

Research Article

Knowledge Base on Food Borne Diseases and Hygiene in Ghana: Appraisal of Food Vendors in Oguaa Koforidua

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Abstract: The study assessed knowledge base of food vendors' hygiene practices in Koforidua in the eastern region of Ghana. As a descriptive survey study, fifty (50) respondents made up of food vendors were purposively and conveniently sampled respectively for the study. The data gathered was analyzed using SPSS Version 17 and converted into frequencies, percentages and tables. This study concluded that street food vendors do have relevant knowledge of hygienic food handling practices through the training they receive, but the knowledge they acquire is not put into practice. The study also revealed that effective and regular inspections by Environmental Health officers will couple stringent enforcement of all regulations governing their practices to streamline the activities of the food vendors for better health of their consumers. It is recommended that the training and certification of food vendors should be organized on a regular basis and should be designed using the Hazard Analysis of Critical Control Point (HACCP). Environmental Health Officers must conduct follow-up exercises after training programmes to ascertain whether food vendors are putting knowledge they have acquired into practice. It is also recommended that, the Metropolitan/Municipal/District environmental health officers should ensure that inspection of street food vendors are carried out effectively, efficiently and regularly so as to monitor the food handling practices of the food vendors' right from the time of preparation to the point of sale. This is to ensure that food served to consumers is safe for consumption. Vendors who do not put the knowledge they have acquired into practice should have their certificates retrieved and signed up for retraining.

Keywords: Appraisal, Training, Awareness, Food, Hygiene, Vendors, Koforidua, Ghana

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1. Introduction

World Declaration on Nutrition adopted by the Food and Agricultural Organization (FAO) International Conference on Nutrition in December 1992, asserts that adequate access to nutritionally and safe food is a right of each individual. As such every individual is entitled to food that is safe and of good quality, since safe food is functional in achieving freedom from hunger and enjoyment of the best attainable state of health. The general well-being of individuals and families all over the world to a large extent depends on the food production chain in their environment, including those who grow, process, market, cook and serve food in various forms for consumption. Anybody who is involved in the production, processing, sale and service of food has a role in ensuring that the final consumer's health is not jeopardized in anyway [1].

The consumption of street food is common in many countries where unemployment is high, salaries are low, work opportunities and social programmes are limited and where urbanization is taking place [2]. Street food contributes substantially to household food spending and provides an income to many female-headed households. It is estimated that

street foods contribute up to 40% of the daily diet of urban consumers in developing countries [2]. Workers from industries, government institutions and the general public are compelled to patronize street food especially in the afternoons since the duration for lunch breaks is not sufficient for them to walk long distances to eat in well-established formal food establishments or at home. In addition to being a significant source of food for the urban dwellers, street food has also in recent years emerged as a tourist attraction.

Unfortunately, the emergence of informal food businesses can cause health problems if the foods are not prepared and handled properly. Street foods are perceived to be a major contributory factor to food borne diseases, as in most instances, food is prepared in unsanitary environment by people not trained in proper food handling techniques and stored for long periods in unsuitable conditions before selling [3]. Although governments all over the world have policies in place to improve the safety of food supply, the occurrence of food borne disease remains a significant health issue in both developed and developing countries. In large scale cooking, food passes through many hands, thereby increasing the chances of food contamination due to improper handling. Deliberate or accidental contamination of food during large – scale production might endanger the health of consumers and have very expensive repercussions on a country [4]. It has been estimated that each year 1.8 million people die as a result of diarrhea and other diseases which can be attributed to contaminated food or water borne diseases [5]. Food-borne disease outbreaks that have been reported in the United States for instance, cited mishandling of food and implicated food from commercial or institutional establishments). Notably, that the outbreak of cholera in Peru in 1991 was as a result of poor street food handling practices [6]. In recent years, Ghana has also experienced instances of cholera outbreaks in its major cities and towns such as Accra, Kumasi, and Koforidua. Numerous studies conducted in Ghana concerning various aspects of food hygiene over the past decade have revealed that most food vendors have poor food hygiene knowledge and attitudes that affect the personal hygiene of the vendors [4]. The Ghana Medical Journal and the World Bank Food Safety Action Plan in 2006 respectively also outlined that, the total number of outpatient cases of food borne diseases reported in Ghana is about 420,000 per year, with an annual death rate estimated at 65,000 and a total cost to the Ghanaian economy at US \$ 69 million, an estimated 25% of these reported food-borne disease outbreaks could have been avoided by safe food handling practices [4,7,8].

