

UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

**FOOD SAFETY AWARENESS AND PRACTICES AMONG FOOD VENDORS IN
THE BASIC SCHOOLS IN BOSOMTWE DISTRICT OF THE ASHANTI REGION**



AMA BIRAGO TAMAKLOE

2018

UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

**FOOD SAFETY AWARENESS AND PRACTICE AMONG FOOD VENDORS IN
THE BASIC SCHOOLS IN THE BOSOMTWE DISTRICT OF THE ASHANTI
REGION**



**AMA BIRAGO TAMAKLOE
(M'TECH CATERING)**

**A Dissertation in the Department of HOSPITALITY AND TOURISM EDUCATION,
faculty of VOCATIONAL EDUCATION, submitted to the school of graduate studies,
University of Education Winneba, in partial fulfillment of the requirements for award
of Masters of Technology Education in (Catering and Hospitality) degree**

December, 2018

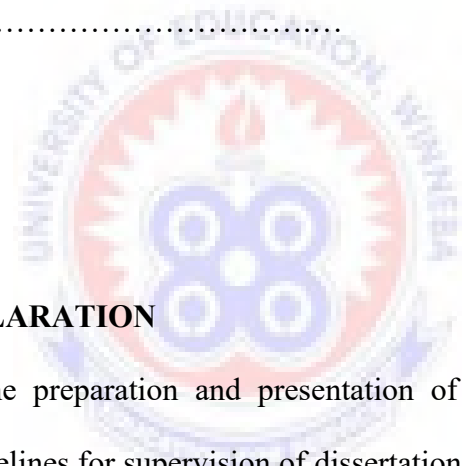
DECLARATION

STUDENT'S DECLARATION

I, Ama Birago Tamakloe, declare that this dissertation, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere

SIGNATURE.....

DATE.....



SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of dissertation as laid down by the University of Education, Winneba.

MR. MICHAEL K. TSORGALI

SIGNATURE.....

DATE.....

DEDICATION

I dedicate this dissertation to my husband Saviour Korbla Tamakloe, I say thank you for the love and support, and also to my kids Dela, Elikplim and Nayram, I say thank you for giving me moral support and peace of mind to complete successfully.



ACKNOWLEDGEMENT

I am most grateful to the Almighty God for bringing me this far despite all the challenges I was confronted with during this work.

I am also very thankful to my learned supervisor, Mr. Michael K. Tsorgali. In fact his depth of knowledge and guidance has made this work a success.

To my parents, I say God bless for being there for me in my absence.

Finally, many thanks to my siblings for their spiritual and financial support given me not forgetting Mr. Bright Frimpong who out of his busy schedule gave me guidance and encouragement for the successful completion.



ABSTRACT

Food vendors in school campuses have become an integral part of the lives of school children since everyday routines demand a significant amount of time. The number of diners continues to escalate and so has the number of food borne illness outbreaks as a result of food prepared in commercial foodservice operations. The study sought to ascertain the level of awareness and the degree of food safety practices among of food vendors in the Basic Schools in the Bosomtwe District. This leads to answer the following research questions. What are the relative levels of awareness on the food safety? What is the frequent practice of food vendors on food safety? What are the causes of non-compliance of food vendors to food safety awareness practices? What measures are used to ensure effective food safety awareness practices among food vendors? Questionnaires were used to collect primary data while secondary data was obtained from library, internet, journal and articles. The scope of the study was limited to Bosomtwe District where eight schools were selected. From the selected schools, questionnaires were administered to the respondents, upon which presentation and analysis were made using SPSS 17 based on their responses. The findings of the study established the following among others; vendors and consumers have high knowledge of food safety awareness as they know that food handler can cause food contamination, washing of bowls/plate/cups in soapy water at least twice before rinsing reduces the spread of germs and handling money with bare hands at the same time serving food with bare hands increases the risk of food contamination. The study recommended among others; authorities should ensure that all vendors go through formal training on food preparation after health screening before issued certificate to commence business. This will enable the vendors to exhibit proper food safety practices.

TABLE OF CONTENTS

CONTENTS	PAGE
DECLARATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT.....	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF TABLES.....	x
LIST OF FIGURES	xi
CHAPTER ONE: INTRODUCTION.....	1
1.1. Background to the Study.....	1
1.2. Statement of Problem.....	4
1.3. Purpose of the study.....	5
1.4. Specific Objectives	6
1.5. Research Questions.....	6
1.6. Significance of the Study.....	6
CHAPTER TWO: REVIEW OF RELATED LITERATURE.....	8
2.1. Introduction.....	8
2.2 The Concept of Food.....	8
2.3. Food Safety	9
2.4. Food safety knowledge and attitudes.....	10
2.5. Food handling practices	12

2.6. Consequences of Inadequate Food Safety Knowledge	15
2.7. Barriers to Food Safety Practices.....	16
2.7.1 Personal Hygiene of The Food Vendors	17
2.7.2. Hand Washing Attitude of The Food Vendors	18
2.7.3 Environmental Hygiene of The Food Vendors	19
2.7.4. Cleanliness of Premises of The Food Vendors	20
2.7.5. Disposal OF Waste by Food Vendors.....	21
2.8. Sources of Food Contamination.....	22
2.8.1 Cross-Contamination of Food.....	25
2.8.2 Preventing Cross-Contamination of Food.....	25
CHAPTER THREE: METHODOLOGY	27
3.1. Introduction.....	27
3.2. Research Design.....	27
3.3 Population	27
3.4 Sampling technique and Sample Size	27
3.5 Data Collection Instruments.....	28
3.5.1 Questionnaire	28
3.5.2 Interview	29
3.5.3 Observation	29
3.6 Data Analysis Procedure.....	29
3.7 Ethical consideration.....	30

CHAPTER FOUR: RESULTS AND DISCUSSION.....	32
4.1 Introduction.....	32
4.2 Demographic Characteristics of respondents.....	32
4.2.1 Gender of the Respondents	32
4.2.2 Age of the Respondents	33
4.2.2.1 Age of food vendors.....	33
4.2.2.2 Age of consumers.....	34
4.2.2.3 Age of supervisors	34
4.2.3 Educational background of the respondents	35
4.2.4 Years of experience as a food vendor	36
4.2.5 Knowledge on Food Safety Awareness of respondents.....	37
4.2.5.1 Knowledge on food safety awareness of vendors.....	37
4.2.5.2 Knowledge on food safety awareness of consumers	41
4.2.6 Food safety practices of food vendors	42
4.2.6.1 Consumers perspective of vendors food safety practices	46
4.2.6.2 Supervisors perspective of vendors food safety practices	48
4.2.7 Causes of non-compliance to food safety awareness practices.....	49
4.2.8 Measures to ensure effective food safety awareness practices	50
CHAPTER FIVE: SUMMARY OF FINDINGS CONCLUSION AND	
RECOMMENDATIONS	54
5.1 Introduction.....	54
5.2 Summary of findings.....	54

5.3 Conclusion	56
5.4 Recommendation	56
REFERENCES	58
INTERVIEW GUIDE FOR SELECTED FOOD VENDORS	65
QUESTIONNAIRE FOR CONSUMERS.....	72
QUESTIONNAIRE FOR SUPERVISORS.....	75
QUESTIONNAIRE FOR OFFICERS.....	78



LIST OF TABLES

Table 4.1: Gender distribution of respondents	33
Table 4.2: Age distribution of vendors	33
Table 4.3: Educational background distribution of respondents	36
Table 4.4: Period of selling distribution of vendors	37
Table 4.5: Training acquired by vendors distribution	39
Table 4.6: knowledge on food safety awareness distribution of vendors	40
Table 4.7a: knowledge on food safety awareness distribution of consumers	41
Table 4.7b: knowledge on food safety awareness distribution of consumers	42
Table 4.8a: Food safety practices distribution of vendors	44
Table 4.8b: Food safety practices distribution of vendors	45
Table 4.8c: Food safety practices distribution of vendor	46
Table 4.9a: Food safety practices distribution of vendors by consumer	47
Table 4.9b: Food safety practices distribution of vendors by consumers	47
Table 4.10: Food safety practices distribution of vendors by supervisors	49
Table 4.11a: Measures to ensure food awareness practices distribution of vendors	51
Table 4.11b: Measures to ensure food awareness practices distribution of vendors	52
Table 4.11c: Measures to ensure food awareness practices distribution of vendors	53

LIST OF FIGURES

Figure 4.1 Age of consumers	34
Figure 4.2 Age of supervisors	35
Figure 4.3 Causes of non-compliance	50



CHAPTER ONE

INTRODUCTION

1.1. Background to the Study

Food vendors in school campuses have become an integral part of the lives of school children since everyday routines demand a significant amount of time. The number of diners continues to escalate and so has the number of food borne illness outbreaks as a result of food prepared in commercial foodservice operations.

According to Acheson (2011), the causes of food borne illness can be viral, bacterial, parasitic, or chemical. The two leading causes are viral and bacterial. Public exposure to unsafe food handling practices is likely to increase as the popularity of dining out and “take out” grows (Acikel, 2007). The changing consumer lifestyle emphasizes the need for better and more effective ways of controlling food hygiene (Guzewich & Ross, 2009). Food borne illness outbreaks are on the rise and food safety continues to be a major concern since food borne illnesses have potential to attack patrons through a variety of ways (Haapala & Probart, 2004).

Food safety is a critical issue facing the foodservice industry (Collins, 2007). An understanding of food safety procedures and potential factors that cause food borne illness is very important for all food handlers. Fieldhouse (2005) stated that the only knowledgeable, motivated, and skilled employees who are trained to follow the proper procedures together with management that effectively monitors employees’ performances can ensure food safety. Foodservice workers play a major role in prevention and control of outbreaks of food borne illness.

Food vendors in school compounds provide services to basically children and teachers. It is not common that the vendors have no foodservice experience. As a result, they may have less awareness of and concern about principles of food safety and hygienic practices. It is very important for food vendors in our basic schools to be educated about food safety, train them to use appropriate food handling procedures, and monitor their performance.

Several studies have been conducted to assess vendors on food safety knowledge, attitudes, practices, and training. Collins (2007), studied food vendors' attitudes, practices, and knowledge of food safety and noted that, the food vendors had less knowledge about food security and practices.

Vendors' food contamination results from proliferation of microbes at unsafe temperatures, handling by infected persons who practice unsanitary habits and direct exposure to microbes that cause the disease (Collins, 2007). Good sanitation practices in food vendors in school are important not only to reduce direct and cross-contamination of food but also to increase the morale and efficiency of vendors and to satisfy the children from an aesthetic point of view.

Food vendors need proper hygiene practices concerning cleanliness of hands and work clothes and correct methods of handling food and utensils. They must not smoke cigarettes while preparing or serving food or work in any area of a food service establishment while infected with any communicable disease. Training the staff on the principles of handling food in all its stages is important. It has been reported that most outbreaks of food borne diseases result from faulty food handling practices (World Health Organization, 2002). For

example, improper food handling practices have contributed to approximately 97% of food borne illnesses in homes and food-service establishments (Bruhn & Schutz, 2009). In order to decrease food borne illness it is essential to gain an understanding of the prevailing food safety practices, beliefs and knowledge of food-handlers.

According to Clayton & Peters (2002), food vendors may contaminate food by poor personal hygiene, cross-contaminating raw and processed food, as well as inadequate cooking and improper storage of food. Maintaining high food safety levels in school food services is very important because any incidences of it can affect a high number of students. In the Basic schools, most children and staff purchase their meals from food vendors. Food vendors provide children, teachers and other customers with a wide variety of foods that are relatively cheap and easily accessible. Therefore it is necessary to investigate the operations of food vendors to determine whether they are adhering to good hygienic practices.

Most of the school compounds are replete with so many things that one can think of. If there is one thing that is most saleable for the school children, it would be campus foods. Food vendors on school campuses are common in most parts of the country. These are convenient, relatively cheap and readily available. Fried or cooked rice, yam, banku and others are prepared and sold in public basic schools.

Health experts suggest that people should think twice before buying and eating campus foods. Vendors often lack access to potable water supply, garbage disposal and sometimes to a clean working environment making these foods exposed to harmful elements which may

result in consumers getting water-borne and food-borne illnesses like diarrhea, hepatitis and even food poisoning (Clayton & Peters, 2002).

Food safety is a corporate social responsibility as food is a product where consumption is not just a matter of choice, but it is ultimately a matter of life and death. Food handlers are very important people when considering food safety. Their hygiene practices affect the people who consume it and depend on them for their meals. Food safety should be a major concern for all food handlers.

The health officials cited the growing number of campus food vendors is increasing as the main reason of food and water-borne diseases. They have not issued sanitation permits to the school because they do not have permanent business addresses. It is difficult to monitor school campus food vendor's sanitary practices and their personal hygiene, food preparing, handling, serving, and storing of foods. These concern health officials and even repeatedly informing students to become cautious in eating foods sold on school campuses. It is in this light that the researchers conducted this study to be able to ascertain the level of awareness and the degree of food safety practices among food vendors in the basic schools at the Bosomtwe District.

