

**UNIVERSITY OF EDUCATION, WINNEBA**  
**COLLEGE OF TECHNOLOGY EDUCATION, KUMASI**

**EXAMINING FOOD SAFETY KNOWLEDGE, ATTITUDE AND PRACTICE OF**  
**STREET FOOD VENDORS IN TAMALE METROPOLIS**



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**NOVEMBER, 2018**

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**A project submitted to the Department of Hospitality and Tourism Education,  
University of Education Winneba, in partial fulfilment of the requirements for the  
award of Master of Technology (Catering and Hospitality) Degree.**

**NOVEMBER, 2018**

## DECLARATION

### STUDENT'S DECLARATION

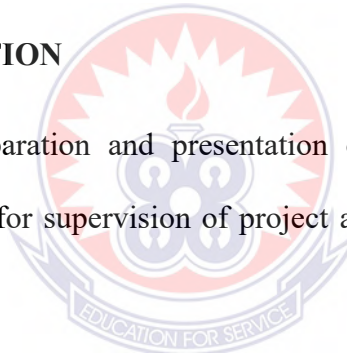
I, Rashidatu Mohammed, declare that, this Project, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

**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 project as laid down by the University of Education, Winneba.



NAME OF SUPERVISOR: MR. MICHAEL TSORGALI

SIGNATURE:.....

DATE: .....

## **ACKNOWLEDGEMENT**

Special thanks go to my supervisor, Mr. Michael Tsogali for his guidance and tolerance during the study. I am grateful to the Head of Department, Dr. Gilbert Owiah Sampson (Catering and Hospitality) for his patience. My sincere gratitude goes to all lecturers at the Department of Catering and Hospitality for their hard work. I wish express my profound gratitude to all employees of Tamale Metropolitan Assembly.



## **DEDICATION**

This project is dedicated to my husband, Mr. Abdallah Abukari and children, Timtooni and Fareeda for their love and support during the entire programme.



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## ABSTRACT

The adoption of impressive and positive attitude and practice towards food hygiene and safety by street food vendors is crucial in enhancing healthy population in communities. The study sought to examine food safety knowledge, attitude and practice of street food vendors in Tamale Metropolis. A sample size of 183 (128 [food vendors], 50 [customers] and 5 [health inspectors]) were selected from using purposive and convenience sampling techniques. Questionnaire, interview guide and observation were used as the main data collection instruments for the study. The results of the study were analyzed using descriptive statistics in the form of percentages, mean scores and standard deviation. There were instances where unsafe water was used for washing utensils. There were poor washing facilities for most of the vendors and foods were contaminated through unwashed hands and unsafe materials such as newspaper and reusable polyethylene bags. Food Vendors were conversant with the issue that contamination leads to food poisoning. Some of the challenges of food hygiene and safety had to do with inadequate refuse disposal and waste bins, poor water supply and drainage system, overcrowding, poor handling and storage of products and unhygienic surroundings. Food vendors do not have knowledge on effective safety practices due to poor logistics and welfare to motivate health inspectorate officers. These have led to poor inspection and monitoring of food vendors activities. There should be adequate training programme organized for food vendors on safe handling of food techniques. This would help in equip skills in them to effectively deal with hygiene and safety measures.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Food is a basic necessity of life without which man cannot survive. The vending of food on the street is considered an important part of many developing countries. It provides numerous jobs for people and serve as a linkage to rural agriculture and the modern economy (Tomlins, 2002; Rheinlander, 2006; Food and Agricultural Organization (FAO), 2009). The sector helps in meeting the basic foods needs of the urban poor, travellers, children and the busy worker by providing easily accessed cooked meals relatively cheaper prices (Muinde & Kuria, 2005; Mensah et al., 2000).

With the mushrooming of street hawkers and other food establishments, people most probably seek the place not only to satisfy hunger but a place to socialize (Lucca, Elizabeth & Torres, 2006). Food consumption activities have changed due to the influence of people's life-style (Abdalla, Suliman & Bakhiet, 2009). However, the increased numbers of people eating out have caused the emergence of food borne illness due to unhygienic preparation and lack of knowledge of personal hygiene (Ghazali, Othman, Nashuki & Roslan, 2012). Most outbreaks of food poisoning have been implicated to human handling errors (Greig et al., 2007). It is important to have an understanding of the interaction on prevailing food safety knowledge and practices of food handlers in order to minimize the occurrence of foodborne illness.

Thus, it is important that people handling food observe certain strict hygienic measures when it comes to cleaning, preserving, cooking or storing food for human consumption. This is because good health is dependent on the manner food is handled.

## **1.2 Statement of the Problem**

The northern region is reported to be under the threat of cholera outbreak due to open defecation and improper waste disposal. Myjoyonline reported that Tamale Metropolitan Assembly scored zero in the current ranking of open defecation. Cobbinah and Patrick (2014) attributed the practices of poor sanitation to attitude of the people of Tamale. This raises the concern of the safety of publicly sold food and the practices they engage in to ensure that sold food are not infected by the unsanitary environment. By October 2014, cholera outbreak in Ghana during the year had hit a record of 17,000 cases with 150 deaths (Myjoyonline,2014). The outbreak was attributed to poor sanitary conditions across the country. Given the generally poor sanitary practices among the Ghanaian populace, food vendors require to be extra meticulous with regard to the safety and health of food sold to the public. The issue of the safety of publicly sold food is of major concern because food vendors represent a source of possibly contamination and infection of the masses. This concerns the handling of farm produce from source to the market, and also importantly the handling, the handling, cooking and serving methods adopted by food vendors.

## **1.3 Purpose of the Study**

The purpose of the study was to enhance the food safety knowledge and hygienic practices of street food vendors in the Tamale Metropolis.

#### **1.4 Objectives of the Study**

The specific objectives of the study are to:

1. Examine the issues of food safety, attitude and practice of street food vendors on quality service delivery.
2. Identify the factors contributing to lack of food safety knowledge of street food vendors in Tamale Metropolis
3. Devise strategies to enhance food safety knowledge, attitude and practice of street food vendors

#### **1.5 Research Questions**

The study was guided by the following research questions.

1. What are the issues of food safety, attitude and practice of street food vendors on quality service delivery?
2. What factors contribute to lack of food safety knowledge of street food vendors in Tamale Metropolis?
3. What intervention measures can be adopted to enhance of food safety knowledge, attitude and practice of street food vendors?

#### **1.6 Significance of the Study**

- The findings of this study will inform decisions concerning the efficacy of the structure of minimum standards for knowledge and practice in food hygiene in Tamale Metropolis.

- This study has implications for positive social change in that it will influence policy that results in better training programs for food handlers in Tamale Metropolis and by extension, Northern region as a whole. This will ultimately lead to the serving of safer food to the public and a reduction in food-borne disease outbreaks.
- The study will contribute to academic literature on food safety knowledge, attitudes and hygiene practices of street food vendors.
- The study will also add more knowledge to existing works done on food vending in Ghana.

### **1.7 Scope of study**

The study was conducted in the Tamale Metropolis. Street food vendors, customers and environmental health officers within the Tamale Metropolitan Assembly were the main people targeted for the study. The main issues covered in the study include street foods, concept of food safety and hygiene practices, knowledge, attitudes and practices of food vendors, knowledge on food safety and foodborne diseases, hazard analysis and critical control points, food handling practices, barriers to food safety practices and food safety and hygiene management systems.

### **1.8 Structure of the Study**

The work would be organised mainly into five chapters. The background of the study; problem statement; objectives of the study; research questions; scope of the study; significance and the overview of the methodology were captured in Chapter One. The researcher will further review some selected literature related to the study on the premise of both theoretical and empirical existing studies using journals, articles and reports in the

Chapter Two. Chapter Three deals with the methodology of the study. Thus, the sampling technique and instruments that would be employed to gather the data. The results from the gathered data would be analysed, discussed and presented in the form of tables, graphs and charts in the Chapter Four. The Chapter Five would present the summary of the findings, conclusions and recommendations on the study based on the results that would be achieved.





## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter review literature to explore studies that have looked at brief history of street food vending, concept of food safety and hygiene practices, knowledge, attitude and practices of street food vendors, knowledge of food safety and foodborne diseases, food handling practices, nutritional aspect of street food, food safety and personal hygiene of handler, barriers to food safety practices and food safety and hygiene management.