The Food and Drugs Authority in Ghana has drafted a food safety policy aimed at streamlining various legislations that govern food safety in the country. The key aspects of this policy include the mission and vision of Ghana with regard to food safety, the streamlining of all legislations with regard to food safety, building the capacity of all institutions involved in food safety management, strengthening inspection services, strengthening laboratory services, and strengthening import control. To ensure the safety of food consumed by individuals who patronize vended foods is indeed a global issue which needs to be seriously addressed by all governments. The motive for this research was to examine the food vendor's knowledge of food borne diseases, their food handling practices, the training facilities available to the vendors and the perception and knowledge of their consumers with regard to the safety of food. In recent times however, there have been a lot of reported cases of food borne illnesses at the Regional Hospital as a result of the consumption of vended foods. Food borne illnesses may arise as a result of poor environmental hygiene. It is for this reason that the researchers deem it crucial to assess what information do the street food vendors have on food safety in Oguaa Koforidua. The purpose of this study was to assess food vendors' knowledge base on training and awareness of food hygiene in Oguaa Koforidua in the Eastern Region of Ghana. The study sought to answer these research questions- (1) What awareness do food vendors in Koforidua have on food borne diseases and the regulations governing their operations? (2) What training in food hygiene have been given to street food vendors?

2. Methodology

The research design for the study was a descriptive survey. The study sought to find and analyze a current food handling situation in the informal food industry in Oguaa Koforidua Central in the New Juaben Municipality of the Eastern Region of Ghana. The population of the study included all food vendors selling cooked food in Koforidua in the New Juaben Municipality. The study required data on the knowledge base of food vendors' hygiene practices from the time of preparation to the point of sale. The target population was the food vendors who cook and sell food on site and the consumers of the vended foods. The study was on the food vendors who cooked and sold food on the spot for sale, included both trained and untrained, licensed and unlicensed food vendors in Oguaa, the central point of Koforidua where most formal and informal businesses are located. The purposive sampling was used to select both the trained and untrained fifty (50) food vendors' food vendors in Oguaa central point in Koforidua. The research instrument used to gather data for the study was structured interview guide. Statistical Package for Social Sciences (SPSS) version 17 was used to analysis structured interview guide.

3. Results and Discussions

3.1 Food Vendors knowledge of Food Borne Diseases and Food Vending Regulations

This section presents findings and discussions on food vendors' knowledge of food borne diseases and regulations governing their operations.

The findings revealed that the respondents were very much aware of food borne diseases and the food safety regulations governing their operations. [Table 1](#) revealed that, 70% had some knowledge on laws regarding food hygiene and penalties for violating these regulations, while 30% had no knowledge on food hygiene at all. In Ghana, various bye-laws on food hygiene aim at ensuring that only safe and wholesome food, drugs and other substances are made available for public consumption. As stipulated by these laws, the sale of food under unsanitary conditions is an offence [\[9\]](#). 70% of food vendors had some knowledge of laws regarding the sale of food and were aware of these aspects of the law. However, only 48% of vendors were able to state correctly the reason for certification. The public health requirements insist on food handlers to undergo medical screening for infectious or contagious diseases such as typhoid fever, tuberculosis, cholera, dysentery and other communicable and air-borne diseases. Periodic screening is also a requirement by metropolitan, municipal and district environmental health officers and inspectors. The vendors are expected to carry out complete physical and medical examination and obtain health certificates issued by the authorized health centers [\[10\]](#).

