full commitment in the scheme	35	100.00
Improve all online practitioner and auditor training classes	12	34.29
Provide specific practitioner training classes for each food sector category	28	80.00
SQF practitioner training and certification should be reviewed and standardized. Current training requirements and certification are insufficient	33	94.29
Understand of the SQF codes by practitioners	35	100.00

Note. SQF = Safe Quality Food.

In response to Research Question 3, all participants in this study perceived that having a good training program specifically for practitioners, auditors, and all food employees is vital to successfully implementing SQF at a facility. In particular, respondents noted that practitioner training and certification seems inadequate. This finding is new and was not highlighted in the literature review preceding this analysis:

Good training program for everybody involved in food processing especially the practitioner should be made mandatory. (Participant 9)

The SQF practitioner requirements are not rigorous and the certification test is not tough enough. (Participant 11)

SQF Practitioner and auditor training/certification should be more intensive to attract credibility. (Participant 12)

I do not feel that the practitioner certification adequately reflects knowledge of the code. The questions in the exam focused primarily on the auditing body, consultants, and use of the SQF shield. (Participant 23)

Furthermore, participants mentioned that occasionally practitioners are not capable of independently interpreting SQF codes. Respondents identified the lack of consistency in understanding and interpreting the codes as a gap in practitioner training:

Inconsistency in interpreting the SQF codes exists among practitioners, some practitioners are not well trained. (Participant 6)

In addition, respondents noted that consistent engagement and facility-management support, commitment, and cooperation is another key component of successfully implementing SQF in facilities. Respondents noted the importance of engaging facility management to stay fully aligned with certification beyond merely passing the audit:

> That all management personnel buy into the program or else it will fail throughout the year. It may be able to survive an audit but not staying on top throughout the year is a failure. (Participant 10)

> Good management commitment is required. It should not be taken as a requirement or compliance necessity but an opportunity for continuous growth. (Participant 24)

> Best course for implementation includes adequate training, implementation plan with action items, follow thru, and upper management support. (Participant 19)

> SQF should require and demand more commitment and engagement from facility upper management. (Participant 2)

Last, to improve training for auditors and practitioners, participants noted that having dedicated food-sector-category training is essential for calibration and consistency. Such training is necessary to accurate interpret and apply SQF codes. Participants also encourage the incorporation of continuous education classes for auditors and practitioners, with opportunities for renewing certification. Respondents cited this

aspect as an avenue to build knowledgeable subject-matter experts in facilities.

Participants also said ensuring auditor calibrations is a means to assure consistency in

auditing services:

> More consistency between auditors, different auditors have different preferences.
> (Participant 19)

> There is not a lot of standardized SQF training program in the industry for
> individual food sector categories. (Participant 24)

> You need to set specific requirement for practitioners to create a more credible
> practitioner certification. Two day of in house training or just online training was
> not enough for practitioner training. It was enough to pass the online test for
> certification but not sufficient to cover the relative sections in much detail that is
> needed in the plants. Current training is too broad, short, and lacking specifics if
> you have not had previous experience with SQF. (Participant 28)

A complete partition of respondents' perceptions based on the categorization of codes to

answer Research Question 3 appears in Table 4.

Summary

This chapter presented the findings related to the three research questions. I

tabulated and highlighted responses to each of the three research questions in this chapter.

Findings showed three potential outcomes. Some results aligned with arguments in the

literature review, whereas others did not. New findings emerged in the results. The next

chapter will explore these three outcomes in detail. Chapter 5 will also include discussion

of lessons from this study. In addition, the limitations of the study, contribution to

science, implications for positive social change, and recommendations for future research

will be discussed.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this qualitative case study was to explore users' perceptions of

SQF certification toward producing safe and quality food products. Findings from this

study revealed perceptions about the adoption and implementation of SQF certification in

food production facilities. Most perceptions were positive, with participants admitting

that this third-party auditing and certification scheme provides the credible and robust

guideline necessary for the production of safe and quality foods. Study results revealed

that SQF certification has enormous potential to positively influence the production of

safe and quality foods, as seen by responses to the first research question. Participant 4

mentioned:

> The SQF is a credible food production certification that promotes good food
>
> practices and helps to eliminate food production risks.

> Other perceptions involved emphasis on implementing the programs accurately in

facilities. Study results revealed that attitudes of SQF professionals are sometimes geared

toward passing the audit and not necessarily adhering to the full sense of the scheme.

Participant 3 said:

> The system works great if you work the system, yes you can create books and not
>
> walk the walk. The system when constructed properly utilizing the guidelines
>
> helps employees and employers produce the highest quality of safe food.