#### Street foods

Street foods are defined by the food and agriculture organization (FAO) as” ready – to- eat foods and beverages prepared and our or sold by vendors and handle especially in streets and other similar places of immediate consumption or consumption at a later stage without further processing others or preparation. This definition includes fresh fruits and vegetables which are outside authorized which are outside authorized market areas for immediate consumption.

#### Briefs history of street food

Street food is type of prepared food sold on the streets and other public places. It usually cheaper food than one sold in restaurants and it can be sold from a kiosk, portable food booth, foot cart or food truck. Food sold there can be of local character or burgers and fried foods. Civilization. Ancient Greek had street vendors that sold small fried fish while the Ancient Romans depended on street food for nutrition because they often did not had ovens in their homes to prepare food.

In ancient china, street food was also intended for poor but the wealth citizens would sometimes send their servants to buy them street food.

In African, street food vending and consumption have proliferated in the last three and a half decades (Marras, Ag Bendeche 2016) Such phenomenon is strictly linked to of urban areas due to natural growth and migrations from rural to urban areas. Indeed, a growing number of the wages labour market, which often does not present opportunities, self – employment becomes the only way to earn a living and street food vending presents one of the easiest and viable jobs as it requires little capital to start.

## **2.2 Concept of Food Safety and Hygiene Practices**

Food safety is becoming a key public health priority because a large number of people take their meals outside their homes. As a result, they are exposed to food borne illnesses that originate from food stalls, restaurants and other food outlets. In line with this, food service employees are a crucial link between food and consumers. World Health Organization (WHO) has developed five main keys to safer food, which include keeping clean, separating raw and cooked food, cooking thoroughly, keeping food at safe temperatures, and using safe water and raw materials (WHO, 2007).

From the food vendors' perspective, the variety, quality, preparation of foods and services are meant to just satisfy the needs of the consumer and not to waste resources and run at a loss. Street food vendors are known to contribute a significant amount of money to the economy. The street foods sector employs more than 60,000 people with an estimated annual turnover of about 100 million dollars and a profit of 24 million dollars (Agyei-Takyi, 2012).

The hygienic aspects of vending operations and the safety of these foods are problematic for food safety regulators. The global food crisis has worsened an already precarious food situation because when food is in short supply people are more concerned about satisfying hunger than the safety of the food. The aetiological agents include various pathogenic bacteria, parasites and viruses. Chemical contaminants are becoming increasingly important. Human factors including: unhygienic practices and deliberate contamination, environmental factors, such as unsafe water, unsafe waste disposal and exposure of food to insects and dust, undercooked food, and prolonged storage of cooked food without refrigeration are the main predisposing factors. WHO's position is that food safety must be recognised as a public health function and access to safe food as a basic human right (Mensah et al., 2012).

Food safety involves the protection of supply from microbial, chemical, and physical hazards that may occur during all stages of food production including growing, harvesting, processing, transporting, retailing, distributing, storing, preparing and consuming to prevent food borne diseases (WHO, 2007). That is to say, that food should not harm people after its consumption. Street food are ready-to-eat foods or beverages prepared and/or sold in the street and other public places for immediate consumption or at a later time without further processing or preparation (WHO, 2006). Street-vended local foods (SVLFs) are specific local foods associated with some particular ethnic groups in Ghana, which are prepared and sold as ready-to eat foods in the streets. There are many factors associated with food handling practices.

In developing country, a large amount of ready-to-eat food is sold on the street due to its convenience rather than its safety, quality and hygiene aspects (Abdalla, Suliman & Bakiet, 2009). The World Health Organization (WHO, 2006) identified several factors

associated with food borne illness such as poor food safety knowledge, poor personal hygiene, cross-contamination as well time and temperature abuse during storage and preparation of food by mobile food handlers (Osaili et al., 2011). In most cases, the process of preparing street food is exposed to unpleasant environmental condition compared to food that prepared in premises. It shows that a mobile food handler has been associated of causing food borne illnesses. These practices had been seen among mobile food handlers and hawkers as well as the numerous small-scale food processors or cottage industries throughout the country (Muyanja et al., 2011).

### **2.3 Knowledge, Attitudes and Practices of Food Vendors**

The relationship between knowledge, attitudes and behaviour is often explained through the KAP model (Simelane, 2005). According to Glanz and Lewis (2002), knowledge accumulates through learning processes and these may be formal or informal instruction, personal experience and experiential sharing. It has been traditionally assumed that knowledge is automatically translated into behaviour. However, Shisana and Simbayi (2002) noted that, behaviour change theorists and experiences in the HIV field have indicated that knowledge alone does not translate into appropriate behaviour modification. Knowledge however is not insignificant and it is found to be vital in the cognitive processing of information in the attitude-behaviour relationship (Simelane, 2005).

On the other hand Keller (1998) is of the view that attitude involves evaluative concepts associated with the way people think, feel and behave. It comprises a cognitive, emotional and a behavioural component implying what you know, how you feel and what you do. It has also been postulated that attitudes may influence one's intention to perform a

given behaviour or practice (Rutter & Quine, 2003). They are thus correlated with behaviour, for instance if a person has a positive attitude towards appropriate hand washing, they are more likely to wash their hands. However, there is an assumption that there is direct relationship between knowledge and behaviour. Behaviourists further add that a number of factors can influence one or more of the KAP variables such as self-esteem, self-efficacy and misconception (Ajzen, 2002, Keller, 1998; Glanz & Lewis, 2002). A few studies have looked at this aspect of behaviour change, including behavioural models in food handler training.

The results of a number of the previously mentioned investigations on consumer food safety showed that the levels of understanding, motivation and trust need to be further cultivated and enhanced in order to maintain an acceptable level of food safety for the whole food chain. Most of the work during the last few years has centered on hazard control in the production sector, but an equal effort was not dedicated to improving the food safety education of consumers (Garayoet al., 2005). It appears food vendors have been allowed to operate without any periodic checks to ascertain whether they are practicing food hygiene. In a related study by King *et al.* (2008) results indicated that, among 160 street food stalls in Ghana, only three (1.85%) of the proprietors met the requirements for basic hygiene based on a five-point check-list. Even though they offer numerous advantages, there are a few health hazards associated with this sector of the economy.

A study done in Ankara, Turkey, Mekelle town, and Bahir Dar town, Ethiopia indicated that knowledge of food handling is significantly related with food handling practices (Nigusse et al., 2012), whereas, a study done on central India, Bangladesh, and Nigeria indicated that food handling practices was related with educational status of food handlers (Kibret et al., 2012). Moreover, a study done in Nigeria and Kenya in 2009 showed that type of premise, unclean equipment and work responsibility were factors affecting food

handling practices (Havelaar et al., 2013). Gender was also found to be associated with food handling practices of vendors of street foods in Nairobi, Kenya (Muinde et al., 2005). A similar study conducted by Lusaka City Council (2010) revealed that poor hygiene practices in food establishments, improper cleaning and bad habits such as smoking and poking of the nose, wearing jewellery and lack of protective gear were potential health hazard (Shinando et al., 2010).

#### **2.4 Knowledge, Attitudes and Practices on Food Safety and Foodborne Diseases**

A study to assess knowledge, attitudes, and behaviour concerning foodborne diseases and food safety issues amongst formal food handlers conducted in Italy found that majority of food handlers who had attended a training course had knowledge and a positive attitude toward foodborne diseases control and preventive measures (Angelillo, Viggiani, Rizzo & Bianco, 2000). In Malawi, a study on the KAP on food hygiene of caregivers showed a poor relation between knowledge, behavioural and sanitary practices, as swabs from caregivers' hands and food tested positive for coliforms and *E Coli*. (Kalua, 2002).

Furthermore, in a study conducted in Mauritius on 50 street food vendors, it was reported that despite the efforts of Health Inspectors in promoting the risks of poor hygiene practices, and an awareness of hygienic conditions, majority were not putting their knowledge into practice as they perceived their products to be of low risk (Subratty, Beeharry & Chan Sun, 2004). The authors attributed this to lack of knowledge and recommended a need to strengthen the educational programme.