All the vendors questioned said they washed their hands frequently. However, twenty-four percent (24%) of the food vendors washed their hands before handling food, 52% of them washed their hands after blowing their nose, 24% washed their hands after greeting people while the remaining 20% also washed their hands after visiting the toilet. A study conducted on Food safety knowledge and practices of street food vendors in Atbara City) revealed that, 74% of street vendors washed their hands because of contamination. Ninety-two percent (92%) gave "after using the toilet" as a reason for hand washing the study also revealed that, 38% indicated that hands should be washed when handling raw foods and 46% indicated that they should be washed continuously while handling foods. Seventy-eight percent (78%) indicated that hands should be washed with soap and water with 8% indicating that they should also be washed in hot water [\[11\]](#). This was a good signal, because that the most common source of food contamination was humans especially when the hand gets into contact with food items. The CDC indicated that hands were the cause of most enteric virus transmissions [\[12\]](#).

Hand washing was one of the fundamental practices that decrease the spread of food borne illnesses [\[13\]](#). Defective personal hygiene could facilitate the transmission of pathogenic bacteria found in the environment and on people's hands from food to humans

[14]. The respondents' knowledge on the keeping of working surfaces clean and the separation of raw and cooked food in the refrigerator was not encouraging since more than (50%) of the vendors were not aware that when raw and cooked foods were put together in the refrigerator it could result in contamination and food borne illness. Storage order should ensure that raw meats, poultry, and seafood were separated and placed below ready to eat and cooked foods [5]

Table 1. Food Vendors knowledge of Food Borne Diseases and Food Vending Regulations

Item	Yes		No		Total	
	f	%	f	%	f	%
Are there laws and regulation governing food vendors?	50	100	0	0	50	100
Are you aware of any food safety regulations?	35	70	15	30	50	100
Do you have certificate of acceptability to handle food?	30	60	20	40	50	100
Do you know why you need certificate of acceptability to handle food?	24	48	26	52	50	100
Do you know who the environmental officer is?	36	72	14	28	50	100
Do you wash your hand frequently when handling food?	50	100	0	0	50	100
Keeping work surfaces clean reduces risk of food borne illness	44	88	6	12	50	100
Storing raw and cooked food separately in the refrigerator help to prevent food borne illness	8	16	4	8	50	100
Do you check on the temperature of food before storage?	12	24	38	76	50	100
Do you cover cooked food properly?	50	100	0	0	0	0
Improper waste disposal can lead to food contamination	40	80	10	20	0	0
Cooked food should be thoroughly reheated	50	100	0	0	0	0
Do you separate equipment and utensils for handling raw and cooked food	6	12	44	88	0	0
There should be portable water at vending sites	50	100	0	0	0	0
Do you cover cooked food properly?	50	100	0	0	0	0

Key: D.K = Don't Know

This study also revealed that food vendors do not check the temperature of food before storage. At an international conference on nutrition resolved that, if food could not

be served immediately, it should be kept hot or cooled down rapidly and reheated completely to a temperature of at least 70C before eating [1]. This is to make sure that microbes will not thrive in the food because microbes flourish well between 10 C and 60 C. It was revealed that food vendors used the same equipment for handling-both raw and cooked food. This implies that food vendors were not aware that when the same equipment was used to handle both raw and cooked foods, it resulted in cross contamination and subsequently food-borne illnesses. Majority of the vendors reported that the reason for wearing an apron was for identification. This is a clear indication that the food vendors did not know the purpose for which aprons are worn by food handlers.

The study also revealed 72% of the respondents knew who the environmental health officer was and the roles they play to ensure food safety. The Environmental Health Officer uses the knowledge and skills of the natural, behavioural and environmental sciences to prevent diseases and injury and to promote human well-being in terms of food control [15]. In this study, 80% of the respondents knew that improper waste disposal can lead to food-borne diseases. The use of potable water at the vending site also helps to prevent food-borne diseases.