1.2. Statement of Problem

Over the years, there has been a lot of reports on several degrees of food borne illness or poisoning (diarrhoea, cholera, typhoid etc.) among the school children in the Bosomtwe District. Observation and personal communication indicates that food vendors and handlers do not attach much importance to hygienic practices during preparation, cooking and serving

of foods, be it raw or cooked. This has been attributed to illiteracy and ignorance of safety rules leading to poor personal hygiene by food vendors, the improper storage conditions and the poor ways of disposing of both solid and liquid waste at the canteens or the vending sites.

Though the District Educational Directorate at the Bosomtwe District authorities has put measures in place to improve hygienic practices amongst food vendors such as medical screening, organizing food health programs for the food vendors located in the school community amongst other interventions, reported cases of food borne illness in the school is on the rise. The action resulting from the unacceptable food handling practices is having direct consequences on the lives of students and putting a huge financial burden on the schools management system and on parents.

In view of the persistent diarrhea and typhoid fever cases of pupils in the various schools, the researcher was prompted to examine and research into the problems and suggest possible solutions.

1.3. Purpose of the Study

The purpose of the study is to ascertain the level of awareness and the degree of food safety practices among of food vendors in the Basic Schools in the Bosomtwe District.

1.4. Specific Objectives

The objectives of the study were to:

1. Examine the knowledge of food safety awareness among food vendors and consumers.
2. Evaluate the food safety practices of food vendors.
3. Identify the causes of non-compliance to food safety awareness practices.
4. Identify measures used to ensure effective food safety awareness practices among food vendors.

1.5. Research Questions

The following research questions will be addressed:

1. What are the relative levels of awareness on the food safety?
2. What is the frequent practice of food vendors on food safety?
3. What are the causes of non-compliance of food vendors to food safety awareness practices?
4. What measures are used to ensure effective food safety awareness practices among food vendors?

1.6. Significance of the Study

The study will enable food vendors to realize the need for food safety awareness and practices to improve the services and patronization thereby increase their revenue.

The study will offer an insight into the level of food vendor's hygienic practices and thereby enhance their job performance.

The research work will serve as a reference material to the academia for future research work.

1.9. Scope of the Study

The study is focused on food safety awareness and practices among food vendors in the basic schools in the Bosomtwe District. This District is one of the districts in the Ashanti region and it is strategically located.

In this regards, finding of the study are limited to the Bosomtwe District alone and may not necessarily reflect the entire region



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Introduction

In this chapter, the researcher review literature relevant to the study. That is the researcher look at the relevant literature under the following headings:

- The Concept of Food
- Food Safety
- Food safety knowledge and attitudes
- Food handling practices
- Consequences of Inadequate Food Safety Knowledge
- Barriers to Food Safety Practices
- Sources of Food Contamination

2.2 The Concept of Food

According to Bekker (2003), food is any substance, liquid or solid that provides the body with materials for heat and energy, growth and repair and for regulating the body processes. Food is also any edible or portable substance (usually plant or animal origin) consisting of nourishing and nutritive components such as carbohydrates, proteins, fats, vitamins and minerals which when ingested and assimilated through digestion sustains the body (FAO/WHO, 2002). Albrecht (2005), also defines food as a composite of natural ingredients normally referred to as nutrients, example protein and carbohydrates, that is needed by man for the maintenance of the body. Abdussalam & Kaferstein (2003), stated that food is the

fuel which supplies chemical energy to the body to support daily activity and the synthesis of necessary chemicals within the body and is therefore critically needed for survival, growth, physical abilities and good health.

For food to perform the intended functions, it must be nutritionally complete and be free of any injurious substances. A lack or insufficiency of food or consumption of food containing inadequate nutrients may result in dietary illnesses including Pellagra, Rickets, Marasmus, Kwashiorkor and Ketosis or food containing harmful bacteria may cause food borne diseases such as Cholera, Dysentery, Hepatitis, Salmonellosis and Typhoid (Chukuezi,2010; Wie & Strohhahn, 2007).

2.3. Food Safety

Food safety is a vital issue both in developed and developing countries; given that food borne illnesses cause a lot of distress and thousands of deaths each year (Bekker, 2003). In view of this, the issue of food safety is becoming a key public health priority considering the large number of people who take their meals outside the home. As a result of this change in lifestyle, many people are exposed to food borne illnesses that originate from food stands, restaurants and other food outlets. Food service employees are a very crucial link between food and consumers (Bekker, 2003), as there are high contamination tendencies on their part. World Health Organization (2004), has established five main keys to safer food including keeping clean hands, separating raw and cooked food, cooking thoroughly, keeping food at safe temperatures, and using safe water and raw materials. These five keys to safer food are of utmost importance in developing countries, and equipping food vendors in countries with such information could impact significantly on food safety.

2.4. Food safety knowledge and attitudes

Albrecht (2005), defined food safety as the inverse of food risk - the probability of not suffering some hazard from consuming a specific food. Food safety is considered as a concept of central importance because it plays an essential public health function (WHO, 2000). The attitude of food vendors also has a big important impact on food safety issues, which are themes of interest to food producers and retailers, public authorities and health educators. This interest has been reflected in discussions about how food safety should be defined and how consumers perceive food safety and choose food. The comparatively lower number of studies conducted on consumer attitudes towards food safety in the third world countries suggests that this issue may not be of as much interest (Cohen, Reichel & Schwartz, 2001).

In general, it is assumed that the majority of consumers probably do not understand the crucial role of food safety regulations. In order to offer supportive benefits to consumers, it is important to first examine their attitudes toward food safety. Attitudes, which are relatively permanent and stable evaluative summaries about an item, are an important psychological construct because they have been found to influence and predict behaviors (Henroid & Sneed, 2004). Cohen, et, al, (2001), indicate that food vendors attitudes towards food safety in general differ according to demographic and socio-economic factors such as gender, age, educational level and economic status. Chukuezi (2010), found that men were more likely to report risky practices than women. Chukuezi (2010), further indicated that the prevalence of risky behaviors increased with increasing socio-economic status. Bas and Kivanc (2004), on the other hand found that food vendors had an acceptable awareness of

appropriate safety practices; however, a considerable number of them did not attribute certain illnesses to being food-borne and believed that it was possibly due to their own actions.

According to Chukuezi (2010), knowledge is defined as a complex process of remembering, relating, or judging an idea or abstract phenomenon (cognitive abilities). Knowledge of the street food vendors has a crucial impact on food safety. In addition to this is the fact that street food vendors are often unlicensed, untrained in food hygiene and sanitation and work under crude unsanitary conditions (Henroid & Sneed, 2004). According to the WHO (2000), street food vendors in most developing countries should be educated as they are currently not sufficiently organized and responsive to undertake the responsibility of their own training. Food vendors should be adequately educated on the role of food in disease transmission as well as on rules of personal hygiene and approved practices in handling street food.

According to the WHO (2000), education of food handlers and consumers is considered as an effective strategy for reducing food-borne illness and economic losses associated with food-borne diseases (WHO, 2000). In particular, the education programs should focus on microbiological, chemical and physical food risks so that consumers and vendors will change their behavior associated with poor food hygiene practice. For examples, generic educational materials on safe food handling and food-borne diseases (FAO/WHO (2003), a five keys manual entitled 'Bringing Food Safety Home' (WHO, 2000), could be considered as an effective guidance for food safety training. Moreover, food vendor's education should

focus on the safe practices in good food hygiene, common causes as well as related factors to food-borne illness, basic safety of food-handling principles such as cross-contamination (WHO, 2000).

2.5. Food Handling Practices

According to WHO (2000), food handlers play an important role in ensuring food safety throughout the food production chain. In particular, food vendors who have poor handling practices or disregard hygienic practices may increase the risk of pathogens coming into contact with foods. These pathogens in some cases can survive and multiply to numbers sufficient to cause illness in consumers. Fawzi and Mona (2009), indicated that street foods are positive vectors of food-borne illnesses. This is mainly explained by the poor practices on hygienic measures associated with the production and vending of street foods. As an example most of the vendors arrange both raw and cooked food items together, a consequence of which is an increased risk of cross contamination (WHO, 2000).

In addition, the hands are the most important vector for the transfer of organisms from faeces, nose, skin or other parts of body to food (WHO, 2000). Abdalla and Bakhiet (2008), indicated that organisms can survive on finger tips and other surfaces for varying periods of time and in some cases after hand washing. Moreover, food handlers can contaminate food either passively or actively. The biological hazards may be introduced from a sick handler, from organisms on the food handlers skin or faeces, from their respiratory tract or by cross contamination after handling raw materials (WHO, 2000).

Physical hazards may be introduced by food handlers wearing jewelry, bandages or by careless food handling practices (WHO, 2000). Furthermore, street food vendors have frequently been considered to use improper food preparation and selling practices (Martins 2006; Richardson & Stevens, 2003). Rennie (2005), highlighted the lack of clean (potable) water at vending sites resulting in hand washing often being done in buckets of water (without soap); waste water and garbage are discarded in the streets, which provides food for insects and rodents; food material is usually not effectively protected from dust and flies which may harbor harmful pathogens; and safe food storage is difficult to maintain. In lower middle income countries preparing and processing street foods is often done by traditional methods using kitchen utensils which are produced by handmade bamboo wood without any quality control (WHO, 2006). Instead, vendors should be motivated by government to replace the traditional utensils by modern plastic or stainless steel utensils. Moreover, the government should monitor and give advice to vendors to wear gloves and masks during the preparation and processing street foods (WHO, 2006).

Many studies have reported that school-based street vendors with higher education levels had a positive impact on food hygiene practices. On the other hand, vendors with a high income may be less attentive to their hygiene practices in that the greater their earnings, the more time they tend to spend on their sales and customers (Rane 2011). Therefore, education and training of street food vendors can contribute to a marked improvement of their food handling practices, which may be the most cost-effective way to reduce the incidence of food-borne diseases by contaminated street vended foods (WHO, 2006). Some studies have revealed that although vendor training in good practices in food hygiene by

local authorities was widespread, most vendors do not translate the acquired basic hygiene knowledge into safe food practices (Griffith, 2000; Abdalla and Bakhiet, (2008). This lack of translation of acquired knowledge has been explained the fact that there are usually large numbers of small street food units which need to be attended to by the local authorities, the low educational level of the majority of street food vendors and their generally poor knowledge of good practices in food hygiene; and the crude conditions under which the vendors often operate (Buted and Ylagan 2014). In some cases, street vendors may completely ignore basic food hygiene practices but consumers probably do not pay much attention to demand safe food (Roberts, 2003). In addition, as one of the major factors contributing to unhygienic practices among street food vendors is the absence of sanitary amenities at vending sites. Therefore, it is urgently required to redesign and organise street food stalls following sanitary guidelines combined with vendor training and consumer sensitisation programmes so that a sufficient provision of food safety and nutritional quality of street foods can be ensured (WHO, 2000).

Therefore, the street food sector deserves official attention from local authorities in developing countries regarding to planning, investments, regulations and education. Furthermore, local governments need to provide support for street vendors with regards to adequate infrastructure in terms of well-designed vending structures, water supply, toilet facilities and waste disposal facilities. It is emphasized that the availability of safe and clean water plays as a crucial and vital contribution to reduce food-borne disease associated with consumption of street vended foods, whilst education plays as a potential strategy to improve the safety of street vended foods. In conclusion, food safety training to the street

vendors and consumers as well as develop food safety strategies, procedures and guidelines should be in charge of local governments in collaboration with academia to minimize the problems associated with street vended food contaminations in urban poor recently.

2.6. Consequences of Inadequate Food Safety Knowledge

Rennie (2005), defines knowledge as the practices which in turn affect willingness to change current practices if it is learned that current practices are unsafe. Variably, Scallan (2011), indicated that food handling practices are known to differ from self-reported practices. This has been established as very fundamental by Sagoo, Little, Griffith (2003), as they indicated that the main factors responsible for the outbreaks of food poisoning were inappropriate storage, inadequate cooking or heating, and cross-contamination.

Food safety experts believe sporadic cases and small outbreaks at home are far more common than those cases constituting recognized outbreaks (Roberts and Deery, 2004). They further emphasized that if food vendors misconstrue the origin and severity of food borne illness, they are less motivated to change. Motivation to practice safe food handling requires a belief that someone is harmed by not doing so, and that new behavior will prevent illness (Roberts and Deery, 2004). They claim that the failure to associate at-home food handling practices with borne illness is a serious inhibition to convince people to discontinue potentially hazardous food handling behavior.

Food safety as put out by Roberts & Brannon (2008), is the inverse of food risk- the probability of not suffering some hazard from consuming a specific food. Potential undesirable residues in foods span a broad range, from natural (mycotoxins) and

environmental pollutants (dioxins) to agro-chemicals (nitrates and pesticides), veterinary drugs, growth promoters, packaging components, and many more(Roberts & Brannon, 2008).