Mukhola (1998) in assessing the factors influencing the safety and quality of street food in a rural area in Limpopo examined the knowledge, attitude and perceptions in both

street food vendors and consumers. Her findings indicated that majority of street food vendors and consumers had little information regarding the proper preparation and storage of food as well as environmental conditions that may be detrimental to health. Furthermore 64.4% of consumers thought that street food is sold under unacceptable conditions and these needed improvement.

Based on the literature reviewed, many of the studies have been conducted on the formal sector; there is limited information on the effectiveness of training conducted on street food vendors. It is therefore very important to explore the KAP of street food vendors in order to allow for a better understanding of these variables in street food vendors in relation to Food Safety.

In a study of food safety practices and readiness to implement HACCP programs in assisted-living facilities in Iowa, Sneed, Strohbehn and Gilmore (2004) identified a number of food safety practice concerns. These researchers found that employees were least knowledgeable about food cooling and thawing practices, sanitizer concentration, and minimum end-point cooking temperatures. Researchers observed that handwashing sometimes was inappropriate, effective hair restraints often were not used, food temperature monitoring and recording were infrequent, and sanitizer concentration was not checked regularly. Researchers concluded that employees in assisted-living foodservice had sufficient food safety knowledge and positive attitudes toward food safety, but food safety practices still needed to improve, which was consistent with findings in the Henroid and Sneed study (2004).



## 2.5 Hazard analysis and critical control points (HACCP) system

The hazard analysis and critical control points (HACCP) system is widely recognized as a management tool capable of ensuring food safety. The keyword of the system is “prevention”, by means of the identification of possible contaminations before they occur, and of the definition of control measures to maximize food safety in every step of the process. Compared with traditional methods of inspection and quality control based on the analysis of finished products, HACCP facilitates a stricter control of contaminations. The HACCP system is recognized as an important tool in the reduction of foodborne diseases (FBDs), and it is a global reference in terms of food safety control. It is recommended by the World Health Organization, the International Commission on Microbiological Specifications for Foods, the *Codex Alimentarius*, and food regulatory agencies in various countries (Cusato, Tavolaro & Fernandes de Oliveira, 2012).

MacArthur (2007) stated that HACCP is a structured approach that assesses the potential hazards of a food operation and decides which areas are critical to the safety of the consumer. Once identified, the critical control points (CCPs) are monitored and deviations from the safety limits corrected. This approach can be applied to all food operations, from large manufacturer to the small caterer. HACCP is a written programme and an active process, which allows one to be proactive and also provides a means by which a continuous monitoring, documentation and corrective measures are taken. The strength of this model lies on its emphasis on building safety into the process rather than waiting to test the end product for quality.

HACCP has become an international standard in food safety assurance. Recommended or mandatory use of HACCP is found in the regulations of several countries, and governments, industries, and consumers are showing growing acceptance of the system



(Fermam, 2007). According to Taylor (2003), the implementation of the system has been largely motivated by the requirements of clients, especially in large companies, such as supermarket chains, which demand from their suppliers documented proof of the use of HACCP. Still, according to Taylor (2003) author, for smaller companies whose clients are the final consumers, the greatest pressure for the implementation of the system comes from legal requirements. In countries where regulations are not strict, these companies may not be motivated to adopt HACCP. Other obstacles and difficulties faced by smaller companies are lack of knowledge of the principles of the system, and how they would fit into their reality (methodology), lack of knowledgeable technical personnel (particularly in hazard identification and monitoring), difficulty in recordkeeping, and greater turnover of employees. However, many of these problems stem from the fact that, most of the time, managers and employees are not adequately trained (Taylor, 2003). Studies carried out by Buchweitz and Salay (2006) in food services in the region of Campinas, Brazil, showed that the lack of information and economic factors are the main reasons for not adopting HACCP. The government and its agencies have a fundamental role in facilitating and stimulating the adoption of HACCP, mainly in small companies.

The system has its own specific concepts and terminology, as follows (Bryan, 1993; Silva, 1999):

*Hazard*: unacceptable biological (growth or survival of microorganisms), chemical (pesticides, antibiotics, heavy metals, cleaning products), or physical (pieces of glass, metal, or other materials) contamination, rendering the food unfit for consumption.

*Severity*: magnitude of the hazard or of the consequences to the health of consumers. Diseases may be classified, in terms of severity, as lethal, chronic, or mild.

*Risk*: probability that the hazard will occur. Risk levels may be high, moderate, or low, and may vary according to the situation.

*Critical control point (CCP)*: a place, practice, procedure, or process that may be controlled to prevent, eliminate, or reduce the hazard to acceptable levels.

*Critical limit*: physical (e.g., time, temperature), chemical (e.g., pH), or biological (e.g., sensorial, microbiological) attribute or value determined for each CCP, which indicates that the operation is controlled.

*Monitoring*: measurement of time/temperature, pH, or acidity, or visual observation of CCPs in order to assess whether critical limits are met; if they are not met, the CCP is not controlled and corrective actions are necessary.

*Corrective action*: immediate and specific procedures to be followed whenever critical limits are not met.

– *Verification*: additional tests and/or review of monitoring records in order to confirm whether the HACCP plan is working as designed. Verification may cause some of the steps of the process to be changed in order to ensure food safety.

*Decision tree*: logical sequence of questions that enable the identification of a raw material, step in the process, or ingredient as a CCP.

A basic requirement for the implementation of the HACCP system is related to the staff involved in the program, who should be aware of the characteristics of the system and of the necessary commitment involved with it. The management of the company should be committed to the objectives of the plan and should be aware of the resources that have to be made available. The HACCP team, responsible for creating and implementing the plan, should be multidisciplinary and knowledgeable regarding production, engineering, health, microbiology, and quality assurance issues (Hajdenwurcell, 2002).

Verification procedures for HACCP are divided into 3 distinct areas (Okojie, Wagbatsoma & Ighoroge, 2005):

1. Each Critical Control Points (CCP) should be validated, as part of verification, to ensure that the CCP, when operated within the defined critical limits, actually achieves the prevention, reduction or elimination of hazards stated in the HACCP plan. This is best achieved in the catering situation by reference to current research data, scientific and technical publications, codes of practice, etc.
2. The records generated as a result of monitoring each CCP should be checked to ensure that each CCP was operating within its defined critical limits for a given period of time. In catering this should be an ongoing process with a record review at least once per week of all records generated since the last review. This should be supplemented by audits of monitoring activities as they are being performed.
3. Internal audits should be performed on a bi-monthly basis. This should include a review of all records relating to the food safety control system(s) including monitoring, corrective action and training records (Bolton, 2004). Food handlers play a major role in ensuring food safety throughout the chain of producing, processing, storage and preparation. Mishandling and disregard for hygiene measures on their part may result in food contamination and its attendant consequences (Okojie et al., 2005).

## 2.6 Food Handling Practices

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. Several studies conducted to assess the quality of street foods in several countries have indicated that street foods are positive vectors of food-borne illnesses (Omemu et al., 2008).

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. Epidemiological studies of *Salmonella typhi*, non-typhi *Salmonella*, *Campylobacter* spp. and *Escherichia coli* have demonstrated that these organisms can survive on finger tips and other surfaces for varying periods of time and in some cases after hand washing (WHO, 2000). 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.

Physical hazards may be introduced by food handlers wearing jewellery, bandages or by careless food handling practices (WHO, 2007). Furthermore, street food vendors have frequently been considered to use improper food preparation and selling practices (Mosupye & von Holy, 1999). In particular, previous studies in some developing countries have 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 harbour harmful pathogens; and safe food storage is difficult to maintain (Ekanem, 1998). In lower middle income countries including Vietnam, 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, 2015). 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, 2007).

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 (Mamun et al., 2013). 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 (INFOSAN, 2010). 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 (FAO, 2013). This lack of translation of acquired knowledge has been explained (Subratty, 2004).

In some cases, street vendors may completely ignore basic food hygiene practices but consumers probably do not pay much attention to demand safe food (Subratty, 2004). 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, 1996). 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.

