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PREVENTING INTENTIONAL FOOD CONTAMINATION IN THE RETAIL FOOD SETTING: HOW DO MANAGERS PERCEIVE THE RISK AND WHAT ARE THEY DOING TO PREVENT IT

BY
Gary Dale Helmuth
Degree to be awarded: M.P.H.
Career MPH

_____

James Buehler, PhD Date
Committee Chair

_____

Melissa Alperin, MPH, CHES Date
Chair, Career MPH Program

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BY
Gary Dale Helmuth
M.P.H., Emory University, 2011
B.S., Mercer University, 1983

An abstract of
A Thesis submitted to the Faculty of the
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Abstract

PREVENTING INTENTIONAL FOOD CONTAMINATION IN THE RETAIL FOOD SETTING: HOW DO MANAGERS PERCEIVE THE RISK AND WHAT ARE THEY DOING TO PREVENT IT

By Gary Dale Helmuth

The safety of the food supply in recent years has been brought back as an important issue for the public due to a number of high profile foodborne illness outbreaks and recalls. The vast majority of these problems have been caused by the unintentional contamination of food but in this era of terrorism risk there is concern about the growing possibility of intentional contamination. FDA has developed a number of initiatives to increase the recognition of the food industry about the potential of intentional food contamination and resources to help them make their facilities safer. It is unclear, however, how effective this outreach has been and there have been very few studies to evaluate the perception of the food industry about intentional food contamination or its prevention. This project sought to determine the beliefs and actions of retail food service managers regarding the possibility and prevention of intentional food contamination through the use of an online survey. Food service managers were also asked about their knowledge and use of the resources provided FDA.

The results indicate that managers recognize that intentional contamination of food is a threat but they feel that their facilities are less at risk than the country as a whole. They have taken steps to prevent intentional food contamination but are not aware of the resources available through FDA and so have not used them. However, many facilities are providing other training and are open to additional training opportunities through the health department. The findings of this project are encouraging for the acceptance of education efforts of health department's and can help to increase the effectiveness of future training activities in the prevention of the intentional contamination of food in retail food service.

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Table of Contents

List of Tables

List of Figures

Chapter 1

Introduction and Rationale

The safety of our food supply has become an important issue for the public in recent years. There have been a number of high profile outbreaks of foodborne illness that have garnered intense media scrutiny such as the peanut butter contamination with salmonella and the contamination of produce with E coli (Maki, 2009). These outbreaks and many others have been caused by unintentional food contamination as a result of break downs in basic food sanitation caused by human error. Another risk to the food supply, not as well known, but perhaps as serious, is intentional food contamination. This may be from a terrorist, a disgruntled employee, or from an individual or group that has its own agenda. This type of scenario has already occurred in the U.S. (Torok, 1997). In 1984, in The Dalles, Oregon, an outbreak of Salmonella typhimurium sickened dozens of people eating at local salad bars. The Rajneesh group was later determined to have inoculated the salad bars with the bacteria that they had grown for that purpose in an attempt to affect the outcome of a local election. While an epidemiological investigation had determined the causative organism and the probable source, it took a criminal investigation and confessions from two members to determine that it was in fact an intentional contamination. This incident points out the fundamental problem of discerning an unintentional outbreak from one that is intentional.

Concerns about the possibility of intentional food contamination gained momentum after the events of September 11, 2001 brought the danger of terrorism back to the forefront of thought in the United States. The subsequent anthrax attack increased the awareness of government and the public about the dangers of bioterrorism. As a result

of this new found respect for the dangers of terrorism, in particular bioterrorism, there has been a renewed focus on public health preparedness. Since 2001 the United States has spent substantial resources preparing the country against acts of bioterrorism (Franko, 2010). The U.S. Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), and the United States Department of Agriculture (USDA) are the primary agencies responsible for food safety in the United States. The FDA regulates about 80% of all food consumed in the U.S. In May of 2007 the FDA was charged with developing a plan to keep the country safe from unintentional and intentional contamination of the food supply. The FDA Food Protection Plan is made up of three primary elements: prevention, intervention and response. An important objective of the prevention component is promoting increased responsibility of the food industry from farm to table so that problems with intentional food contamination do not occur in the first place. In order to further this goal, FDA has formulated three tools to help retail food service facilities combat intentional contamination of food.

The FDA has produced a guidance document for retail food establishments called Food Security Preventive Measures Guidance (FDA). It is designed to aid food service managers in developing the appropriate types of preventive measures that can limit the likelihood of intentional food contamination in their facilities. The guidance recommends that operators organize their prevention activities into five basic sections: management, human element – staff, human element – public, facility and operations. Management includes assigning responsibility for food defense to someone in the facility and having a prevention plan in place. Human element – staff concerns screening employees before hiring, maintaining appropriate scheduling and identification and training staff in food

defense. Human element – public involves keeping customers out of areas in the facility where they could contaminate food and having a process to control access of other people like service personnel and delivery drivers. Facility relates to the physical security of the premises such as locks on outer doors and monitoring of people entering and leaving the facility. Operations concerns using only known suppliers and monitoring the delivery of all items into the facility.

ALERT (FDA), which stands for assure, look, employees, reports, and threat, is a training initiative developed by the FDA for food service managers to use to train their employees in food defense. Assure relates to the process of making sure that supplies and other ingredients come from safe sources and that supply partners practice the ALERT protocol as well. Look represents the act of evaluating the physical security of the facility and improving any weaknesses found. Employees refers to conducting background checks of all workers, controlling and monitoring public access to the facility. Reports involves documenting all aspects of the food defense process for internal purposes and for use of outside agencies. Threat is knowing when and to whom to report any occurrences that may reflect attempts or acts of intentional contamination.

A third tool is called Carver+Shock (FDA). Carver+Shock is a process of studying a facility to determine how a potential attacker might decide to go about causing contamination of the food and thereby understanding how to prevent the attack. Carver was originally produced by the military and stands for: Criticality, a measure of the public health impact of a potential attack; Accessibility, the ability to physically access the facility; Recuperability, the ability of the facility to recover from an attack; Vulnerability, how easy it is the accomplish the attack; Effect, the amount of direct loss

because of an attack measured in loss production; and Recognizability, ease of identifying the target of attack. Shock was added to Carver to assess the combined health, economic and psychological impact of a potential attack.

While these programs have been developed with retail food service in mind, it is not well known how food service managers perceive the risk of intentional food contamination or their level of knowledge about these education resources. This project is designed to gain a better understanding of these issues so that outreach efforts by local health agencies (LHA's) can be more effective.

Problem Statement

The Retail Food Industry in the United States presents an attractive target for terrorists. According to the National Restaurant Association retail food sales for 2009 are projected to be 566 Billion dollars (National Restaurant Association, 2009). There are about 935 thousand retail food service locations in the U.S. with 13 million employees. On a typical day in the U.S., food service outlets have 130 million patrons. It is evident from these numbers that there is ample opportunity for attacks in this industry to cause great harm to the economy of the U.S. and to instill a great deal of fear in the population. In order to prepare for the possibility of bioterrorism in this industry it is imperative to educate food service managers to the very real danger of intentional food contamination in their facilities and educate them how they can help to prevent intentional food contamination from occurring.

Purpose Statement

This project will seek to determine how food service managers perceive the threat of intentional contamination of food in their facility and their level of knowledge about how

to prevent intentional food contamination. There are not many examples of studies in the literature devoted to looking at how retail food service managers feel about the risk of bioterrorism in their facilities. One study at South Dakota State University (Frantz, 2007) evaluated what food service operators understand about the threat of food bioterrorism and what measures they use to combat this problem. The study found that almost three quarters of respondents did not have a food protection plan in place or responded Don't Know.

Project Questions

How do food service managers perceive the threat of intentional food contamination?

What is the prevalence of retail food service facilities that perform specific activities to prevent intentional food contamination?

How likely will food service managers be open to education about intentional food contamination?

What type of educational format regarding the prevention of intentional food contamination would be most suitable to food service managers?

Are food service managers aware of the education resources regarding the prevention of intentional food contamination available from the FDA?

Does a manager's perception of the risk of intentional food contamination affect the likelihood of the manager attending training in the prevention of intentional food contamination?

Does a manager's perception of the risk of intentional food contamination affect the likelihood of a facility having a plan in place to prevent intentional food contamination?

Does the type of food service facility affect the likelihood of preparedness activities being performed?

Summary

LHA's have been instrumental in the dissemination of food safety information to the public and the food service industry. While the possibility of the intentional contamination of food has been with us for a long time, LHA's have only addressed the issue tangently through normal food safety education efforts. This project is an attempt to understand what level of knowledge food service managers have about intentional food contamination in the retail food service industry to better inform future education efforts.

The survey questions were developed for this purpose and some were based on historical perceptions of operators held by LHA's based on past interactions. For example, it is a long held belief of food inspectors that larger restaurants or franchises respond differently to inspections and violations than do small owner operated so called “mom and pop” facilities. This has been rationalized based on the assumption that the larger restaurants have more access to training resources and more funds to carry out needed changes. It is useful for LHA’s to know if these different facilities have different perceptions of intentional food contamination in order to tailor education campaigns accordingly.