2.7. Barriers to Food Safety Practices

Martins (2006), asserted that food-service establishments were expected to address emerging issues of barriers to food safety practices to narrow the gap between food safety knowledge and practice. Consequently, they argued, food safety training could incorporate strategies that eliminated barriers to proper handling practice in order to improve compliance and reduce the incidence of food-borne related disease outbreak. The report further asserted that training was only valuable if its importance was translated into performance. Transfer of training was viewed as the core issue that linked individual change to an organization's requirements. To realize the difference on food handlers in the organizational performance, Buted and Ylagan (2014), indicated that the transfer of knowledge must be clear to ensure it is translated into practice. Roberts & Brannon (2008), gave strength to that argument by adding that the managers had to be on the frontline in training and the management had to support food safety training and reinforce the adoption of safe food handling behaviors. Education and training were expected to enable trainees to perform the given tasks effectively and with understanding. It is on these premises that this study saw the need to cover the three types, which included personal, environmental and food hygiene.

2.7.1 Personal Hygiene of The Food Vendors

Seaman and Eves (2010), stated that every person working in a food handling area shall – maintain a high degree of personal cleanliness and wear suitable clean and appropriate protective clothing. Personal hygiene was defined as the maintenance of personal health, particularly by cleanliness (Yiannas, 2009). Taylor (2008), indicated that personal hygiene was achieved through daily bathing or showering, wearing clean underwear, caring for the hair, mouth, teeth, hands and nails. Sharif and Al-Malki (2010), reiterated that good hygiene was the foundation for preventing the spread of food-borne illnesses, as human beings were said to be the major source of food contamination. On the same breath, Martins, Hogg and Otero (2012), postulated that if a food handler was not clean, any food handled by dirty hands could contaminate the food with organisms from their gastrointestinal tract. In another observation, Knabel (2005), shared the same sentiments and asserted that lack of personal hygiene amongst food handlers were likely to contribute to food-borne illnesses. Baş Ersun and Kivanç (2006), in addition, argued that good personal hygiene prevented incidences of cross-contamination to a reasonable level. The same was noted by Ansari-Lari, Soodbakhsh and Lakzadeh (2010), who observed that personal hygiene could be a source of cross contamination. Griffith (2006), cited personal hygiene of food handlers as the most important aspect in the prevention of food poisoning.

According to (FAO/WHO, 2003), components of personal hygiene included the cleanliness of the hands and body and maintaining good personal cleanliness, wearing clean and appropriate uniforms, and by following hygienic sanitary habits in addition to maintaining good health and reporting any ill health to medical personnel. On the same note, Guzewich

& Ross (2009), reiterated that inappropriate food handling practices alone led to 97.0% of food-borne diseases. Guzewich & Ross (2009), further indicated that food handling played an important role in the safety of the clients and therefore, the managers were expected to take an active “coaching-style” approach to promote hand washing. In a similar study on food handlers’ perspectives of barriers to hand washing, participants stated that they wanted “hands-on” hand washing training to be included in pre and post- training as an element of motivation to food handlers in sustaining safe handling practices learnt during training (Guzewich & Ross, 2009).

2.7.2. Hand Washing Attitude of The Food Vendors

Hand washing was said to be the most critical aspect of personal hygiene. Proper hand washing was very important in the prevention of transfer of *staphylococcus* from one surface area to another. Griffith (2006), noted that food worker hand washing practice was critical because pathogens from the hands to food were a major contributing factor to food-borne illnesses. Many food handlers failed to wash their hands as required especially where hand washbasins were not provided. Though hand washing took only twenty seconds, staff rarely practiced it. There was need to train in the five steps of washing hands: wetting, applying soap, scrubbing hands and arms for 10 to 15 seconds, rinsing thoroughly, then drying hands using disposable towels or hot air dryers.

WHO (2007), stipulated six steps of hand washing procedure that took the following sequence: Step 1: Wet hands thoroughly under warm running water and squirt liquid soap onto the palm of one hand. Step 2: Rub hands together to make a good lather. Step 3: Rub

the palm of one hand along the back of the other and along the fingers. Repeat with the other hand. Step 4: Rub in between each finger on both hands and around the thumbs, fingertips and nails. Step 5: Rinse off soap thoroughly with clean running water. Step 6: Dry hands thoroughly using a paper towel or a hand dryer. Turn off tap with the towel and dispose of the towel or turn off the tap using an elbow. Another premise in support of proper hand washing came from The National Restaurant. Griffith (2006), recorded that food handlers were to be trained to wash their hands before they started work, during preparation processes particularly after every procedure in operation. He added that nails were to be kept short, nail polish was not to be worn and artificial nails were not to be used. Griffith (2006), continued to say that all cuts and wounds on the hands were to be covered and in case one had burns, boils, sore skin infection or infected wounds, one was not to work.

According to Adams and Motarjemi (2009), hands had to be washed before wearing gloves and more importantly, gloves were not to be used before hand washing. The gloves were to be made from safe, durable and easy to clean materials. Disposable gloves and finger cots had to be worn on bandaged wounds and hands. Adams and Motarjemi (2009), further observed that food-handling personnel had to report health problems to the manager of the establishment before working.

2.7.3 Environmental Hygiene of The Food Vendors

According to WHO (2007), food establishment had to comply with legal requirements covering constructions. The premises had to be designed and constructed in ways that prevented contamination and access to pests. It considered the layout of the kitchen,

equipment and other facilities in relation to hygiene in and around the food production premises. Becker (2003), defined a food premise as the building, structure, caravan, vehicle, or stand used for storage, preparation and service of food. It also included areas where equipment were washed and stored, lockers, washrooms and garbage disposal areas. Soon and Baines (2011), defined the term food premises to comprise the kitchen (where ingredients were brought, prepared and cooked according to the menu of the day), the restaurant (where food was served and consumed), and the storage area (where food materials were ordered, stored and issued for production). WHO (2007), advised that food premises had to be designed properly to ease cleaning.

2.7.4. Cleanliness of Premises of The Food Vendors

WHO (2007), particularly recommended that all sections of the premises where food-related activities were carried out had to be kept clean, in good repair and well maintained. Specifically, kitchens and restaurants as the major areas of operations where food was prepared, had to be designed to separate “low risk” (uncooked product) from “high risk” (cooked product) areas. The premises were required to have adequate space, hygiene, design and construction, appropriate location and provision of adequate facilities to control the hazards. Food premises design as explained by Jevsnik and Raspor (2008), referred to the entire facility while the layout involved a consideration of each small unit or workspace in the facility. Ingelfinger (2008), recorded that the size of the facility was supposed to be determined by the menu to be served and the workload expected, as well as the type of establishment and the purpose for its intended use. Besides, the facility was required to be large enough to accommodate all materials and equipment required, as well as to allow free movement during operation.

2.7.5. Disposal OF Waste by Food Vendors

Waste if not properly removed would potentially result into contamination of food, equipment and water and also attract breeding of pests. According to Knabel (2005), waste needed to be disposed in designated containers with covers for temporary collection of waste and garbage. The containers were to be properly identified and were to be made of durable impervious materials. Besides, the containers needed to be kept in sanitary condition. Knabel (2005), further stated that no leakage from the waste containers was to be allowed, and that the containers needed to be well maintained so that they would not become sources of contamination or pest infestations.

During the course of preparation, waste products were recorded to be generated in the store, kitchen and restaurant. These waste products were either organic (waste food, used cooking oils) or inorganic (papers, plastics, cans). These waste products became breeding grounds for microbes and served as potential sources of contamination when allowed to accumulate, or became centre of attraction for rodents, pests and flies if not disposed of properly. Adams and Motarjemi (2009), recommended immediate waste disposal by sorting and destroying according to type. According to Ko (2011), the method of waste disposal needed to be in line with the recommendation of the public health officers. Adams and Motarjemi (2009), maintained that accidents, contamination, pest infestation, unpleasant odours, fire hazard and pollution needed to be prevented with correct clearing and handling of wastes.

According to Adams and Motarjemi (2009), food and other waste containers needed to be closed, cleaned and disinfected, and all storage and waste disposal facilities needed to be designed and built with pest proof materials to allow easy cleaning. Pest infestations were

recorded to occur as a result of inadequate cleaning, poor building maintenance, as well as suppliers' deliveries. Food pests included rodents (such as rats, mice, squirrels), birds and insects (such as cockroaches, flies, ants and wasps). Pests in food production areas were not only unsightly and repugnant; they also caused damage to food and building. According to Walker and Forsythe (2003), pests contaminated food products by their bodies or body parts, fur, eggs and droppings and were a potential source of infection. Infestation of pests as suggested by Walker and Forsythe (2003), was controlled by denying the pests access, harbor, warmth, sources of food and water in the premises. This was achieved through regular inspection of the premises, cleaning of the workshop and immediate cleaning of spillage and food particles from the kitchen surfaces.

2.8. Sources of Food Contamination

Ready to eat food naturally contains some levels of both harmful and safe bacteria. However, the provision of favourable conditions allows bacteria to grow to sufficient numbers to cause health problems (Fieldhouse, 2005). Oteri and Ekanem (2009), isolated cross contamination as the most singular source responsible for food contamination. Cross contamination is the process where harmful bacteria are transferred to food. The transfer could be direct contact between one food and another; from food handlers who do not wash their hands between handling raw and cooked food; or indirect contact, which is between equipment and improper storage practices (Oteri and Ekanem, 2009). Fischer and Nauta (2006), also noted that the most common source of food contamination is humans especially when the hand gets into contact with food items. Motarjemi and Käferstein (2009), indicated that hands are the cause of most enteric virus transmissions.

Veiros and Rocha (2009), opined that the major food contamination sources are water, air, dust, equipment, sewage, insects, rodents and human activities. Contamination of raw materials can also occur from the soil, live animals, external surface and internal organs of animals. Veiros and Rocha (2009), stated that food can be contaminated through the following ways:

- Chemicals that entered the foods accidentally during the growth, preparation or cooking of the food for instance those from pesticides and clearing fluids.
- Germs (harmful bacteria) that have entered the food from humans, animals or other sources of the bacteria themselves or the toxins produced in the food. Thus, the greatest numbers of cases of food poisoning are caused by harmful bacteria.
- Bacteria and viruses that have come from people, animal, insects, raw food, rubbish, dust, water and air. The bacteria or toxins produced in the food causes the food to become harmful.

Owing to conditions under which street foods are sold, there is concern that food may be contaminated by heavy metals and pesticide residues. These contaminants may come from the utensils, raw materials, or transport methods used and may also occur due to the lack of appropriate storage facilities (Annor and Baiden, 2011).

Annor and Baiden (2011), indicated that street food vendors purchased their pots and other utensils from both formal and informal manufacturers/retailers. Some of the street food samples had higher levels of lead, cadmium, arsenic, mercury, and copper than average food samples, suggesting possible leaching from the utensils. Further tests showed that lead from

the pots obtained from informal manufacturers could leach into the food. These pots are manufactured using scrap metal that could come from diverse sources such as derelict cars, car batteries and industrial machinery, which are obviously not suitable for use with foods. Therefore, their continued use must be discouraged (Annor and Baiden, 2011).

Kittler & Sucher (2004), found houseflies in most of the street food stalls. They further found houseflies in 54.8 % of the vending stalls. This implies that food contamination is most likely to occur despite efforts to keep the stalls clean. This is due to the fact that houseflies are believed to pass on pathogens mechanically onto food. *Salmonella tphinurium* and *Shigella*, for instance, can multiply in the gut of flies and be excreted for weeks or longer (Kittler & Sucher, 2004).

Food stalls often lack the necessary storage (refrigeration and cooking) facilities to prevent contamination by bacteria. Limited access to clean water and improper waste disposal practices increase the risk of contamination being passed on to customers. Adequate temperature in cooking and storage of foods is important to minimize the growth of bacteria and the food that cannot maintain within the safety temperature zone may act as incubator for pathogenic bacteria whether the food is raw, partially cooked or fully done (Fieldhouse, P2005; Haapala & Probart, 2004) indicated that, bacteria from dirty dish washing waters and other sources on utensil surfaces constitute a risk for contamination during food vending.

2.8.1 Cross-Contamination of Food

When raw food products come into contact with any surface, piece of equipment, utensils, or even the food service employees' hands, those surfaces become contaminated with microorganisms. Cross-contamination is defined as the point where microorganisms are transferred from one surface to another (Omaye, 2004). The human hands are among the obvious culprits of transferring bacteria from raw to ready to eat food. Findings by Adams and Motarjemi (2009), indicated that 60% of street food vendors ($n = 80$) handled food with their bare hands.

