THE USE OF COMMUNICATION STRATEGIES TO INFLUENCE STAKEHOLDERS TO IMPLEMENT FOOD SAFETY MANAGEMENT SYSTEMS IN SMALL CUSTOM-EXEMPT MEAT PLANTS

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MASTER OF SCIENCE

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ABSTRACT

This exploratory study used interviews to understand the culture and communication patterns of the stakeholders, employers, and employees. Interviews revealed that the topic of Food Safety was a very sensitive one as many were reluctant to share information. The study found that direct informal communication strategies are the best method to communicate custom-exempt meat plants. These communication strategies can be used to influence food safety practices.

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When Hannibal Barca decided to conquer Rome, no one expected him to cross the Alps. The extreme weather, treacherous terrain made his conquest even more daunting. Yet Hannibal achieved the impossible, he crossed the Alps, achieving one of the greatest feats in ancient history. As I reflect on my journey, I always looked upon to this tale for inspiration. This has been a long hard journey, and those who have been with me know the adversities and challenges I faced. To grow up in a small island, travel thousands of miles away to a foreign land, and then finish master's degree is truly a dream come true, an impossible one.

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CHAPTER I. INTRODUCTION

Food safety has become a growing concern in the United States (U.S.). A recent study by the Centers for Disease Control (CDC, 2011) has revealed that every year approximately one in six Americans gets sick, 128,000 get hospitalized, and 3,000 die of foodborne diseases. According to this report by the CDC, because of foodborne diseases an astounding 48 million people get sick in the U.S. These numbers show that the food industry is still further away from safety. Various bacteria, viruses, fungal toxins, and residues of agricultural chemicals have the ability to cause human illness. It is this threat to humans that prompts this study of food safety. There have been many food contaminations in the past that have led to human casualties. The peanut butter recall of 2009 is a good example of how poor sanitary standards or human error could lead to casualties (Harris, 2009).

Statement of the Problem

The demand for locally-sourced products has increased over the years. According to the 2007 Census of Agriculture, direct-to-consumer marketing amounted to $1.2 billion in current dollar sales ("Census of agriculture 2007," 2009). The sales numbers have increased in 2007, compared with $551 million in 1997, achieving a growth of 118 % ("Census of agriculture 2007," 2009). The meat processing sector including livestock and poultry slaughter, processing, and rendering is the largest single component of food and beverage manufacturing, with 24 percent of shipments in 2011(ERS, 2013). Food processing plants include many small local plants and a relatively few large plants. However, large plants account for the major portion of shipments. In 2007, small plants (0-19 employees) accounted for 66 percent of all plants, but only four percent of the total

value of shipments (Johnson, Marti, & Gwin, 2012). The number of livestock farms selling to local markets may be relatively small, but consumer interest in how meat is produced, how animals are raised and slaughtered, and the particular diet fed to livestock has attracted a great deal of attention (Johnson et al., 2012). These consumers who buy local meats generally place a higher importance on perceived differences in product relating to quality, animal welfare, nutrition value, and environmental implications from production (Martinez et al., 2010).

It is also important to note that meat is one of the food products that has a high risk of contamination. Because of this, it is very essential that meat or poultry producers understand this risk. In this exploratory study, we will look specifically into the current food safety management systems in custom-exempt small meat plants, the potential benefits and difficulties of implementing these systems, and the use of good communication practices to help stakeholders understand that benefits outweighs the potential negative consequences.

Purpose of this Study and Research Question

The purpose of this exploratory study is to identify the communication strategies perceived by owners of small custom-exempt meat plants to be most effective in encouraging adoption of food safety management systems. To accomplish this, the study was guided by the following research questions:

1. How do custom-exempt small meat plant stakeholders perceive industry food safety management systems?
2. How do stakeholders of custom-exempt small meat plants communicate industry food safety management systems to employees?

3. How are the perceptions of custom-exempt small meat plants about food safety management systems related to the willingness to use these systems to reduce the risk of food contamination?

Significance of the Study

In the past there have been studies that have focused on the large producers, but many have ignored the small meat producers. It is important to note that small meat producers contribute to the economy not only by production of food, but also by providing livelihood for people in the community (USDA, 2010). The scarcity of resources and economic uncertainty plays a key role in small producers decision-making, and as a result of this, they might ignore the potential benefits of implementing food safety management systems (FSMS). This could lead to the risk of developing contamination in their meat plants. Many of these small plants would not be able to cope with a crisis and could potentially lose their business as a result of it. That is why it is important that they be educated with FSMS such as hazard analysis critical control point (HACCP), good manufacturing practices (GMP), and sanitation standard operating procedures (SSOP).

FSMS such as the internationally recognized risk based HACCP system, GMPs, and SSOPs play a vital role in ensuring the safety of food. For this reason, small and medium meat processor must understand the basic principles behind SSOPs (Keener, 2003), and GMPs, and how to comply with them (Keener, 2003). Meat and poultry processors should understand that SSOPs lay the foundation for many food safety programs (Keener, 2003). Creating and complying with SSOPs can be challenging for the small processor.

Even though HACCP has been implemented in large food manufacturing enterprises, it has remained difficult to implement in small and medium enterprises (SME) (Mensah & Julien, 2011). Even though SMEs are said to contribute significantly to the economies of most countries, they are the least likely to comply with regulatory requirements because of resource constraints (Mensah & Julien, 2011).

Definition of Terms

The following systems will be used throughout this study and merit further definition and explanation.

Custom-Exemption

Federal Meat Inspection Act (FMIA) exempts from inspection animals that are slaughtered and processed for the household use of the owner, his/her family, employees, and nonpaying guests. According to a report by Economic Research Service, livestock producers legally can use custom-exemption to sell a whole, half, or quarter share of a live animal for "freezer meat" (Johnson et al., 2012). If the whole animal is sold before slaughter known as "on the hoof", it can be slaughtered and processed for the new owners at a custom-exempt facility (Johnson et al., 2012). Since "on the hoof" sales of wholes, halves, and quarters of meat is marketed in volume and all animal cuts are sold together, it minimizes marketing costs and resolves many inventory management issues for producers, (Thiboumery & Lorentz, 2009). This also may allow a customer to obtain a lower per-pound price for the product than when buying the same type of meat by the cut in a retail setting (Thiboumery & Lorentz, 2009). The custom-exempt slaughter establishment must also meet specified regulatory requirements established under the FMIA and the PPIA, including humane handling and sanitation requirements (Johnson et

al., 2012). Neither Federal nor State inspectors are required to examine the animals and carcasses during slaughter or processing at a custom-exempt facility (Johnson et al., 2012). However, the Federal and State food safety inspectors do review custom-exempt operations at least annually for compliance with recordkeeping and sanitation requirements (Johnson et al., 2012).

Hazard Analysis Critical Control Point (HACCP)

HACCP plays a critical role in the global food supply chain to minimize the occurrence of food safety hazards for consumers (Wilcock, Ball, & Fajumo, 2010). HACCP is a system of risk management developed to control food safety that is an operation specific, internally managed system of preventative control that identifies, evaluates, and controls hazards of significance to food safety (Gilling, Taylor, Kane, & Taylor, 2001). HACCP has a long history that dates back to the 1960s, where it was part of assuring the safety of meals for the first U.S. manned space program (Gilling et al., 2001). Only in the last decade has it emerged as the primary approach to securing the safety of the food supply. HACCP has been recommended by the U.S. National Academy of Science, the International Commission on Microbiological specifications for Food, and the Codex Alimentarius Commission (Gilling et al., 2001). In an effort to produce a standard methodology the Codex Alimentarius Commission produced definitive guidelines to the principles and application of HACCP for food operators in 1993 (Gilling et al., 2010).

Good Manufacturing Practices (GMPs)

Good manufacturing practices (GMPs) contain both requirements and guidelines for manufacturing of food and drug products in a sanitary environment. The Food and

Drug Administration (FDA, 2008) has developed GMPs for all foods, and that agency enforces those GMPs for all foods except meat, poultry, and egg products. The U.S. Department of Agriculture's Food Safety Inspection Service (USDA-FSIS) is the regulatory authority for those products (Keener, 2003). USDA-FSIS has developed a sanitation regulation that is the Code of Federal Regulations (CFR) Title 9 Part 416, to address sanitary requirements for processing of meat and poultry products. GMP regulations require a quality approach to manufacturing that enables companies to minimize or eliminate instances of contamination, mix-ups, and errors (ISPE, 2009). If the plants fail to comply with GMP regulations they could face very serious consequences including recall, seizure, fines, and jail time (ISPE, 2009). Meat and poultry processors are required to adhere to sanitation program requirements in 9 CFR 416 (Keener, 2003). The USDA enforces 9 CFR 416, while FDA enforces 21 CFR 110 (Keener, 2003). Meat and poultry plants are responsible for preventing adulteration of their products through their written Sanitation program (Keener, 2003).

Sanitation Standard Operating Procedures (SSOPs)

SSOPs are the specific, written procedures necessary to ensure sanitary conditions in the food plant. They include written steps for cleaning and sanitizing to prevent product adulteration. SSOPs are required in all meat and poultry processing plants, CFR Title 9 Part 416 (Keener, 2003). The GMPs can help guide when the plant's SSOPs are being developed (Keener, 2003). The SSOP procedures are specific to a particular plant, but may be similar to plants in the same or a similar industry. All SSOP procedures must be appropriately documented and validated. Both pre-operational and operational sanitation needs are included in SSOPs to prevent direct product contamination or

adulteration (Keener, 2003). Therefore, the decision about how often to clean the processing line should be addressed in the plant's SSOPs and supporting documentation (Keener, 2003).