It is also important to determine the level of concern food operators have about this subject. It is clear that most managers recognize that food safety is an important issue for them day to day, although we sometimes wish that it was more important to them. Their level of knowledge and concern about intentional contamination is not well known.

If managers do not view this as important outreach efforts that do not take this into consideration may be much less effective.

Some other factors that were evaluated in the survey that may affect future education included the type of facility, such as “fast food” versus “fine dining”. The different types of facilities have been shown to react differently to food safety issues during inspections and so may affect how education is presented. The survey also included the sex and age of the manager. These attributes were included to understand if they were related in anyway to the perceptions of the managers.

Definition of Terms

Intentional food contamination – the deliberate and willful action of adulterating any edible substance with the intent to cause harm to humans by any person or group for any purpose.

Unintentional food contamination – the inadvertent adulteration of any edible substance due to a breakdown in basic food safety procedures.

Food Safety - Food safety refers to the conditions and practices that preserve the quality and wholesomeness of food to prevent unintentional contamination and foodborne illnesses.

Food Security - means “an adequate food supply” or “do we have enough food?”

Food Defense - The collective term used by the FDA, USDA, DHS, etc. to encompass activities associated with protecting the nation’s food supply from deliberate or intentional acts of contamination or tampering.

Preparedness - Process of ensuring that an organization has instituted measures to prevent the intentional contamination of food.

Bioterrorism - is terrorism involving the intentional release or dissemination of biological agents.

Food Terrorism - an act or threat of deliberate contamination of food for human consumption with biological, chemical and physical agents or radionuclear materials for the purpose of causing injury or death to civilian populations and/or disrupting social, economic or political stability.

Certified Food Safety Manager - means the owner or manager of a food service establishment who has successfully completed a food safety training program approved by the Department and passed a professionally validated CFSM examination that is accredited by the Conference for Food Protection or other accrediting agency as conforming to national standards for organizations that certify individuals.

Chapter II

Review of the Literature

Introduction

Outgoing Secretary of the Department of Health and Human Services Tommy Thompson, startled many in the media in 2007 when he said, “I, for the life of me, cannot understand why the terrorists have not . . . attacked our food supply because it is so easy to do (Branigin et al., 2004).” There have been numerous studies in recent years to assess the preparedness of the public health system to respond to bioterrorism, but there has been little effort focused on industry, especially the food service sector. The following discussion reviews the studies in recent years that specifically target bioterrorism preparedness in the food industry.

Are Foodservice Operators Prepared for Terrorism?

The study that is perhaps the most applicable to the question of preparedness of the retail food service industry which was alluded to earlier was done by researchers at South Dakota State University in 2007 (Frantz, 2007). Frantz and his colleagues surveyed food service operators about their understanding of the threat of intentional food contamination in their facilities and what if anything they were doing to mitigate the threat. Specific questions were asked about assessment measures and management plans that were in place in the facility. Some of the research questions that were asked included, Do commercial and non-commercial food service operators know and understand the threat of food bioterrorism?, What operation assessment measures are in use?, What management plans are in place for bio-security contingencies?

Frantz (Frantz, 2007) and his colleagues randomly sampled 1000 food service units in the state of Kansas. The survey was adapted from the National Restaurant Association Initial Food Security Checklist. They also included demographic questions of the respondents as well. The results revealed that almost three quarters of them (72.7%) did not have a food protection plan in place or their response was Don't Know. Over one half (58.6%) felt unprepared to respond to a terrorism incident or response was Don't Know.

One of the strengths of the study was that the survey was based on national standards that have been developed by FDA. As a result, this should increase the ability of the findings to be applied to other food service operators in the rest of the country. This is important due to the low response rate which is a significant weakness of this study. Further, the research question, Know and understand the threat of food bioterrorism, is not directly addressed by the results of the survey. The managers were asked if they performed specific actions to prevent contamination of food, such as having procedures for screening employees, with the possible answers of yes, no, or don't know. Yes answers were defined as being prepared and no answers as not being prepared. These questions do not determine the perceptions of the managers about intentional food contamination and require that an inference be made about their knowledge of the possibility of intentional food contamination. The authors also make the statement in the conclusion section that "these research results led to the conclusion that new food defense awareness training and materials should be developed that include role playing and community response participation" (page 90). While this sounds like a potential good approach to training, it could apply to most anything and is not supported by any specific finding in this study.

Restaurant industry preparedness against intentional food contamination: results of a South Carolina survey

A more recent study done by Sudha Xirasagar and colleagues at the University of South Carolina (Xirasagar, 2010) was conducted to find out the status of preparedness in food service facilities to prevent intentional food contamination. The study consisted of a survey of a fifty percent random sample of all restaurants in the state of South Carolina regarding their food defense practices. The survey was based on the Food Defense guidelines of the FDA and was developed through focus groups of food service owners and managers. The survey was mailed to 6980 food service facilities but 317 were eliminated as not being actual restaurants and 510 were returned as non-deliverable, leaving an effective sample of 6153. There were 926 completed surveys returned for a response rate of just over 15%.

This study (Xirasagar, 2010) is strengthened by the use of FDA guidelines to develop the questions and by using actual food service managers to increase the validity of the questions. The response rate is low, which affects the ability to translate findings to a larger population. Participants were different in some important ways from the overall population, 23% were from franchise restaurants whereas the proportion of franchise restaurants for all facilities in South Carolina is almost 40%. There is also a difference in the number of ethnic businesses (Latino, Asian, middle-eastern, or African), with almost 17% in the study population but only about 11% in South Carolina as a whole. This comparison however, may not be accurate because the respondents self –identified as being an ethnic food restaurant while the proportion of all ethnic food restaurants in South Carolina was estimated by the authors based on the name of the facility.

Food defense preparedness in small and very small meat and poultry establishments

In 2008 Lisa Sobering (Sobering, 2008) conducted a survey of meat and poultry processing establishments on food defense issues. The primary intent of the survey was to determine what was the understanding and perception of the importance of food defense in meat and poultry processing facilities in the U.S. The survey contained questions that were based on those asked in the Carver+Shock assessment. The survey was pilot tested with several professionals in the field such as current and former owners of processing plants. A web based survey was developed and made available to facilities throughout the United States. Access to the survey was circulated through a number of industry trade associations with a total number of members of these organizations determined to be about 1539, of which 121 usable surveys were completed. This represented a response rate of approximately 7.8%.

The questions asked of the operators for this study were very similar to the current project. Sobering (Sobering, 2008) asked respondents to rate the importance of food defense in their facility by using a Likert scale consisting of not important, somewhat important, and very important. The results were that 59% rated food defense as very important, 33% percent as somewhat important, and 9 % as not important. The next question related to this project was concerning a written food defense plan. Operators were asked if their facility had a written plan, with 74 % of the facilities responding that they had a food defense plan in place.

This study (Sobering, 2008) also examined the perceptions of the operators of meat and poultry establishments about the likelihood of an intentional contamination event occurring in the U.S. and in their own facility. Thirty three percent felt that it was

very likely that an intentional contamination event would occur in the U.S., 50% thought it was somewhat likely, and only 17% felt it was not likely. The results were different for how likely they thought an intentional contamination event would occur in their own facilities. Sixty six percent felt that intentional contamination of food was not likely to happen while only 27% thought that it was somewhat likely to occur. As noted earlier, the breakdown of possible responses could be biased in favor of the affirmative.

The final question that has bearing on this project is the question of the perception of how prepared the operators felt that their facilities were to handle an intentional contamination event. Another Likert scale was used with three choices, not prepared, somewhat prepared and very prepared. Again, the possible answers were skewed to the positive. Thirty five percent felt that their facility was very prepared and 53% felt that their facility was somewhat prepared. The fact that many of the questions in this survey were similar to this project allows some comparison but the fact that the population is much different and that there is significant issues with the answer wording and choices limits the usefulness considerably.

Food security practice in Kansas schools and health care facilities

Euju Yoon and Carol Shanklin at Kansas State University conducted a survey of food service operators at healthcare institutions and school districts in the state of Kansas to evaluate their perception of bioterrorism and what measures they were performing to prevent it (Yoon, 2007). The authors were investigating if the perceived importance of bioterrorism preparedness of the food service directors was related to the actual implementation of preparedness measures in their facilities. The questionnaire was also designed to find out how willing the operators were to devote the necessary time and

energy in developing a bioterrorism prevention program. The sample was taken from institutions listed in the Kansas Hospital Association directory and the Kansas Assisted Living directory. A list of all food service district directors was obtained from Kansas State Department of Education. A total of 151 surveys were mailed to acute healthcare facilities, 181 were mailed to long term care facilities, and 450 to school districts. 193 surveys were returned for a response rate of 24.7% but 3 surveys were incomplete and were not used in the analysis.

This study (Yoon, 2007) was strengthened by using the U.S. Department of Agriculture's (USDA) biosecurity management plan guidelines as a basis of developing the questionnaire and by aggregating the questions to simplify it for the respondents. By asking about the performance of specific preparedness measures recommended in the guidelines and how the operators perceived the measures a direct analysis of the correlation could be conducted. The study was limited in the relatively low response rate (24.7%) and the narrow sample population in Kansas.