Direct contact with raw foods, dirty chopping boards, knives and other cooking implements can also spread the contamination. Chopping boards, plates and knives that have been in contact with raw food need to be carefully washed with hot water and detergent, then rinsed and thoroughly dried before being used for ready to eat foods. Food and kitchen tools may become contaminated from raw food products such as meat and poultry. A study conducted in Ghana by Annor and Baiden (2011), revealed that a majority (53.81%) of respondents used the same knife for both raw fresh produce and ready-to-eat food items. Disturbing percentages of 31.43% did not apply any treatment to the knife in-between use, 20.95% rinsed with only water and) 8.75% wiped the knife with a towel which may not be washed regularly.

2.8.2 Preventing Cross-Contamination of Food

Cross-contamination can be fairly easy to prevent as long as food handlers are properly trained to recognize where microorganisms thrive and how microorganisms are transferred. The following factors outlined by Minnesota Department of Health Consumer Fact Sheet

(WHO, 2007), should be considered by food handlers in their quest to prevent food borne disease:

- When shopping separate raw meat, poultry, and seafood from other foods in grocery-shopping cart.
- Place raw foods in plastic bags to prevent their juices from dripping onto other foods. It is also best to separate these foods from other foods at check out and in grocery bags.
- When refrigerating food, place raw meat, poultry, and seafood in containers or sealed plastic bags to prevent their juices from dripping onto other foods, since raw juices often contain harmful bacteria.
- Store eggs in their original carton and refrigerate as soon as possible.
- Hands should be washed with soap and hot water before and after handling food, and after using the bathroom, changing diapers; or handling pets.
- Use hot, soapy water and paper towels or clean clothes to wipe up kitchen surfaces or spills.
- Wash cutting boards, dishes, and counter tops with hot, soapy water after preparing each food item and before you go on to the next item.

The Minnesota Department of Health Consumer Fact Sheet (WHO, 2007), went on to indicate that, clean cutting board should always be used and if possible, food handlers should use one cutting board for fresh produce and a separate one for raw meat, poultry, and fresh fish. Once cutting boards become excessively worn out or develop hard-to-clean grooves, they should be replaced. Fruits and vegetables should be washed thoroughly under running water to remove all visible dirt. Remove and discard the outermost leaves of a head of lettuce or cabbage.

CHAPTER THREE

METHODOLOGY

3.1. Introduction

This chapter presents the research methodology, the sources of data, the study site and population, the sampling technique and sample size, the procedures of data collection, the data gathering tools, and Ethical considerations.

3.2. Research Design

Among the various types of research design, the researcher opted for descriptive research design. Descriptive research designs help to provide answers to the questions who, what, when, where and how associated with a particular research problem. It cannot conclusively ascertain answers to why.

3.3 Population

The target population of the study included food vendors who sell cooked food, pupils (consumers) and head teachers (supervisors) in Basic schools and town council officer at the Bosomtwe District of the Ashanti Region.

3.4 Sampling technique and Sample Size

Purposive sampling technique which is a non-probability sampling technique was used to select supervisors who are one set of respondents. This is because it is believed that all respondents are in the best position to respond to the research questions. Also, it enables the researcher to handpick the cases to be included in the sample on the basis of her/his judgment of their typicality.

Secondly, random sampling technique was used to select the consumers, with this type of technique respondent is chosen entirely by chance and each member of the population has an equal opportunity of being included in the sample. It is normally used to select respondent from a large population.

Finally, the food vendors were selected using convenience sampling technique. The reason being that, they were nearer and available to be questioned.

A sample size of 108 respondents was selected. The respondents consisted of 40 food vendors, 60 pupils (consumers), 8 supervisors and an officer from the town council in the District Assembly. This size was selected because Fraenkel & Wallen (2002), argue that a sample size for a study should not be too large or too small in order to obtain the needed data at a less cost and within an affordable time.

3.5 Data Collection Instruments

The data collection instrument for the study the researcher used involved questionnaires, interview and observation.

3.5.1 Questionnaire

In all 68 questionnaires were administered to consumers and supervisors of the selected schools. Thus, 60 consumers and 8 supervisors were given questionnaires. Out of the 68 questionnaires sent out, 65 were retrieved. The issues involved in the questionnaire were relating to the level of awareness and the degree of food safety practices among food

vendors, measure to ensure effective food safety awareness practices and food safety practices of vendors.

3.5.2 Interview

The researcher interviewed 40 food vendors who cannot read and write one-on-one using structured interviewed guide. The researcher focused on the knowledge of food safety awareness, food safety practices and causes of non-compliances to food safety awareness and practices of food vendors.

3.5.3 Observation

Non participation observation was used by the researcher, consumer and supervisor to observe 40 food vendors in all. 8 from Esereso D/A JHS, 8 from Fayiase Catholic Basic School, 6 from Jachie Anglican JHS, 6 from Konkoma D/A Basic School, 6 from Brodekwano Methodist Basic School and 6 Beposo Catholic School all in the Bosomtwe District. Observation was made on the personal appearance of the vendor, the vending site, the soapy water and rinsing water for the washing of bowls and plates and how their refuse is disposed of.

3.6 Data Analysis Procedure

In this study, questionnaire, interview and observation were combined. Data from the field were analyzed using the Statistical Package for Social Sciences (SPSS). All questionnaires collected from the field were first edited for completeness. The data was then entered into SPSS (Version 17). Using the SPSS tools, frequency distributions tables and graphs will be

undertaken on the data for interpretation. The interviews were transcribed verbatim and coded into themes. All field notes on the other hand were immediately typed upon returning from field each day. Analysis was undertaken through content analysis. It involves transforming raw data (texts, books, newspaper publications, interview transcripts,) into categories based on some conceptual schemes. This enables the researcher to make sense out the data gathered.

3.7 Ethical consideration

Ethical issues arise from the kind of problems that social scientists investigate and the methods used to obtain valid and reliable data. Ethical considerations were pertinent to this study because of the nature of the problem, the methods of data collection and the kind of persons serving as research participants. While carrying out this study, cognizance was taken of the fact that this study would be investigating very sensitive issue and as such followed ethical procedures suggested by Bryman (2008).

Bryman (2008), advise that researchers should ensure that participants are protected from any physical or psychological harm that may arise from research procedures. In line with international best practices in education, I revealed the intentions of the study to the participants and sought informed consent for their participation. I verbally assured the participants of anonymity of their identities and confidentiality of the data I got from them. I also promised to assign them pseudonyms during the writing of the report. All the participants to be interviewed agreed before I commenced the research.

In addition, with regard to the ethical issue of confidentiality, I stored all information from the study safely. Hard copies were locked in a cabinet and soft copies stored in files protected with a password which was only accessible to me.



CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

In this chapter, data gathered from the field is analysed using frequencies, bar chart and pie chart and discussed under the research objectives. This chapter also includes the background characteristics of the respondents.

4.2 Demographic Characteristics of respondents

The socio-demographic characteristics include gender of respondents, age of respondents, level of education and period of selling. These are discussed as follows:

4.2.1 Gender of the Respondents

Out of 60 consumers who participated in the studies, 20 were male which represented 33.3% and 40 were female representing 66.7%. Out of 8 supervisors, 5 (62.5%) were female whereas 3 (37.5%) were male. With regards to the food vendors, all of them were female. This implies that food vending in Basic schools is considered as female activity. This information is depicted in Table 4.1.

Table 4.1: Gender distribution of respondents

Respondents	Gender		
	Male (%)	Female (%)	Total (%)
Consumers	20 (33.3%)	40 (66.7%)	60 (100%)
Supervisors	3 (37.5%)	5 (62.5%)	8 (100%)
Vendors	-	40 (100%)	40 (100%)

Source: (Author's field study, 2018)

4.2.2 Age of the Respondents

4.2.2.1 Age of food vendors

The study revealed that 40% of the vendors, were within the ages of 31-40 years with the least age group being 51 years and above representing 10%. Also 30% and 20% of the vendors were within the ages of 41-50 years and 20-30 years respectively. This findings indicate that the youth dominates in Basic schools food vending in the Bosomtwe District.

Table 4.2: Age distribution of vendors

Ages	Frequency	Percent %
20-30 years	8	20.0
31-40 years	16	40.0
41-50 years	12	30.0
51 years and above	4	10.0
Total	40	100.0

Source: (Author's field study, 2018)

4.2.2.2 Age of consumers

From the study, it was realized that most of the consumers (58.3%) were within the age group of 13-14 years while 25% were within the age group of 12 years and below. Consumers between the ages of 15 years and above formed the least age group with a percentage of 16.7%.

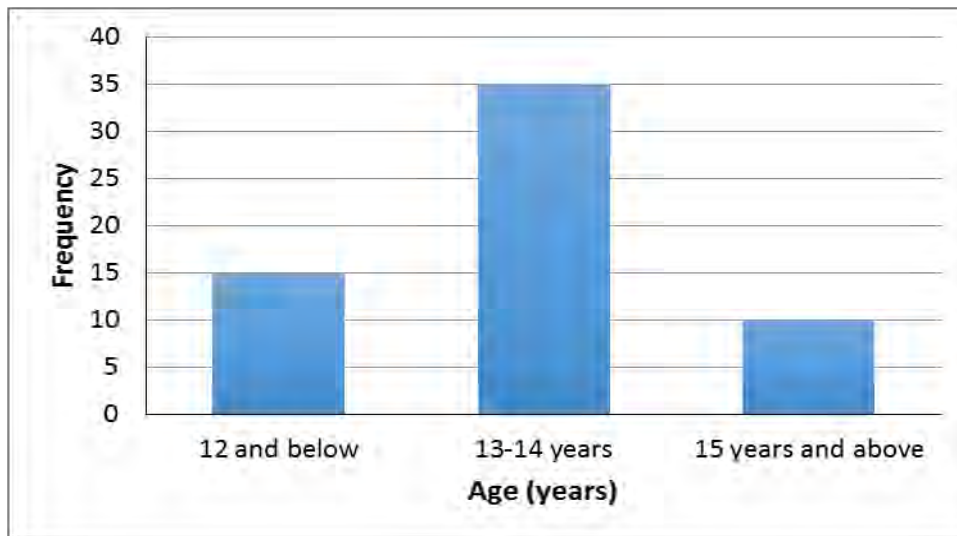


Figure 4.1 Age of consumers

4.2.2.3 Age of supervisors

The findings show that 50% of the supervisors were between the ages of 20 – 30 years followed by the ages of 31 – 40 years representing 25% and the age group of 41 – 50 years being the least. It can be deduced that the youth predominate the supervisory position and their exuberance will enhance monitoring and proper supervision.

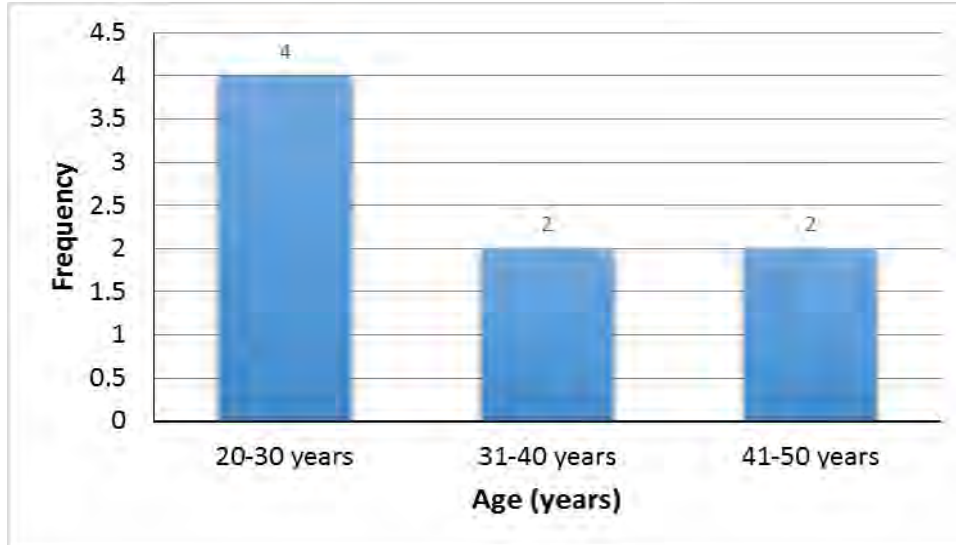


Figure 4.2 Age of supervisors

4.2.3 Educational background of the respondents

Table 4.3 shows that almost all the vendors have had at least basic education (70% basic education and 10% secondary education) with only few, 20% having no formal education. Previously, food vending was dominated by non-formal educationists according to earlier researches conducted (Griffith, 2006), but currently it proves otherwise. People now see the venture to be a viable source of employment for all and not the uneducated.

The educational status of consumers was based on their classes, 33.3% of the respondents were in JHS 1 with 41.7% and 25% in JHS 2 and JHS 3 respectively. Out of the eight supervisors interviewed, 6 (75%) had attained 1st degree and 2 (25%) had attained Diploma.

The educational status of the consumers and supervisors go a long way to help them know some food safety practices which they look out for when going to buy food from the vendors and also aid the supervisors in carrying out their duties during supervision.