Delimitation of the Study

Food safety is a very broad area of study that goes across various disciplines. The focus of this study remains on the successful implementations of FSMS systems in custom-except small meat plants of North Dakota. This study was concerned about food safety in general, food safety perceptions and behaviors, education and current culture of beliefs, traditions, and concerns regarding food safety. The population of this study was limited to the stakeholders, employers, employees of the custom-exempt small meat plants and members of the communities where such plants exist in North Dakota.

Organization of the Remaining Chapters

Chapter one provided background information about Food safety management systems and importance of implementing them to reduce risk. Chapter one focused on the statement of the problem, purpose of this study, research question, and significance of the study, definition of terms, and delimitation of the study. Chapter two of this study will provide the literature review, which will look into previous research in the area of food safety. The final chapters consist of: methodology, discussion of results, and conclusions/directions for further research.

CHAPTER II. LITERATURE REVIEW

This chapter reviews relevant and related key concepts for this study. The purpose of this study is to find out how communication strategies can be used to influences food safety behaviors, and in return influence stakeholders to use and implement better food safety management systems such as good manufacturing practices (GMPs), sanitation standard operating procedures (SSOPs), and hazard analysis critical control point (HACCP) in small meat plants. This review of literature is subdivided into the following sections: benefits of food safety regulation; adopting food safety management systems; barriers for food safety management systems; importance of education and literacy skills; communication to influence food safety behaviors; and food safety culture.

Benefits of Food Safety Regulations

Why is food safety so important? According to Antle (1998), benefits of food safety are regulation and reductions in risks of illness and death associated with consuming foods that could be contaminated with microbial pathogens and other hazards. Antle (1998) also stated that that an individual's demand for risky foods depends upon income, prices, the objective risk associated with the food, the perceived risk of the food, the likelihood that an individual will be exposed to the risk, and the individual's susceptibility to the risk. Antle (1998) also mentioned that costs of food safety regulations include industry's cost of compliance, borne by both industry and the consumers of their products, as well as administrative costs borne by taxpayers and the deadweight loss associated with taxation.

It is vital that food handlers and manufactures understand the significance of food safety practices. A study conducted by Howes, McEwen, Griffiths, and Harris (1996)

found that 97% of foodborne illnesses in food-service establishments and homes were the result of improper food handler practices. This is why we need to change preexisting behaviors to promote better food safety practices. Bandura addressed this need for change on health promotion from the perspective of social cognitive theory (Bandura, 2000). This theory suggests a multifaceted causal structure in which self-efficacy beliefs operate in concert with cognized goals, outcome expectations, and perceived environmental impediments and facilitators in the regulation of human motivation, action, and well-being (Bandura, 2000). Beliefs of personal efficacy play a key role in this theory (Bandura, 2000). Bandura states in his study that efficacy belief is a major basis of action, and unless people believe they can produce desired effects by their actions, they have little incentive to act or to persevere in the face of difficulties and setbacks (Bandura, 2000).

He further states that whatever else may serve as motivators, they must be founded on the belief that one has the power to produce desired changes by one's actions (Bandura, 2000; Gilling et al., 2001) also adds the importance of efficacy in their hazard analysis and critical control points (HACCP) awareness to adherence model (Gilling et al., 2001) which will be discussed further in this study. In their study they state that efficacy plays a key role in behavior change (Gilling et al., 2001). Bandura (1986) supports this argument by proposing that individuals may avoid tasks that they perceive as exceeding their capabilities. This proves why many small and medium businesses are discouraged on implementation of HACCP because of their own beliefs that implementation is difficult (Gilling et al., 2001).

Adopting Food Safety Management Systems

Like changing behaviors, it is equally important that the meat plants adopt food safety management systems (FSMS) such as GMP, and HACCP. Adhering to high standards not only insures a safe product, but a quality product to consumers. This is not always the case because food manufactures continue to make mistakes and thus result in contaminated food getting into the market. Some of these mistakes have led to major food recalls such as the peanut butter crisis in 2009 (Harris, 2009). This is why it is important that even small business follow good safety practices such as GMP and HACCP.

GMP's require that manufacturers, processors, and packagers of drugs, medical devices, some food, and blood take proactive steps to ensure that their products are safe, pure, and effective (ISPE, 2009). GMP regulations require a quality approach to manufacturing that enables companies to minimize or eliminate instances of contamination, mix-ups, and errors (ISPE, 2009). If the plants fail to comply with GMP regulations they could face very serious consequences including recall, seizure, fines, and jail time (ISPE, 2009). It is also important that plants abide by HACCP, which is a system of risk management developed to control food safety (Gilling et al., 2001). It is an operation specific, internally managed system of preventative control that identifies, evaluates, and controls hazards significant to food safety (Gilling et al., 2001). HACCP has been recommended by organizations such as the U.S. National Academy of Science and Codex Alimentarius Commission (Gilling et al., 2001). Understanding the barriers that small meat plants face will help determine better implementation strategies and help small food manufactures follow these strict protocols.

Barriers for Food Safety Management Systems

There are a few barriers that hamper the implementations of better food safety management systems (FSMS). A study by Holt and Hanson (2000) found that small businesses were slow to adopt GMPs due to the lack knowledge about standards (Holt & Hanson, 2000). Businesses with small resource bases have also informed that it's an economic burden to implement HACCP plans (Ball, Wilcock, & Aung, 2009). Some of the other barriers include lack of knowledge about standards, lack of expertise and resources (Panisello, Quantick, & Knowles, 1999; Holt & Henson, 2000). Research by Mortimore (2001) suggests that HACCP would be a practical and major contribution in food safety management only if the people charged with its implementation have the proper knowledge and expertise to apply it effectively. This is further supported by the research done by Ehiri, Morris, and McEwen (1995) that claims food operators have not embraced this strategy with the anticipated enthusiasm and successful HACCP implementation has been limited (Panisello et al., 1999).

This could be further explained by the five key barriers for HACCP implementation that include using HACCP as difficult, burdensome and unnecessary, and hindered by staff and external problems (Taylor & Taylor, 2004; Gilling et al., 2001) further strengthens this by the HACCP awareness to adherence model which mentions 11 barriers for the use of HACCP. These barriers are: a lack of awareness, understanding, agreement, self-efficacy, outcome expectancy, motivation, and presence of a cueing mechanism, competence, negative environmental factors, guideline factors, and external factors (Gilling et al., 2001). This model provides a framework through which barrier can be identified and used to develop intervention strategies to implement HACCP.

Importance of Education and Literacy Skills

Like knowledge, another factor that should be given specific consideration is the educational level or literacy skills of the employees. Nieto-Montenegro, Brown, and LaBorde (2006) addressed this issue when they developed a successful food safety educational program for Hispanic workers in the mushroom industry. A majority of the workers in their study were at or below sixth grade level (Nieto-Montenegro et al., 2006). Results of the study indicated that a well-designed and structured educational program can be effective with a low literacy audience (Nieto-Montenegro et al., 2006). The study also revealed that regardless of ethnic mix, low level of education is related to low food safety knowledge scores (Nieto-Montenegro et al., 2006). There have been previous studies that have taken socio-psychological view, which focused on factors influencing safe food handling. The article by Gilling et al. (2001) on HACCP awareness to adherence model is one of the notable studies.

Communication to Influence Food Safety Behaviors

Communication can be used as a tool to influence food safety behaviors, specifically on implementation of food safety management systems such as GMPs and HACCP in small meat plants. Communication is central to the functioning of any organization, and is generally easier but more informal in small companies, and as a result some of these companies take communication for granted (Griffith, Livesey, & Clayton, 2010a). There is an increasing range of communications options within a company and they all serve the same purpose: the transfer of information from one person to another. Further, it is important to understand that organizations involve people, and they cannot interact without internal communication. Without communications

people would not know their roles and responsibilities or the objectives of their businesses, and this includes what a food business believes, feels and wants to achieve concerning food safety (Griffith et al., 2010a).

Another important aspect in this is the effective communication between leaders and employees. Leader-member exchange (LMX) can be used to measure this quality of social exchanges between leaders and employees that has been found to influence culture (Flin & Yule, 2004). That is why communicating with employees effectively can help them to feel involved and empowered, increase productivity and reduce staff turnover by increasing staff motivation and commitment. Uzzi (1997) in his study found that positive associations between employees tend to build reciprocity that promotes the transfer of knowledge that was not included in training schemes.

Additionally it is important to consider how informal communication about food safety can often have higher impact and influence on behavior than formal communications (Griffith et al., 2010a). A good communications policy will be balanced blend of different approaches including formal, semi-formal and formal (Griffith et al., 2010a). Companies should also look into nonverbal communication that is regularly expressed through dress, use of interpersonal space, which can sometimes confuse the communication of appropriate safety messages (Lingard et al., 2004). One problem is that unknowingly a business may send out the wrong messages and this has been found to be the case in non-compliance with food safety requirements (Griffith et al., 2010a). This could lead the food handlers to believe that other things, such as saving money are more important than practicing food safety (Griffith et al., 2010a). Businesses should therefore have a communications strategy based on communications objectives, choosing the most

appropriate form for message delivery followed by measurement, evaluation and feedback (Griffith et al., 2010a).