The questionnaire included 35 items related to bioterrorism preparedness such as "Our operation monitors chemical use to prevent deliberate food contamination or human exposure". For each item the respondents were asked to rate on a five-point Likert scale (1: very unimportant, 2: somewhat important, 3: neither unimportant nor important, 4: somewhat important and, 5: very important) their perception of the importance of the activity to prevent biosecurity threats in their facility. They were also asked to indicate how often the same items were implemented in their facilities on a five-point Likert scale (1: never, 2: seldom, 3: some of the time, 4: most of the time, and 5: all of the time). The individual responses to each question were evaluated to come up with a "gap" score, or

the difference between how important the item was perceived and how often it was implemented. The results of this calculation were then divided into two groups using cluster analysis, smaller gap group and larger gap group. The authors compared the two groups based on a number of characteristics asked in the survey. They found that when managers perceived the preparedness activity more important, the more likely that the activity would be performed. There were two particular survey questions that were relevant to this project. First, respondents were asked if their operation had one or more personnel responsible for implementing or monitoring food defense practices. Respondents indicated that 26.3% of the facilities had someone responsible for food defense. Second, the respondents were asked if they had attended a seminar or training on food defense with 9% answering in the affirmative. While this population is potentially very different from retail food service managers, it might be expected that the institutional food service professional would be more likely to have had training in bioterrorism preparedness as a result of their more susceptible clientele and closer relationship to government agencies. The results of this study supports the idea that education initiatives may be more effective when the students are given information to increase their understanding of the risks of bioterrorism as well as information about preparedness activities.

Summary

There were some common themes that these studies found in their results that are important for this project. The operators that perceived preparedness activities to be more important also practiced the preparedness measures more frequently. The researchers found that those facilities that had a person assigned responsibility for food defense

activities had a corresponding increase in the frequency of the preparedness measures being performed as well. In addition, it was shown that the attendance of personnel at bioterrorism training increased the frequency of food defense practices by those facilities where they were employed. There was no correlation with the size of the operation, having a person responsible for food safety, the years of experience of the food service director, the age of the director, or the level of education of the director with the frequency of implementing preparedness measures to combat bioterrorism. While there was a correlation found between concern about the threat of bioterrorism and the implementation of preparedness activities, the design of these studies did not allow for a cause and effect to be determined.

The results of these studies provide a foundation for the present project and for training outreach in the future. There is evidence that future studies should be conducted to evaluate how to better educate food service managers of the risks of intentional food contamination and how to increase the effectiveness of the educational materials already available form FDA. These studies suggest that the food service industry as a whole has accepted that bioterrorism is a significant threat as they have with food safety in general. The continued media attention on food safety might be used to good effect if the concern of the industry about food safety can be used to increase awareness about bioterrorism.

Chapter III

Methodology

Introduction

The purpose of this project was to conduct a survey for the Forsyth County Health Department of food service managers regarding intentional food contamination. The survey was designed to elicit the perceptions of the managers about the risk of intentional food contamination, preparedness activities currently being performed, and if any specific aspects of the managers might affect these conditions. This chapter will present how the survey was accomplished. Future training efforts by the Health Department will use the results of this survey to make the outreach more effective. The project was determined to be exempt from the Emory University Institutional Review Board clearance process.

Population and Sample

The population for this project was the Certified Food Safety Manager (CFSM), or proposed CFSM, of all the permitted retail food service establishments in the county. The State of Georgia Food Code adopted in 2008 required that most food service facilities have a person on staff that had passed an American National Standards Institute (ANSI) accredited exam. The CFSM is responsible for food safety training of the employees and making sure that all aspects of the Food Code are followed. The survey was made available to all the CFSM in Forsyth County through the web site Survey Monkey (www.surveymonkey.com).

Project Design

This project was observational and used a cross-sectional design. It was determined that this design would provide the needed data at the least amount of cost. The Forsyth County Health Department does not have any money allocated for surveys so the use of the free online Survey Monkey web site was chosen. Forsyth County has a well developed communication system which allows most of the county to have high speed internet access. All of the food service managers in the county have access to email and the web. The survey was developed using examples from the literature involving studies with similar subjects and with feedback from the committee chair and the field advisor. The survey was first posted on the web site and reviewed online for clarity.

Procedures

The names and email addresses of the managers are stored in a database file at the Forsyth County Health Department. The first name, last name and email address of the managers was exported into a comma delimited text file. This file was then imported into the Survey Monkey web site address book. A common invitation letter (Appendix B) was developed and sent to each manager by email. After one week another email was sent to those managers that had not responded requesting them to complete the survey (Appendix C). Sending the email invitation through the website allowed for tracking of responses but still maintained the confidentiality of the respondents .A third and last email (Appendix D) was then sent one week later to all non-responding managers as a last attempt to gain as many responses as possible. Another week was given for any additional responses and the survey was terminated on Survey Monkey so that the web site would not allow any further responses. The results were downloaded in a comma delimited text file for importation into a database for analysis.

Instrument

The full survey that was hosted on the Survey Monkey web site is shown in Appendix A. It includes questions designed to understand the perceptions of managers about the risks of intentional food contamination. A Likert Scale format was used to determine the level of feeling where appropriate. The questions have been grouped into five categories to make it easier to analyze and discuss. The questions about the likelihood of intentional contamination occurring will be called Perception. The questions regarding what preparedness activities are being performed in the restaurants will be called Performance. The questions involving the education resources available will be called Education Resources. The two questions about interest in training from the health department and the desired format will be called Health Department. Finally, the questions about the individual aspects of the facilities and the managers will be called Manager and Facility Attributes. Table 1 lists the questions, their corresponding category and the possible responses.

Plans for Data Analysis

A variable for each question was defined so that a frequency distribution for each variable in percent was computed. This was accomplished so that results could be compared to future data and to similar surveys that have been produced. The study type does not allow for any cause and effect to be evaluated but the results did allow for comparisons of different variables to see if there were any correlations of significance. These correlations allowed the evaluation of the project questions related to how best to conduct future education on the prevention of intentional food contamination. Statistical

analysis was conducted in PASW Statistics 18 (SPSS) and Epi-Info (CDC). Graphs were created in Excel 2003 (Microsoft) with some output tables from Epi-Info (CDC).

Table 1

Categories	Questions	Response Categories
Perception	How likely do you believe it is that an intentional contamination of food will occur in the US during the next five years?	very likely somewhat likely neither likely nor unlikely somewhat unlikely very unlikely not sure / don't know
	How likely do you believe it is that an intentional contamination of food will occur in your community during the next five years?	
	How likely do you believe it is that an intentional contamination of food will occur in your facility in the next five years?	
Performance	Have you received any training in the prevention of intentional food contamination in the past year?	yes no not sure / don't know
	Does your facility have a specific plan in place to prevent intentional food contamination?	
	Do you provide training for your food service employees in the prevention of intentional food contamination?	
	How would you rate the ability of your facility to prevent an intentional contamination of food?	very prepared somewhat prepared neither prepared nor unprepared somewhat unprepared very unprepared not sure / don't know
	How would you rate the importance of planning to prevent intentional contamination of food for your facility?	very important somewhat important neither important nor unimportant somewhat unimportant very unimportant not sure / don't know
Education Resources	Have you heard of the Food and Drug Administration's ALERT program?	yes no not sure / don't know
	Have you read the Food and Drug Administration's Food Security Preventive Measures Guidance?	
	Have you heard of the Food and Drug Administration's Carver Software Tool?	
	Have you used the Food and Drug Administration's Food Security Preventive Measures Guidance to train your employees?	yes no
	Have you used the ALERT program to train your employees?	
	Have you used the Food and Drug Administration's Carver Software Tool?	
Health Department	Would you be interested in training by the Health Department on preventing intentional contamination of food in your facility?	yes no not sure / don't know
	What informational format would you find most useful for increasing your awareness and knowledge about preventing intentional contamination of food?	Class at the Health Department As part of the normal food service inspection Newsletter, brochures, etc. Web site CD-ROM Other
Manager and Facility Attributes	What is your facility type?	Fast-food Fast casual-dining Family style Casual dining Fine dining Other
	Are you a franchise?	yes no
	What is your sex?	male female
	What is your age?	18 - 29 30 - 39 40 - 49 50 - 59 60 +

Limitations and Delimitations

The results of this project may not be generalized to all food service managers in the country due to the population being only managers in Forsyth County and the fact the results were based on a convenience sample. It cannot be determined if the managers that responded to the survey are representative of all the managers in Forsyth County or in the whole country. A cross-sectional design also cannot determine cause and effect and because it samples at a point in time it may not correctly reflect the state of the population at a later time. Many other influences such as world events or news reports could significantly change how managers would respond to the survey. As with any survey there is always the possibility of response bias and since this survey was conducted by the Forsyth County Health Department on managers that are inspected by the Department the managers may have altered their answers to respond in a way that put them in a more favorable light.

Summary

A survey of the CFSM's of Forsyth County was conducted using the online service Survey Monkey. The questions were designed to elicit information about the perceptions of the managers regarding intentional food contamination, preparedness activities occurring in the facilities, the knowledge of the managers about education resources already available, and input about future educational programs given by the health department. The results of the survey were analyzed to help inform future educational efforts of the Forsyth County Health Department.

