



Research Article

Food Service Establishment Safe Food and Handling Prac- tices

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Abstract

Food safety starts from the farm, that product does not have chemical residues before delivered to the market for sale. It is also the responsibility of everyone who is affiliated with food service operation as food handler. Food safety is an important issue that has been given global attention and is vital for public health, socio-economic stability and global commerce. Food-borne illness can be serious or even fatal. Therefore, the objectives of this study are to enhance the awareness of food businesses in selected southwest Mississippi counties as well as the broader community about the importance of food safety practices. Another objective is to develop a curriculum to promote food safety practices for food businesses and consumers. A majority of consumer daily meals come from restaurants and other food service establishments, therefore food safety practices is very critical. The study investigated aspects of food service establishment and food safety practices. The information gathered will be used for the development of effective food safety initiatives at Alcorn State University. Data was collected by means of face-to-face surveys. Analysis was done using the Statistical Package for Social Science (SPSS Version 17.0, 2009). Ten (10) food service establishments were surveyed with a response rate of 100 percent. Results indicate that respondents consisted of 40 percent white, 30 percent Black-African Americans, and 30 percent other. Seventy percent of respondents were male and 30 percent female. Forty percent were between the age of 40-54 and 60 percent were over 55 years of age. A majority of respondents strongly agreed that practicing food safety helps maintain good health accompanied by clean utensils and serving dishes. This project provides an opportunity for the development and implementation of food safety and hygiene education strategies to improve specific food safety and behaviors of food service providers.

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Keywords: Global commerce; Handling practices; Food borne illness; Food business establishment; Food preparation; Food safety; Socio-economic stability

Introduction

Food safety is first and foremost the responsibility of food producers, processors and others throughout the food chain. It is also the responsibility of everyone who affiliated with food service operation as food handler and should be a top priority. Safe food is important for public health, socio-economic stability and global commerce.

The Center for Disease Control estimates that in the year 2011, roughly one in six Americans or 48 million people got sick, 128,000 were hospitalized and 3,000 died of food borne diseases, which provides us a clear idea of the economic implications. Although the number of reported infections has steadily declined, foodborne diseases remain a significant problem [1]. A 2014 estimate from the U.S. Department of Agriculture placed the direct and indirect costs associated with illnesses caused by major food borne pathogens at \$15.6 billion per year and a more recent estimate from Ohio State University that covered all causes of foodborne illness, not just illness from the major foodborne pathogens, was at least \$55.5 billion [2].

Due to constant increases in reported outbreak of food related illnesses, Congress has responded to the public's growing concern over food safety with new legislation purported to augment the food safety system. Congress's actions reflect the common perception that food is becoming less safe [3]. Many government agencies and other related associations are constantly developing and implementing food safety programs, regulations, and training specifications [4]. A key question is whether legislation that leads to more regulations and inspections will result in significant improvements in food safety.

According to Medeiros et al. [5], improving food safety and hygiene knowledge and belief through training had a positive outcome on food handling practices. To prevent foodborne illness, emphasis should be placed on improving personal hygiene, cooking foods properly, avoiding cross contamination, storing food at safe temperatures, and avoiding food from questionable sources. Personal hygiene is very critical in preventing contamination of food and foodborne illnesses.

Food safety education is a very important aspect of the overall food safety initiative. It must be made clear that without the knowledge of proper food safety and handling practices, foodborne illnesses cannot be reduced. Food safety is not just for the prevention, but also for avoiding chemical contamination.

Food safety is of major importance now than it has ever been. Business level, international trade, retail pressure and the ever increasing consumer demands dictate that safe manufacturing, retail, and transportation of food from sources to dinner plates must be in place. While the food supply in the United States is one of the safest in the world [6], The U.S. Department of Agriculture (USDA), Centers

of Disease Control and Prevention (CDC), now estimates that 47.8 million illnesses and 3,037 deaths were caused by contaminated food consumed [7].

Preventing foodborne illnesses and deaths remains a major public health challenge. Although food safety involves physical, chemical, and microbial causes, recent trends have shown microbial defects; especially pathogenic bacteria have been a major problem in the food industry and have affected the industry greatly.

The economic toll on society from foodborne illness is astronomical. Batz et al. [8], estimate the annual cost of foodborne illnesses at \$14 billion. And according to the Pew Health Group [9], the economic impact of the problem of food safety is considerable, with an estimated \$420 billion spent on direct medical costs and \$152 billion attributed to lost productivity annually. Most food-related illness is caused by bacteria, viruses and parasites. Salmonella, is one of the major common bacteria found in food and are responsible for millions of cases of foodborne-related hospitalizations and deaths annually [10]. E. coli bacteria are another common strain of bacteria that can cause severe symptoms and even life-threatening complications, such as hemolytic uremic syndrome, which can lead to kidney failure and death [11].