Food Safety Culture

The term culture can be used to describe the emergent history and traditions, that applies meaning to the underlying values and beliefs held by the members of, formal and informal social groupings (Buchann & Huczynski, 2010). The initial concept of "safety culture" can be traced back to the nuclear accident at Chernobyl in 1986 and has gained in popularity (Zhang, Wiegmann, Thaden, Sharma, & Mitchell, 2002). Safety culture has been studied in a wide range of highly regulated environments, such as aviation, nuclear power and healthcare (Harvey et al., 2002) and now has led to the development of Food Safety Culture.

Safety culture could be considered as one dimension of organizational culture focusing on how to improve and enhance safer work practices (Griffith, Livesey, & Clayton, 2010b). The term a positive safety culture can be used to describe a culture in which safety is understood and accepted to be the number one customer/business priority (Griffith et al., 2010b). Bierly and Spender (1995) in their study argue that a culture founded on appropriate knowledge and experience could support a safety management system consequently transforming a high risk system into a high reliability system. Organizations that employ these function as high reliability organizations (Weick & Sutcliffe 2007). High reliability organizations (HRO) work in high-risk environments and they are compelled to operate with a very high level of reliability because the prospect of failure is unconscionable (Barrett, 2008).

HROs exhibit five hallmark communication practices: (1) a preoccupation with failure, (2) sensitivity to operations, (3) deference to expertise, (4) a refusal to simplify the nuances of near misses and failures, and (5) resilience to respond to the unexpected (Weick & Sutcliffe, 2001). This is particularly applicable to the food industry because the potential consequences of food poisoning, could lead to the death of a consumer, and because of that safety should be the number one priority before moral and financial reasons. However, if the business has a good food safety management system and a culture of compliance with it, the risk to consumers can be dramatically minimized (Griffith et al., 2010b).

The reason why food handlers choose not to implement known hygiene practices has been studied and approaches to predicting behavior have been examined (Clayton & Griffith, 2008). The findings from these studies indicate that while some aspects of behavior relate to the individual over 40% may be related to the prevailing food safety organizational culture. This organizational work culture occurs among people within a business by how they interact, what an organization is about and how they behave (Griffith et al., 2010b). Food handlers can only be as hygienic as the business and the leadership within it requires, allows and encourages them to be (Griffith et al., 2010b). This is also influenced by the facilities provided as well as the management systems and culture in place (Griffith et al., 2010b). In a positive culture, food safety is an important business objective and there is compliance with documented systems. In a negative culture, food safety is not perceived of prime importance with often other business priorities dominant (Griffith et al., 2010b) and there is poor compliance with documented food safety requirements.

Best Practices in Crisis Communication

Seeger (2010) describes best practices in crisis communication as "a form of grounded theoretical approach for improving the effectiveness of crisis communication specifically within the context of large publicly-managed crisis" (p.232). Having a crisis management plan is one important step in the best practices (Seeger, 2010). In their studies Barton (2001) and Coombs (2006) suggested that organizations are better able to handle crisis when they have a crisis management plan that is updated at least annually; have a designated crisis management team; conduct exercises to test the plans and teams at least annually; and pre-draft some crisis messages. A quick, early response allows an organization to generate greater credibility than a slow response (Arpan & Rosko-Ewoldsen, 2005). Communication also plays a vital role as crisis response and mitigation requires uncertainty reduction, coordination, information dissemination, and messages relevant to the specific needs of each stakeholder (Seeger et al., 2003).

According to Seeger (2010), developing a pre-crisis network is an effective way of coordinating and collaborating with other credible sources. Seeger (2010) also emphasized the importance of collaboration and coordination with credible sources, "To maintain effective networks, crisis planners and communicators should continuously seek to validate sources, choose subject-area experts, and develop relationships with stakeholders at all levels" (p.240). Coordinating messages increases the chance of having consistent messages and reduce the confusion the public may experience (Seeger, 2010).

It is important that we continue to focus on developing the food safety as the threat of food borne illness increase. One of the primary ways that this can be achieved is

through the use of food safety management systems (FSMS) such as HACCP, GMPs, and SSOPs.

Summary

The literature review in this chapter highlighted important factors such as importance of education and literacy skills, communication to influence food safety behaviors and food safety culture. Based upon on the literature presented we know barriers for adoption food safety management systems, including economic burden (Ball et al., 2009) and difficulty (Gilling et al., 2001) in implementing FSMS. Holt and Hanson (2000) in their research found that small businesses were slow to adopt GMPs due to the lack knowledge about standards. Thereafter the importance of education and literacy skills was highlighted by the study by Nieto-Montenegro et al. (2006) that developed a successful food safety educational program for Hispanic workers in the mushroom industry that were at or below sixth grade level. Results of that study indicated that a well-designed and structured educational program was effective with a low literacy audience (Nieto-Montenegro et al., 2006). Past literature in communication identified were that communication is more informal in small companies, and communications policy should be balanced blend of different approaches including informal, semi-formal and formal (Griffith et al., 2010a). Food Safety culture was supported by research from Bierly and Spender (1995) and Weick & Sutcliffe (2007), that identified culture founded on appropriate knowledge and experience could support a safety management system consequently transforming a high-risk system into a high reliability system. Finally research by Seeger (2010) outlined the importance on having a crisis management plan as one important step in the best practices. This was further supported in studies by Barton

(2001) and Coombs (2006), that suggested that organizations are better able to handle crisis when they have a crisis management plan that is updated at least annually; have a designated crisis management team; conduct exercises to test the plans and teams at least annually; and pre-draft some crisis messages. However what is missing is an understanding of the current FSMS in custom-exempt small meat plants, the potential benefits and difficulties of implementing these systems, and the communication strategies perceived by owners of small custom-exempt meat plants to be most effective in encouraging adoption of food safety management systems, prompting the following questions to guide this study:

RQ1: How do custom-exempt small meat plant stakeholders perceive industry food safety management systems?

RQ2: How do stakeholders of custom-exempt small meat plants communicate industry food safety management systems to employees?

RQ3: How are the perceptions of custom-exempt small meat plants about food safety management systems related to the willingness to use these systems to reduce the risk of food contamination?

Better understanding of these factors will help serve the purpose of this study.

CHAPTER III. METHOD

This chapter examines the data collection and analysis procedures that were implemented for this study. This study gathered qualitative data using a mix method approach with surveys and semi structured telephone interviews. Primary data was collected using a survey through telephone interviews. Data analysis was used to identify how their current culture of beliefs, traditions, concerns regarding food safety, how food safety concerns and practices influence the behavior and how implementation of FSMS will affect individuals.

The methods and procedures used in the study including the research design, participants, instrumentation, data collection, instrument, confidentiality, and data analysis is as follows:

Research Design

Qualitative research methods were used to collect data for this study. According to Keyton (2006), "Interviews are a practical qualitative method for discovering how people think and feel about their communication practices" (p.269). Even though researchers prefer face-to-face interviews, they still can collect data through telephone, email, websites and fax (Fontana & Frey, 2000). Survey research design helps the investigator gather the necessary qualitative data that will be statistically and thematically analyzed (Creswell, 2005). Planning helped to keep the study on course and allowed the researcher to complete the study within the time schedule. It is necessary that the researcher remains faithful to the purpose of the research as it is important for framing the task of the survey and for all subsequent decisions the researcher will make about the research project (Richmond & Curtis, 2009).

Participants

The population for this study included all the custom-exempt small meat plants of North Dakota. Currently in North Dakota there are 27 geographically distributed custom-exempt small meat plants in operation. The primary participants for this study were those in charge and making critical decisions regarding food safety such as owners, senior managers, and lead employees in quality assurance or food safety coordination. These participants were also referred as meat processors in this study.

The primary method of recruitment was a letter to owners of custom exempt meat plants inviting them to a phone interview and notifying them of the researchers intent to contact them. The 27 business owners were identified with the assistance of the North Dakota State University Department of Animal Science.

Instrumentation

The survey instrument included in this study was based upon from the literature review for content validity. The instrument was pilot-tested to ensure the face validity and clarity of the instructions and items. Research question one was as follows: How do custom-exempt small meat plant stakeholders perceive industry food safety management systems? To find answers this research question, three interview questions were asked. Do you implement any food safety management systems in your plant? Do you consider "safety" when you make decisions about plant? What motivates you to implement food safety management systems?

Research question two asked how do stakeholders of custom-exempt small meat plants communicate industry food safety management systems to employees? In search for answers to this question, a number of interview questions were asked as follows: How

do you communicate food safety management systems to your employees? Why did you choose this method?

Research question three asked the following: How are the perceptions of custom-exempt small meat plants about food safety management systems related to the willingness to use these systems to reduce the risk of food contamination? In order to find answers to research question three, five interview questions were asked: “In your opinion do you find food safety management systems to be helpful or not? Why?” “Do you think food safety management systems will become more important in the future to your plant? Why?.” “How important will food safety management systems be in the future in the food industry?” In this question, the interviewer still had options for further probe questions. The presentation of the data from the interviews proceeded by starting with interview questions relating to research question one.

Data Collection and Limitations

First, an invitation to participate in a telephone interview was mailed to the owners and managers of custom exempt meat plants. Informed consent letters were attached with each mail invitation to owners and managers. The participants were then contacted by telephone to follow up and ask if they were willing to participate. This was then followed by telephone interview. Telephone interview consent scripts were read at the beginning of each telephone interview followed by a brief set of questions. Telephone interviews were used to better understand participants’ views on FSMS. The open-ended questions then allowed the interviewer to better describe the FSMS that is been used.