One of the many benefits study results showed is that SQF certification has unified and created consistency in food safety and quality auditing of food facilities. The data revealed that food facilities typically go through several audits and certifications based on customers' demands; however, the introduction of SQF has reduced the number of plant audits and also created a more consistent set of guidelines. Participant 11 indicated:

Pre-SQF we would have several food safety audits from several customers yearly. Now that has reduced to almost elimination of customer audits with just passing the SQF.

Key Findings

In this section, I present the key findings for each research question and how they connect to the theoretical framework and the literature review. These findings include responses that confirmed the literature, those who disagreed with the literature, and the new findings from the study results.

Research Question 1

In the initial literature review, Grzesiak and Manno (2016) asserted that food manufacturers are now using SQF certification to implement a robust food safety control system into their operations. Of responses to Question 1, 77.14% confirmed the ability of SQF certification to create the viable guideline needed for the production of safe and quality food. Because of the proactive nature of the SQF, 92.43% of responses to Question 1 mentioned that the proactive nature of SQF certification has created an avenue to identify and eliminate the risk inherent in the food production process. Results also showed that SQF certification provides not only guidelines for mitigating risks, but

also solutions for fast recovery in cases of food production failure. This study's results

showed that SQF certification emphasizes food safety beyond other GFSI schemes.

As indicated in the literature review, Sevenich et al. (2014) identified 66% of

consumers believe food producers are not transparent about how they produce food at

their facilities. However, results from this study showed that by implementing SQF

certification, food producers are proving to be credible and truthful about their food

production operations. For example, 97.14% of responses to this question indicated that

passing SQF certification provides trust in the food-manufacturing process (see Figure 5).
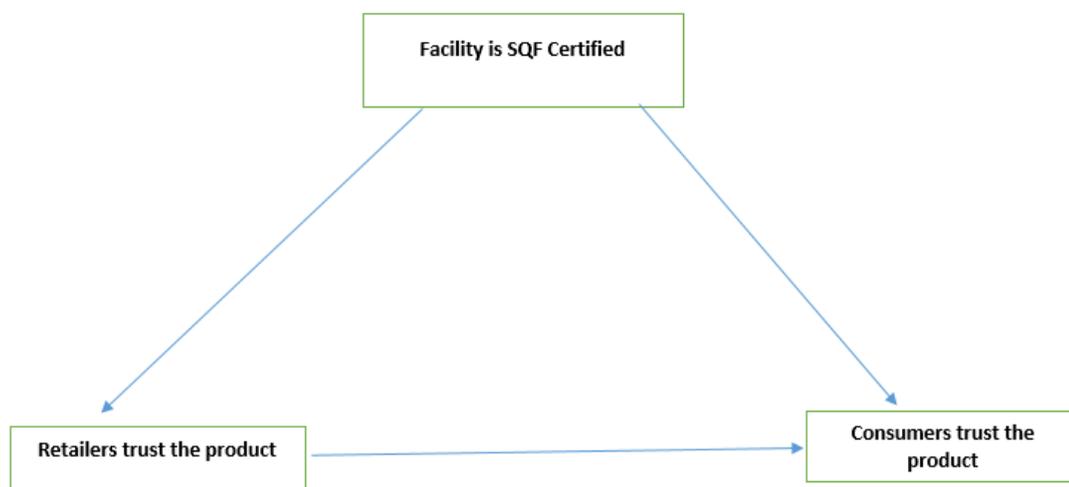
Figure 5. Trust cycle of products from a Safe Quality Food-certified facility.

With SQF being a holistic auditing process that verifies the entire food production

process, food processors who adopt and truthfully implement this process are sincere and

hold high credibility with consumers. With the current endeavors to make food readily

available to consumers at a reasonable cost, Stuckler and Nestle (2012) discussed the

necessity for adequate food safety and quality measures to be in place as the mass

production of food continues to be on the rise. Results from this study confirmed this

important necessity and concluded that food producers who adopt and implement the SQF scheme are confident in fulfilling all food safety requirements needed to produce safe and quality food products. Figure 5 illustrates that SQF certification provides trust in the food-manufacturing process for processors that adopt this scheme. This figure describes the trust level among all parties in the SQF network, as it evolved in this study.

Research Question 2

In the literature review, Van Der Meulen (2011) averred that private or voluntary food standards are initiated to remedy the flaws and inadequacies of regulations or legislation to attain premium levels of consumer protection. Havinga (2013) also discussed that huge food retailers are applying their economic power to enforce stringent food safety and quality management systems for producers. Although results in this study agree that food producers adopt the SQF scheme to meet retailer or customer demand, the results further showed that upper facility management in food plants adopts the SQF because of the numerous benefits it provides in the food production network. Results showed that meeting customer requirements with genuine concern for food safety and quality is a major reason food producers adopt this scheme.