Food businesses effort to provide safe and nutritious food is essential for maintaining the overall health and wellbeing of consumers. It is also important that food businesses understand how their behavior and compliance contribute to the safety of the food they provide and how they can decrease the risk of foodborne illness.

Methods

Population description

Ten food businesses from selected southwest Mississippi counties participated in the survey. These participants came from diverse socioeconomic backgrounds and were selected using simple random sampling. The random sampling methods was employed because it guaranteed that the sample chosen would be representative of the population, and the researchers wanted everyone in the target population to have the same chance of being selected to participate in the study.

Research Design and Data Analysis

The design used for the study was the descriptive method. In order to meet the study objectives, a two- part questionnaire was designed. Part one was designed to collect demographic data and part two determined the participants’ opinion on consumer food safety. The survey participants were asked to rate their level of agreement to statements by using the Likert scale ratings of “strongly agree, agree, disagree or strongly disagree.” The questionnaire was designed as described by Dillman [12]. The instrument was reviewed for content validity by a panel consisting of selected agricultural and extension educators within the School of Agriculture and Applied Sciences, Alcorn State University. The survey was pilot tested to determine the reliability of the instrument. No problem or revision was warranted. The demographic information collected included nationality, gender, marital status, age and education level. Analysis was done using the Statistical Package for Social Science (SPSS version 17.0, 2009).

Results and Discussions

Ten (10) food business respondents were administered a face-to-face survey instrument. The researcher received 100percent completed surveys instrument. The majority of respondents, 70 percent were male, while 30 percent were female. Participants over fifty-five were more likely to participate in the survey. Seventy percent of the respondents were married (Tables 1-6).

Gender	Frequency	Percentage	Age	Frequency	Percentage
Female	3	30%	40-54	4	40%
Male	7	70%	Over 55	6	60%
Total	10	100%		10	100%

Table 1: Gender and age information of food business participants.

Education	Frequency	Percentage	Nationality	Frequency	Percentage
Graduate high school	0	0	African American	3	30%
Attend college	5	50%	White	4	40%
Graduate college or more	5	50%	Hispanic	1	10%
			Asian	1	10%
			Other	1	10%
Total	10	100%		10	100%

Table 2: Education level and racial/ethnic groups information.

Marital Status	Frequency	Percentage
Single	0	0
Married	7	70%
Separated	2	20%
Divorced	1	10%
Widowed	0	0
Total	10	100%

Table 3: Marital status.

Survey Items 1-12	Strongly Agree %	Agree %
Begin food preparation with proper hand washing	60%	40%
Preparation counter should be disinfected regularly	40%	60%
Utensils and serving dishes should always be kept clean	80%	20%
Practicing food safety helps maintain good health	80%	20%
All food businesses should have a cleaning schedule	20%	80%
All food employees should have some food service training.	60%	40%
All food handlers should wash hands before putting on gloves	20%	80%
Hot food should be kept hot, at or above 140 degrees F	20%	80%
Cold food should be stored at 40 degrees F or below to prevent bacteria growth	60%	40%
Cook food should only be left at room temperature for, at most two hours to prevent bacterial growth	20%	80%

Never rely on the look or smell of food to be sure it's still good	20%	80%
Foodborne illness is caused by consuming contaminated food or drink	50%	50%

Table 4: Food establishment level of agreement on food safety practices (n = 10).

Level of agreement: Eighty percent of participants strongly agreed that utensils and serving dishes should always be kept clean and that practicing food safety helps maintain good health. When asked if all food businesses should have a cleaning schedule, 80 percent agreed.

Survey Items 12-24	Strongly Agree %	Agree %	Disagree %
Food safety has an impact on food security	20%	80%	
Healthy clean workers do carry food poisoning bacteria on their bodies	20%	60%	20%
Most foodborne diseases are infections caused by a variety of bacteria	40%	60%	
Trash and food scraps in preparation area should be emptied daily	50%	50%	
Good food hygiene practices and personal cleanliness will minimize the risk of food poisoning	40%	60%	
Raw foods of animal origin are most likely to be contaminated	40%	60%	
Any food item that is touched by a person who is ill with vomiting or diarrhea can be contaminated	60%	40%	
Food businesses should be inspected regularly by the local or state department of health	50%	50%	
Food businesses should check that all food received is from a reliable source and is under proper temperature control, protected from contamination and has the best before or after use date	40%	60%	
Food safety management is to ensure that consumers are kept safe from foodborne illness and that facilities can pass required health inspection	60%	40%	
Legal action can be taken against any food establishment for any action where food safety can be compromised	40%	60%	
It is important to remain informed about food safety issues to avoid Foodborne illness.	60%	40%	

Table 5: Food establishment level of agreement on food safety (n = 10).

Level of agreement: A majority of participants, 80 percent agreed that food safety has an impact on food security.