The results from the answers to each interview question were grouped in themes. The analysis of these themes provided a total evaluation of the how industry food safety management systems communicated to small business owners.

Since most participants did not indicate a contact time, they were contacted between the hours of 10 a.m. to 11a.m. and 12 p.m. to 1 p.m. However this time was not the most optimal because custom-exempt small meat plants operation times varied and many of these plants functioned on limited resources, therefore many did not wish to spend time on a telephone interview. The telephone interview time varied from five minutes to 15-25 minutes, depending on the interest of the participants. Many participants, however, avoided or reschedule the interviews. Participants who did two or more rescheduling were not further contacted as the researcher was exhausting his limited resources. Since an international researcher or an outsider conducted the interviews, the participants could have been uncomfortable sharing sensitive information about food safety. This was not an anticipated issue before the data collection, as the researcher was a fluent English speaker and had experience conducting interviews before. As Littlefield (2013) highlighted in communicating risk and crisis communication to multiple publics, "if sensitive to how different publics prefer talking with outsiders, communicators should use cultural agents to establish some credibility with cultural groups" (p.245). In the case of this study, since all participant of the region were Caucasian, a Caucasian cultural agent may have been able to establish trusted relationship because "establishing a trusted relationship between communicator and multiple publics take time" (Littlefield, 2013). Cultural agents are "border-spanners" who understand the worldview of the communicator and the publics, and should be compensated accordingly (Littlefield,

2013). However cultural agents are difficult to find and the use of one would have required compensation, which the researcher was unable to afford due to budget constraints. The researcher also believed there may have been prejudice or pre-conceived notions about the interview process as some participants did not wanted to engage in conversation. Out of the 27 listed functioning meat plants, only six responded representing a response rate of 22%. While this is a low response rate, the sensitive nature of the subject matter may have contributed to this outcome. Though the response rate was low, of those who actually participated in the interviews (6), 100% actually answered all the questions. All telephone interviews were audio recorded.

Confidentiality

Research was conducted only after permission was granted from the North Dakota State University Institutional Review Board (IRB) for the protection of human subjects. Anonymity was assured for all informants, as there was no request for name or any other identifier on the survey or the interview.

Data Analysis

After the telephone interviews were conducted the interviews of the participants were transcribed. The resulting qualitative data was transcribed to 15 pages consisting of 553 lines. Then a line was used as the unit of analysis for this data. Following this, the researcher coded each respondent by the number questions. A description of data is given in Table 3.1. showed that 425 lines of data, equivalent to 76.8% of the entire data set, were available for analysis while the 128 lines that were generated by questions within the text made up the remaining 23.3%. The coding continued with 425 lines, reflecting 76.8% of the data.

Table 3.1. Breakdown of the Interview Transcripts for Analysis

Description	No. of lines	Percentage
Questions	128	23.2%
Interview answers	425	76.8%
Demographic data	75	13.5%
Data pertaining to RQ 1	155	28%
Data pertaining to RQ 2	78	14%
Data pertaining to RQ 3	230	41%

The qualitative data of their responses were then subjected to a thematic analysis to find emerging themes. Thematic analysis is a qualitative research method used for identifying, analyzing and reporting patterns within data (Braun & Clarke, 2006). This has been a widely used method within psychology that offers an accessible and theoretically flexible approach to analyzing qualitative data (Braun & Clarke, 2006). It was vital to this exploratory study to discover any themes that were relate to education and literacy skills, communication to influence food safety behaviors, and food safety culture. Finding more established communication patterns that were in the organization or the community assisted the researcher in identifying communication strategies to influence behavior.

After the necessary data for the thematic analysis was gathered the themes were analyzed and coded accordingly. Two methods of coding that were used for this study were open and axial (Pandit, 1996). Open coding is part of analysis that deals with the labeling and categorizing of phenomena as indicated by the data (Pandit, 1996). In this method, data is initially broken down by asking simple questions, and then data is compared and similar incidents are grouped together (Pandit, 1996). In this study Pandit (1996) found though “open coding fractures the data into concepts and categories, axial coding puts those data back together in new ways by making connections between a

category and its sub-categories" (p.10). The process of open coding highlighted many concepts and categories related to this study. These categories were further analyzed using axial coding methods.

Summary

Chapter three described the methods and procedures used in this study including the research design, participants, instrumentation, data collection, instrument, confidentiality, and data analysis. The population for this study was recruited from the custom-exempt small meat plants of North Dakota. A network sampling method was used to administer the survey to the participants of the study. Following the survey the participants were contacted by telephone inviting them to participate in a short telephone interview. The interviews of the participants were then transcribed and subjected to a thematic analysis. Data was then coded using both open and axial coding methods.

CHAPTER IV. RESULTS

The answers to these interview questions were evaluated according to each research question. In each response category, recurrent themes were evaluated to determine their contribution to the clarification of the research question.

Research Question One: Perception

Research question one investigated how small business owners perceive industry food safety management systems. To get a better understanding of the FSMS that they use the following question was asked: "Do you implement any FSMS in your plant?" the respondents gave the following answers.

Identified Food Safety Management Systems in Use by Frequency

Table 4.1. Identified Food Safety Management Systems in Use by Frequency

FSMS	No.
IQ 6: Do you implement any FSMS in your plant?	
HACCP	6
GMP	4
SSOP	6
GFSI	1
SQF	1

Research question one asked, "How do custom-exempt small meat plant stakeholders perceive industry food safety management systems?" The answers were gathered by three interview questions that were asked from the participants. In order to get a better understanding of the perceptions of FSMS, it was important to know the FSMS that the research participants used. This was gauged by the question, "Do you implement any FSMS in your plant?" Participants were given a list of current popular

FSMS to choose from. The findings revealed that all participants used HACCP and SSOP. However, there were some participants who used more recent FSMS such as Global Food Safety Initiative (GFSI) and Safe Quality Foods (SQF). These efforts to implement new safety standards show that some meat processors are indeed aware of the importance of FSMS, and believe not only complying by the regulations, but taking additional steps to secure the safety.

Frequency of Food Safety Decision-making

IQ 4 investigated if small meat processors consider "safety" when they make decisions about their plant.

Table 4.2. Frequency of Food Safety Decision-making

Theme	Responses	Description
IQ 4: Do you consider "safety" when you make decisions about plant?		
Yes	6	Food safety is all ways considered
No	0	

Responses of "Yes."

Answers that implied food safety is all ways considered were included in this. There were four "Yes" responses, "absolutely" and "Important."

Responses of "No."

The second interview question related to research question one was "Do you consider "safety" when you make decisions about plant?" All participants answered "Yes" or answers that implied food safety is all ways considered were included in this. There were four "Yes" responses that implied "yes" such as "absolutely" and "Important." There were no participants that answered "No." The answers for this

question imply that "safety" is always considered when any decision is taken regarding the meat plant. The following question was then used to find the motivator for the importance of safety.

Frequency of Motivation Factors

IQ 5 investigated what motivates small meat processors to implement food safety management systems. The responses for this question were grouped into three themes: "Regulations dictate", "Regulations and consumers," and "Regulation, consumers and costs."

Table 4.3. Frequency of Motivation Factors

Theme	Responses	Description
IQ 5: What motivates you to implement food safety management systems?		
Regulations dictates	1	Regulations are the primary motivator
Regulations and consumers	1	Regulations and consumers are the primary motivators
Regulation, consumers and costs	4	Regulations, consumers and economic cost to implement are the primary motivators

Regulations Dictate.

Responses that implied that food safety decisions were motivated primarily due to regulations were included in this. "Its very small, its really more regulation"

Regulations and Consumers.

Responses that implied both regulations and consumers were the primary motivator behind the implications were included. "It's a toss between regulations and consumers"

Regulation, Consumers and Costs.

In this theme, the respondents were motivated by regulations, consumers and economic costs. “I want to say I check regulations and consumers both, but it comes down to economics as well” “all of it (economics, consumers, regulations)” “All” “Economics, regulations, and consumers”

The motivators were categorized to three responses. “Regulations dictates,” “Regulations and consumer” received one response each. This was expressed by participant that shared, “I want to just say regulations. Its a very small, its really more regulation.” The small meat plant owners indicated that these two factors were the primary motivators for them. The response that received most answers was for “Regulations, consumers and Economic costs.” Most small meat processors believed that these three factors were the drivers of their safety decisions.

Research Question Two: Communication

And this leads us to the second research question on how industry food safety management systems were communicated by small business owners. Two research questions were asked from the meat plant stakeholders to understand the communication methods used in small meat plants.

Frequency of Communication Method Relating to Food Safety

IQ 9 investigated how small meat processors communicate food safety management systems to their employees. The responses for this question were grouped into four themes: “Lead by example,” “Communicate in person/direct approach,” “The mix approach, use multiple methods to get message across in person and training sessions,” and “Training sessions.”

Table 4.4. Frequency of Communication Method Relating to Food Safety

Theme	Responses	Description
IQ 9: How do you communicate Food Safety Management Systems to your employees?		
Lead by example	1	Communicate food safety practice by showing /implementing them through day to day activities
Communicate in person/ direct approach	2	Communicate directly, on one with workers
The mix approach	2	Use multiple methods to get message across in person and training sessions
Training sessions	1	Have periodic training sessions so that workers can improve and maintain their food safety knowledge

Lead by example.