## **2.7 Nutritional Aspects of Street Foods**

Street foods are popular in developing countries where they provide affordable sustenance for a broad spectrum of consumers including the urban poor. A study on nutritional aspects of street foods concluded that although some types of street foods can provide nutritionally balanced meals, most cannot provide sufficient nutritional value to replace a complete meal (Ohiokpehai, 2003). Noodles, rice, fried snacks, cakes, pastries, soups, cereals, porridge, drinks, fruits, vegetables, meat, and poultry are prominent foods sold

by street vendors. Street foods can be processed by frying, roasting, boiling, baking and steaming as well as being served raw. To date most of the studies on street foods have focused on their safety, the food safety knowledge and attitudes of street food vendors and consumers, and the microbiological quality of street foods. Much less attention has been paid to their nutritional quality.

A study in Gaborone, Botswana, stated that street foods can be considered as a strategy of reducing problems of urban food insecurity a possible vehicle for micronutrient supplementation (Ohiokpehai, 2003). The street foods vended in Gaborone were mostly cereal based and served with meat and salad which enhanced the nutrient content. A study carried out in Nairobi, Kenya, concluded that street foods were mostly bought by the urban poor in areas around their work places as a major meal (Mwangi, 2002). These major meal servings like cereals based can provide enough protein and iron; however, insufficient energy and poor vitamin A source were evaluated. Furthermore, this study also stated that female vendors normally provided foods with higher nutritional value than their male counterparts. According to Mpuchane et al. (2001), attention should be paid during the preparation and processing of street foods in order to retain minimize nutrient losses.

On the other hand, food colours and additives are also important in the production of some street foods. This is of concern as street food vendors can use harmful (or illegal) preservatives and/or abuse legal preservatives in order to extend the shelf-life of their foods (Ohiokpehai, 2003). It has been suggested that the labelling for street foods should be seriously taken into consideration (Ohiokpehai, 2003). As a result, the street foods consumers would know what has been added to the foods allowing them to make informed decisions about what they eat.



## 2.8 Food Safety and Personal Hygiene of the Handlers

A microbiological study of open, ready-to-eat, prepared salad vegetables from retail catering premises by Sagoo, Little and Mitchell (2003) identified a direct relationship between food hygiene training and practice of food safety procedures. Another study of ready-to-eat food from retail premises in North Eastern England by Richardson and Stevens (2003) also indicated that members of staff who practiced poor personal hygiene could contaminate food items with infected excreta, pus, respiratory drippings or other infectious discharges. This claim implied that food handlers were the major sources of contamination either as carriers of pathogens or through poor hygienic practices (Kafenstein, 2003). The study further suggested that food handlers could carry microbial pathogens on their skin, hair, hands, digestive systems or respiratory tracts. As a result, the report asserted that it was imperative for the staff to understand and follow basic food hygiene principles to avoid unintentional contamination of foods, water supplies and/or equipment used during the processing of food (Richardson & Steven, 2007).

Sneed, Strohbahn and Gilmore (2004) conducted another study on food safety practices and implementation of HACCP programme in facilities in Iowa and identified a number of food safety practice concerns. They observed that hand washing was inappropriately done and food handlers had no effective hair restraints. The study also noted that food temperature monitoring and recording were infrequent and sanitizer concentration used was not checked regularly. The study concluded that employees in foodservice operations had sufficient food safety knowledge and positive attitudes toward food safety but were not following the correct procedures, an indication that there was need to improve food safety practice (Sneed et al., 2004).



As a consequence of humans also containing microorganisms naturally or from the surrounding environment it is important to maintain an appropriate personal hygiene. Important hygienic aspects related to Personal Hygiene includes (Boateng, 2014):

1. Food vendors practicing hand washing before handling food and often during food preparation.
2. Food vendors washing hands after going to the toilet (WHO, 2010).
3. Food vendors drying hands after hand washing procedure.
4. Food vendors wearing clean protective clothing.
5. Food vendors wearing head covering.
6. Food vendors avoiding wearing of personal effects such as jewellery, watches, pins or other items in food handling areas.
7. Food vendors ensuring that cuts and wounds are covered by suitable waterproof dressings.
8. Food vendors avoiding personal behaviour such as smoking, spitting, chewing or eating, sneezing or coughing over unprotected food

Burt, Volel and Finkel (2003), conducted study to assess the food handling practice of 10 processing mobile food vendors operating in Manhattan, New York City and found out that over half of all vendors (67%) contacted served food with bare hands. Also, some vendors were observed vending with visibly dirty hands or gloves and no vendors once washed his or her hands or changed gloves in the 20 minutes' observation period, more so, four (4) vendors were observed to contaminate served food with uncooked meat and poultry.

## 2.9 Food Safety and Employee-Related Characteristics

Apart from personality related behaviours, Bertin (2009) also observed that certain employee-related characteristics such as poor educational level, low socio-economic level, rapid staff turnover, literacy barriers and poor motivation due to low pay also contributed to poor professional performance at work. Bertin found that food handlers had a very important role in preventing contamination during food preparation and distribution and this responsibility became even greater in hospitals.

Other studies used for testing effectiveness of hygiene education pointed out that hygiene knowledge alone was not sufficient in improving hygienic attitude and practices of food handling personnel. The studies further indicated that discrepancies still existed between hygiene, knowledge and practices (Park, Kwak & Chang, 2010).

One explanation for the discrepancy between food safety knowledge and practice was the barriers experienced in the food-service establishment that could prevent food handlers from implementing practices such as good hand washing in the restaurants (Green & Selman, 2005). The duo observed that availability and accessibility of hand washbasins was a major concern followed by peak time pressure during operations. Moreover, high volume of business, stress, lack of accountability, lack of equipment, type of restaurant and inadequate food handler training were considered as critical barriers mentioned by participants in other studies (Pragle, Harding & Mack, 2007). Another significant contribution by Clayton, Griffith, Price and Peters (2002) recorded that time was a major factor that barred correct practices of food safety.

## 2.10 Barriers to Food Safety Practices

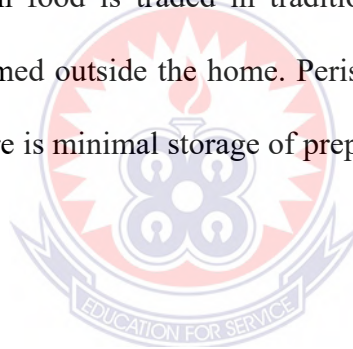
Praglet al. (2007), asserted that food-service establishments were expected to address emerging issues of barriers to food safety practices to narrow the gap between food safety knowledge and practice. Consequently, they argued, food safety training could incorporate strategies that eliminated barriers 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 organization's requirements.

To realize the difference on food handlers in the organizational performance, Yamnill and McLean (2001) recorded that the transfer of knowledge must be clear to ensure it is translated into practice. Seaman and Eves (2009), 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 behaviours. 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.

One obstacle to food safety in Nigeria for instance is refuse disposal and lack of toilet facilities for the customers. Most of the eating stalls around markets in Nigeria are characterized by unsanitary conditions, including poor water supply and poor drainage systems, unsanitary waste disposal and overcrowding, resulting in poor personal and environmental hygiene (Rheinländer et al., 2008). Another area of food safety concern is the source foods, and ingredients supply. Most of these establishments purchase their raw materials and ingredients in the open markets. Foods, especially meat, fish and ingredients

are often displayed openly on tables and on the ground in very poor sanitary environments, while unwashed fingers are used to feel foodstuffs and ingredients for texture and to ascertain the adequacy of manual grinding. The prevalence of flies at the markets and the apparent lack of facilities for food protection suggest a high potential for contamination in preparation, facilities and infrastructure (Osagbemi et al., 2010).

Some of the food safety challenges include: importation of sub-standard and/or unregistered food products e.g. non-iodized salt, unfortified flour, sugar and vegetable oil, etc (Adegboye, 2009). Food safety challenges differ by region, due to differences in income level, diets, local conditions, and government infrastructures. In developing countries, the food producer and the consumer often have a close connection. There are fewer processed and packaged foods; most fresh food is traded in traditional markets; and street vendors supply much of the food consumed outside the home. Perishable food is often prepared and consumed immediately, and there is minimal storage of prepared foods (Centre for Science in the Public Interest, 2005).