In Chapter 2, Ribera and Knutson (2011) cited that preventive actions rather than reactive measures are necessary for the food production process, with a call for consistency in the various auditing or inspection programs. Study results also showed that with the emphasis on paperwork and documentation in the SQF scheme, food producers are embracing a proactive approach, gain consistency in their operation network, and remain profitable while producing safe and quality food products. Results from this study

further showed that the ability to sustain growth with consistent continuous improvement is a reason many food producers adopt this scheme.

Another key finding of this study did not appear in the literature: food producers who have adopted this SQF scheme are happy with the scheme. Study results revealed that 71.43% of participants had only worked with SQF schemes and have no experience with other GFSI schemes. This outcome shows that respondents are happy with this scheme and are unwilling to investigate or adopt other GFSI schemes. This result also showed that participants in the SQF scheme are confident that this scheme is capable of providing the continuous guidelines needed for the production of safe and quality foods in their respective food facilities.

Research Question 3

Holleran et al. (1999) mentioned that passing a third-party food safety certification proves the presence of good food safety practices and provides eligibility for global food export. Havinga (2013) also mentioned that adoption of the SQF gives room for food producers to participate in international trade. However, results from this study showed that passing the SQF audit and certification is not a guarantee of adequate food safety practices in a facility. Participant responses showed that a food facility can pass the audit and still engage in poor food safety practices. In moving beyond merely passing the certification and audit, results showed that good training programs for all parties involved in the process and strong engagement and commitment in each facility are key requirements to fully implementing this scheme. The summary of key findings for this study follow:

- Passing the SQF certification provides credibility to the food operation.

- Possessing SQF facility certification proves due diligence of safe and quality food operations.

- Respondents are happy with this scheme and unwilling to investigate or adopt other GFSI schemes.

- Passing the SQF audit and certification is not a guarantee of adequate food safety practices in a food facility.

- Respondents noted that correctly implementing the scheme in a food facility is vital to sustaining a culture of food safety and quality.

- Respondents noted that good training programs for key players in the SQF program in food facilities are currently lacking.

Theoretical Framework

For this research, I used innovation diffusion theory as the theoretical framework. According to Lyytinen and Damsgaard (2001), the theory of innovation of diffusion was developed by E. M. Rogers in 1962 to investigate how an idea, product, service, or innovation enjoys acceptance and spreads in the population, and how such innovation performs in realizing desired objectives. This lens informed how I formulated the interview questions. Using this theory provided the opportunity to identify how stakeholders in the food industry are receptive to this initiative and evaluate the extent of their compliance and implementation of the program in various food facilities.

Lewandowski and Faaij (2006) described steps in the development of the SQF certification scheme toward the production of safe and quality foods. I deduced a model from the steps and combined this model with the innovation diffusion theory to suit this

study. From the model, the usefulness of SQF certification to aid in the production of safe and quality foods is measured in the output state. The initial model (see Figure 4) placed emphasis on the output state of producing safe and quality foods as the important factor in the diffusion of the SQF scheme across food production facilities.

The results of this study identified two key components of the process stage that are missing from this model. This result showed that to fully implement SQF certification in a food facility, two components need to be included in the model. The study showed that although the output stage is quite important, two important elements needed to be added to the process stage to realize a sustainable benefit in the output stage. Although passing the certification is important, how one implements and passes the certification is, however, more important. These two findings were identified as additions to science that are important to adopt, implement, and diffuse in SQF certification across food production facilities.

1. Appropriate and ongoing training of all key players in the certification is important to successfully adopt and implement the scheme and to gain maximum benefit from the scheme. A sample training picture in a food facility appears in Appendix F.

2. Engagement and full commitment of facility upper management to SQF certification beyond passing the certification is important in producing safe and quality food products.

The purpose of this study was to understand the perceptions of users of SQF certification toward the aim of producing safe and quality food products. With the application of the theory of diffusion of innovation, these two findings presented a new