Statements showing that plant owners or safety officers showing /implementing food safety practices by their own day to day activities/actions were recorded under this theme. Data analysis revealed that such statement appeared once in the data: “by example most effective, just my style”

Communicate in person/direct approach.

This theme included statements that showed plant owners or safety officers that preferred to communicate one on one with their employees. Such statements appeared two times in the data as follow: “it’s always in person because it is a such a small tight knit environment,” and “in person.”

The mix approach.

The mix approach included statements that include the use of multiple methods to communicate about FSMS to employees. This was revealed in two statements as follows: “I have a couple here, I have in person, like meetings..” and “in person, training”

Training sessions.

Statements that included having periodic training sessions for workers to improve and maintain their food safety knowledge were included in this. Only one meat plant solely relied on this communication method, their statement follows: “we have training sessions.”

The first interview question related to research question two was “How Do You Communicate Food Safety Management Systems to Your Employees?” Participants of the study revealed that they use different methods to communicate FSMS. “Lead by example” and “training sessions” both had one response each. The smaller meat plants owner preferred to “lead by example most effective, his style,” whereas the other participant revealed why they did training sessions. The theme “communicate in person/directly approach” got two responses. They were “it’s always in person because it is such a small tight knit environment,” and “in person.” Here the term “small tight knit environment” sheds more light about the working environment of these small meat plants. It also gives us a glimpse into the work culture, where a high importance is placed on team work. The “the mix approach” was also preferred as well. Here they would rely on the direct informally approach, combining it with another approach such as meeting or training. The preference for mix approach was revealed in the comments “I have a couple here, I have in person, like meetings” and “in person, training.”

Communication Method Selection

IQ 10 investigated reasons why they choose their communication method. The responses for this question were grouped into three themes: “Most effective,”

"Opportunity to ask questions, hands on," and "Small plant, we work right along each other."

Table 4.5. Communication Method Selection

Theme	Responses	Description
		IQ 10: Why choose this method?
Most effective	3	They have identified the most effective communication method by using multiple approaches
Opportunity to ask questions, hands on	1	Giving workers the opportunity to ask questions, they learn better in training sessions
Small plant, we work right along each other	2	Small plant with limited resources rely on team work and collaboration therefore direct approach works the best

Most effective.

The theme "most effective" was implied in all answers. The theme "Most effective" reflected what the meat processors found through trial and error. After trying multiple approaches they had discovered the most effective communication approach was. The following statements reflect this answer: " like meetings..Which does not seem to be….I'm going to say the word efficient, I'm going to say that because..If I have..If I do something in person its effective" "in person better" "by example most effective."

Opportunity to ask questions, hands on.

Under this theme respondent stated that giving workers the opportunity to ask questions, helped them learn better in training sessions. This is a valuable finding because current FSMS heavily rely on training sessions as a method of educating workers. The reasoning behind the claim was supported by the following comment:

So our employees could ask us question or, if they had any questions or issues they can learn a little bit more hands on than just giving them a book to read to. I'm sure that they fully understand our policies and regulations.

Small plant, we work right along each other.

While analyzing an important theme emerged from the respondents of small plants that had very limited workers compared to the others that were interviewed. It was that limited resources made them rely on teamwork and collaboration. Statements that revel the theme "Small plant, we work right along each other" were: "we work right along with each other, it's a small plant" "it's always in person because it is such a small tight knit environment"

The data gathered revealed that "most effective" was the most implied answer. Here the participants had found the communication strategy that suited the best for their plant. It is important to note that the communication strategy they choose varied according to the plant size. The second most response was for "Small plant, we work right along each other." This response sheds more light on how small meat plants function. Small plants with limited resources have to rely on teamwork and collaboration for their day-to-day operations. Their responses "it's always in person because it is such a small tight knit environment" indicate that a direct informal communication strategy works the best in this setting. Most meat plants that were family business and operated for a long time confirmed this response. Both these plants were in operation for 13 and 23 years in North Dakota.

"Opportunity to ask questions, hands on" received the least amount of responses. However the meat processor who made this comment had a clear rational to why they used this communication strategy:

> So our employees could ask us question. If they had any questions or issues, they can learn a little bit more hands on than just giving them a book to read to. I'm sure that they fully understand our policies and regulations.

It's also important to note that this plant had been operational only for two years.

Research Question Three: Future Orientation

The third research question asked how the perceptions of small business owners about food safety management systems related to the willingness to use these systems to reduce the risk of food contamination? Three interview questions were asked from the participants to gather the insights for this. These questions were asked understand the current perceptions about FSMS, and to understand how their perceptions on the future of their plant and the food industry.

Opinion on Helpfulness of Food Safety Management Systems

IQ: 11: In Your Opinion do You Find Food Safety Management Systems to be Helpful or Not? Why?

Table 4.6. Opinion on Helpfulness of Food Safety Management Systems

Theme	Responses	Description
IQ 11: In your opinion do you find Food Safety Management Systems to be helpful or not? Why?		
Yes	4	
Yes, but it interferes	2	

The answers for this question were divided into two themes “Yes” and “Yes, but it interferes.” Even though none of the plant owners said “No,” the ones that said yes did mention that current FSMS interferes.

Responses “Yes”.

The theme “Yes” was found in all answers. There were three “Yes” responses, and “yes, we are all in the same page”

Yes, but it Interferes.

“Yes, I do. I also think that they view as it getting in the way sometimes, but it is absolutely helpful to keep them in line” and “a written mandated set of rules breeds a mechanical note methodology”

While analyzing this data two themes emerged. They were “Yes” and “Yes, but it interferes.” The theme “Yes” received four responses and the theme “yes, but it interferes” received two responses. They were, “Yes, I do. I also think that they view as it getting in the way sometimes, but it is absolutely helpful to keep them in line” and “A written mandated set of rules breeds a mechanical note methodology, but an acquired sense of safety for each task brings a certain consciousness of responsibility to mankind.” It is important to note that both these responses were from small meat processors that had five to nine employees at their plant. They have also been in operation for 48 and 27 years in North Dakota. It is possible that limited amount resources and current regulations interfered with their comfort level.

Importance of Food Safety Management Systems in Small Meat Plants Future

IQ: 14: Do you Think Food Safety Management Systems Will Become More Important in the Future to Your Plant? Why?

The answers to this question was divided in to two themes "Yes, it is the trend" and "It is always important." The second theme received the most responses here.

Table 4.7. Importance of Food Safety Management Systems in Small Meat Plants Future

Theme	Responses	Description
IQ 14: Do you think food safety management systems will become more important in the future to your plant? Why?		
Yes, it is the trend	2	Current regulation requirements will force them to follow (modernization act)
It is always important	4	It has always been important, will continue to be

Yes, it is the trend.

"Yes, it's the trend" "yes I do, you know right now the modernization act is saying you need a recall program"

It is always important.

" Food safety is always important" "it would always be important" "yes" "yes" "Do you think food safety management systems will become more important in the future to your plant? Why?" The response this question revealed two themes. Theme one was "Yes, it is the trend." Two responses were received for this theme.

The second theme that was revealed was "it is always important." The four responses revealed that for them food safety has always been important, and will continue to be. The responses to this question reveal the value these rural meat processors place on

the importance of food safety. They indeed place a high value on safety and some have even embraced it because its wide spread use. But here the most important theme that was discovered was "it is always important." This theme shows the value some meat processors place on the future of their meat plant, and the importance of food safety in it. And as they highlighted in their responses, food safety has always been important for them, and will continue to be an integral part in their meat plant operations.

Factors Relating to the Future Use of Food Safety Management Systems in Food Industry

IQ: 15: How Important Will Food Safety Management Systems be in the Future in the Food Industry?

The answers to the final question were grouped into three themes. They were the following "Absolutely", "Government makes it important" and "No safety, no business." Here "Absolutely" received the highest response indicating a strong preference on the future use of food safety.

Table 4.8. Factors Relating to the Future Use of Food Safety Management Systems in Food Industry

Theme	Responses	Description
IQ 15: How important will Food Safety Management Systems be in the future in the food industry?		
Absolutely	3	Safety will be the most important aspect
Government makes it important	1	Government regulations will make things mandatory
No safety, no business	1	The consumers drive the safety and business

Absolutely.

"Very important" "yes" "food safety is always important"

Government makes it important.

"Anytime with USDA, you are going to get into a pickle if you are not going to do the right thing, and that good to have, and that's why they exist"

No safety, no business.

"If you don't have FSMS you are unable to provide good food for industry and consumers, without food safety there is no business" "when they (customers) are driving the requirements, you are going to do what they want."

The third question was as follows: "How important will Food Safety Management Systems be in the future in the food industry?" The answers to this question revealed three themes. The theme Absolutely received three responses. This theme identified that Safety will be the most important aspect in the future for small meat processors. The second theme that was identified was "Government makes it important." The following response revealed this with the following, "Anytime with USDA, you are going to get into a pickle if you are not going to do the right thing, and that good to have, and that's why they exist." The last theme that was revealed was "No safety, no business."

The responses for this theme reveal the small meat processors indeed believe that FSMS would play a crucial role in the future of their industry. The data gathered from this study clearly showed that all participants had some form of FSMS in their meat plants. Not only that there were some that went the extra mile to employ the most modern FSMS systems such as GFSI. However there were some who felt that these FSMS were forced upon them, and this may have made meat processors to believe that the government will continue to force food safety on them. Another meat processors who responded clearly believed that having FSMS is the only way he could have business in

the future. The response indicated that the consumers would be driving the food industry in the future.