### **2.11 Food handling practices and Food-Borne Diseases**

Despite the numerous benefits provided to people, street-vended foods can also be a source of foodborne illnesses resulting from poor hygiene practices by vendors, insanitary conditions at food vending points, among others (Chukuezi, 2010). According to Chapman et al. (2002), about 70% of disease outbreaks have been linked to street-vended foods while evidence provided by Mensah et al. (2009) point to the fact that, street foods are potential sources of entomopathogens. Estimates by the World Health Organisation (2008) suggest that, food-borne illnesses account for about 2.2 million deaths annually, out of which about

86% are children. In Ghana, about 65,000 people die annually from food-borne diseases resulting in the loss of some US\$69million to the economy (Gadugah, 2014).

The high incidence of food-borne illnesses especially in developed countries where statistics are compiled has led to an increase in global concern about food safety and has been associated with poor personal hygiene of food handlers. An estimated 76 million foodborne illnesses occur annually in the United States. These foodborne illnesses result in an estimated 325,000 hospitalizations and 5,000 deaths every year in the United States (Tonder, 2007). More often than not, street food vendors are always at the end of accusing fingers for the spread of food-borne diseases, particularly cholera outbreaks, across the country and are sometimes banned momentarily as a desperate measure to control the outbreak (Gadugah, 2014).

Several outbreaks of foodborne diseases such as cholera, shigellosis, konzo (an acute paralysis caused by consumption of high cyanide cassava) and acute aflatoxicosis continue to occur in many countries in the African Region. A worrying development is the presence of chemical contaminants in food and the development of multi-drug resistant strains of the causative agents of foodborne diseases due to their misuse in health care and animal husbandry. There are emerging and re-emerging threats to the food chain from zoonotic and other diseases (Mensah et al., 2012). An outbreak of bloody diarrhoea caused by *Escherichia coli* 0157 infections occurred in southern Africa with an attack rate of 42% among 778 residents that were investigated. Consumption of beef and untreated water were significant predisposing factors. *E coli* 0157: NM was recovered from seven affected foci in Swaziland and South Africa. Isolates from 27 of 31 patient and environment samples had indistinguishable pulse-field gel electrophoresis patterns. The important factors that

contributed to the outbreak were droughts resulting in increased carriage of *E. coli* O157 by cattle, heavy rains and contaminated surface water (Effler et al., 2001).

Illness resulting from food borne disease has become one of the most widespread public health problems in the world today. The surveillance of food-borne disease outbreaks is fairly established in developed countries but in spite of that only less than 10% are recorded in official statistics. In case of developing countries, it could be even less than 1% (WHO, 2006). International studies have shown that a significant proportion of foodborne diseases arise from practices in the kitchen of a home. Food borne diseases remain a major public health problem globally (Zeru et al., 2007). In developing countries, up to an estimated 70% of cases of diarrheal disease are associated with consumption of unwholesome food (Zeru et al., 2007; Annor et al., 2011). Food contamination can occur at any point during its preparation, bringing to bear the importance of food safety and hygiene in the prevention of food borne diseases (Mudey et al., 2010).

According to FDA (2008), the loss of productivity in Ghana in 2006 due to food borne diseases was approximately 594,279 days (19,809 months) this could be huge in terms of cost to the state. Studies from the commercial food sector have dominated research in the country with special focus on street foods although there are reported food poisoning cases on the media from institutional set ups specifically schools. Saba and Gonzalez-Zorn (2012) reported that studies on microbiological food safety is on the decline and highly centred in the capital city of the country. Although all food hazards are detrimental to the health of consumers and require monitoring and control in the country, currently microbiological hazards in ready to eat foods and chemical hazards mostly pesticides from agricultural products including fresh vegetables and fruits have been highlighted (Feglo & Sakyi, 2012).

Also, a study carried out by Volland et al (2004), to assess the risk factors for transmission of food borne illness in restaurants and street vendors in Jakarta, Indonesia sought to explain a previous study in Jakarta which showed that eating from restaurant was not associated with disease. To explain this 128 street food vendors with the food handlers from restaurant were engaged in a cross sectional study. Poor hand washing hygiene and direct hand contact with food, male sex and educational level were independent characteristics of street vendors in logistic regression analysis.

## **2.12 Food Safety and Hygiene Management Systems**

Maintaining the quality and safety of food throughout the food chain requires both operating procedures to ensure the wholesomeness of food and monitoring procedures to ensure operations are carried out as intended (European Food Information Council, 2006). Food safety management systems provide a structured approach to ensuring the safety of food and demonstrating due diligence. They enable the operators to identify the points in the food chain that are likely to have the most effective impact on the safety of the final product. The effectiveness of a system is reliant upon a corporate commitment to the programme. All levels within a company from top management down must be dedicated to its development, implementation and continuous review (World Food Safety Guidelines for Airline Catering, 2010).

It is important to have an understanding of the interaction on prevailing food safety beliefs, knowledge and practices of food handlers in order to minimize foodborne outbreaks (WHO, 2000). Mortlock et al. (1999), stated that there was general agreement revealed from several authors as good levels of knowledge towards food safety among food handlers and

the effective practices of such knowledge in food handling were imperative in ensuring the safe production of food in any catering operations. Many studies pinpoint the need for training and education of food handlers in public hygiene measures due to their lack of knowledge on microbiological food hazards, temperature ranges of refrigerators, cross contamination and personal hygiene (Bas et al. 2004; Nel et al. 2004).

Education on food safety should be given to all staff in food processing businesses so as to bring behavioural changes besides adoption of positive attitudes (Coleman & Roberts, 2005). But in some previous studies no differences were detected between the staff who attended an educational course with those who did not. Meanwhile, Ehiri and Morris (1996) pointed out that knowledge alone is not sufficient to promote positive attitudes and safe behaviours among food handlers. Therefore, alternative educational strategies, such as those based on motivational health education and promotion models are required (Nee & Sani, 2011).

Previous reports indicate that besides poor hand and surface hygiene, lack in personal hygiene amongst food handlers was also one of the most commonly reported practices that gave rise to foodborne illness (Collins, 2001). This shows that if food handlers take serious note on the cleanliness of their hand, body and clothing, this will help in preventing incidence of cross-contamination from occurring (Sneed et al. 2004) (Nee & Sani, 2011).



## CHAPTER THREE

### METHODOLOGY

#### 3.1 Introduction

This chapter presents the methodology of the study. It contained the research design, study population, determination of the sample size, sampling techniques and procedure, data collection methods, data collection instruments, data analysis technique, and ethical considerations.

#### 3.2 The Study Area

The study was conducted in Tamale, the northern regional capital with high urban-population.