construct that is necessary for the adoption, implementation, and diffusion of the scheme among food producers, based on the participants' perceptions. Deduced from research data, I present the two findings as an addition to science that is useful to support the realization of the full benefits of this scheme by food producers. Figure 6 describes this new model.
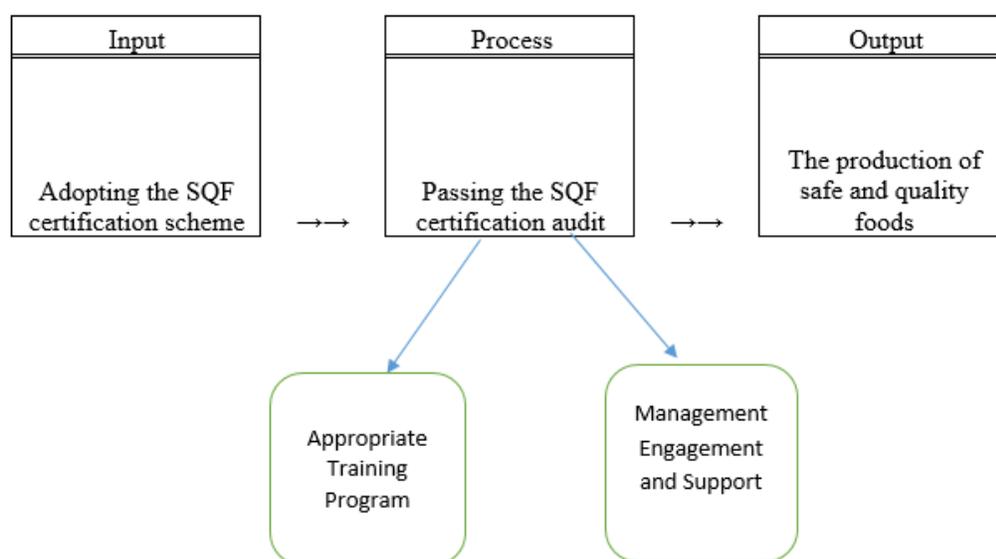
Figure 6. New steps for development and implementation of Safe Quality Food.

Adequate training for all food employees is a good method to improve food safety practices in a food facility (Gomes et al., 2014). Beyond providing guidebooks and policies, focusing on employees who come in contact with processed foods with essential training is essential to maintaining good practices. Food handlers who have regular and consistent training have a low risk of handling foods that will link to foodborne outbreaks (da Cunha, Braga, de Camargo Passos, Stedefeldt, & de Rosso, 2015). Furthermore, food

handlers who have received training have carried less food safety risk than untrained handlers.

Initial training for food handlers' declines and wanes over time (McIntyre, Vallaster, Wilcott, Henderson, & Kosatsky, 2013). Therefore, recertification and continuing-education classes are a plausible solution to retain and improve knowledge of food handlers. Hence, the identification of training as a key finding of this study is essential for the successful implementation and use of the SQF scheme in food facilities to enhance production of safe and quality food products.

To boost any new method or change the behavioral climate of a work place, management commitment is a key factor. Laurent, Chmiel, and Hansez (2017) proposed encouraging facility management to lead by example and show full support to new initiatives as an avenue to achieve necessary climate change. Facility managers sometimes do not even support changes they institute (Bucero & Englund, 2015). In such events, employees find means to avoid such changes or new initiatives.

However, to improve adoption of new initiatives in the work place, the support and engagement of facility management needs to be the priority (Pinion et al., 2017). In a work place, several novel initiatives have lacked employee support through the absence of engagement from key players. This lack of thorough management support links to the inability of new initiatives to enjoy full support and the realization of the full benefit. Employee perceptions of low management support for initiatives usually results in low participation (Stackhouse & McDouall, 2015). This lack of full management support has brought about inefficiencies to programs that may have encouraging potential. Therefore, Pinion et al. (2017) concluded that facility management should endeavor to embrace new

initiatives with full engagement beyond compliance. This welcoming of new systems is important as a pivotal tool in enforcing initiatives in a work place beyond compliance, leading to achievement of optimum benefits of such innovations.

Limitations of the Study

One limitation of this study was the low response rate. The 35 participant responses built from 112 solicitation requests, yielding a response rate of 31.25% for this study. In addition, 14% of participants were SQF auditors whereas the remaining 86% were SQF practitioners, suggesting that most responses rested on SQF practitioners' perspectives. This demographic imbalance may have been skewed toward practitioners' perspectives and may not have revealed a good combination of practitioners' and auditors' views. Therefore results may not be generalizable perceptions of both auditors and practitioners.

Study results showed that 60% of participants had an undergraduate academic degree whereas 31% had graduate degrees. This result showed that participants achieved academically and could confidently answer the interview questions. Furthermore, 54% of participants had more than 10 years' experience in the food industry, whereas a quarter had between 5 and 10 years' experience in the food industry. Thus, the participant pool comprised a group of knowledgeable respondents who had the requisite ability to answer the interview questions raised in this study.

The SQF standard developed in Australia and subsequently moved to the United States (Henson & Reardon, 2005). SQF has been in the United States for a relatively short period of time. Almost half of participants has between 5 and 10 years' experience with this standard whereas 14% actually has more than 10 years' experience. This

number confirms the composition of the participant pool as a group of respondents with enough experience and exposure to the certification to form opinions and hold genuine perceptions of the scheme through years of experience.