Table 4.3: Educational background distribution of respondents

Vendors	Frequency	Percent (%)
No formal education	8	20.0
Basic school	28	70.0
Secondary school	4	10.0
Tertiary	0	0.0
Total	40	100.0
Consumers		
JHS 1	20	33.3
JHS 2	25	41.7
JHS 3	15	25.0
Total	60	100.0
Supervisors		
Post-secondary	0	0
Diploma	2	25.0
1 st Degree	6	75.0
2 nd Degree	0	0
Total	8	100.0

Source: (Author's field study, 2018)

4.2.4 Years of experience as a food vendor

With regards to years of experience as a food vendor, 40% said 2-5 years, 30% said 6-10 years, 20% also said above 10 years with only a few, 10% said a year and below. This reveals that half of the vendors have been in the business for more than 5 years.

Table 4.4: Years of experience distribution of food vendors

Years of experience	Frequency	Percent (%)
a year and below	4	10.0
2-5 years	16	40.0
6-10 years	12	30.0
above 10 years	8	20.0
Total	40	100.0

Source: (Author's field study, 2018)

4.2.5 Knowledge on Food Safety Awareness of respondents

4.2.5.1 Knowledge on food safety awareness of vendors

According to WHO (2000), food safety is an essential public health indicator since it is considered as a concept of importance. However, food safety awareness of vendors also plays an important role in food safety. In as much as their activities can contaminate food leading to health issues of consumers. The researcher sought to test the knowledge of vendors on food safety awareness.

Formal training on food services exposes food vendors to hygienic food preparation methods, good handling practices during selling of food, as well as good management of leftovers. Vendors were asked whether they went through formal training on food services before starting business. It was noticed that majority of the vendors (80%) acquired no training before commencing business while 20% had training. This suggests that authorities are not up and doing and the end result is the outbreak of food borne diseases. In the long

run, it is the consumer who suffers the consequence as they are affected by various food borne diseases. Griffith et al., (2003) posted that the main factors responsible for the outbreaks of food poisoning were inappropriate storage, inadequate cooking or heating, and cross-contamination. They further emphasized that if food vendors misunderstand the origin and severity of food borne illness, they are less motivated to change.

Also, findings revealed that 40% of the vendors had participated in training on food safety and hygiene ever since they started selling. However, 60% of the vendors said that they had never participated in such trainings. Upon finding reasons for their failure to attend training on food safety, 16 (66.7%) said non availability of such trainings, 4 (16.6%) said they don't have enough time to attend such programs and 4 (16.6%) also said cost of attending trainings is high. This suggests that there should be proper information dissemination on food safety training. Also there should be a way of reaching out to vendors in their various communities to educate them than converging all to one place which will only be disadvantaged to many. The results are depicted on Table 4.5.

Table 4.5: Training acquired by vendors distribution

Before starting this business, did you go through formal training on food preparation or catering course?	Frequency	Percent (%)
Yes	8	20.0
No	32	80.0
Total	40	100.0
Have you ever attended any training/workshop on food safety/ hygiene since you started this business?		
Yes	16	40.0
No	24	60.0
Total	40	100.0
You said that you have never attended any training/workshop on food safety, which of the following best describe your reason?		
none availability of such trainings	16	66.7
I don't have enough time to attend such programs	4	16.6
cost of attending such trainings is high	4	16.6
Total	24	100.0

Source: (Author's field study, 2018)

With respect to contamination, all the vendors affirmed that food handling can cause food contamination during food preparation or sale as 90% and 10% of the vendors strongly agreed and somehow agreed respectively. Meanwhile, 90% of the vendors believed that washing bowls/plate/cups in soapy water at least twice before rinsing helped reduced the spread of germs as they strongly agreed. However, 10% of the vendors thought otherwise. They are of the view that washing bowls/plates/cups once in soapy water can reduce the spread of germs and need not to be done twice. Also, almost all the vendors agreed that

handling money with bare hands at the same time serving food increases the risk of food contamination as 24% and 8% of the vendors strongly and somehow agreed respectively.

Table 4.6: Knowledge on food safety awareness distribution of vendors

The food handling can cause food contamination during food preparation or sale	Frequency	Percent (%)
strongly agree	36	90.0
somehow agree	4	10.0
Total	40	100.0
It said that washing of bowls/plate/cups in soapy water at least twice before rinsing them reduces the spread of germs.		
strongly agree	36	90.0
strongly disagree	4	10.0
Total	40	100.0
Holding/handling of money with bare hands (collecting or giving out change to customers) at the same time serving food with bare hands increases the risks of food contamination.		
strongly agree	24	60.0
somehow agree	8	20.0
neither agrees nor disagree	4	10.0
strongly disagree	4	10.0
Total	40	100.0

Source: (Author's field study, 2018)

4.2.5.2 Knowledge on food safety awareness of consumers

From Table 4.5, majority of the respondents agreed to the fact that food handling can cause food contamination during preparation and sales as 50% and 33.3% strongly agreed and somehow agreed respectively. But 16.7% of the respondents thought otherwise as they somehow disagreed to it. Mensah et al., (2002) posted that improper handling of cooked food by vendors and/or their assistants has been identified as one of the major contributors to food contamination. Meanwhile, all the respondent (100%) strongly agreed that handling money with bare hand and at the same time serving increased the risks of introducing germs into the food. In addition, all the respondents (100%) attested that proper washing of bowls reduces the spread of germs from contaminating food.

Table 4.7a: Knowledge on food safety awareness distribution of consumers

	Strongly agree	Somehow agree	Neither agree nor disagree	Somehow disagree	Strongly disagree
Food handlers can cause food contamination during food preparation or sales	30 (50%)	20 (33.3%)	-	10 (16.7%)	-
Handling money with bare hand and serving food	60 (100%)	-	-	-	-
Proper washing of bowls can reduce the spread of germs	50 (83.3%)	10 (16.7%)	-	-	-

Source : (Author's field study, 2018)

From Table 4.7b, almost all the consumers (91.7%) knew the importance of reheating food during sales but 8.3% somehow disagreed. In addition, all the consumers think it is important to wash hand after visiting the toilet/urinal since germs carried from the washroom can easily contaminate food.

Table 4.7b: Knowledge on food safety awareness distribution of consumers

	Yes (%)	No (%)	Total
is reheating of food during its sale important	55 (91.7%)	5 (8.3%)	60 (100%)
is hand washing after visiting the toilet/urinal important	60 (100%)	-	60 (100%)

Source : (Author's field study, 2018)

4.2.6 Food safety practices of food vendors

With respect to personal hygiene, majority of the vendors (60%) always washed their hands with soap and water after touching their face. Meanwhile, 20% of the vendors sometimes did and 20% never did. On the same note, almost all the vendors (80%) washed their hands with soap and water after visiting the toilet but only few (20%) sometimes did so. Griffith (2006), argued that hand washing with soap and water practiced by food vendors is very critical as pathogens from hands to food is a major contributing factor to food-borne illnesses. It is sad to know that some of the vendors never washed their hands after touching their face, example after blowing their nose. Some vendors did not see the need to wash hands with soap and water after being to the toilet. They thought washing hands with only water can remove germs but it is a misconception. Furthermore, 50% of the vendors covered their hair during food preparation, 20% sometimes did and 30% did not cover their hair when preparing food.

With the questions on food hygiene, the findings indicate that most of the vendors (80%) always cleaned raw meat or fish first before cooking. Meanwhile, 20% of the vendors said they sometimes did. When asked why, they attributed it to; when we are far beyond time, cooking kills germs irrespective of washing or not among the rest. One thing they forgot is that cleaning meat/fish first removes dust or any form of dirt from them. Further, the vendors were split when asked whether they clean kitchen area soon after cleaning raw meat prior to cooking, 50% said always while the other half said sometimes. Additionally, all the vendors always washed hands before handling food and also cover cooked and uncooked foods.

In the area of environmental hygiene, all the vendors (100%) washed food utensils with detergent as they answered “always”. However, washing cooking area using detergent split among the vendors as 50% each answered ‘sometimes’ and ‘always’. The results show that most of the vendors (70%) always cleaned their surroundings during and after sales while 30% sometime did. The vendors who sometimes did gave reasons like pressure from consumers, tiredness among others. Meanwhile, all the vendors (100%) always changed their washing water as reviewed by the result. In spite of this, it was observed during data collection that some of the vendors had their washing water not changed and very dirty. This was confirmed by the consumers as 50% and 25% said that vendors sometimes and never respectively provided clean water for washing. However, disposing of waste in covered bins among vendors was not encouraging, 50% of the vendors never disposed waste in covered bin, 20% sometimes did and 20% always did.

Table 4.8a: Food safety practices distribution of vendors

Personal hygiene	Sometimes	Never	Always
Do you wash your hands with soap and water after touching your face (such as nose, ears and mouth)?	8 (20%)	8 (20%)	24 (60%)
Do you wash hands with soap and water after a visit to the toilet?	8 (20%)	-	32 (80%)
Do you cover your hair during food preparation?	8 (20%)	12 (30%)	20 (50%)
Food hygiene			
Do you clean raw meat or fish first before cooking?	8 (20%)	-	32 (80%)
Do you clean kitchen area soon after cleaning raw meat prior to cooking process?	20 (50%)	-	20 (50%)
Do you wash hands before handling food?	-	-	40 (100%)
Do you always cover cooked and uncooked foods?	-	-	40 (100%)
Environmental hygiene			
Do you wash food utensils using detergent?	-	-	40 (100%)
Do you wash cooking area using detergent?	20 (50%)	-	20 (50%)
Do you clean your surroundings during and after sales?	12 (30%)	-	28 (70%)
Do you change your washing water?	-	-	40 (100%)
Do you dispose waste in covered bins?	8 (20%)	20 (50%)	12 (30%)

Source: (Author's field study, 2018)

In the area of food left overs, 24 (60%) of the respondents sometimes got food leftovers. When asked how they treated the leftovers, 16 (66.7%) of them answered they stored in a refrigerator and used it the day after. The remaining vendors, 8 (33.3%) however ate the leftover food. On the contrary, 40% of the 40 vendors had never had food leftovers as they answered 'no'. The findings are summarized in the Table 4.8a.

Table 4.8b: Food safety practices distribution of vendors

Do you sometimes get food left overs (unsold) food including stew, meat, fish etc.)?		
	Frequency	Percent (%)
Yes	24	60.0
No	16	40.0
Total	40	100.0
(If yes) how do you treat your leftover food		
Stored in a refrigerator/ freezer to be used the next day	16	66.7
Eat leftovers	8	33.3
Total	24	100.0

Source: (Author's field study, 2018)

It is recommended that food should be kept warm always when selling to prevent contamination (WHO, 1996). When vendors were asked about how often they reheated food during the day, 90% of them answered always as 10% said once. From this, it can be deduced that all the food vendors considered reheating of food during selling very important as it helped keep food warm, kill germs and prevent food from going bad. Furthermore, all the vendors affirmed well water is their main source of water for cooking and cleaning utensils and dishes.

Table 4.8c: Food safety practices distribution of vendors

How often do you reheat your food or stew during the day?		
day?	Frequency	Percent (%)
Do not reheat food at all	-	-
Always	36	90.0
Once	4	10.0
Total	40	100.0
What is your main source of water for cooking and cleaning of utensils and dishes?		
Well	40	100.0
Total	40	100.0

Source: (Author's field study, 2018)

4.2.6.1 Consumers perspective of vendors food safety practices

The consumers were asked to indicate the factors which determined their choice of vendor when buying food. Almost all of the respondents (91.7%) looked out for personal neatness and appearance of seller with only a few (8.3%) who did not. However, all the respondents (100%) attested that they considered cleanliness of selling environment before buying from a particular vendor. Moreover, with regards to neat display of food items, 75% of the respondents did consider before buying while 25% of the respondents did not consider. In whole, it can be deduced that as majority of the respondents are very cautious when buying food as they consider all the factors, there were few who thought once the selling environment is clean, there is no need to look out for personal neatness and appearance likewise neat display of food items.

Table 4.9: Food safety practices distribution of vendors by consumers

Responses	Yes (%)	No (%)	Total
Personal neatness and appearance of seller	55 (91.7%)	5 (8.3%)	60 (100%)
Cleanliness of selling environment	60 (100%)	-	60 (100%)
Neat display of food items	45 (75%)	15 (25%)	60 (100%)

Source: (Author's field study, 2018)

Considering the display of dishes, it split between the consumers as 50% said that vendors display dishes in a way that flies cannot get to them thereby contaminating them. However, the other half also said that vendors do not display dishes properly.

Among the consumers, 8.3% said vendors always disposed refuse in covered bins, 20% said vendors sometimes and 58.3% said vendors did not cover their bins. Also, most of the consumers (50%) said vendors sometimes provided clean water for washing hands before and after eating while 25% said vendors never did and 15% said vendors always provide.