The respondents' knowledge needed to be confirmed by their food handling practices to ascertain whether their knowledge commensurate with their practices. A study conducted in Kumasi, Ghana found that many vendors do in fact have sufficient knowledge to ensure hygiene handling of food, such as knowledge of the dangers of faecal contamination and serious food-borne diseases [16]. However, the knowledge was not turned into safe practices, not even by those vendors who had obtained formal training in cooking.

3.2 Training on food hygiene for street food vendors

This section of the study was designed to identify the training facilities that are available for the informal food sector by the municipal assembly health officers on food hygiene. All the food vendors (100%) know that they required training to enable them to carry out their operations effectively and efficiently. Yet only 60% had been trained and were licensed.

Table 2. Training Period

Training period	Frequency	Percentage
1-3 days	24	48
One week	4	8
One month	2	4
No training	20	40
Total	100	100

Table 2 had revealed that the food vendors stated varying periods of training. Some of them said they were trained for 1-3 days, others said they were trained for one week while others were trained for one month. However, the duration of training may not have a great impact on food vendor's food safety practices. A study in Oklahoma County found that there was no significant difference between the number of hours of training and improvement of food safety practice [17]. Employees must have a firm understanding of food safety and more importantly, employees must be obligated to actively practice sanitation in the workplace at all times. This posits that food vendors are required to undergo basic training in food hygiene before licensing. The implication here is that; the food vendors will continue to sharpen their basic skills in food preparations. This is because inadequate hygiene training and/or instruction and supervision of all people involved in food-

related activities poses a potential threat to the safety of food and its suitability for consumption. Since poor personal hygiene, cross-contamination, and time-temperature abuse are the three main causes of food borne illness, there is the need for food safety and sanitation training to be conducted and maintained on a regular basis in foodservice establishments [18].

Table 3. Reasons for Not Having Training

Reasons for not Being Trained	Frequency	Percentage
Not having money	4	8
Time constraint	16	32
Already trained	30	60
Total	50	100

The reason why some of the vendors had not received any training was: no money (8%), time constraint (32%) since the training periods always coincide with their busy periods. The remaining 60% were trained and as such gave no response to this question. The study had revealed that those food vendors who had not undergone for training are a threat to the public health. This implies that the districts and municipal assemblies should organised free training for food vendors to prepare good meals for public consumption. Food handlers should have the necessary knowledge and skills to enable them to handle food hygienically [5]. Systems should be put in place to ensure that food handlers become aware of all procedures necessary to maintain the safety and suitability of food. Moreover, food will remain safe as long as critical behaviors are observed in food handling [19].

Table 4. Where Vendors were Trained

Where did you Train	Frequency	Percentage
Workshop	30	60
On the Job	0	0
Not trained	20	40
Total	50	100

On the account of where the vendors had their training, 60% stated that they trained at workshops with none trained on the job. The remaining 20(40%) were not trained. The researcher probed further to find out from the respondents who organized the training sessions for them. All the 30 (60%) trained vendors were trained by municipal health officers mandated. Forty percent (40%) were not trained. All trained food vendors in this study admitted being trained at workshops organized by the Municipal Assembly health officers. The main focus of the workshops as revealed by the study was food and environmental hygiene. Training is critical to any system of food hygiene. Training, instruction and proper supervision increase the potential of the food vendors.

However, a study conducted in Kumasi, Ghana found that many vendors do in fact have sufficient knowledge to ensure hygienic handling of food, such as knowledge of the dangers of faecal contamination and serious food borne diseases, but the knowledge was not turned into safe practices, not even by those vendors who had obtained formal training in cooking [20]. This clearly shows that, those trained and not trained need to be given quarterly training by their district and municipal health officers to keep them fit in providing good food items to the public.