In the scope of SQF certification, separate levels specify food safety (Level 2) and food quality (Level 3). In this study, however, I combined the two parameters for evaluation. I did not emphasize individual attributes in assessing quality and safety. This study is therefore limited to describing participants' perceptions of food safety and food quality as a combined parameter. Last, this study was limited to SQF participants in food processing facilities in the United States. Thus, in the study I only sampled respondents from the food processing and manufacturing sector of the SQF scheme.

Recommendations

Beyond passing the SQF audit and certification, key elements that are necessary for adopting and implementing the scheme in a food facility are also important. This will form part of the recommendations and key findings that would be provided to the SQF Institute (Appendix G) for consideration to improve the scope of this certification program. Recommendations accrued from the responses of study participants in two broad categories. Participants identified passing the certification as essential, but averred that creating a facility climate that supports the production of safe and quality foods in the full components of the SQF guideline is desirable. Participants in this study noted that rather than implementing the certification to meet customer requirements or show compliance in a facility, the SQF certification should be implemented as a holistic program for the production of safe and quality foods. Therefore two recommendations identified from the research data follow:

1. **Improve training programs and certification**—Respondents in this study

   admitted that the training they received is sometimes inadequate to function

   effectively in facilities and be able to consistently apply SQF codes. They

   suggested specific food-sector-category training rather than generic training as

   an avenue to improve the knowledge base of stakeholders. Participants

   mentioned another opportunity to avoid inconstancies in interpreting and

   using SQF codes is establishing an avenue for practitioner and auditor

   calibrations.

Subsequently, to provide a holistic and credible training program, participants

recommended revamping and elevating SQF practitioner certifications to make them

more recognizable. Elevating the certification requirements of the practitioner and auditor

to include more rigor provides an avenue to create more credibility for practitioners. The

inclusion of continuing-education classes beyond the initial certification examination is a

way to continue to build subject-matter experts in this field. One participant noted that

the current SQF certification process seems easy and needs to include more work to

become more credible. Participants in this study mentioned this notion as a way to gather

more industry recognition for practitioners and auditors. Having an improved and well-

designed validated training plan with room for continuing-education classes for SQF

practitioners and auditors is a needed way to continuously improve this scheme.

2. **More commitment and involvement of facility management**— SQF should

   mandate facility-management commitment beyond merely passing the audit.

   Participants in this study noted that engagement and commitment from

   location managers are sometimes lacking. Respondents further mentioned that

they often feel unduly challenged when upper management seem only

concerned about passing the audit.

Therefore, SQFI should establish programs to hold facility management more

accountable for support and engagement. This accountability is needed to establish the

full use of SQF certification in a facility, beyond passing the audit inspections. Using

facility management for continuous growth is a way to maximize the benefits of this

scheme beyond compliance, to amplify the production of safe and quality foods.

Implications for Social Change

The first implication for social change in this study is that moving beyond

compliance to pass the SQF-audit inspection or gain facility certification, two key

elements of training and facility commitment are required. This implication means that

each facility should maximize the full benefits and potential of this scheme to produce

safe and quality foods and gain a competitive advantage over other forms that do not

participate in this scheme.

The next implication for social change is that other food producers who have not

adopted this scheme can benefit from this holistic third-party certification to enhance

their food production network. This study identified SQF certification as encompassing a

growing body of knowledge and holding a credible opportunity to identify and mitigate

risk in food safety and quality operations in a food facility. This study confirmed that

using the SQF certification process in a facility can provide navigation to contribute to

the processing and production of safe and quality foods. Findings also revealed that food

producers without a GFSI scheme may not enjoy a wide range of customer acceptance.

Participants indicated that having SQF certification was a huge component of customer

requirements. Therefore, this study elucidated the need for more food producers to

consider SQF as a way to enlarge their customer base.

Furthermore, amid the myriad of colossal failures emanating from food

production operations, customers and retailers can have assurance that they are receiving

safe and higher quality food products from food producers who have adopted this

scheme, based on this certification process. This assurance can serve as a trust factor and

a marketing-opportunity channel for producers. Using SQF certification as a quality

assurance theme may convince customers of the safe and high quality state of products

produced at SQF-certified facilities.