Table 4.9b: Food safety practices of vendors' distribution by consumers

	Sometimes	Never	Always
Do they dispose of their refuse in a covered bins?	20 (33.3%)	35 (58.3)	5 (8.3%)
Do they provide clean water for washing of hands before and after eating?	30 (50%)	15 (25%)	15 (25%)

Source: (Author's field study, 2018)

4.2.6.2 Supervisors perspective of vendors food safety practices

Data gathered from supervisors suggests that most of the vendors cover their hair during selling with only few who did not. This is shown in Table 4.10 as 6 (75%) of the supervisors answered yes and 2 (25%) answered no. However, with covering of cooked and uncooked foods, 4 (50%) of the supervisors mentioned always, 2(25%) said sometimes and 2(25%) said never. In a whole, majority of the vendors are aware of the importance of covering cooked and uncooked food during selling. Additionally, the findings show that all the vendors washed utensils with soap and water, cleaned their surroundings during and after sales as all the supervisors answered yes 8(100%). With regards to waste disposal, 5(262.5%) of the supervisors said Yes while 3(37.5%) said No.



Table 4.10: Food safety practices of vendors' distribution by supervisors

Do the vendors cover their hair during service?	Frequency	Percentage (%)
Yes	6	75.0
No	2	25.0
Total	8	100.0
Do vendors always cover cooked and uncooked foods when selling?		
Sometimes	2	25.0
Never	2	25.0
Always	4	50.0
Total	8	100.0
Do vendors wash utensils with soap and water?		
Yes	8	100.0
Do they clean their surroundings during and after sales?		
Yes	8	100.0
Do they dispose waste in covered bins?		
Yes	5	62.5
No	3	37.5
Total	8	100.0

Source: (Author's field study, 2018)

4.2.7 Causes of non-compliance to food safety awareness practices

Notwithstanding the positive attitude of the vendors to food safety practices, there were some non-compliances to certain questions among the vendors as they gave responses such as 'sometimes', 'never', disagree and so on and so forth. The author sought to finding out the causes of non-compliance to food safety awareness practices among the vendors.

Through an in-depth interview, 70% of the vendors attributed non-compliance to food safety awareness practices to financial constraints example, attending training, buying water, soap among others is sometimes cost intensive. On the contrary, 30% of the vendors chose other and gave the following reasons; some food safety practices are unnecessary e.g. covering of hair during food preparation, washing of hand after touching face etc. What they refused to understand is that non-compliance to food safety practices increases the risk of food contamination and thereby increasing the incidence of food-borne related disease outbreak.

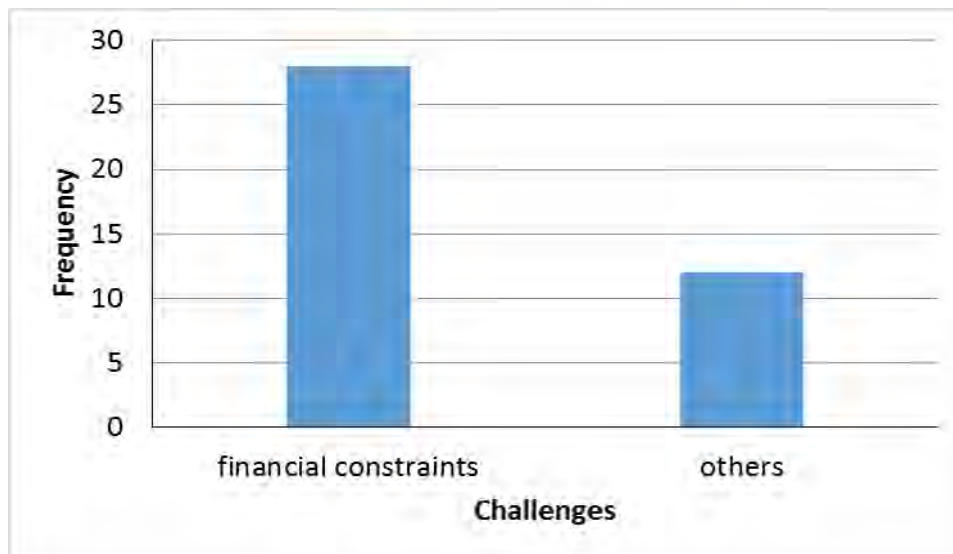


Figure 4.3 causes of non-compliance

4.2.8 Measures to ensure effective food safety awareness practices

Supervisors are expected to carry out regular inspection of food vendors' activities thereby ensuring that they comply with effective food safety practices. According to WHO (1996), regular inspection of food vendors activities by regulatory authorities can contribute to the enhancement of the safety and hygienic levels of food vendors. The author sought to access the measures used to ensure effective food safety awareness practices among food vendors.

Data gathered from field indicates that supervisors checked the medical report of vendors before they started selling in the school as all (100%) answered ‘yes’. Considering the fact that the health certificate of vendors is subjected to renewal, supervisors were asked how often they check the certificate of the vendors. It split up between the supervisors, 4 (50%) mentioned every 6 months and the other half said every year. This implies that they checked the validity of the health certificate of vendors at least once every year. In relation to organizing seminars on food safety for vendors, majority of the supervisors, 5 (62.5%) mentioned once a term while 3 (37.5%) said not at all.

Table 4.11a: Measures to ensure food awareness practices distribution of vendors

Do you check the medical report of vendors before they start selling in the school?	Frequency	Percent
Yes	8	100.0
Total	8	100.0
How often do you check the health certificate of food vendors?		
every 6 months	4	50.0
every year	4	50.0
Total	8	100.0
How often do you organize seminars on food safety?		
once a term	5	62.5
not at all	3	37.5
Total	8	100.0

Source: (Author’s field study, 2018)

Responds from Table 4.11b indicate that all the vendors 40 (100%) went through health screening before commencing business. The vendors were given health certificate as evidence declaring them healthy to sell. With respect to renewal of health certificate, all the vendors, 100% affirmed that they had renewed their health certificate. The author then sought to know the last time vendors renewed their certificate. Upon responding, 60% of the vendors had their certificate renewed 1- 2 years ago while 40% had theirs renewed within 6-12 months ago.

Table 4.11b: Measures to ensure food awareness practices distribution of vendors

Before you started selling here, were you required by the Assembly to go through a health screening?	Frequency	Percent %
Yes	40	100.0
Total	40	100.0
Do you have a health certificate from the Assembly, Clinic or hospital which declares you healthy to sell food?		
Yes	40	100.0
Total	40	100.0
Have you ever renewed your health certificate?		
Yes	40	100.0
Total	40	100.0
If yes: When was the last time you renewed it?		
6-12 months ago	16	40.0
1-2 years	24	60.0
Total	40	100.0

Source: (Author's field study, 2018)

Information gathered shows that during the last 12 months, all the vendors (100%) have been visited by environmental/ sanitary inspector for inspection. When asked how often the inspectors came around for inspection, 60% of the vendors said 2-5 times yearly while 40% of the vendors said once a year. During the survey, 4% of the vendors said that they had never received any education on food safety/hygiene though some officers did come around but only to inspect their activities. Meanwhile, majority of the vendors (90%) also confirmed that they had acquired education on food safety /hygiene.

Table 4.11c: Measures to ensure food awareness practices distribution of vendors

Has an environmental officer or sanitary inspector visited your business for any inspection during the last 12 months	Frequency	Percent %
Yes	40	100.0
If yes, how often do they visit		
2-5 times yearly	24	60.0
once a year	16	40.0
Total	40	100.0
Has any environmental officer /sanitary inspector or health worker visited your business to educate you on food safety/hygiene		
Yes	36	90.0
No	4	10.0
Total	40	100.0

Source: (Author's field study, 2018)

CHAPTER FIVE

SUMMARY OF FINDINGS CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings of the study, conclusions and recommendations based on the study findings. Suggestions are also offered for further research on food safety awareness practices.

5.2 Summary of findings

➤ Knowledge on Food Safety Awareness of food vendors and consumers

The findings indicate that majority of the vendors did not go through formal training on food preparation before starting business except few. Meanwhile minority of the vendors had been attending workshop during selling. It was also found that almost all the vendors strongly agreed that food handling can cause food contamination during food preparation or sale. In addition, majority of the vendors strongly agreed that washing of bowls/plates/cups in soapy water at least twice before rinsing helped reduced the spread of germ. Vendors knew that handling of money with bare hands at the same time serving food increases the risk of food contamination as the majority of them agreed to it.

➤ Food safety practices of food vendors

It was reviewed that majority of the food vendors always washed their hands with soap and water after touching their face and visiting the toilet. Half of the food vendors did not cover their hair during food preparation whereas majority of them cleaned raw meat or fish first before cooking. Some of the food vendors cleaned kitchen area soon after cleaning raw meat

prior to cooking process. Also, all the food vendors washed their hands before handling food and always cover cooked and uncooked foods. Food vendors washed utensils and cooking area using detergent. It was also seen that most of the food vendors cleaned their surroundings during and after sales whereas all of them changed their washing water always. However, half of them never disposed their waste in covered bins. The results indicate that majority of the food vendors stored food leftovers in refrigerator and also reheated their food always. Lastly, well water is the main source of water used by food vendors for cooking and cleaning dishes.

➤ **Causes of non-compliance to food safety awareness practices**

The findings show that the causes of non-compliance of food vendors to food safety awareness practices are financial constraints and irrelevant of some food safety practices.

➤ **Measures to ensure effective food safety awareness practices**

Ensuring effective food safety awareness practices, the findings reviewed that supervisors checked the medical report of vendors before they started selling in the schools. At least once every 6 months supervisors checked the validity of health certificate of the vendors. It was also seen that at least once every term, seminars on food safety were organized for the food vendors to equip them.

5.3 Conclusion

- The knowledge of food safety awareness of food vendors and consumers is good since they knew that food handling can cause food contamination, washing of bowls/plate/cups in soapy water at least twice before rinsing reduces the spread of germs and handling money with bare hands at the same time serving food with bare hands increases the risk of food contamination. Also consumers strongly agreed that reheating of food and washing of hand after visiting the toilet is important.
- Food safety practices of food vendors was encouraging as food vendors' exhibited high personal hygiene, food hygiene and environmental hygiene. They stored food leftovers in refrigerator and always kept their food warm.
- The causes of non-compliance to food safety awareness practices of food vendors were found to be financial constraints and irrelevant of some food safety practices.
- Measures used to ensure effective food safety awareness practices among food vendors are health screening and issuing of health certificate to, checking of validity of health certificate from time to time, regular inspection and organizing of seminars on food safety.

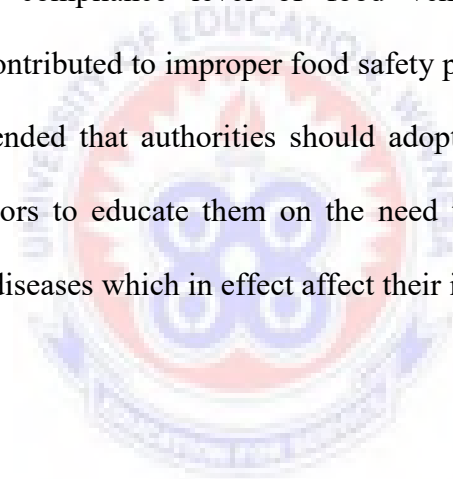
5.4 Recommendation

In view of the findings of the study, the following recommendations have been made to help improve food safety awareness practices:

- The study revealed that most of the food vendors did not go through formal training on food preparation and handling, a situation they observed to negatively affect the level of proper hygiene practices. It is therefore recommended that authorities should ensure that

all vendors go through formal training on food preparation after health screening before issued certificate to commence business. This will enable the food vendors to exhibit proper food safety practices.

- The study revealed that most of the food vendors had renewed their health certificates a year or two ago indicating that some were operating with invalid health certificate which cannot be compromised. The author recommends that there should be law enforcement on validity of health certificate of food vendors, ensuring that vendors with invalid certificate are not allowed to sell until they renew their certificate.
- Notwithstanding the compliance level of food vendors, there were some non-compliances which contributed to improper food safety practices among food vendors. It is therefore recommended that authorities should adopt other forms of educating and reaching out to vendors to educate them on the need to practice food safety thereby avoiding food borne diseases which in effect affect their income.