Chapter IV

Results

Introduction

This chapter presents the results of a survey conducted with a group of food service managers regarding intentional food contamination. The questions were developed to elicit the perception of the risk of intentional contamination, what preparedness activities were being done related to intentional food contamination events and what resources managers were using to help prevent these types of events. The basic descriptive statistics will be discussed first and then the inferential statistics that have been chosen for review will be presented.

Survey Respondents

There were 314 retail food service facilities at the time the survey was initiated on the Survey Monkey website. Of this total, 21 did not have a contact email available at the time the survey was begun. Of the remaining 293 there were 7 that had previously opted out of receiving unsolicited email which prevented the web server from delivering the email. There were also 3 emails that were rejected due to an error with the address that we were not able to correct in time for resending the survey. This left a total of 283 surveys that were actually received by the food service managers. A total of 134 surveys out of 283 were completed for a response rate of 47.3 %.

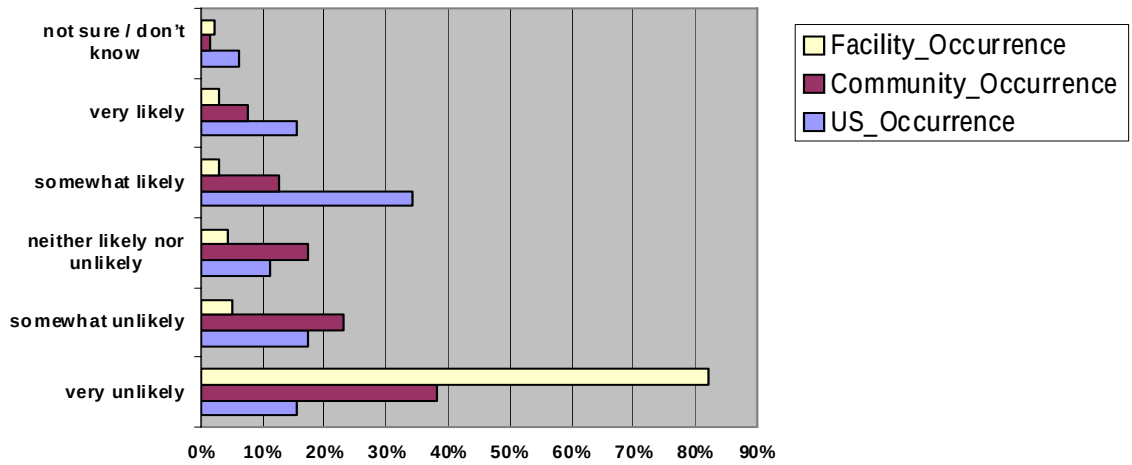
Descriptive Analysis

Perceptions

Managers were asked how likely they thought that an intentional contamination of food would occur in the United States, their community or their facility in the next five

years. The results are shown in Figure 1. One half (n=67, 50%) of managers felt that an intentional contamination of food was either somewhat or very likely to occur in the next

Figure 1 **Perceptions of Intentional Food Contamination**



five years in the U.S. but about 1 in 5 (n=27, 20.2%) thought that it was somewhat likely or very likely to occur in their own community. Their perception of intentional food contamination occurring in their facility was even less, with 6% (n=8) believing that it was somewhat likely or very likely to occur.

Performance

Figure 2 shows the training of managers, employees, and if the facility had a prevention plan. Managers were asked if they provided training to their employees regarding the prevention of intentional food contamination, with almost two thirds (n=87, 64.9%) saying that they did provide training. Most managers (n=77, 57.5%) responded that their facilities had a plan to prevent intentional contamination of food while 27.6% (n=37) said that their facility did not have one. Managers indicated that 44.8% (n=60) of them had not received training in the prevention of intentional food contamination in the past year with 46.3% (n=62) as having received training.