Results will also help SQF program administrators realize two key opportunities

they require to further improve implementation of this scheme. Respondents understood

that this program is viable and robust in enabling the production of safe and quality

foods. Hence, respondents provided measures to improve the credibility and effectiveness

of this study. This qualitative study can be used as a foundation for future quantitative

studies that can be used to evaluate food safety and quality parameters separately,

compare SQF with other GFSI schemes, look at other food supply chain operations of the

SQF scheme (e.g. logistics, packaging, retailing, provision of sanitation and hygiene

services, manufacture of animal feeds etc.), and to conduct similar studies outside the

United States.

Conclusion

This qualitative case study explored the perceptions of stakeholders about SQF

certification in the quest to produce safe and high quality food products. Stakeholder

interviews and online document review of publicly published documents elicited

responses to the research questions. This study's findings revealed that SQF certification

is a credible, robust, and widely effective certification scheme that provides a useful

guide to producing safe and quality foods.

All participants agreed that if properly implemented, SQF is a better scheme in

GFSI programs in enforcing food safety practices in a food facility. These respondent

perceptions align with evidence from the literature review on the use of third-party

certification in food facilities. Furthermore, findings provided more evidence for

implementing a comprehensive SQF program in a facility. Likewise, results undergirded

a new framework that considers training, commitment, and engagement.

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Appendix A: Interview Questions

Years of experience in the food industry

Years of experience with SQF

Highest educational achievement

RQ1:   What are the perceptions of food producers to participating in the SQF

certification?

What are your general thoughts on the SQF certification?

What experiences can you share in the food safety and quality practices before the

introduction of the SQF certification and now?

What impact do you feel the SQF certification has made to food production

process?

What has been your experience passing the SQF certification in your facility?

RQ2:   What are the differences in food safety practices between SQF certified facilities

and non-SQF certified facilities? If so could you discuss them?

What differences do you see with facilities in SQF and with other schemes?

What suggestions do you have for the SQF certification as a whole?

What is your opinion on the SQF certification in providing guidelines to support

the production of safe and quality foods?

Why did you adopt the SQF scheme and not the other GFSI schemes?

RQ3:   What are the best practices for implementing SQF to ensure usefulness in the

various food-processing facilities?

What is your opinion of the SQF practitioner training and the practitioner

certifications?

How do you think the practitioners are implementing the SQF codes?

What gaps or benefits do you see in the SQF practitioner training?

How would you describe your role in the SQF certification?

Appendix B: List of Public Domain Websites Used as Data Sources

1. Food online: Safe processing and Packaging

a. https://www.foodonline.com/doc/what-are-the-benefits-of-being-sqf-certified-0001

2. Just food:

a. http://justfooderp.com/blog/everything-wanted-know-sqf/

3. Intertek Group Plc:

a. http://www.intertek.com/food/auditing/sqf-safe quality-food/

4. Food Online benefits:

a. https://www.foodonline.com/doc/what-are-the-benefits-of-being-sqf-certified-0001

5. The American Feed Industry Association:

a. http://www.afia.org/article_content.asp?edition=1&section=33&article=264

Appendix C: Recruitment Letter

<<Date>>
<<Name of potential participant>>
<<Address>>
Re: Examining the SQF Certification towards Producing Safe and Quality Food Products

Dear <<insert name>>:

You are invited to take part or make referrals of eligible individuals that might be interested in an interview session for a research study. You were selected as a possible participant or to make referrals based on our prior contact as professional colleagues in the food manufacturing network. *(In case of referral, I will add - I obtained your contact information from.... [I will describe source]* The research is investigating "The user perception of the SQF certification towards producing safe and quality food products". As a stakeholder in the SQF certification and the food manufacturing operation, your opinions or opinions of people you refer may be important to this study. I would appreciate the opportunity to speak with you about your experience on this topic.

I am inviting certified SQF practitioners, SQF auditors, and SQF stakeholders from food processing facilities, certifying bodies, or organizations with interests in the SQF scheme to participate in this study. Participants must have a minimum of two years' direct work experience with the SQF scheme after the initial practitioner certification. Your involvement in this interview is confidential and entirely voluntary and there are no known or anticipated risks to participation in this study.

With your consent, I would then ask you to provide about 30 minutes of your free time for an audio-taped interview. The interview will be scheduled at a time that is most convenient for you. The interview sessions will be conducted via phone conversations and audio recorded after proper oral consent are obtained. The interview will consist of open-ended questions about your experience and perceptions of the SQF certification. The questions are quite general, however, you may decline answering any questions you feel you do not wish to answer. All information you provide will be considered confidential and will be grouped with responses from other participants.

You might also be asked to voluntarily provide the names of other potential recruits in your professional network who might also be interested, however, you have the right to decline to provide this information.