REFERENCES

- Abdalla M. A., & Bakhiet A. (2008). *Food safety knowledge and practices of street food vendors in Khartoum City*. Sudan J Vet Sci Anim Husbandry, 47:126-131.
- Abdussalam, M. & Kaferstein, F. K. (2003). Safety of street foods. *World Health Forum* 14, 191–194.
- Acheson, D. (2011). Slides on food safety and legislation. *Food Journal* 102(6), 145-156. In *Food Safety Modernization Act*.
- Acikel, C. H. (2007). The hygiene training of food handlers at a teaching hospital, *Food Control* 19, 186-190.
- Adams M, & Motarjemi Y. (2009) *Basic food safety for health workers*. Geneva: World Health Organization. p. 113–4.
- Albrecht, J. A. (2005). Food safety knowledge and practices of women in the United States. *Journal of Consumer Studies Home Economics*, 19:119- 134.
- Annor G. A., & Baiden E. A. (2011). Evaluation of food hygiene knowledge attitudes and practices of food handlers in food businesses in Accra, Ghana. *Food Nutr Sci*; 2 (8):830.
- Ansari-Lari M, Soodbakhsh S, & Lakzadeh L(2010). Knowledge, attitudes and practices of workers on food hygienic practices in meat processing plants in Fars, Iran. *Food Control*.;21(3):260–3.
- Baş M, Ersun A. Ş, & Kıvanç G. (2006) The evaluation of food hygiene knowledge, attitudes, and practices of food handlers' in food businesses in Turkey. *Food Control*.;17 (4):317–22.

- Bas, M., & Kivanc, G. (2004). The evaluation of food hygiene knowledge, attitudes and practices of food handlers in food businesses in Turkey. *J. Food Control*, 17 : 317-322.
- Bekker, J. L. (2003). *Principles of food hygiene and safety*. Pretoria: Technikon Pretoria Press.
- Bernard, H. R. (2005). *Research methods in anthropology: Qualitative and quantitative approaches*. Walnut Creek, CA: AltaMira.
- Bruhn, C. M., & Schutz, H. G. (2009). Consumer food safety knowledge and practices. *Journal of Food Safety*, 19, 73–87.
- Bryman, A. (2004). *Social Research Methods (Second Edition)*, New York: Oxford University Press.
- Bryman, A. (2008) *Social Research Methods* (3rd ed.). Oxford: Oxford University Press.
- Bryman, A. (2012). *Social Research Methods*, (4th ed) New York: Oxford University Press Inc.
- Brynard, P. A. & Hanekom, S. (2006). *Introduction to research in Management Related Field*. Pretoria: Van Schaik.
- Brynard, P. A. & Hanekom, S. (2006). *Introduction to research in Management Related Field*. Pretoria: Van Schaik.
- Buted D, & Ylagan A. (2014). Street Food Preparation Practices. *Asia Pacific Journal of Education, Arts and Sciences*; 1 (2).
- Chukuezi O. C. (2010). Food safe and hygiene practices of street food vendors in Owerri, Nigeria. *Stud Sociol Sci*,1:50-57.

- Clayton, D. A., & Peters, A. C. (2002). Food handlers' beliefs and self-reported practices. *International Journal of Environmental Health research*, 12, 25-39.
- Cohen, E., Reichel, A., & Schwartz, Z. (2001). On the efficacy of an in-house food sanitation training program: Statistical measurements and practical conclusions. *Journal of Hospitality & Tourism Research*, 25 (1), 5-16.
- Collins, J. E. (2007). Impact of changing consumer lifestyles on the emergence/reemergence of foodborne pathogens. *Emerging Infectious Diseases*, 3(4), 1-13.
- Cresswell, J. (2003). *Research Design, Quantitative and Mixed Approaches*, (2nd edition). London: Sage Publishing Inc.
- Creswell, J. W. (2007). *Qualitative inquiry and Research Design. Choosing Among Five Approaches* (2nd Ed.). California: Sage Publications.
- Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed methods Approaches* (3rd Ed.). Los Angeles: Sage Publications.
- Creswell, J. W. (2013). *Qualitative Inquiry and Research Design: Choosing Among the Five Approaches* (3rd ed.). Los Angeles: Sage publications.
- Creswell. J. W. (2012). *Educational research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*: (4th edition). Pearson Education, Inc.; Boston, USA.
- FAO/WHO (2003). *Codex Alimentarius: basic text on food hygiene*. 3rd ed. Italy: FAO/WHO; 2003.
- Fawzi, M. & Shama, Mona E. (2009). Food Safety Knowledge and Practices among Women Working in Alexandria University, Egypt. *J. Egypt Public Health Assoc.*, 84 : 1 &2.
- Fieldhouse, P. (2005). *Food and nutrition* (2nd ed.). San Diego, CA: Chapman and Hall.

- Fischer, A. R. H., & Nauta, M. J. (2006). Toward improving food safety in the domestic environment: A multi-item rasch scale for the measurement of the safety efficacy of domestic food-handling practices. *Risk analysis*, 26(5): 1323-1338.
- Food and Agricultural Organization (FAO). (2009). *Good Hygienic Practices in the preparation and sale of Street Food in Africa, Tools for Training*.
- Fraenkel, J. R. & Wallen, N. E. (2009). *How to Design and Evaluate Research in Education* (7th ed.). New York: McGraw Hill.
- Frankel, J. & Wallen, N. (2003). *How to design and evaluate research in education*. New York, NY: Mc Graw - Hill publishing
- Griffith, C. (2000). Safe handling of food, mercel Dekker, New York, PP 235-56.
- Griffith, C.J. (2006). Food safety: where from and where to? *British Food Journal*, 108(1): 6-15.
- Guzewich, J., & Ross, M. (2009). A literature review pertaining to foodborne disease outbreaks caused by foodworkers. *Federal Register Notice*, 64, 1975-1998.
- Haapala, I., & Probart, C. (2004). Food safety knowledge, perception, and behaviors among
- Henroid, D. & Sneed, J. (2004). Readiness to implement hazard analysis critical control point (HACCP) systems in Iowa schools. *Journal of the American Dietetic Association*, 104, 180-185.
- Ingelfinger, J. R. (2008). Melamine and the global implications of food contamination. *New England Journal of Medicine*, 359 (26), 2745-2748
- Jevsnik, M., & Raspor, P. (2008). Consumers' awareness of food safety from shopping to eating. *Food control*, 19(8), 737-745.

- Kidler, L. H. (2001). *Research Methods in Social Relation* 4th Ed New York; Holt Rinehart and Winstone
- Kittler, P. G., & Sucher, K. P. (2004). *Food and Culture*, (4th Edition). Stamford: CT, Thomson and Wadsworth.
- Knabel, S. J. (2005). Foodborne illness: role of home food handling practices. *Food Technology* 49, 119-130.
- Ko, W.-H. (2011). Food sanitation knowledge, attitude, and behavior for the university restaurants employees. *Food and Nutrition*, 2: 744-750.
- Leedy, P. D. & Ormrod, J. E. (2005). *Practical Research: Planning and Design* (8thed.). New Jersey: Pearson Prentice Hall.
- Martins J. (2006). Socio-economic and hygiene features of street food vending in Gauteng. SAJCN, 19 (1).
- Martins RB, Hogg T, & Otero J. G. (2012). Food handlers' knowledge on food hygiene: The case of a catering company in Portugal. *Food Control*.;23 (1):184–90.
- middle school students. *Journal of Nutrition Education Behavior*, 36(2), 71-76.
- Motarjemi, Y. & Käferstein, F. (2009). Food safety, hazard analysis and critical control point and the increase in foodborne diseases: a paradox? *Food Control*, 10(4-5): 325-333.
- Omaye S. T. (2004). *Food and nutritional toxicology*. Boca Raton: CRC press. p. 163–73.
- Oteri, T. & Ekanem, E. (2009). Food hygiene behaviour among hospital food handlers. *Public Health*, 103(3): 153-159.
- Punch, K. F. (2009). *Introduction to research methods in Education*. Los Angles: SAGE.

- Rane S. (2011). Street Vended Food in Developing World: Hazard Analyses. *Indian J Microbiol.*; 51(1): 100–106.
- Rennie, D. M. (2005). Health education models and food hygiene education. *The Journal of the Royal Society for the Promotion of Health*, 119(2), 75 – 79.
- Richardson, I. R. & Stevens, A. M. (2003). Microbiological examination of ready-to-eat stuffing from retail premises in the North-East of England. The Get Stuffed survey. *Journal of Applied Microbiology*, 94, 733-737.
- Roberts, D. (2003). *Practical Microbiology*. (3rd Ed.). Oxford: Blackwell.
- Roberts, K. R., & Brannon, L. A. (2008). Food safety training & food service employees knowledge and behaviour. *Food Protection Trend*, 28 (4), 252 – 260.
- Roberts, L. M., Deery, M., (2004). *International Journal of Contemporary Hospitality Management* 16 (3) 151-158.
- Sagoo, S. K., Little, C. L., Griffith, C. J. E. (2003). A study of cleaning standards and practices in food premises in the UK: Communicable Diseases. *Food Protection*, 66(9), 21-25.
- Scallan, E. (2011). Foodborne illness acquired in the United States - Major Pathogens. *Emerging Infectious Diseases* 17, 7–15.
- Seaman P, & Eves A. (2010). Perceptions of hygiene training amongst food handlers, managers and training providers—A qualitative study. *Food Control*; 21(7):1037–41.
- Sharif L, & Al-Malki T. (2010). Knowledge, attitude and practice of Taif University students on food poisoning. *Food Control*; 21 (1):55–60.
- Soon J. M, & Baines R. (2011). Foodborne disease in Malaysia: A review. *Food control* 22: 823 – 830.

- Taylor, E. A., (2008). A new method of HACCP for the catering and food service industry. *Food Control* 19, 126-134.
- Veiros, M., & Rocha, A. (2009). Food safety practices in a Portuguese canteen. *Food Control*, 20(10): 936-941.
- Walker, E., & Forsythe, S. (2003). Food handlers' hygiene knowledge in small food businesses. *Food Control*, 14(5): 339-343.
- WHO (2000), Food Borne Disease: A Focus For Health Education, Geneva: WHO.
- WHO (2004), *Food and Health in Europe: A New Basis for Action*, WHO regional publications European series, no. 96.
- WHO. (2007) Food Safety and Foodborne Illness. Fact sheets No. 237. Geneva: World Health Organization.
- Wie, S.H., & Strohbehn, C. H. (2007). The impact of a sanitation food safety course on attitudes and knowledge of hospitality students. *Journal of Hospitality & Tourism Education*, 9, 65-73.
- World Health Organization (2002). *Food safety and food borne illness*. Retrieved from: <http://www.who.int/medicenetre/factsheets/fs237/en/print.htmj>
- World Health Organization (2006). Essential safety requirements for street-vended foods.
- Yiannas, F. (2009). *Food safety culture: Creating a behaviour- based food safety management system*. Bentoville: Springer.

INTERVIEW GUIDE FOR SELECTED FOOD VENDORS
ASSESSING THE LEVEL OF AWARENESS AND THE DEGREE OF FOOD
SAFETY PRACTICES

Dear Respondent,

This interview is part of the study design for collecting relevant data about the topic ‘*Food Safety Awareness and Practices among Food Vendors in the Basic Schools in Bosomtwe District*’. You are kindly assured that your responses would be kept confidential. Any information collected from you will be used solely for academic purposes and as such it will be treated with the outmost confidentiality.

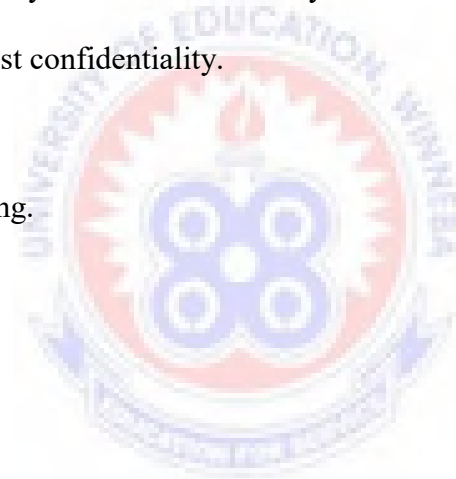
Thank you for participating.

Yours faithfully,

.....

Ama Birago Tamakloe

(Researcher)



SECTION A: Background information

(Please tick (√) the correct answer as pertaining to you.)

1. Age.

- [1] Under 20 years [2] 20 – 30 years [3] 31 – 40 years [4] 41 – 50 years
[5] 51 and above

2. Educational Status

- [1] No formal education [2] Basic school [3] Secondary school [4] Tertiary

3. Period of selling

- [1] a year and below [2] 2-5 years [3] 6-10 years [4] above 10 years

SECTION B: Knowledge on Food Safety Awareness

4. Before starting this business, did you go through formal training on food preparation or catering course?

- i. Yes
ii. No

5. Have you ever attended any training/workshop on food safety/ hygiene since you started this business?

- i. Yes (if yes skip)
ii. No

6. You said that you have never attended any training/ workshop on food safety, which of the following best describe your reason?