Summary of Results

The answers to the interview questions provided data for the three research questions. The data also gave some valuable insights for additional studies as well. The analysis of the data showed the communications strategies that the small meat plants used. Details of the analysis were presented in Tables 4.1 to 4.3, which included the themes, number of responses and the description of each theme. The first question that was asked gauged the use of FSMS. The findings revealed that all participants used HACCP and SSOP. However, there were some participants who used more recent FSMS such as Global Food Safety Initiative (GFSI) and Safe Quality Foods (SQF).

Research question one, investigated how small business owners perceive industry FSMS with three interview questions. There after each interview question was carefully analyzed to gather the necessary data. The two interview questions generated seven themes. The themes were recorded in table's 4.1 to 4.3 and all the generated themes were given detailed descriptions. Responses under research question one discovered that food safety is always considered when decisions are made in small meat plants.

Research question two, investigated how FSMS were communicated by small business owners. Similar to research question one, research question two data was carefully examined. The two interview questions generated seven themes. The answers revealed that for communication, meat processors rely on the direct informally approach, combining it with the mix approach such as meeting or training. The data revealed that the participants had found the communication strategy that suited the best for their plant.

It is important to note that the communication strategy they choose varied according to the plant size. The smaller plants preferred the direct communications, whereas the size of the plant increased they utilized mix methods to deliver their message.

Research question three, investigated the perceptions of small business owners about FSMS related to the willingness to use these systems in the future. The same process was also performed on research question three for which three interview questions were asked. The answers revealed that meat processors believed that FSMS were helpful to them. As for the importance of FSMS in small meat plants future, they highlighted in their responses that food safety has always been important for them, and will continue to be an integral part in their meat plant operations. The final question asked about factors relating to the future use of FSMS in the food industry. The responses for this theme reveal the small meat processors indeed believe that FSMS would play a crucial role in the future of their industry. Their response indicated that the consumers would be driving the food industry in the future. The study also analyzed extra data that was gathered from probing questions. The analysis of these data gave some valuable insights about the small meat processors. These findings will be discussed further in chapter five.

CHAPTER V. DISCUSSION OF FINDINGS

This study sought to identify the communication strategies perceived by owners of small custom exempt meat plants to be most effective in encouraging adoption of food safety management systems. This chapter provides a discussion of the findings and provides critical implications for researchers. This study sought to answer three research questions: (1) how do custom-exempt small meat plant stakeholders perceive industry food safety management systems? (2) how do stakeholders of custom-exempt small meat plants communicate industry food safety management systems to employees? and (3) how are the perceptions of custom-exempt small meat processors about food safety management systems related to the willingness to use these systems to reduce the risk of food contamination?

Research Question One: Perception

How do custom-exempt small meat plant stakeholders perceive industry food safety management systems?

The study revealed that small meat plants have embraced the use of current FSMS into their daily operations. It was commendable to note that all of those interviewed for the present study used HACCP and SSOP. HACCP in particular is a complicated system to implement for business with small resources (Ball et al., 2009), but these rural small meat plants were diligent in the use of it. This study reveled that safety decisions of small meat processors on FSMS were mostly influenced by regulation, consumers and economics. This was revealed in the following responses:

> Absolutely regulations dictates it, I mean title 9, consumers are actually driving food safety, probably just as heavily currently as regulatory bodies as the

> government, and it wasn't always that way. It was the government that said slow down, do it right, consumers now want certification saying that I'm serving my families safe food, you know. So I want to say I check regulations and consumers both, but it comes down to economics as well.

However the researcher found some resentment for current FSMS as well. Their responses indicated that they felt these regulations were forced upon them:

> A food safety system (plan) is not just a written document or a computer file delineating certain points. Our small meat plants "implemented" food safety long before the 1990's, when HACCP became the vogue modus operandi, whole-heartedly endorsed by USDA-FSIS and various inspector agencies.

This comments enlightens us to the fact that these small meat plant had some measures to make their food safe, long before the modern FSMS:

> All of these items are fanciful acronyms for official plans that have been officially on paper implemented at different eras in our history. Each of these systems, however, were in some form or another implemented from day one in our business.

For some "food safety" was a deeply rooted concept that they learned through life experience, not something that was forced upon them through a training manual. This was further evident in "You see, food safety is a 'value based' concept planted in our minds by traits, ideas, and habits of our parents, teachers, ministers, mentors, and life's experiences."

The above comment reveals how some meat plant owners perceive HACCP. The comments clearly revel that they had their own method of producing safe food before the

introduction of HACCP. This resentment was further expressed in the following comments:

> My opinion is our regulatory agencies need a paradigm shift in how they perceive an “acceptable plan” and go more than “skin deep” with each new set of mandates or directives comes a certain resistance on the plant owners part. “Oh no, just another layer of paperwork effecting little or no food safety benefits”

This resentment was continued in the following comments, where FSMS were described as “Chains” that they needed to free themselves from:

> But so often the academic adherence to a set of guidelines breeds a certain mechanical approach to a much deeper concept, with that comes the "check the box" got it done mentality and mistakes (over sights) begin to occur. So when we can instill in the mind a "character, " dedicated to a responsibility to mankind then we can begin to free ourselves from the "CHAINS" of a "Food Safety System."

As mentioned in previous literature, Gilling et al. (2001) in their study highlighted how small and medium business were discouraged on HACCP implementation because of its difficulty. Ball et al. (2009) identified that the HACCP implementation was an economic burden for these small business. Some of the other barriers identified in previous studies include lack of knowledge about standards, lack of expertise and resources (Paniscello et al., 1999; Holt & Henson, 2000), and successful HACCP implementation has been limited (Paniscello et al., 1999). However the data gathered by this study suggests otherwise. All the meat plants that were interviewed for this study had HACCP in their plant. This data shows that small meat plants over the years had developed the necessary expertise to overcome the knowledge, resources and economic

barriers. What is even more encouraging is that they not only have HACCP, but operate other FSMS in their plants. This challenges the findings of Holt and Hanson (2000) who found that small businesses were slow to adopt GMPs due to the lack knowledge about standards. Because all small plants that participated in this study not only used GMPs, but used SOP, SSOPs and even more recent FSMS such as GFIS. The following comments revealed a proactive step taken by a rural ND small meat processor:

> We actually currently have 8 HACCP plans, we have a SSOP program that is looked at every single day, and a new element that we undertake in is the Global Food Safety Initiative (GFSI), we currently are SQF certified, so we have SQF on top of all that is required by the government.

However, one of the most intriguing findings was that of the participant that developed her own FSMS "CASSIP" (Control Analysis for Safety Sanitization Implemented Policies). This led the researcher to ask further probing questions about this new FSMS. The responses gathered from the participant gave additional details on "CASSIP":

> And then we have one that I designed myself called CASSIP. The acronym stand for Control Analysis for Safety Sanitization Implemented Policies, and that's a training manual that I designed my self, for my staff and employees, has an overview of all of the things that we do here

According to her "CASSIP" was developed to fit their specific skills, limited resources, and needs. This was a great revelation that showed the researcher that there were innovative thinkers who would adopt by developing something unique that address their food safety concerns. It would be noteworthy to see if further studies could be

carried out to measure the effectiveness of CASSIP and see if it could be applied to other small meat plants as a FSMS.

The answers to research question one shows us that all meat processors are using HACCPs and SSOPs. There are also a few that rely on GMPs as well. The findings revealed some plants used new methods such as GSIF and SQF stating that these would give them a distinct advantage. This study's findings highlights that small meat plants of ND, have indeed embraced these modern protocols over the years, and the researcher believes that he has identified the reason for this. The following paragraphs would reveal more information about this.

One reason for the successful implementation for these strict protocols maybe the literacy levels of the ND employees. The researcher in the literature review highlighted the importance of education and literacy skills and importance on FSMS. This was highlighted by the study by Nieto-Montenegro, Brown, and LaBorde (2006) that developed a successful food safety educational program for Hispanic workers in the mushroom industry that were at or below sixth grade level. Results of the study indicated that a well-designed and structured educational program was effective with a low literacy audience (Nieto-Montenegro et al., 2006). The data gathered in this study found that all ND employees had at least high school education or some college experience. This high literacy rate may have played a significant role in these successful implementations of FSMS. High literacy rate means the employees have the ability to comprehend and read instructions and have better use of educational material. This also meant that the owners did not need to design special training material for a low literacy audience.

Research Question Two: Communication

Research question one findings indicated that even though the meat processors used the most current FSMS, some custom-exempt small meat processors did not prefer the way the government and inspectors placed the regulations on them. This however did not deter them in communicating the FSMS effectively to their own employees. The studies findings revealed that small meat processors used two distinct communication strategies in their approach. They were the direct informal approach and the mixed approach that accompanied two or more communication approaches including direct face-to-face informal communication, with training sessions or meetings to educate about FSMS. While analyzing the data an important pattern emerged. The smallest meat plant (1-4) preferred the direct informal communication strategy. This information confirms the findings on informal communication about food safety can often have higher impact and influence on behavior than formal communications (Griffith et al., 2010a). When the number of employees increased they used the mix approach as their communication strategy. The participants used a mix approach that accompanied direct face-to-face communication, with training sessions or meetings to educate about FSMS. This information further supports the finding of Griffith et al. (2010a) that reported "A good communications policy to be balanced blend of different approaches including formal, semi-formal and informal." The direct informal approach was preferred mostly by the smaller meat plants that were functioning in ND for more than 10 years.