If you have questions or willing to participate in this study, please contact me via email adeniyi.odugbemi@waldenu.edu . Likewise, you can choose to contact me by phone call or text message at telephone number 317-366-5069. A copy of the informed consent form will be emailed to keep for your records and future reference. This study has been reviewed and received ethics clearance through the Walden University Institutional Review Board (will insert IRB # here).

Thank you again for considering this research opportunity.

Adeniyi Odugbemi

Appendix D: Interview Protocol

The purpose of this interview is to answer the research question on the user perceptions of the SQF certification to aid the production of safe and quality foods. As the researcher, I will complete the following procedural steps for each interview session.

1. I will send letters/emails to known people outside of my establishment, known individuals and colleagues in the food industry asking for referrals of eligible participants interested in the study or if they will also be personally willing to participate. I have several business cards that I have received and I will contact these individuals.

2. These will be people I have previously met at conferences, networking sessions, professional groups, former classmates, or colleagues that we have previously shared contact information with each other. These will exclude people I work with, customers, or people that I have direct business transactions with. These will also exclude, clients, future clients, or subordinates to prevent a conflict of interest. The letter / email will also include the informed consent form as attachment alongside the IRB-approval.

3. The recruitment letter would be clearly stated as a recruitment advertisement for a voluntary research study only. This letter would also explain the purpose and procedures of the study. The letter would ask the prospective participant to call or email for additional information or if interested in participating in the study to send an e-mail or phone call to set up the interview.

4. The letter is introduced to potential participants in a way that allows them ample time to consider their participation with no undue pressure or coercion.

5. The letter will also let the subjects know that they may be asked to voluntarily provide the names of other potential recruits within their professional network that might also be interested in the study. However, they will be informed but that they have the right to decline to provide this information.

6. After the initial email/ letter, I will allow the prospective participant to contact me if they are willing to participate in the study through email or phone contact.

7. Snowball sampling from participants will also be utilized. In doing this, currently recruited participants will be asked to refer me to other people in their professional network who might meet the inclusion criteria. Based on the referral, I will approach those people with my recruitment letter and get their consent to participate in the study. I will be careful to prevent undue influence and coercion. I will approach the referrals to get their consent because individuals may have difficulty saying no to referral from an authority figure.

8. The interview will be scheduled at a time that is most convenient for the participant to be audio recorded.

Data Collection

All interviews will be conducted via phone conversations and digitally recorded after proper oral consent are obtained from prospective participants. This discussion will then be transcribed following the discussion.

1. As I initiate the phone call, I will start the audio recording, and will read the informed consent form (see Appendix E) and review the contents of the form with the prospective participant.

2. After they agree to participate in the study via the verbal consent, I will thank the participant for agreeing to participate in the interview. I will explain to the participant that there is no right or wrong answer. I will also inform the participant that I am only interested in an honest responses and learning about their true experiences about this certification scheme.

3. I will explain that their participation is voluntary, and they can withdraw from the study at any time. I will confirm confidentiality, anonymity, and the voluntary nature of the interview with each participant.

4. I will provide my contact information to each participant again in case they need to follow up.

5. I will ask if the participants has questions or concerns before starting the interview session.

6. I will commence the interview session and will continue to take the audio recording of the entire conversation.

7. I will ask the participant to provide the names of other potential recruits in their professional network who might also be interested, but they have the right to decline to provide this information

8. I will inform the participant that the research summary / study results will be sent to each participant through email or post.

9. I will end the interview and thank the participant for taking the time to participate

10. I will stop the recording that that time and end the call.

Appendix E: Participant Consent Form

CONSENT FORM

Obtaining Your Consent

Hello, this is Adeniyi Odugbemi. I am following up on the initial contact to participate in a research study on the user perceptions of the SQF certification. The email contained information of an intended study designed to obtain your experience in participating in the SQF certification. Thank you for your willingness to talk with me. Is this still a good time to talk?

Before we get started, I will read out a consent form. Please listen.

Interview Invitation

You are invited to take part in a research study about "The user perception of the SQF certification towards producing safe and quality food products". The researcher is inviting certified SQF practitioners, SQF auditors, and SQF stakeholders from food processing facilities and certifying bodies with interests in the SQF scheme to participate in this study. Participants must have a minimum of two years' direct work experience with the SQF scheme after the initial practitioner certification.

This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part. This study is being conducted by a researcher named Adeniyi Odugbemi, who is a doctoral student at Walden University. The form has been reviewed and approved by Walden University's Institutional Review Board (IRB).

Background Information:

The purpose of this study is to carry out a quality assurance /program evaluation study on the perceived usefulness of participating in the SQF certification scheme by food producers.

What happens if I join this study?