Figure 2

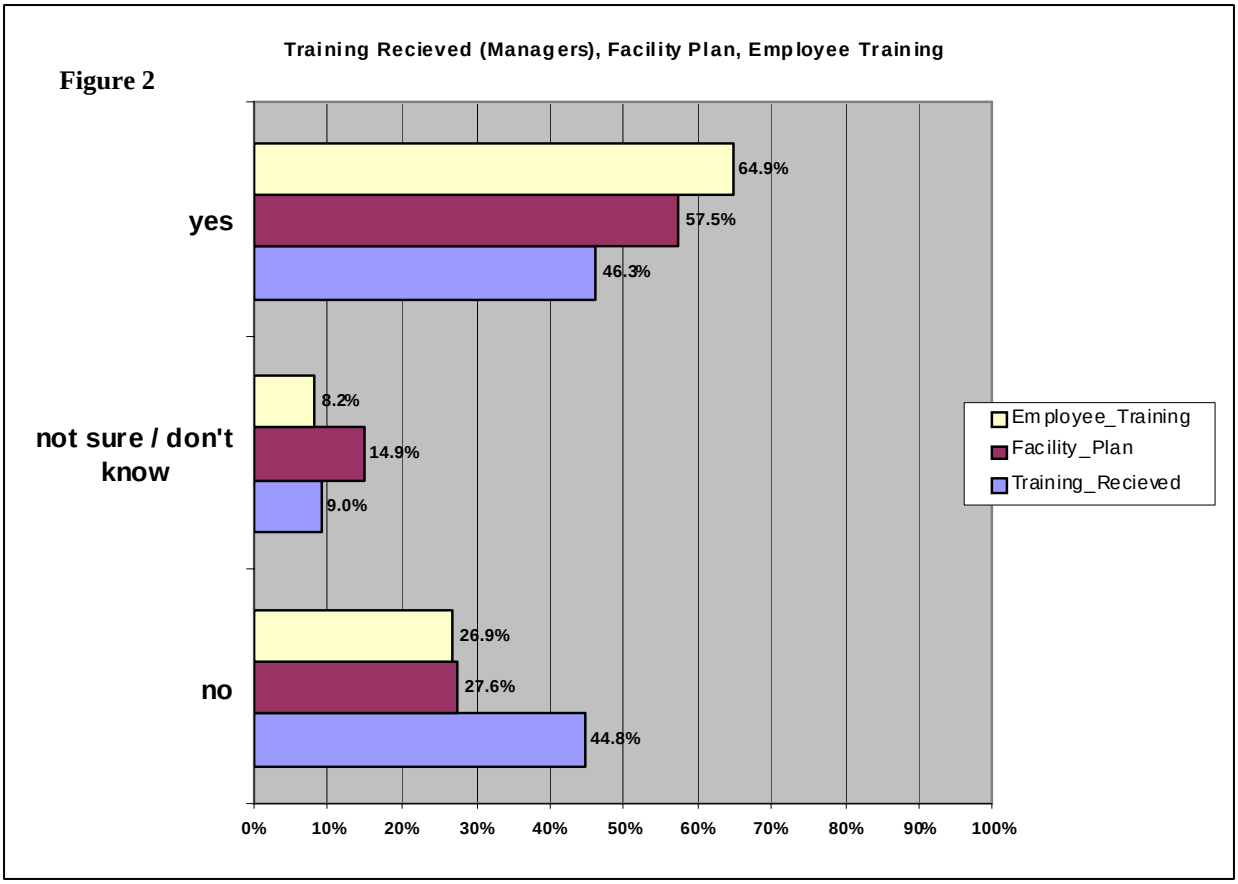


Figure 3

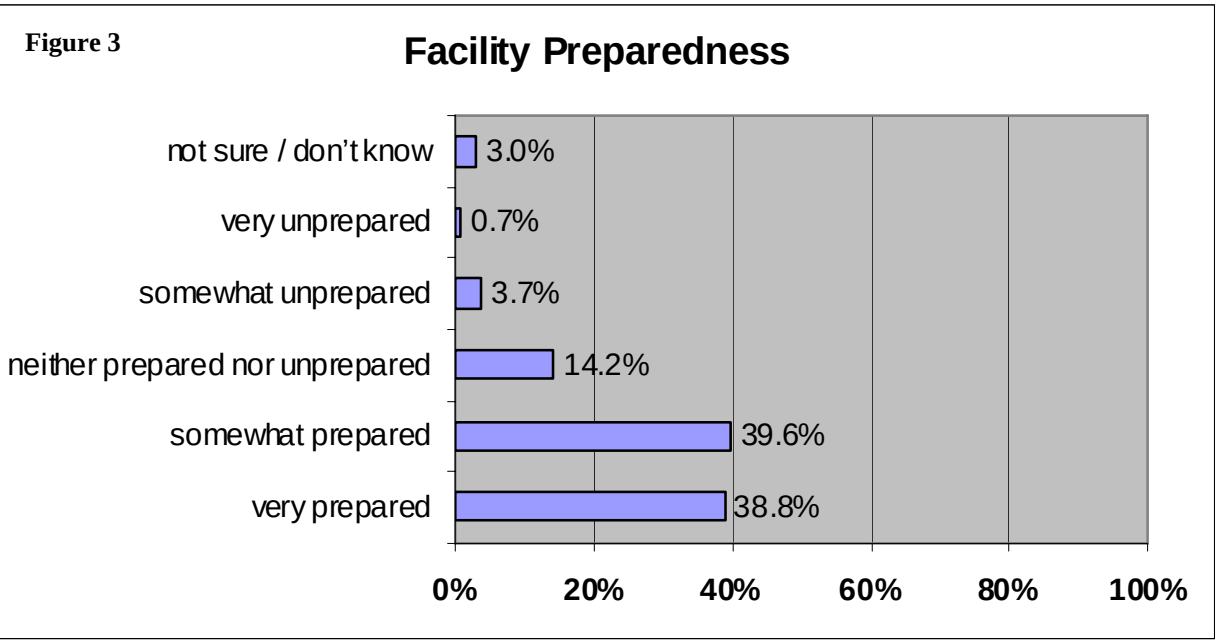


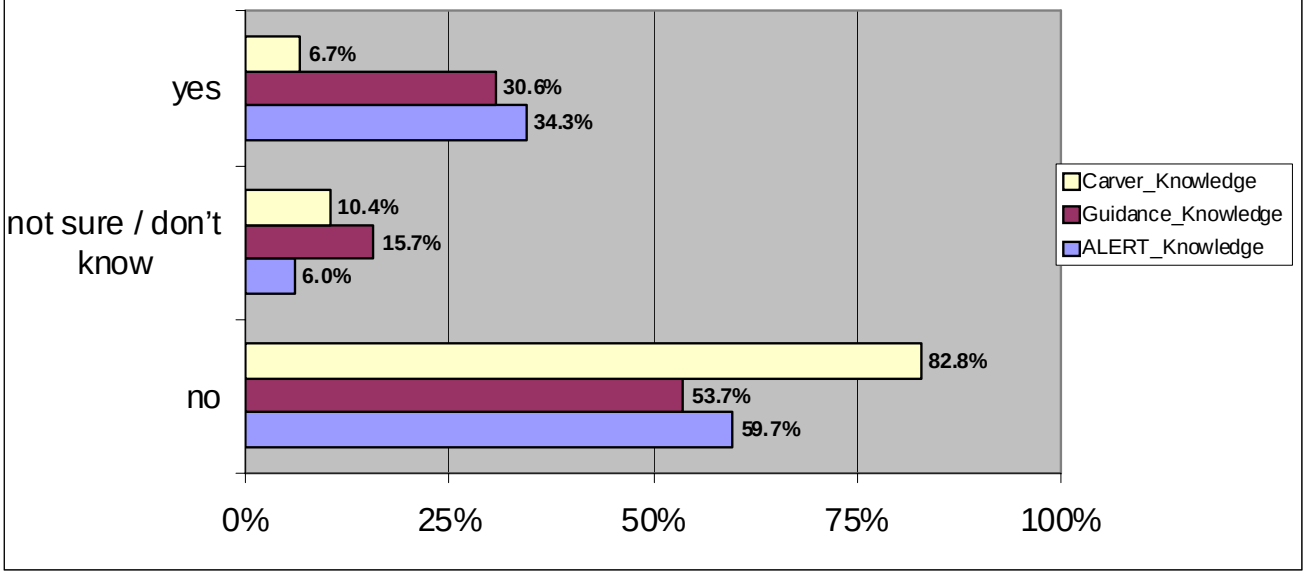
Figure 3 shows managers perception of their facility preparedness to prevent intentional food contamination. Over three quarters, (n=105, 78.4%) said that their facility was either somewhat or very prepared to prevent an intentional food contamination. A low percentage, 4.4% (n=6), answered that their facility was either

somewhat or very unprepared.

Educational Resources

The managers were asked about the three educational resources provided by the FDA, ALERT, Food Security Preventative Measures Guidance, and Carver+Shock. The results are shown in Figure 4. The majority of managers were not familiar with these

Figure 4

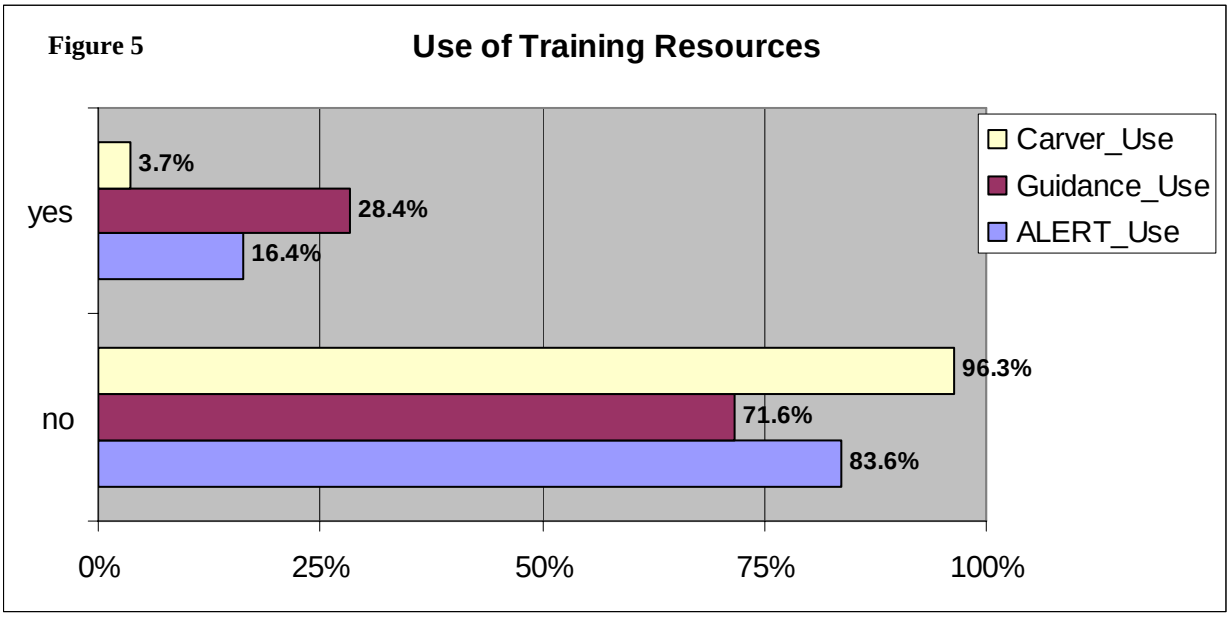


resources. The greatest number (n=46, 34.3%) had knowledge of the ALERT training curriculum with the fewest (n=9, 6.7%) indicating knowledge of the Carver software tool. A companion question was asked about the use of these resources in their facility. The results of this question are in Figure 5. As one would expect, with low knowledge of the resources it follows that there was low use as well.

Health Department

Managers were asked if they would be interested in training by the health department in the prevention of intentional food contamination with the results shown in