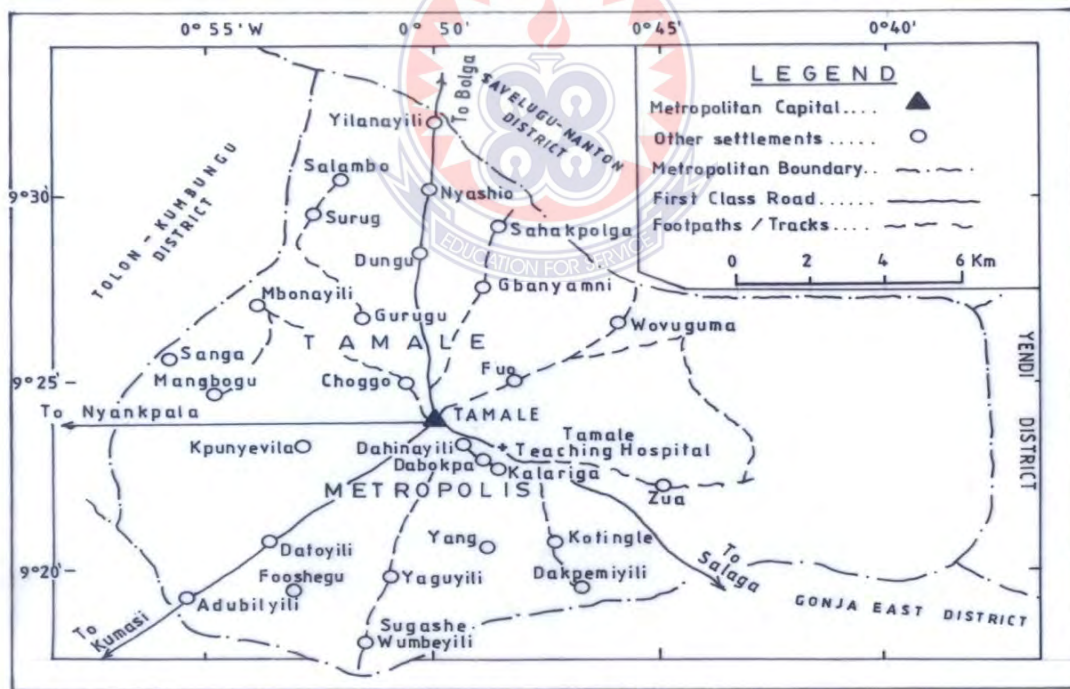


FIG. 1 A MAP OF TAMALE METROPOLIS  
SOURCE : Tamale Metropolitan Assembly

**Figure 3.1: A Map of Tamale Metropolis**

Source: Tamale Metropolitan Assembly

### 3.3 Research Design

A descriptive cross-sectional survey research design was adopted. Amin (2005) opines that a descriptive cross-sectional survey research design is a research plan that is concerned with systematic description of the characteristics of an event, place, population or item being studied at a given time. The study was cross-sectional because the study considers a cross-section of respondents over short period of time. A survey has been chosen because it allows the study to get a detailed description of the phenomenon. Both quantitative and qualitative techniques were adopted for the study. The nature of research questions made it imperative for adopting both techniques in dealing with issues in the study. The qualitative technique enhanced direct contact with participants through interviews to gather data on their perceptions, views and comments on issues raised in the study.

### 3.4 The Study Population

A research population is a well-defined collection of individuals or objects known to have similar trait or characteristics. According to Castillo (2009), a research population is generally a large collection of individuals or objects that is the main focus of a scientific query. The study population consists of food vendors, consumers and health inspectors within Tamale Metropolis.

### 3.5 Sample Size Determination

In determining a representative sample size from a cross-section of the population, the Yamane statistical model was adopted. That is:  $n = \frac{N}{1+N(\alpha)^2}$  where  $n$  = sample size;  $N$  =

Population size and  $\alpha$  = level of precision/sampling error at 0.05. However, the study will adopt a multi-stage sampling technique. The sample size will be computed on the assumption that 190 food vendors are registered. That is,  $n = \frac{190}{1+190(0.05)^2} = 128$ . Hence, the sample size will be optimal at 128 food vendors, 5 health inspectors and 50 customers were conveniently selected.

### **3.6 Sampling Procedure and Sample Size**

The study employed cluster and simple random sampling. Cluster sampling was applied during the selection of the food vendors. In the selected cluster, food vendors were selected by simple random sampling. Simple random sampling was employed to avoid bias. The study adopted the use of convenience sampling technique to select customers. Six towns were selected for the sample size to be chosen from. After that, the selection of individuals (customers) were carried out by visits to various food vending sites in the selected towns. Thus, the selection was done to cover only people who were available at the time the researcher visited the vending sites. This means that household customers who were not present at the time of the visit did not have the chance of been selected for the sample size.

### **3.7 Instruments for Data Collection**

In this study, questionnaire, interviews and observational guide were used to examine the impact of food safety knowledge, practices and behaviour of food vendors and customers of Tamale Metropolis.

### **3.7.1 Questionnaire**

The questionnaire was used because it represents the most economical way of interrogating large number of respondents. One set of questionnaire was constructed to collect data from customers involved in the study. The questionnaire was made up of closed-ended items (where respondents were offered options from which they were to select those items that they deemed appropriate) and open-ended questions (those that participants provided their own responses). Each questionnaire was made up of three parts. The first part sought information about the personal background of the respondents. The second part focused on identifying awareness of food safety and knowledge practices among vendors and customers and food safety and hygiene practices by vendors and assess whether there have been the compliance and enforcement of the necessary legislation and regulation on food safety practices in the metropolis. The third part concentrated on the impact of food safety practices on the on the lives of the people and strategies that can improve effective food safety practices at the metropolis. The questionnaires were distributed to customers and almost all those who responded completed it the same day.

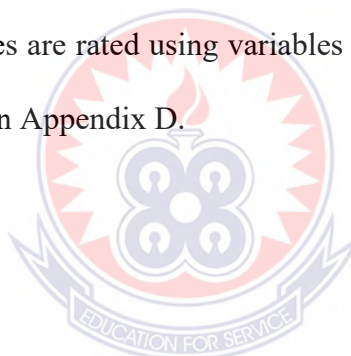
### **3.7.2 Interview guide**

A semi-structured interview was designed to enhance the qualitative aspect of the study. Some food vendors were selected for the interview. It is common to find most of the food vendors to be illiterate (no formal education) and therefore it was imperative to conduct the interview in language that is mostly understood by majority of people in the study area. Food vendors were visited and the purpose of the study communicated to them. The questions within the guide consist of vendors' knowledge on food hygiene and safety practices. It also

involved whether food vendors are aware of existing safety rules and regulations concerning food selling.

### **3.7.3 Observation**

The guide presents various factors regarding personal hygiene and safety. The researcher visited 5 vending sites at Lamashegu, Zogbeli and Choggu to observe sanitary conditions of the premises and how food is prepared and served. The researcher found that, most vendors did not use clean water for hand and plate washing, sanitation of selling premises were unclean and poor and there was existence of flies in around vending sites. The various hygiene and safety practices are presented in the form of table and the situation observed recorded. The responses are rated using variables such as Yes or No. Details of the observational guide is captured in Appendix D.



### **3.8 Pre-testing of Instrument**

The pre-testing of the instrument for data collection was conducted a week at Savelugu before actual field took place to identify and delete items that were repetitive and redundant. This was meant to capture the required data for the analysis.

### **3.9 Data Analysis Procedure**

The data were analysed using SPSS version 20 for windows. The output was presented in tables and graphs while the field notes were transcribed and processed into the reports. The responses given to the questionnaires were coded and organised before being analysed

statistically. The content analysis technique was adopted. Descriptive Statistics were used to describe the differences in means and the variations in individual responses. To ensure effective, accurate, consistency and reliable results, the data were thoroughly checked for possible errors and if any corrected before making the final presentation of the findings in the form of tables, graphs and charts.



## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Introduction

This chapter presents the results of the study. It focuses on the presentation, interpretation and analysis of the responses of respondents sampled for the study. The results are presented in sections which correspond with the study's objectives. The results were presented using descriptive statistics in the form of Mean scores, Relative Importance Index (RII) and Ranking.

#### 4.2 Results of Questionnaires

This deliberate the result and discussions of questionnaires administered to customers.

##### 4.2.1 Results of Questionnaires from Customers

Discussing medium through which food is served to customers, opinion on buying food close to gutters customers preference of food, factors that determine customer food choice from vendor.

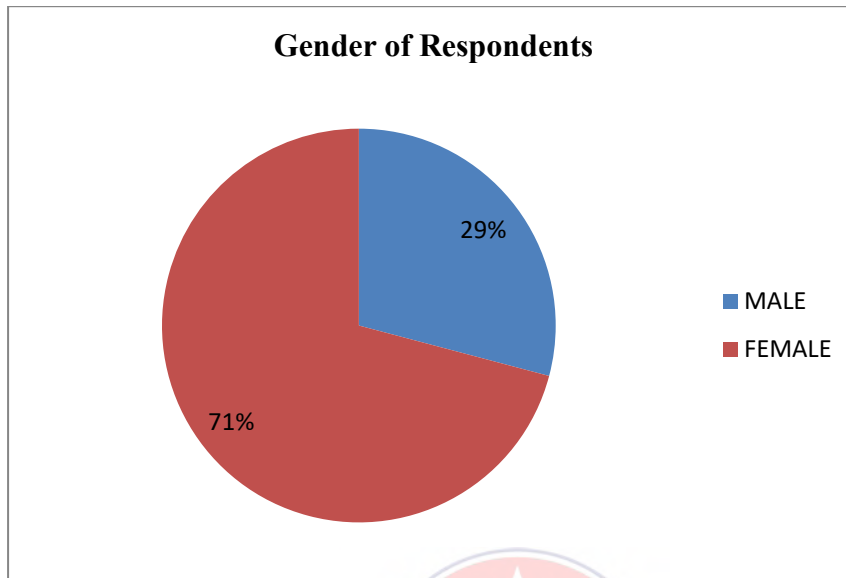
#### Demographic characteristics of Customers

In the quest to deal with demographic characteristics of customers, it was established from the results that gender, age and educational background were taken into consideration. Out of the 50 selected for the sample, 46 responded and this gives a response rate of 92%.