Communication plays a critical role in any organization, and is generally easier but more informal in small companies (Griffith et al, 2010a). And as Griffith et al., (2010a) highlighted communication helps employees know their roles and

responsibilities or the objectives of their businesses, and what a food business believes, feels and wants to achieve concerning food safety. One of the key findings on their study was how informal communication about food safety can often have higher impact and influence on behavior than formal communications (Griffith et al., 2010a). The results of this study indeed compares well with previous research. The small meat processors heavily relied on direct informal communication with their own employees. Comments such as “we work right along with each other, it's a small plant” and “it’s always in person because it is a such a small tight knit environment” further confirms this. As their interviews suggested they believed that this direct informal communication indeed worked best to get their message across, and most importantly helped them make behavioral changes with their employees.

One of the more import and unique finding that this research unveiled was the correlation of direct informal communication to the plant size. The results of this study indicated that smaller plants relied on direct informal communication. The smallest meat plant (1-4) preferred direct informal communication strategy. This information confirms the findings on informal communication about food safety can often have higher impact and influence on behavior than formal communications (Griffith et al., 2010a). When the number of employees increased, they relied on more a mix method approach, a blend between formal and informal communication methods. The participants used a mix approach that accompanied direct informal communication, with training sessions or meetings to educate about FSMS. The mix approach was used more often when the number of employees increased. This was revealed in the following comment:

> Like meetings, which does not seem to be, I'm going to say the word efficient, and I'll explain that. If I do something in person its effective, but I have to be careful who my audience is. So I do training sessions. If I need something, mind you I'm in an office upstairs very often, and our food is produced on the floor, by people I don't see everyday. So if I really need to get the message across, it seems like specifically in our environment, I need to down to them, directly face-to-face and let them know the severity of the situation, and typically it makes an impression.

This study also unveiled very important factor that was the communication between the small meat processors and food safety officers. The comments from the interviews highlighted significant tension between them. The meat processors mentioned that the safety inspectors were only interested in paperwork, rather than paying attention to the hard work that was in place. There also were negative opinions regarding the communication strategies that the food inspectors used dealing with small meat plants. As some believed that the food inspectors were interfering with their plant operations:

> Perhaps a more hands off approach would create a more healthy relationship with regulatory agencies where they can become a resource or an asset in the "big picture" of food safety. Instead they come to the plant perusing our documentation like vultures, waiting for an opportunity to say, "I got ya!"

There also was a general dissatisfaction with current government regulations, as some meat plant owners felt that the regulations failed to acknowledge the fact that many of these facilities were functioning fine without them for many years. The owners felt that these regulations were forced upon them without considering the obstacles they face.

They also highlighted the fact that these inspectors were like “vulture” that were only interested in finding the flaws. Perhaps these inspectors themselves should consider using an informal communication approach when they visit the small meat plants. They may help reduce the tension between both parties and improve communication through all channels.

The findings of the study also confirm the importance of communication between leaders and employees. The leadership roles are very prominent in small plants, and they work one on one with their workers in meat plants operation. And it is here that leaders communicating with employees effectively help them feel involved and empowered, increase productivity and reduce staff turnover by increasing staff motivation and commitment (Flin & Yule, 2004). This behavior was very prominent in small meat plant owners, and safety officers whom constantly had to stay up to date with FSMS and government regulations.

Like communication culture plays an important role. Bierly and Spender (1995) in their study argue that a culture founded on appropriate knowledge and experience could support a safety management system consequently transforming a high risk system into a high reliability system. Organizations that employ these function as high reliable organizations (Weick & Sutcliffe 2007). In a positive culture, food safety is an important business objective and there is compliance with documented systems. The term a positive safety culture can be used to describe a culture in which safety is understood and accepted to be the number one customer/business priority (Griffith et al., 2010b). The results of this study confirm this as the small meat plants of ND have always valued safety.

From the data that was gathered through the interviews, there was no intelligence gathered on the area of Crisis communication or crisis planning. Seeger (2010) highlighted the importance of Crisis communication. Since this is a use of best practice and is not something that is forced upon small meat processors, they are yet to see its importance and value. Even though this is essential to their counterparts, the large meat processors, whose mistakes often result on large recalls and significant media attention; small meat processors serve a much smaller customer base. It could also be that since most small meats plants of ND employ multiple FSMS, that they are quite confident of the safety of their product.

Research Question Three: Future Orientation

"How are the perceptions of custom-exempt small meat processors about food safety management systems related to the willingness to use these systems to reduce the risk of food contamination?"

The study found that small meat processors have both negative and positive perceptions on FSMS. The negative perceptions were mostly from interactions they had with officials. Some shared sentiments that these modern FSMS got in their way of doing their day-to-day operations. This theme revealed that small meat processors believed that current regulation requirements will force them to follow FSMS:

> I wanna just say regulations. Otherwise they seriously would not have some of the requirements without the government. Its a very small, its like your mother going in to the pie business, and everybody likes your pies, so she decides to open a little business, and she just makes more of them. A mom and pop shop. And they

have a very niche product. And I want to say that they actually have 16 products and that's it. And it's really more regulation, because its, we have to follow that.

The following comment further supports the role regulations play:

Yes I do, you know right now the modernization act is saying you need a recall program; I had to write a recall program for them that is applicable. Food security is a requirement, so you need to have all these things on how you are going to react on paper.

The answers to research question also revealed that small meat processors who positively viewed current FSMS were more willing to use them to reduce risk:

However I'd tell you what, when you don't have a recall, isn't that invaluable? I mean, so I don't have a dollar figure here, but it depends on your mindset. I would say food safety is invaluable. Just leave it at that for these guys. Cause when it comes to small, or very small plant, a recall could total shut you down.

The findings reveal that regulations, consumers and economics loss influenced participants to implement FSMS, regardless of their own perceptions. The response for this revealed the strong correlation between the safety and business aspect that were driven by consumer requirements:

When you have the people who pay you, customers are paying, our way of making money essentially, when they are driving the requirements, you are going to do what they want. The government on the other hand was the previous driver, pretty much the sole driver...and that's a different element..but when the people who are paying you require it, its very important.

Additionally some small meat processors took the opportunity to thank the researcher's effort in the exploratory study. As some felt that it was time that their efforts to safety were appreciated:

> Thank you so much, and I appreciate it, somebody is looking into it, it seems like we do have a lot more manufacturing in North Dakota than we ever had before and it's really important that people become aware of what actually goes on.

The comments "somebody is looking into it", "people become aware of what actually goes on" demonstrate that some of the small meat processors are indeed frustrated that their hard work not being acknowledged by the public and officials. This comment also ties back to the comment where one participant described inspectors as "Vultures". This problem can stem back to the inspectors deploying the wrong communication strategies. As this study found, small meat processors prefer the direct informal communication approach, rather than a formal one. Inspector should also take the time to acknowledge the fact that most of the processors functioned with their own FSMS long before the current FSMS were implemented. They should also take their time to evaluate their past FSMS and find strategies to implement the modern FSMS in a way that complement the manufacturing process.

Summary of Chapter Five

The data in this study clearly shows that small meat plants have incorporated the use of current FSMS into their daily operations. It was commendable to note that all of those interviewed for the present study used HACCP and SSOP. This study reveled that safety decisions of small meat processors on FSMS were mostly influenced by regulation, consumers and economics. However there were some resentment for current

FSMS as well. Certain meat processors in their responses indicated that they felt these regulations were forced upon them. For these individuals "food safety" was a deeply rooted concept that they learned through life experience, not something that was forced upon them through a training manual. Their comments clearly revel that they had their own method of producing safe food before the introduction of HACCP. This resentment was continued in comments, where FSMS were described as "Chains" that they needed to free themselves from.

Even though there were some resentment, the data gathered by this study suggests otherwise. All the meat plants that were interviewed for this study had HACCP in their plant. This data shows that small meat plants over the years had developed the necessary expertise to overcome the knowledge, resources and economic barriers. What is even more encouraging is that they not only have HACCP, but operate other FSMS in their plants. This information challenges the findings of Holt and Hanson (2000) who found that small businesses were slow to adopt GMPs due to the lack knowledge about standards. Because all small plants that participated in this study not only used GMPs, but used SOP, SSOPs and even more recent FSMS such as GFIS.

One of the most intriguing findings was that of the participant that developed her own FSMS "CASSIP" (Control Analysis for Safety Sanitization Implemented Policies). This was a great example that showed the innovation of rural North Dakota. This participant developed something unique that addressed their own food safety concerns.

Another unique finding of this study was that all ND employees had at least high school education or some college experience. This high literacy rate may have played a significant role in these successful implementations of FSMS. High literacy rate means

the employees have the ability to comprehend and read instructions and have better use of educational material. This also meant that the owners did not need to design special training material for a low literacy audience as the study by Nieto-Montenegro, Brown, and LaBorde (2006) that developed a successful food safety educational program for Hispanic workers that were at or below sixth grade level.

The studies findings related to RQ2 revealed that small meat processors used two distinct communication strategies in their approach. They were the direct informal approach and the mixed approach that accompanied direct face-to-face informal communication, with training sessions or meetings to educate about FSMS. The more unique finding that this research unveiled was the correlation of direct informal communication to the plant size. The data also revealed that the smallest meat plant (1-4) preferred the direct informal communication strategy. When the number of employees increased, they relied on a mix method approach, a blend between formal and informal communication methods accompanying direct informal communication, with training sessions or meetings to educate about FSMS. This information confirms the findings on informal communication about food safety can often have higher impact and influence on behavior than formal communications (Griffith et al., 2010a).