Figure 5



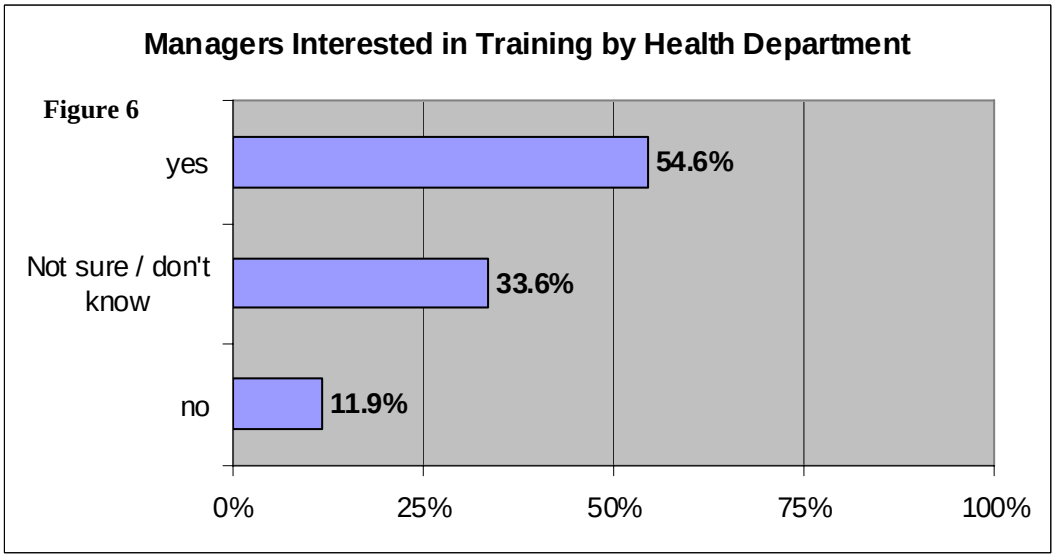
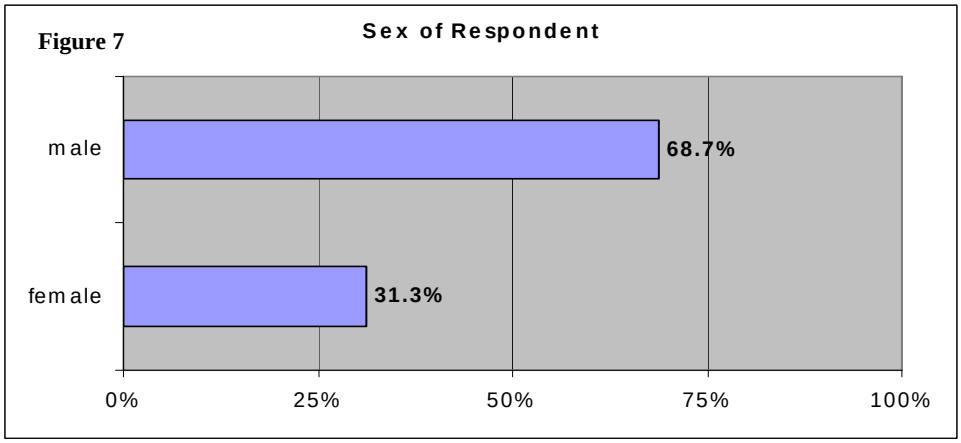
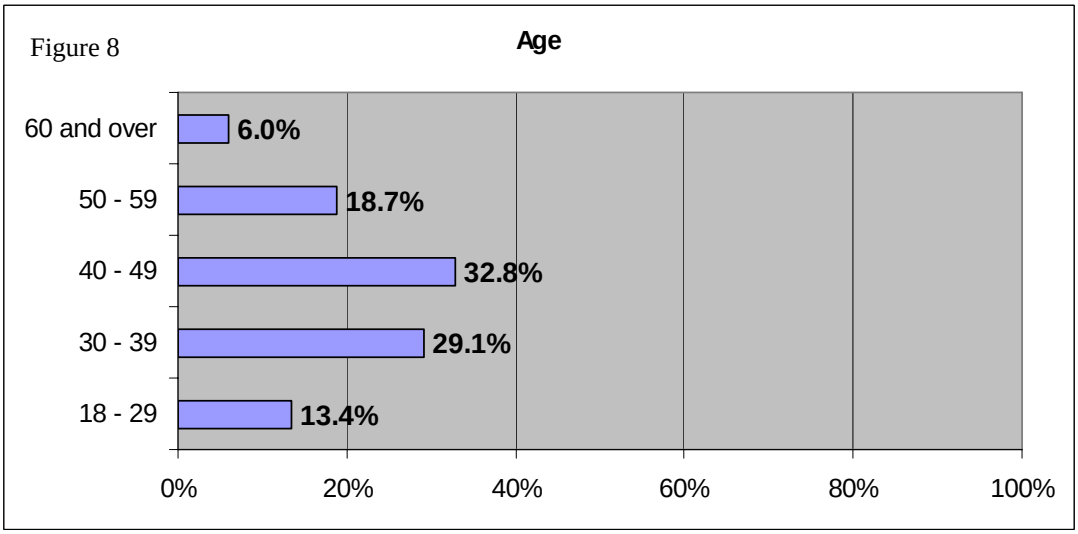


Figure 6. More than half, (n=73, 54.5%) indicated that they would be interested in training by the health department. The managers were then asked what type of format for this education they would prefer. Just under thirty percent, (n=40, 29.9%) chose web site, with the next most popular being newsletter, brochure, etc (n=33, 24.6%). The choices were based on what was determined as most possible for health department's to accomplish. The five "other" responses were combinations of the possible responses

except for having a training class at the place of business and email alerts. Having the training as part of the normal food service inspection had the fewest responses (n=9, 6.7%).



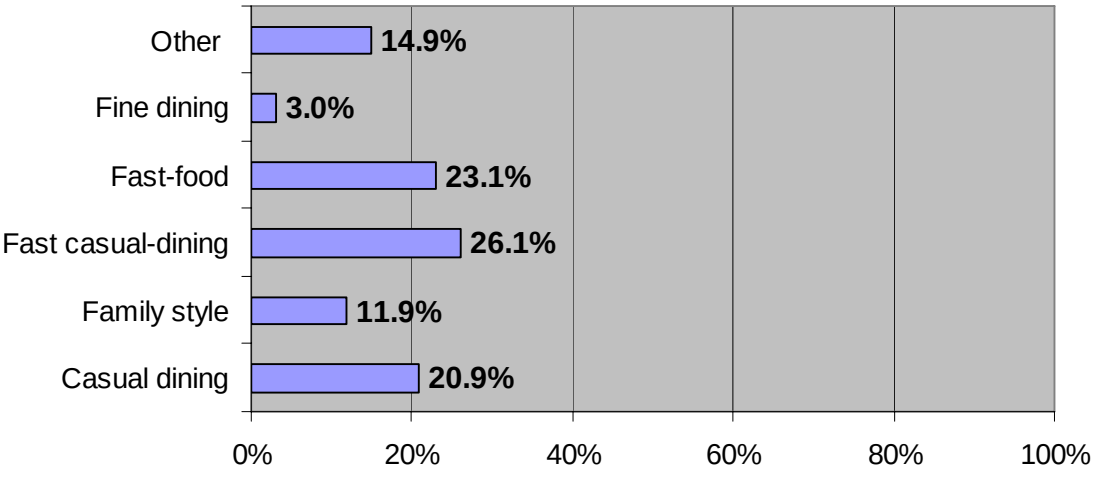


Manager and Facility Attributes

Figure 7 shows the break down of respondents by sex and Figure 8 represents the age of respondents grouped into the divisions in the survey. The majority of respondents were male by over two to one (male, n= 92, 68.7 %) (female, n=42, 31.3%). The age of respondents was requested in predetermined ranges so mean could not be calculated, however, the largest number of respondents were in the 40-49 age group (n=44, 32.8%)

and more than half (n=77, 57.5%) were older than 39. Respondents were asked to describe the type of facility based on the choices in Figure 9. These are common delineations of food operations used in the industry (National Restaurant Association).

Figure 9



The responses were fairly evenly distributed among the choices except for a low response for fine dining (n=8, 6%). The greatest number was in fast casual dining (n=35, 26.1%) with fast food (n=31, 23.1%) being a close second. The "other" category had 14.9% (n=20). The managers were also asked if the facility was a franchise or not, Figure 10, approximately half were (franchise, n=68, 50.7%).

Inferential Statistics

All of the variables were categorical in nature so the Chi-Square was calculated (PASW 18 and Epi-Info) to determine if there were any relationships between them. The cause and effect cannot be determined from these data. The Fishers Exact Test was used when possible due to the fact that many of the cells were less than five. Table 2 lists the survey questions and the corresponding variable name.

Table 2	
US_Occurrence	How likely do you believe it is that an intentional contamination of food will occur in the US during the next five years?
Community_Occurrence	How likely do you believe it is that an intentional contamination of food will occur in your community during the next five years?
Facility_Occurrence	How likely do you believe it is that an intentional contamination of food will occur in your facility in the next five years?
Training_Received	Have you received any training in the prevention of intentional food contamination in the past year?
Facility_Plan	Does your facility have a specific plan in place to prevent intentional food contamination?
Employee_Training	Do you provide training for your food service employees in the prevention of intentional food contamination?
Prevention_Ability	How would you rate the ability of your facility to prevent an intentional contamination of food?
ALERT_Knowledge	Have you heard of the Food and Drug Administration's ALERT program?
ALERT_Use	Have you used the ALERT program to train your employees?
Guidance_Knowledge	Have you read the Food and Drug Administration's Food Security Preventive Measures Guidance?
Guidance_Use	Have you used the Food and Drug Administration's Food Security Preventive Measures Guidance to train your employees?
Carver_Knowledge	Have you heard of the Food and Drug Administration's Carver Software Tool?
Carver_Use	Have you used the Food and Drug Administration's Carver Software Tool?
HD_Training	Would you be interested in training by the Health Department on preventing intentional contamination of food in your facility?
Training_Format	What informational format would you find most useful for increasing your awareness and knowledge about preventing intentional contamination of food?
Facility_Type	What is your facility type?
Franchise	Are you a franchise?
Sex	What is your sex?
Age	What is your age?

Perceptions

The questions about expectations of the possibility of intentional food contamination at the national, community, and facility level were asked to gauge the perceptions of the managers because a number of studies have shown a correlation between belief in the risk of the occurrence of intentional food contamination and the likelihood of implementing prevention activities. However, in this case there was no

association with the perceptions of the managers or any of the preparedness activities such as having attended training, providing training for employees or having a prevention plan in place. Table 3 is an example of output from Epi-Info (CDC).