- i. None availability of such trainings

- ii. I do not have enough time to attend such programs
- iii. Cost of attending such trainings is high
- iv. Other
- v. (Specific)

Please, respond to the statements by ticking the right answer

	Strongly agree	Somehow agree	Neither agree nor disagree	Somehow disagree	Strongly disagree
7. Food handlers can cause food contamination during food preparation or sales					
8. Handling money with bare hand and serving food					
9. Proper washing of bowls can reduce the spread of germs					

SECTION C: Food safety practices

Please, respond to the statements by ticking the number of the 3-point scale using the following keys: 1= sometimes 2 = Never 3 = always

Personal hygiene	Sometimes	Never	Always
10. Do you wash your hands with soap and water after touching your face (such as nose, ears and mouth)?			
11. Do you wash hands with soap and water after a visit			
12. Do you cover your hair during food preparation?			
Food hygiene			
13. Do you clean raw meat or fish first before cooking?			
14. Do you clean kitchen area soon after cleaning raw			
15. Do you wash hands before handling food?			
16. Do you always cover cooked and uncooked foods?			
Environmental hygiene			
17. Do you wash food utensils using detergent?			
18. Do you wash cooking area using detergent?			
19. Do you clean your surroundings during and after			
20. Do you change your washing water?			
21. Do you dispose waste in covered bins?			

22. Do you sometimes get food left overs (unsold) food including stew, meat, fish etc.)?

- i. Yes
- ii. No

23. (If yes) how do you treat your leftover food.

- i. Stored in a refrigerator/ freezer to be used the next day
- ii. Poured into a container and cover to be used the next day

- iii. Poured into container and leave open to be used the next day
- iv. Eat leftovers
- v. Throw it away
- vi. Other (specific)

24. How often do you reheat your food or stew during the day?

- i. Do not reheat food at all
- ii. Always
- iii. Once
- iv. 2-4 times

25. What is your main source of water for cooking and cleaning of utensils and dishes?

- i. Pipe borne water
- ii. Well
- iii. River
- iv. Tanker service
- v. Other.....



SECTION D: Causes of non-compliance to food safety awareness practices

26. Challenges faced by food vendors as they practice food safety

- A. Financial constraints
- B. Pressure from consumers
- C. Access to clean water
- D. Other, specify _____

Section E: Measures to ensure effective food safety awareness practices

28. Before you started selling here, were you required by the Assembly to go through a health screening?

- i. Yes
- ii. No

29. Do have a health certificate from the Assembly, Clinic or hospital which declares you healthy to sell food?

- i. Yes
- ii. No

30. Have you ever renewed your health certificate?

- i. Yes
- ii. No

31. If yes: When was the last time you renewed it?

- i. Less 6 months ago
- ii. 6-12 months ago
- iii. 1 -2 years
- iv. More than 2 years ago.

32. if never renewed; why haven't you renewed your health certificate

- i. No money/ cost of renewal is high
- ii. Cumbersome procedure/limited time
- iii. Authorities don't check
- iv. Don't know renewal date
- v. Other-----



33. Has any environmental officer or sanitary inspector visited your business for any inspection during the last 12 months?

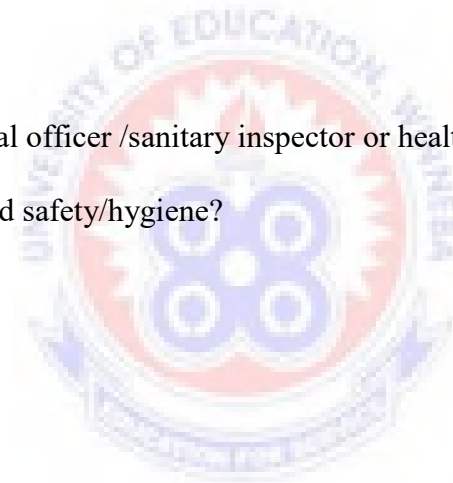
- i. Yes
- ii. No

34. If yes, how often do they visit?

- i. Once a week
- ii. 2-3 times monthly
- iii. Once a month
- iv. 2-5 times yearly
- v. Once in a year

35. Has any environmental officer /sanitary inspector or health worker visited your business to educate you on food safety/hygiene?

- i. Yes
- ii. No



QUESTIONNAIRE FOR CONSUMERS
ASSESSING THE LEVEL OF AWARENESS AND THE DEGREE OF FOOD
SAFETY PRACTICES

Dear Respondent,

I am carrying out a study on the topic “ *Food Safety Awareness and Practices among Food Vendors in the Basic Schools in Bosomtwe District*”. You have been randomly selected to participate in the research by completing the questionnaire. It would thus be very helpful if you assist by answering the questionnaire as per instructions at the beginning of each section. You are required to provide the most appropriate answer in your opinion. Your responses will be kept confidential. In any case the questionnaire is anonymous.

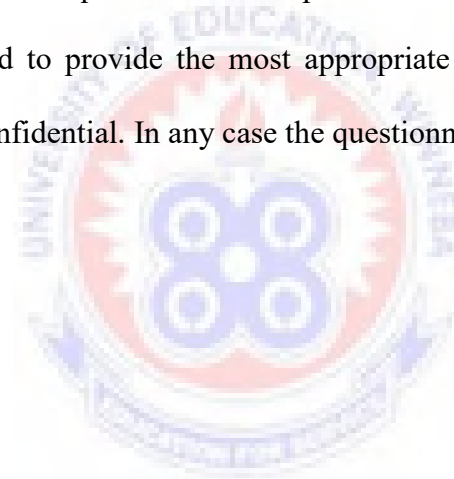
Thank you.

Yours faithfully,

.....

Ama Birago Tamakloe

(Researcher)



SECTION A: Background information

(Please tick (√) the correct answer as pertaining to you.)

27. Gender

[1] Male [2] Female

28. Age.

[1] Under 15 years [2] 15 – 20 years [3] 21 – 25 years [4] 26 – 30 years

[5] 31 - 35 years [6] 36 and above

29. Educational Status

[1] Basic school [2] Secondary school [3] Tertiary

SECTION B: Knowledge on Food Safety Awareness

Please, respond to the statements by ticking the right answer

	Strongly agree	Somehow agree	Neither agree nor disagree	Somehow disagree	Strongly disagree
30. Food handlers can cause food contamination during food preparation or sales					
31. Handling money with bare hand and serving food					
32. Proper washing of bowls can reduce the spread of germs					

33. In your opinion is reheating of food during its sale important?

- i. Yes
- ii. No

34. From your from your view point is hand washing after visiting the toilet/urinal important?

- i. Yes
- ii. No

SECTION C: Food safety practices of vendors

35. When buying food, which of the following factors determine your choice of seller/vendor?

- i. Personal neatness and appearance of seller
- ii. Cleanliness of selling environment
- iii. Neat display of food items
- iv. Others (Specify)

36. In your opinion, is the display of dishes done in a way that flies cannot get to them?

- i. Yes
- ii. No

11. Do they dispose of their refuse in a covered bins?

- i. Yes
- ii. No

12. Do they provide clean water for washing of hands before and after eating?

- i. -Yes
- ii. -No

QUESTIONNAIRE FOR SUPERVISORS
ASSESSING THE LEVEL OF AWARENESS AND THE DEGREE OF FOOD
SAFETY PRACTICES

Dear Respondent,

I am carrying out a study on the topic “ *Food Safety Awareness and Practices among Food Vendors in the Basic Schools in Bosomtwe District*”. You have been randomly selected to participate in the research by completing the questionnaire. It would thus be very helpful if you assist by answering the questionnaire as per instructions at the beginning of each section. You are required to provide the most appropriate answer in your opinion. Your responses will be kept confidential. In any case the questionnaire is anonymous.

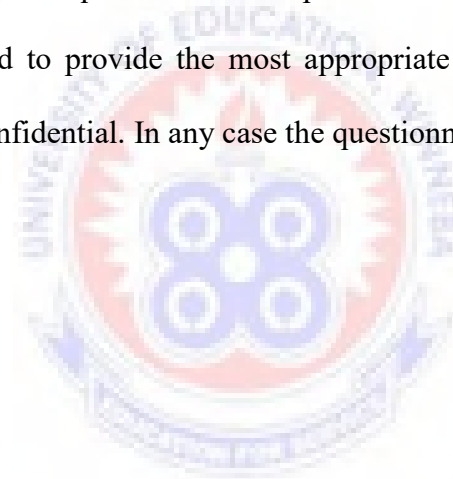
Thank you.

Yours faithfully,

.....

Ama Birago Tamakloe

(Researcher)



SECTION A: Background information

(Please tick (√) the correct answer as pertaining to you.)

1. Gender:

[1] Male [2] Female

2. Age Range:

[1] 20 - 30 [2] 31 – 40 years [3] 41 – 50 years [4] 51 – 60 years

3. Highest level of educational:

[1] Post-secondary [2] Diploma [3] 1st Degree [4] 2nd Degree

SECTION B: Measures to ensure effective food safety awareness practices

Please, respond to the statements by ticking the right answers

4. Do you check the medical report of food vendors in your school?

i. Yes

ii. No

5. If yes how often?

i. Every 3 months

ii. Every 6 months

iii. Every year

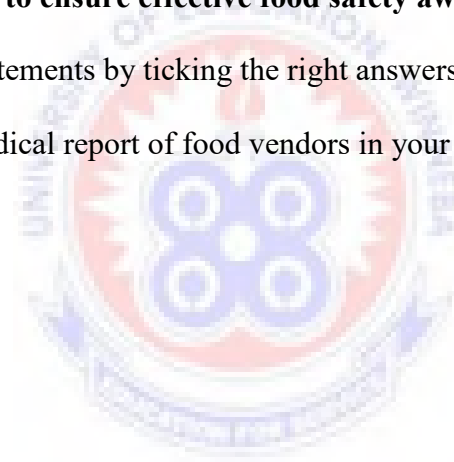
iv. Every 18 months

6. How often do you organize seminars on food safety?

i. Once a term

ii. Once a year

iii. Not at all



iv. Any other specify

.....
.....

7. Do the vendors cover their hair during food preparation and services?

- i. Yes
- ii. No

8. Do the vendors always cover cooked and uncooked foods when selling?

- i. Sometimes
- ii. Never
- iii. Always

9. Do the vendors wash used utensils with soap and water

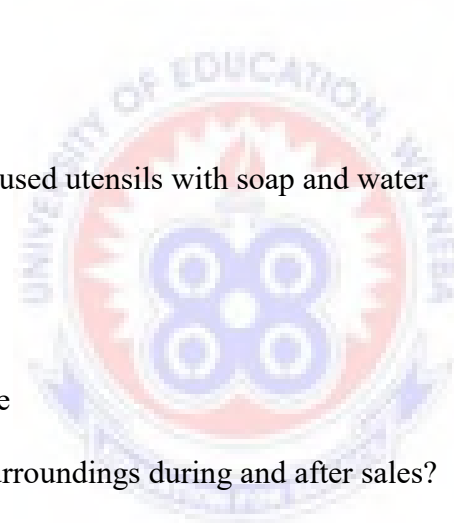
- i. Yes
- ii. No
- iii. -Don't observe

10. Do they clean their surroundings during and after sales?

- i. Yes
- ii. No

11. Do they dispose waste in covered bins?

- i. Yes
- ii. No



QUESTIONNAIRE FOR OFFICERS
ASSESSING THE LEVEL OF AWARENESS AND THE DEGREE OF FOOD
SAFETY PRACTICES

Dear Respondent,

I am carrying out a study on the topic “ *Food Safety Awareness and Practices among Food Vendors in the Basic Schools in Bosomtwe District*”. You have been randomly selected to participate in the research by completing the questionnaire. It would thus be very helpful if you assist by answering the questionnaire as per instructions at the beginning of each section. You are required to provide the most appropriate answer in your opinion. Your responses will be kept confidential. In any case the questionnaire is anonymous.

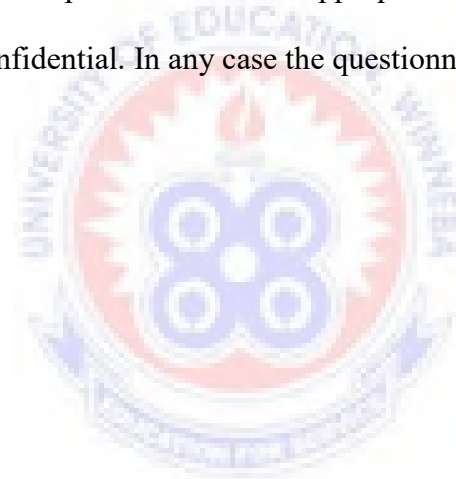
Thank you.

Yours faithfully,

.....

Ama Birago Tamakloe

(Researcher)



1. How long have been working as a town council officer?
2. Do you take the food vendors through some training before they start selling?
3. How often do you organize training/workshop on food safety for food vendors?
4. How important is food safety awareness and practices to food vendors
5. Do you visit food vendors?
 - i. Yes
 - ii. No
6. If yes how often do you visit?
 - i. Once a week
 - ii. Ii. 2-3 times monthly
 - iii. Iii. Once a month
 - iv. Iv. 2-5 times yearly
 - v. Once in a year
7. If no, why don't you visit?
8. What are the challenges you face in carrying out your duties?
9. How can these challenges be solved?