If you join this study, you will be asked to take a phone based interview. In the interview, you will be asked to provide information on your perceptions and experience regarding the SQF certification protocol. The survey will last approximately 30 mins and will take place during the phone call. The survey questions will be read out to you in English and your responses will be recorded.

Procedures:

To participate in this study:
- Before the interview starts, I will read out the entire consent form to you and ensure you have full understanding of the document.
- Afterwards, if you choose to participate in the interview through a phone conversation, I will obtain informed verbal consent.
- The phone interview will commence once oral consent is obtained.
- The interview will last for approximately 30 minutes.
- The interview will be audio recorded.
- Your privacy is assured for this study and the recording is done confidentially. The audio data cannot be traced back to you within the raw data.
- You might be asked to voluntarily provide the names of other potential recruits. However, you have the right to decline to provide this information.

Sample Questions:

Here are some sample questions to give you a reasonable idea of what to expect.
- What are your general thoughts on the SQF certification?
- What impact do you feel the SQF certification has made to food production process?
- What suggestions do you have for the SQF certification as a whole?

Voluntary Nature of the Study:
This study is voluntary. You are free to accept or turn down the invitation. No one will treat you differently if you decide not to be in the study. If you decide to be in the study now, you can still change your mind later. You may stop at any time during the interview.

Risks and Benefits of Being in the Study:
Being in this type of study involves some minor discomforts that can be encountered in daily life, such as taking about 30 minutes of your time for the interview. However, being in this study would not pose risk to your safety, your job, or your wellbeing.

A benefit of this study is to understand participant perception of the SQF certification scheme as an intervention program to aid the production of safe and quality foods since inception. This study will also investigate whether the current SQF concept is sufficient to address the prevailing food safety risks occurring in food manufacturing facilities. At the conclusion of the study, 1-2 page summary of the results will be set to you through postal mail or email.

Payment:
Participants in this study will not be compensated or rewarded for their participation. The participants will however be provided with detailed information about the aims and objectives of the study and how their responses can affect the research conclusions.

Privacy:
Reports coming out of this study will not share the identities of individual participants. Details that might identify participants, such as the work place or job title also will not be shared. The researcher will not use your personal information for any purpose outside of this research project. Data will be kept secure by a password protect thumb drive that will be secure under lock and key at all times when not in use. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via email adeniyi.odugbemi@waldenu.edu,   likewise, by phone call or text message at 317-366-5069. If you want to talk privately about your rights as a participant, you can call the Research Participant Advocate at my university at 612-312-1210. Walden University's approval number for this study is 06-19-17-0540689 and it expires on June 18th, 2018.

I will give you a copy of this form to keep through email.

Do you agree to participate in the survey?

- No: Thank the participant for their time and end the call

- Yes: Thank the participant and continue with the interview.

This has been approved by the Institutional Review Board of WALDEN UNIVERSITY as acceptable documentation of the informed consent process and is valid for one year after the stamped date.

2017.06.19
15:54:41
-05'00'

Appendix F: Sample SQF Information Signs Used for Training in a Food Facility

Appendix G: SQF Institute Letter

Odugbemi, Deni

To: Odugbemi, Deni
Subject: RE: SQF Research

From: Robert L. Garfield (FMI) [mailto:rgarfield@fmi.org]
Sent: Friday, February 17, 2017 3:43 PM
To: Odugbemi, Deni <Deni.Odugbemi@waynefarms.com>
Subject: RE: SQF Research

Deni,

Thanks for the note, and good luck with the project. I hope you will be able to share the results once it is published.

Best regards,

Robert.

Robert Garfield
Chief Food Safety Assessment Officer & SVP
Safe Quality Food Institute
2345 Crystal Dr. Suite 800
Arlington, VA 22202
(202) 220-0633
rgarfield@fmi.org

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★DALLAS, TEXAS★

From: Odugbemi, Deni [mailto:Deni.Odugbemi@waynefarms.com]
Sent: Friday, February 17, 2017 9:27 AM
To: Robert L. Garfield (FMI)
Subject: RE: SQF Research

Good morning Robert,

Thank you for your initial review of my document. Your feedback was helpful to correct and amend the misplaced facts. I have therefore decided to carry out this study as an independent research. It is my intention to carry our personal interviews and individual reviews of success stories from facility audits from willing participants. I have no doubt in my mind that this study will definitely help to showcase the multiple benefits that suppliers gain from the SQF certification. As I have said severally, the SQF certification has continued to promote continuous improvement in the food business of which I can personally testify, this has always been with the aim to continually provide safe and quality foods to consumers. However, scientific and academic studies like this needs to be done, primarily to showcase the benefits of the scheme, the success stories, and to boost consumer confidence in the food industry.

Thank you for your willingness.

Deni O

1