Table 5. Frequency for Organizing Training Sessions

How often	Frequency	Percentage
Once every	0	0
Six months	26	52
Once every year	4	8
Not trained	20	40
Total	50	100

On when the training programmes are organized for them, majority of the vendors (52%) said they were given training once every six months while 8% stated they were trained once in a year. The remaining 40% respondents were not trained and so could not respond to this question. At this wavelength, periodic training is very paramount in the domain of food vendor business in Ghana. Research has shown that the key to preventing food borne disease is to educate and train food handlers [21]. This implies that, training programmes should be frequently organised for food vendors to curtail the spread of food borne disease.

Table 6. Curriculum of the Training Sessions

Training offered	Frequency	Percentage
Hygienic food handling	8	16
Food and environmental Hygiene	22	44
Not trained	20	40
Total	50	100

The training given to the food vendors covered hygienic food handling (16%), food and environmental hygiene (44%). The remaining (40%) untrained food vendors could not respond to this question since they were trained. Seventy-two percent (72%) of the food vendors stated that environmental health officers visited and inspected their vending sites regularly to make sure they adhered to the rules and regulations that governed their operations. The remaining 28% indicated no such visits.

The study revealed that only 60% of the food vendors were trained and certified to cook food for sale which is a very important requirement in food vending. These unsatisfactory results were in agreement with a study conducted in Ghana discovered that 45% of street food vendors in Cape Coast Ghana were not certified medically to handle food [17]. Another study conducted by Musa and Akande, revealed that 60% of the food vendors interviewed had no health certificate which is an indication that they have not been trained [18]. Some of the food vendors who were not trained explained that they were not trained because of time constraints since training sessions normally coincide with their peak periods. A study in Konongo, Ghana had a similarly reported that, 52.6% of food vendors were without medical examination certificates because they were not aware of the requirement whereas others gave reasons such as lack of finances, not a necessary requirement and too busy to make time for medical screening as justification for not having been medically examined.

Food handlers should have the necessary knowledge and skills to enable them to handle food hygienically [5]. Food vendors were required to undergo basic training in

food hygiene before licensing and any further training as required by the relevant authorities [1, 19]. This is necessary because inadequate hygiene training and/or instruction and supervision of all people involved in food related activities pose a potential threat to the safety of food and its suitability for consumption. Food safety training attempts to improve employees' food safety practices [18]. Since poor personal hygiene, cross-contamination, and time-temperature abuse are the three main causes of food borne illness, there is a need for food safety and sanitation training to be conducted and maintained on a regular basis in foodservice establishments.

This study also revealed that, the food vendors stated varying periods of training. Some of them said they were trained for 1-3 days, others said they were trained for one week while others were trained for one month. However, the duration of training may not have a great impact on food vendor's food safety practices. A study in Oklahoma County found that there was no significant difference between the number of hours of training and improvement of food safety practice [17]. Employees must have a firm understanding of food safety and more importantly employees must be obligated to actively practice sanitation in the workplace at all times. All trained food vendors in this study admitted being trained at workshops organized by the Municipal Assembly health officers. The main focus of the workshops as revealed by the study was food and environmental hygiene. Training is critical to any system of food hygiene. Training, instruction and proper supervision increase the potential of the food vendors.

4. Conclusions

This study has shown that some street food vendors do have some knowledge in hygienic food handling practices through the training they receive but the knowledge they acquire are not put into practice. Effective and regular inspections by Environmental Health officers coupled with stringent enforcement of all regulations governing their practices as has been identified earlier would go a long way to streamline the activities of the food vendors for better health of their consumers.

5. Recommendations

It is recommended that the training and certification of food vendors should be organized on a regular basis and should be designed using the Hazard Analysis of Critical Control Point (HACCP). Environmental Health Officers must conduct follow-up exercises after training programmes to ascertain whether food vendors are putting knowledge they have acquired into practice. It is also recommended that, the Metropolitan/Municipal/District environmental health officers should ensure that inspection of street food vendors are carried out effectively, efficiently and regularly so as to monitor the food handling practices of the food vendors' right from the time of preparation to the point of sale. This is to ensure that food served to consumers is safe for consumption. Vendors who do not put the knowledge they have acquired into practice should have their certificates retrieved and signed up for retraining.

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