#### Gender of Respondents

Figure 4.1 presents gender characteristics of customers. As established from Figure 4.1, it emerged that respondents were females constituting 71% whereas their\ male

counterparts obtained 13%. This indicates that there were more female customers than their male counterparts.



**Figure 4.1: Gender characteristic of Customers**

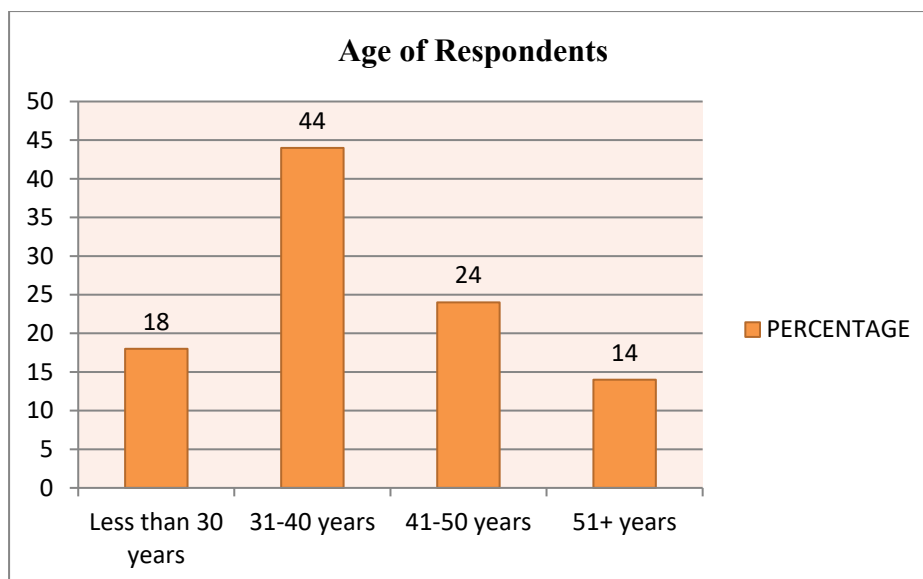
**Source: Field data, 2018.**



### **Age of Respondents**

Figure 4.2 presents the age distribution characteristic of respondents. As evidenced in Figure 4.2, most respondents were 31-40 years and people within this age bracket constituted 44%. Next to this was respondents within the age bracket of 41-50 years who obtained 24%. Some respondents less than 30 years did constitute 18% and those with 51+ years had 14%. The results indicate youthful respondents.



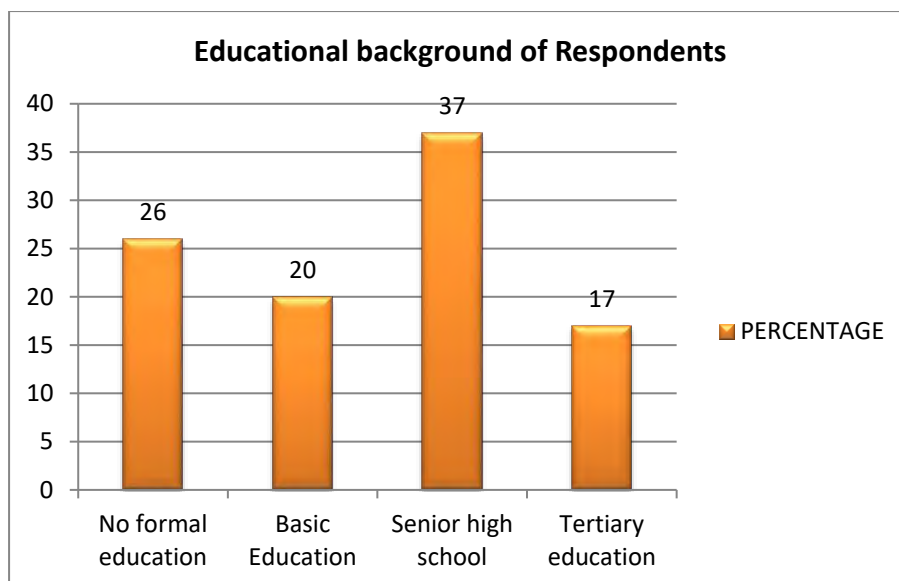


**Figure 4.2: Age of Respondents (Customers)**

**Source: Field data, 2018**

### **Educational background of Respondents (Customers)**

It was established from Figure 4.3 that most respondents were senior high school leavers and category of these respondents were rated with 37%. Some respondents, most food vendors had no formal education and constituted 26%. Next to this were those with basic education who obtained 20% and the least been people who have completed tertiary education, representing 17%. The results indicate majority of respondents were not highly literates. The acquisition of knowledge through formal and informal means helps in the building and enhancing skills and talents of food vendors. It also teaches and informs vendors on best practices to good food safety management practices. In view of this, education can be said to be a major influential factor of food hygiene and safety practices among customer's choice of foods.



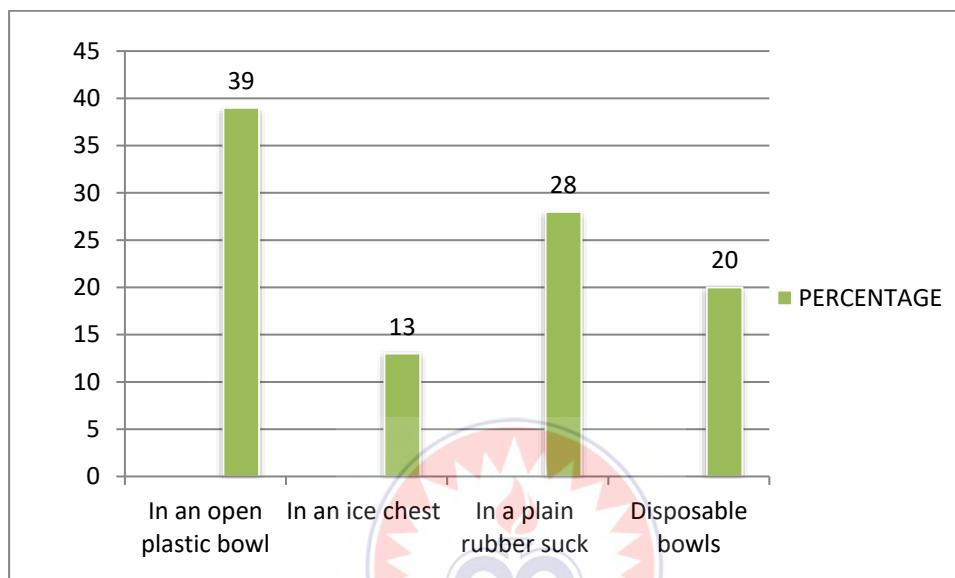
**Figure 4.3: Educational background of respondents**

**Source: Field data, 2018**

### **Medium through which food is served (Customers opinion)**

In responding to the issue of how food are served to customers, it emerged from Figure 4.4 that most consumers (39%) who responded to the survey were of the view that food were served in an open plastic bowls. Most of the vendors who served food through this medium sold ‘Waakye’, ‘Tuozafi’, rice and stew and ‘ampesi’. It was observed during the researcher’s visit to some vending site that some of the bowls dirty and were prone to bacterial infection since the place was dusty. Aside this, it was established that some vendors served food to customers using polythene (28%). This was a common practice with most porridge or ‘‘Koko’’ sellers within the metropolis. Next to these were keeping of food in plastic disposable bowls (20%). Keeping of food in these plastic disposable bowls were common with ‘‘ fried rice’’ sellers. From the observation, it was noticed that most of the

vendors did not keep their medium of serving food to customers clean with the exception of those who used disposable bowls to serve customers. WHO (2015) emphasised the appropriateness of food vendors to take massive precautions in ensuring food served are done to minimise the risk of contamination through careless handling practices.