Table 3 **FACILITY_PLAN**

Facility_Occurrence	no	not sure / don't know	yes	TOTAL
neither likely nor unlikely	1	2	3	6
Row %	16.7	33.3	50.0	100.0
Col %	2.7	10.0	3.9	4.5
not sure / don't know	0	1	2	3
Row %	0.0	33.3	66.7	100.0
Col %	0.0	5.0	2.6	2.2
somewhat likely	1	1	2	4
Row %	25.0	25.0	50.0	100.0
Col %	2.7	5.0	2.6	3.0
somewhat unlikely	0	2	5	7
Row %	0.0	28.6	71.4	100.0
Col %	0.0	10.0	6.5	5.2
very likely	0	0	4	4
Row %	0.0	0.0	100.0	100.0
Col %	0.0	0.0	5.2	3.0
very unlikely	35	14	61	110
Row %	31.8	12.7	55.5	100.0
Col %	94.6	70.0	79.2	82.1
TOTAL	37	20	77	134
Row %	27.6	14.9	57.5	100.0
Col %	100.0	100.0	100.0	100.0

Single Table Analysis

Chi-square	df	Probability
10.6979	10	0.3815

Franchise was found to be unrelated to any of the other variables except facility_type, which is consistent with the fact that they are inherently related. Table 4 and 5 show output from Epi-Info (CDC). Facility_type was also not found to be

Table 4

FACILITY_PLAN				
Franchise	**no**	**not sure / don't know**	**yes**	**TOTAL**
No	19	12	35	66
Row %	28.8	18.2	53.0	100.0
Col %	51.4	60.0	45.5	49.3
Yes	18	8	42	68
Row %	26.5	11.8	61.8	100.0
Col %	48.6	40.0	54.5	50.7
TOTAL	37	20	77	134
Row %	27.6	14.9	57.5	100.0
Col %	100.0	100.0	100.0	100.0

Single Table Analysis

Chi-square	**df**	**Probability**
1.4339	2	0.4882

Table 5

EMPLOYEE_TRAINING				
Franchise	**no**	**not sure / don't know**	**yes**	**TOTAL**
No	20	4	42	66
Row%	30.3	6.1	63.6	100.0
Col %	55.6	36.4	48.3	49.3
Yes	16	7	45	68
Row%	23.5	10.3	66.2	100.0
Col %	44.4	63.6	51.7	50.7
TOTAL	36	11	87	134
Row%	26.9	8.2	64.9	100.0
Col %	100.0	100.0	100.0	100.0

Single Table Analysis

Chi-square	**df**	**Probability**
1.3365	2	0.5126

associated with the other variables except for employee_training, which was one of the Pearson results that may not be valid due to low cell number.

Summary

The survey response rate of 47.3% was greater that most similar types of surveys that have been discussed. This level was somewhat disappointing given the fact that all 314 managers were contacted. This indicates that greater advanced contact and follow-up is needed to increase participation. The perception of the risk of intentional food contamination was greater the more distanced fro the individual indicating that there is recognition of this being an increased threat but also shows that education efforts must include ways to convince managers that it can happen to them as well. There were no associations between the attributes of the facilities or the managers and any of the perception or preparedness questions so education activities will not have to be adjusted for these differences.

Chapter V

Conclusions, Implications, and Recommendations

Introduction

The threat of terrorism has become an important part of the federal government's activities since 9/11. Public health preparedness has gained more recognition as an important function of federal, state, and local health agencies as a result. Recent food safety issues have also brought attention to the risks to our food supply and increased concern of the public and government health authorities. The FDA and the USDA have developed initiatives to combat the potential of attacks on the food supply. These are primarily based on education outreach through guidelines produced for different parts of the food supply system. It is unclear, however, how effective this outreach has been. What is clear is that it will take the cooperation of industry and local health departments, the people in the "trenches", to make our food supply as safe as possible.

Summary of Study

This project used a cross-sectional survey design to evaluate the perceptions of food service managers regarding the possibility of intentional food contamination and the preparedness measures that were being utilized. The results of the survey will be used to improve the effectiveness of future training efforts by local health departments to improve food defense in retail food service establishments.

The questions were organized into five different categories with the questions designed to assess the perceptions of the managers about the likelihood of intentional food contamination, the measures being instituted by the facilities to prevent the intentional contamination of food, if the managers would be receptive to receiving

education from the health department about preventing intentional food contamination, and the characteristics of the facilities and managers that might act affect their perceptions and response to education efforts.

Conclusion

While half of the food service managers felt that there is a possibility of intentional food contamination occurring in the United States somewhere, they did not believe that it was very likely to occur in their community or practically no chance at all of occurring in their facility. There is evidence (Yoon, 2007) to suggest that the more aware managers are of the risk of intentional food contamination the more likely they are to perform prevention activities. However, there was no association found in this survey with manager's perception of risk and any of the preparedness activities they were asked about.

Most of the managers felt that their facility was prepared to prevent food from being intentionally contaminated but at the same time very few of them were familiar with any of the education resources about bioterrorism prevention provided by the FDA. Their responses to this question may have been affected by their lack of concern about the possibility of intentional contamination in their facility. Less than half of the managers indicated that they had received training in the prevention of intentional food contamination in the past five years as well, which is another indication that this threat may not be considered that important by managers or their supervisors. It was also interesting that almost two thirds of the managers said that they provide training about the prevention of intentional food contamination to their employees, more than the number of managers that had attended training themselves. Since the managers are not using the

resources provided by the FDA, and not being trained themselves, the type of training that is actually being done may not be specific to intentional contamination and may actually be general food safety training.

A very positive finding from this survey is that over fifty percent of the managers expressed an interest in receiving education from the health department in the prevention of intentional food contamination and another third of them were non-committal (not sure / don't know). This indicates that future training efforts will at least be favorably received. The least desired format of this training turned out to be as part of the normal food service inspection. This was somewhat surprising as it was thought initially that this would be more acceptable because it would be less intrusive and time consuming. It may be that the managers thought that it would be more time consuming because of the adoption of the new state food code that already had served to increase inspection times and intensity. This format had also been envisioned as more suitable by health department personnel since they would already be in the facility. The managers were about evenly split between using a web site or newsletters and brochures. A class at the health department was a close third, which was perhaps the most surprising of all because of the time away from the facility that it would require. The acceptance of managers for different types of electronic training aids is encouraging for the future because of the increasing use of this method by government agencies at all levels due to shrinking budgets.

Finally, the results show that training activities should not have to take into account any characteristics of the audience, such as the sex or age of the participants, or the particular type of facility, such as the size or ownership. It has long been an

assumption of health department personnel that facilities had to be approached differently depending on if the operation was part of a larger business such as a franchise of if it was a independent “mom and pop” operation. These findings suggest that the development and implementation of training efforts can be designed without concern that some segments of the population will not participate or be able to use the information.

Implications

The results of this survey are positive for the future efforts overall. It demonstrated that there is a definite need to improve the outreach regarding the prevention of intentional food contamination and that managers are open to learning more about it. The results suggest that a significant number of managers perform preventive measures even though they do not believe that their facility is at risk. This may be because the preventive activities are similar to their food safety activities. This can provide an opportunity to improve the risk perception of managers by including food defense education in ongoing food safety education. It is unclear, however, if these findings can be applied to all retail food service facilities. This will need further clarification through additional surveys and also the feedback of actual training activities. While this project did not find an association between manager’s perception of risk and the likelihood of performing preventive activities, the fact that few managers recognized the risk of intentional food contamination in their facilities makes it clear that education efforts must find methods to change their attitude.

This project demonstrates that LHA’s can successfully use surveys to gather information about their communities and to determine program priorities. The use of surveys in this manner is an effective means for LHA’s to complete one of their essential

public health functions, assessment of the needs of their community. This project also indicates that online surveys can be used effectively to gather information in those areas where internet access is well developed which can greatly reduce the costs of these activities. LHA's in areas with poor access to the internet will have to rely on more traditional methods like the mail and hand delivery.

Recommendations

The FDA has developed educational resources concerning food defense that can be used by LHA's in their education outreach. This project demonstrated that these resources are not well known or utilized by managers currently. A majority of managers indicated that they would favor a web based education format and this would be a cost effective means for LHA's to provide the education, an important consideration in these times of dwindling budgets. The fact that the FDA has an extensive web presence and has the education resources online already would also be a plus.

Food Defense is an important issue for our society and a challenge for public health so it is important that we work to make our training efforts as effective as possible.

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Appendix A

Food Defense

1. Default Section

* **1. How likely do you believe it is that an intentional contamination of food will occur in the US during the next five years?**

- ◯ very likely
- ◯ somewhat likely
- ◯ neither likely nor unlikely
- ◯ somewhat unlikely
- ◯ very unlikely
- ◯ not sure / don't know

* **2. How likely do you believe it is that an intentional contamination of food will occur in your community during the next five years?**

- ◯ very likely
- ◯ somewhat likely
- ◯ neither likely nor unlikely
- ◯ somewhat unlikely
- ◯ very unlikely
- ◯ not sure / don't know

* **3. How likely do you believe it is that an intentional contamination of food will occur in your facility in the next five years?**

- ◯ very likely
- ◯ somewhat likely
- ◯ neither likely nor unlikely
- ◯ somewhat unlikely
- ◯ very unlikely
- ◯ not sure / don't know

Food Defense

* **4. Have you received any training in the prevention of intentional food contamination in the past year?**

- ◯ yes
- ◯ no
- ◯ not sure / don't know

* **5. Does your facility have a specific plan in place to prevent intentional food contamination?**

- ◯ yes
- ◯ no
- ◯ not sure / don't know

* **6. Do you provide training for your food service employees in the prevention of intentional food contamination?**

- ◯ yes
- ◯ no
- ◯ not sure / don't know

* **7. How would you rate the ability of your facility to prevent an intentional contamination of food?**

- ◯ very prepared
- ◯ somewhat prepared
- ◯ neither prepared nor unprepared
- ◯ somewhat unprepared
- ◯ very unprepared
- ◯ not sure / don't know

* **8. Have you heard of the Food and Drug Administration's ALERT program?**

- ◯ yes
- ◯ no
- ◯ not sure / don't know

Food Defense

* 9. Have you used the ALERT program to train your employees?