A majority of respondents agreed on eight issues (Table 4), while (2) strongly agreed that Utensils and serving dishes should always be kept clean (80 percent, M = 1.67), practicing food safety helps maintain good health (80 percent, M = 1.67), begin food preparation with proper hand washing (60 percent, M = 1.70), all food employees should have some food service training (60 percent, M = 1.70), cold food should be stored at 40 degrees F or below to prevent bacteria growth (60 percent, M = 1.70), any food that is touched by a person who is ill with vomiting or diarrhea can be contaminated (60 percent, M = 1.70), food safety management is to ensure that consumers are kept safe from foodborne illness and that facilities can pass required health inspection (60 percent, M = 1.70) and it is important to remain informed about food safety issues to avoid foodborne illness (60 percent, M = 1.70).

Survey Items 1-24	Mean	Standard Deviation
Begin food preparation with proper handwashing	1.70	.52
Preparation counter should be disinfected regularly	1.60	.52
Utensils and serving dishes should always be kept clean	1.67	.51
Practicing food safety helps maintain good health	1.67	.51
All food businesses should have a cleaning schedule	1.70	.48
All food employees should have some food safety training	1.70	.48
All food handlers should wash hands before putting gloves	1.50	.52
Hot food should be kept hot, at or above 140 degrees F	1.70	.48
Cold food should be stored at 40 degrees F or below to prevent bacteria growth	1.70	.48
Cook food should only be left at room temperature for, at most, two hours to prevent bacteria growth	1.80	.42
Never rely on the look or smell of food to be sure it's still good	1.80	.42
Foodborne illness is caused by consuming contaminated food or drink	1.58	.62
Food safety has an impact on food security	1.70	.48
Healthy clean workers do carry food poisoning bacteria on their bodies	1.80	.42
Most foodborne diseases are infections caused by a variety of bacteria	1.68	.62
Trash and food scraps in preparation area should be emptied daily	1.80	.42
Good food hygiene practices and personal cleanliness will minimize the risk of food poisoning	1.80	.42
Raw foods of animal origin are most likely to be contaminated	1.70	.48
Any food item that is touched by a person who is ill with vomiting or diarrhea can be contaminated	1.70	.48
Food businesses should be inspected regularly by the state department of health	1.60	.51
Food businesses should check that all food received is from a reliable source and is under proper temperature control, protected from contamination and has the best before or after use date	1.80	.42
Food safety management is to ensure that consumers are kept safe from foodborne illness and that facilities can pass required health inspection	1.70	.48
Legal action can be taken against any food establishment for any action where food safety can be compromised	1.70	.48
It is important to remain informed about food safety issues to avoid Foodborne illness	1.70	.48

Table 6: Food establishment level of agreement on food safety (n = 10).

Conclusion

Investigators were provided with valuable insights into southwest Mississippi food handlers' participants' level of awareness on food safety procedures, and how they can lead to good health. The investigators believe that the findings show that food service businesses in southwest Mississippi have basic knowledge of food safety issues and how they play a crucial role in the health and safety of the consumer. It is important to note that although the contamination of food can

occur at any stage of the food production process, a considerable level of foodborne diseases is caused by improper food handling, not properly cooked, storage, and preparation in the food business establishments.

Results also showed that participants have decided to take the safety of their food more seriously in order to avoid foodborne illnesses and keep their customers healthy. Participants understand that foodservice managers are responsible for making sure that employees follow safe food handling practices at all times. Result also indicated that participants are aware that all food employees should have some food service training.

It is of vital importance that emphasis be placed on prevention of foodborne illnesses, which is quite inexpensive, and the economic impact of food safety should not be taken lightly. We must understand the many challenges in keeping food safe, however, we should never stop trying to find ways to eliminate foodborne disease because Americans and the world at large deserve to have safe food at all times, whether it is prepared in the home or food establishment.

Limitations

Unfortunately, many of the reviews focusing on the effectiveness of food safety training on food handler behavior use self-reporting surveys and questionnaires. The number of food service businesses was small because we did not survey food trucks or those services in gas stations. The information gathered was priceless to the researchers and the southwest Mississippi community as we move forward to developing a curriculum on food safety handling and practices as a teaching tool for a specific audience. The investigators believe that more experimental research studies should be conducted to help augment the belief that employer and employee behavior and knowledge on food safety is paramount.

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Treatments	Composition
T1 (Control)	River sand 1: Coir dust 1
T2	River sand 1: Compost 1
T3	River sand 1: Compost 1: Coir dust 1
T4	River sand 1: Compost 1: Coir dust1: Top soil 1
T5	River sand 1: Compost 1:Coir dust 1: Cow dung 1
T6	River sand 1: Compost 1:Coir dust 1: Leaf mold 1
T7	River sand 1: Compost 1: Coir dust 1: half burned paddy husk 1

Table 1: Treatments and composition of the potting mixtures of the experiment.

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