The comments from the interviews highlighted significant tension between the small meat processors and food safety officers. They were dissatisfied with current government regulations, as some meat plant owners felt that the regulations failed to acknowledge the fact that many of these facilities were functioning fine without them for many years. Perhaps these inspectors themselves should consider using an informal communication approach when they visit the small meat plants. This communication

strategy may help reduce the tension between both parties and improve communication through all channels.

The findings of the study also confirm the importance of communication between leaders and employees. The leadership roles are very prominent in small plants, and they work one on one with their workers in meat plants operation. And it is here that leaders communicating with employees effectively help them feel involved and empowered, increase productivity and reduce staff turnover by increasing staff motivation and commitment (Flin & Yule, 2004).

The study found that small meat processors have both negative and positive perceptions on FSMS. The negative perceptions were mostly from interactions they had with officials. The answers to research question also revealed that small meat processors who positively viewed current FSMS were more willing to use them to reduce risk. The findings reveal that regulations, consumers and economics loss influenced participants to implement FSMS, regardless of their own perceptions. The response for this revealed the strong correlation between the safety and business aspect that were driven by consumer requirements. Limitations, recommendations for future research, and final conclusions are presented in the next chapter.

CHAPTER VI. CONCLUSIONS, LIMITATIONS, AND DIRECTIONS FOR FUTURE RESEARCH

The results of this study showed that the small meat processors understand the importance of FSMS. The study also showed the preferred communication methods that they use to function on a day-to-day basis. This chapter reveals the conclusions that were drawn from the findings. The exploratory study made a glimpse to the small meat processors of North Dakota.

Answers to Research Questions and Other Conclusions

Past research that was referred on this study included in the areas of adoption and barriers for food safety management systems. Some of the highlights here included were the economic burden (Ball et al., 2009) and difficulty (Gilling et al., 2001) in implementing FSMS. The importance of education and literacy skills was highlighted by the study by Nieto-Montenegro et al. (2006) that developed a successful food safety educational program for Hispanic workers in the mushroom industry that were at or below sixth grade level. Results of the study indicated that a well-designed and structured educational program was effective with a low literacy audience (Nieto-Montenegro et al., 2006). Past literature in communication identified were that communication is more informal in small companies, and communications policy should be balanced blend of different approaches including informal, semi-formal and formal (Griffith et al., 2010a). Food Safety culture was supported by research from Bierly and Spender (1995) and Weick & Sutcliffe (2007), that identified culture founded on appropriate knowledge and experience could support a safety management system consequently transforming a high-risk system into a high reliability system. Finally research by Seeger (2010) outlined the

importance on having a crisis management plan as one important step in the best practices. This was further supported in studies by Barton (2001) and Coombs (2006), that suggested that organizations are better able to handle crisis when they have a crisis management plan that is updated at least annually; have a designated crisis management team; conduct exercises to test the plans and teams at least annually; and pre-draft some crisis messages.

Participants for this study were recruited from the custom-exempt small meat plants of North Dakota. A network sampling method was used to administer the survey to the participants of the study. Following the survey the participants were contacted by telephone or e-mail inviting them to participate in a short telephone interview. The interviews of the participants were then transcribed and further analyzed.

The data from this research study revealed that small meat plants were using current FSMS systems. There were others who incorporated the latest FSMS. One of the more significant finding was that of the Safety officer who developed her own unique FSMS. This innovative practice revealed how innovation exists in rural communities. The study also found that small meat plant owners developed their own FSMS in the past, and current regulations are not equally viewed as favorable as some believe that they interfere in their operations. The study further revealed that there is resentment towards authority, and communication between the food inspectors and meat plant owners needs to be improved.

This study hoped to identify the communication strategies perceived by owners of small custom exempt meat plants to be most effective in encouraging adoption of food safety management systems. The data revealed that small meat plants used different

tailored methods to communicate. The study found that the most effective for communication strategies small meat plants were direct informal communication strategies, and as the numbers of employees increase a mix method approach was better suited. Using different communication styles the meat plants were able to get their information on safety to their employees. Based on the discussed research findings, food inspectors should incorporate better communication strategies to get their message across in an effective manner.

As the perception on FSMS and willingness to use they, there appears to be a connection between government rules and the influence on it for the implementation of FSMS. There also is the contradictory view, where rules and inspection gets in the way the meat plants day-to-day operations. Finally the data gathered proves a strong correlation between the safety and business aspect were driven by consumer requirements.

Limitations

The researcher faced four methodical obstacles and limitations when he was collecting data. North Dakota is a vast land mass and it has been proven to be difficult to contact the North Dakota small meat plants. As the researcher attempted to gather data, he found resistance and reluctance from many of the participants. Since the meat plant operators had significantly low resources, they had very little time to invest on a potential phone interview to discuss about food safety. For many this was a waste of time and avoided answering by rescheduling the interview multiple times. Others who answered simply hung up the phone, refused to speak. This may have been due the subject matter it self. Food safety is a sensitive topic in the current regulatory environment, and answering

or providing wrong information could potential lead to a loss of business. Over the years major food recalls have made consumers aware of poor food safety practices by food processors. As many who participated in the interviews highlighted consumers and economics play a much greater role now. Consumers now have access to a wide range of sources, including news media and the Internet, and could easily find out negative information on a meat plant or their product. This could have made them be more reluctant to answer the question regarding their safety practices. They may have even been under the impression that the questions were asked by a government safety official and a negative answer could have affected their plants operations.

The researcher believes that this reluctance could have been further avoided by having cultural agents as liaisons. A lucrative incentive could have been helpful for participating in the interview, potential worth monetary value since engaging in an interview, slowed down their production process, which meant financial loss. The researcher also believes that some small meat processors were uncomfortable with having a foreign researcher from a different nation conducting the interview, this was not an anticipated issue, but proves the importance culture plays even in a rural setting. This was evident in the following comments:

> Food security systems (an important part of food safety) are a very confidential matter for maximum effectiveness they need to be "in the mind" and not even committed to paper should the information be pilfered by disgruntled employees, a theft job, inspection personnel with an agenda, or outside source via computer or unsuspecting surveys conducted through a "trusted" source such as this.

Even though this was a limitation, this was one of the most important findings of this study as it validated the use of cultural agents. The research study also proved that International students gathering security information are going to be faced with challenges. This was highlighted in their reluctance to answer food safety questions. Many who answered the phone avoided the interview questions and said that the researcher had to speak to the food safety officer or person in charge, who most times seem to be away from the plants. Since food safety is a very sensitive topic where unsafe practice means the significant loss of business, some workers were extra careful when they were answering questions. Most attempted to avoid speaking or suggested contacting them on a different date. Meat processors who did two or more rescheduling were not further contacted as the researcher was exhausting his limited resources. In future research studies, if international students want to increase the quality and reliability of the information, they may be better off using cultural agents who are familiar with the people being interviewed.

Additional limitations of this study include the time for the phone interviews. It seems that all meat processors had various different times of operation, where it was difficult to schedule a time for an interview. The researcher first tried to call the meat plant between the hours of 10 a.m. to 11 a.m., and 12 p.m. to 1 p.m. The researchers attempt was to conduct interviews on their break times, but after the initially round of call were unsuccessful, he opted to call between the hours of 8 a.m. to 5 p.m. The researcher believes that this limitation may be avoided in the future if the interviews are conducted at a function where these meat plant owners or safety officers gather annually. As the study found small meat processors prefer the direct approach, and this face-to-face

personal interviews indeed may provide opportunity to gather more valuable data. However the information the researcher gathered with much difficulty provided vital information on this distinct rural population.

Directions for Future Research

This exploratory study has preliminary results that provide direction for research in an area of food safety and communication where very little research has been conducted. As this study have found, communication remains a vital key in food safety. The researchers hope is that this exploratory study leads to provide insights to future foreign researcher to understand the importance of cultural agents, that may lead to discover new research opportunities that will help in Food Safety.

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APPENDIX

1. How long has your meat plant been in operation?
2. How many employees do you have working for you?
3. What is the average education level of your employees?
    - High school
    - College
4. Do you consider “safety” when you make decisions about plant?
    - Yes
    - No
5. What motivates you to implement food safety management systems?i
    - Economic reasons
    - To satisfy regulators and regulatory agencies
    - Consumer safety reasons
    - Are there other reasons?
6. Do you implement any FSMS in your plant?
7. If yes, are any of the following FSM systems in place?
    a. Good Manufacturing Practices (GMP)
    b. Hazard Analysis & Critical Control Points (HACCP)
    c. Sanitation Standard Operating Procedures (SSOP)
    d. Other- …….
8. When was the first time you implemented each of these food systems?
9. How do you communicate Food Safety Management Systems to your employees?
    - In person

- Email
- Training session
- Other

10. Why choose this method?
11. In your opinion do you find Food Safety Management Systems to be helpful or not? Why?
12. How much do you estimate is spent for food safety for your plant?
13. Do think that revenue may increase, or potentially increase with the adaptation of a more comprehensive food safety plan?
14. Do you think food safety management systems will become more important in the future to your plant? Why?
15. How Important Will Food Safety Management Systems be in the Future in the Food Industry?