- ◯ yes
- ◯ no

* 10. Have you read the Food and Drug Administration's Food Security Preventive Measures Guidance?

- ◯ yes
- ◯ no
- ◯ not sure / don't know

* 11. Have you used the Food and Drug Administration's Food Security Preventive Measures Guidance to train your employees?

- ◯ yes
- ◯ no

* 12. Have you heard of the Food and Drug Administration's Carver Software Tool?

- ◯ yes
- ◯ no
- ◯ Not sure / don't know

* 13. Have you used the Food and Drug Administration's Carver Software Tool?

- ◯ yes
- ◯ no

* 14. Would you be interested in training by the Health Department on preventing intentional contamination of food in your facility?

- ◯ yes
- ◯ no
- ◯ Not sure / don't know

Food Defense

*** 15. What informational format would you find most useful for increasing your awareness and knowledge about preventing intentional contamination of food? Please pick only one.**

- ◯ Class at health department
- ◯ As part of the normal food service inspection
- ◯ Newsletter, brochures, etc.
- ◯ Web site
- ◯ CD-ROM
- ◯ Other (please specify)

*** 16. What is your facility type?**

- ◯ Fast-food
- ◯ Fast casual-dining
- ◯ Family style
- ◯ Casual dining
- ◯ Fine dining
- ◯ Other (please specify)

*** 17. Are you a franchise? Please answer yes even if restaurant is owned by the corporation.**

- ◯ Yes
- ◯ No

*** 18. What is your sex?**

- ◯ Male
- ◯ Female

Food Defense

*** 19. What is your age?**

- ◯ 18 - 29
- ◯ 30 - 39
- ◯ 40 - 49
- ◯ 50 - 59
- ◯ 60 +

Appendix B

Invitation email

The Forsyth County Environmental Health Department is conducting a survey about how local food service operators feel about the possibility of intentional food contamination and what they are doing to prepare for it. We are asking the managers who are responsible for planning for this type of incident to participate. The purpose of the survey is to better understand how to help local food service establishments prevent intentional food contamination. The survey consists of 19 questions that should take no more than fifteen minutes and your participation is completely voluntary.
Thank you for allowing us to contact you by email, your participation is greatly appreciated. If you have any questions about this survey or any food safety related questions please do not hesitate to email or call me at 770-781-6909. Thanks again.

Gary Helmuth

If you are not a food service manager in Forsyth Co. or are not the appropriate person for this survey please email back and let me know.

We are also using this opportunity to get email addresses of the Certified Food Safety Manager so that we can contact you about food safety issues as needed in the future. Your email will be kept confidential and only used for the survey and important food safety information such as code changes or recall information. Please email me at gdhelmuth@dhr.state.ga.us with your name and restaurant name so that we can update our records. I will reply to you with a link of the web survey location. If you have any questions please call me at 770-781-6909 and thank you for your help.

Appendix C

Second invitation email through Survey Monkey

This message is intended for [FirstName] [LastName]

Just following up on our previous request to take our survey. It is very important that we receive as many responses as possible. Please take a moment now to take our survey with my appreciation. If I can ever be of any assistance please let me know.

770-781-6909
Gary Helmuth

Here is a link to the survey:
http://www.surveymonkey.com/s.aspx

This link is uniquely tied to this survey and your email address. Please do not forward this message.

Thanks for your participation!

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
http://www.surveymonkey.com/optout.aspx

Appendix D

Final email invitation through Survey Monkey

Sorry to bother you again [FirstName], but it is important that we get your response to our survey so that we can better serve you. We must close the survey soon so we are asking you again to take our short survey of 19 questions that will take only a few minutes. Your responses cannot be linked to you or your facility. SurveyMonkey keeps up with who has taken the survey by email address but not your responses. Please take a moment now to take our survey with my appreciation. If I can ever be of any assistance please let me know.

770-781-6909
Gary Helmuth

Here is a link to the survey:
http://www.surveymonkey.com/s.aspx

This link is uniquely tied to this survey and your email address. Please do not forward this message.

Thanks for your participation!

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
http://www.surveymonkey.com/optout.aspx

Appendix E

Survey response total report from Survey Monkey

Food Defense

1. How likely do you believe it is that an intentional contamination of food will occur in the US during the next five years?

	Response Percent	Response Count
very likely	15.7%	21
somewhat likely	34.3%	46
neither likely nor unlikely	11.2%	15
somewhat unlikely	17.2%	23
very unlikely	15.7%	21
not sure / don't know	6.0%	8
answered question		134
skipped question		0

2. How likely do you believe it is that an intentional contamination of food will occur in your community during the next five years?

	Response Percent	Response Count
very likely	7.5%	10
somewhat likely	12.7%	17
neither likely nor unlikely	17.2%	23
somewhat unlikely	23.1%	31
very unlikely	38.1%	51
not sure / don't know	1.5%	2
answered question		134
skipped question		0

3. How likely do you believe it is that an intentional contamination of food will occur in your facility in the next five years?

	Response Percent	Response Count
very likely	3.0%	4
somewhat likely	3.0%	4
neither likely nor unlikely	4.5%	6
somewhat unlikely	5.2%	7
very unlikely	**82.1%**	**110**
not sure / don't know	2.2%	3
answered question		134
skipped question		0

4. Have you received any training in the prevention of intentional food contamination in the past year?

	Response Percent	Response Count
yes	**46.3%**	**62**
no	44.8%	60
not sure / don't know	9.0%	12
answered question		134
skipped question		0

5. Does your facility have a specific plan in place to prevent intentional food contamination?

	Response Percent	Response Count
yes	57.5%	77
no	27.6%	37
not sure / don't know	14.9%	20
answered question		134
skipped question		0

6. Do you provide training for your food service employees in the prevention of intentional food contamination?

	Response Percent	Response Count
yes	64.9%	87
no	26.9%	36
not sure / don't know	8.2%	11
answered question		134
skipped question		0

7. How would you rate the ability of your facility to prevent an intentional contamination of food?

	Response Percent	Response Count
very prepared	38.8%	52
somewhat prepared	39.6%	53
neither prepared nor unprepared	14.2%	19
somewhat unprepared	3.7%	5
very unprepared	0.7%	1
not sure / don't know	3.0%	4
answered question		134
skipped question		0

8. Have you heard of the Food and Drug Administration's ALERT program?

	Response Percent	Response Count
yes	34.3%	46
no	59.7%	80
not sure / don't know	6.0%	8
answered question		134
skipped question		0

9. Have you used the ALERT program to train your employees?

	Response Percent	Response Count
yes	16.4%	22
no	83.6%	112
answered question		134
skipped question		0

10. Have you read the Food and Drug Administration's Food Security Preventive Measures Guidance?

	Response Percent	Response Count
yes	30.6%	41
no	53.7%	72
not sure / don't know	15.7%	21
answered question		134
skipped question		0

11. Have you used the Food and Drug Administration's Food Security Preventive Measures Guidance to train your employees?

	Response Percent	Response Count
yes	28.4%	38
no	71.6%	96
answered question		134
skipped question		0

12. Have you heard of the Food and Drug Administration's Carver Software Tool?

	Response Percent	Response Count
yes	6.7%	9
no	82.8%	111
Not sure / don't know	10.4%	14
answered question		134
skipped question		0

13. Have you used the Food and Drug Administration's Carver Software Tool?		
	Response Percent	Response Count
yes	3.7%	5
no	96.3%	129
answered question		134
skipped question		0

14. Would you be interested in training by the Health Department on preventing intentional contamination of food in your facility?		
	Response Percent	Response Count
yes	54.5%	73
no	11.9%	16
Not sure / don't know	33.6%	45
answered question		134
skipped question		0

15. What informational format would you find most useful for increasing your awareness and knowledge about preventing intentional contamination of food? Please pick only one.

	Response Percent	Response Count
Class at health department	20.1%	27
As part of the normal food service inspection	6.7%	9
Newsletter, brochures, etc.	24.6%	33
Web site	**29.9%**	**40**
CD-ROM	14.9%	20
Other (please specify)	3.7%	5
answered question		134
skipped question		0

16. What is your facility type?

	Response Percent	Response Count
Fast-food	23.1%	31
Fast casual-dining	**26.1%**	**35**
Family style	11.9%	16
Casual dining	20.9%	28
Fine dining	3.0%	4
Other (please specify)	14.9%	20
answered question		134
skipped question		0

17. Are you a franchise? Please answer yes even if restaurant is owned by the corporation.

	Response Percent	Response Count
Yes	50.7%	68
No	49.3%	66
answered question		134
skipped question		0

18. What is your sex?

	Response Percent	Response Count
Male	68.7%	92
Female	31.3%	42
answered question		134
skipped question		0

19. What is your age?

	Response Percent	Response Count
18 - 29	13.4%	18
30 - 39	29.1%	39
40 - 49	32.8%	44
50 - 59	18.7%	25
60 +	6.0%	8
answered question		134
skipped question		0