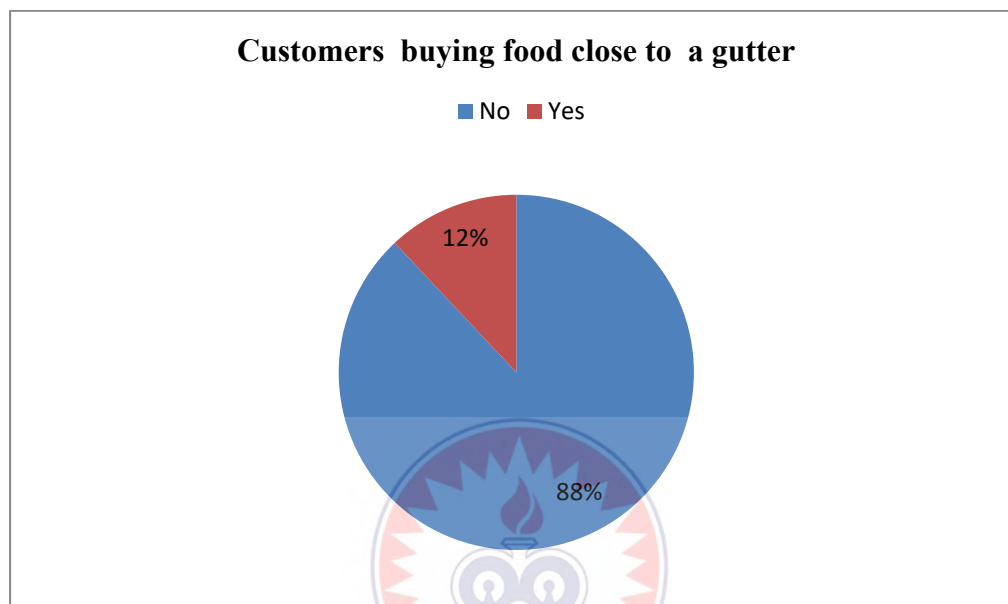
Source: Field data, 2018

Figure 4.4: Medium through which food is served (Customers opinion)

#### Customers opinion on buying foods close to gutters

The respondents were further probed to ascertain whether they were willing to purchase food close to a gutter. It was established from Figure 4.5 that most respondents (88%) were not in support of the idea of selling food close to a gutter. Selling of food close to gutters attract flies which contaminate food and lead to foodborne diseases such as cholera, diarrhoea and fever. Ekanem (1998) noted that food material is usually not effectively protected from dust and flies which may harbour harmful pathogens and safe food storage is difficult to maintain in most developing countries. However, 12% of respondents indicated

that they will prefer to buy food irrespective of its closeness to a gutter. It was observed that though, some food vending sites were not clean but still had numerous patronage from customers. This was attributed to scarcity of variety of foods located at particular places which force them to patronise what is available despite their possible health implications.



Source: Field data, 2018

Figure 4.5: Customers opinion on buying foods close to gutters

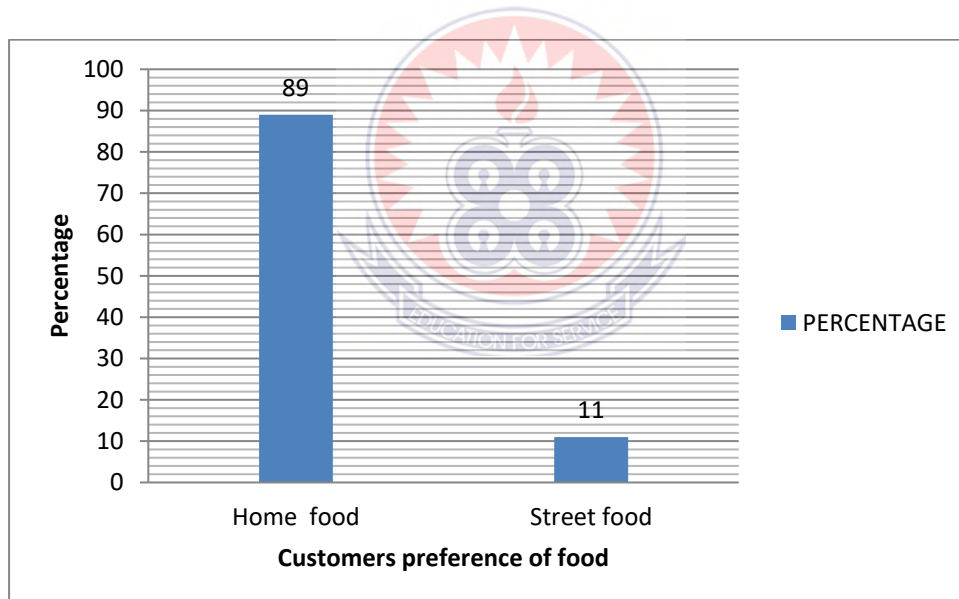
### Customers preference of foods

Customers were asked to give their opinion on whether they prefer food prepared at home to that of street foods. It was established from the responses shown in Figure 4.6 that most customers who responded to the study preferred home prepared food to those sold outside. Some reasons to this was the notion that food prepared at home contain good nutritional volumes and are more secured to eat than street ones that are usually prepared without adhering to proper hygiene methods. Muyanja et al. (2011) held the view that the

process of preparing street food is exposed to unpleasant environmental condition compared to food that prepared in premises. For instance, it was reported by one respondent that

*‘ home food are usually do not contain more spices as compared to street foods and this has the possibility of minimising risk of foodborne diseases’.*

This assertion was backed by a percentage of 89 whilst 11% advocated for street food. This was partly due to their convenience to customers base on their busy schedules and accessibility issues. Muinde and Kuria (2005) noted that street food meet the basic foods needs of the urban poor, travellers, children and the busy worker by providing easily accessed cooked meals relatively cheaper prices. Subratty (2004) indicated in some cases, street vendors may completely ignore basic food hygiene practices but consumers probably do not pay much attention to demand safe food.



**Figure 4.6: Customer preference of foods**

**Source: Field data, 2018**

#### **Reasons for purchasing food (Customers opinion)**

In responding to the issue of reasons customers purchase foods, it was realised from Figure 4.7 that most respondents eat to satisfy hunger (67%). Next to this were respondents who alluded that their main reason of eating street foods was due to their nutritional value whilst 7% indicated it was for fun.



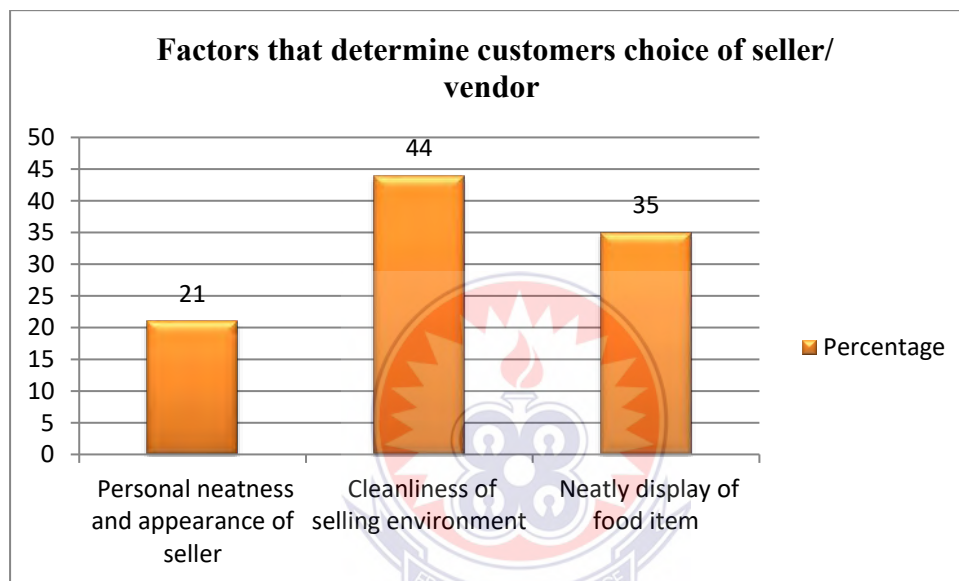
**Figure 4.7: Reasons for purchasing food**

**Source: Field data, 2018**

### **Factors that determine customer food choice from vendor**

It was captured from Figure 4.8 that most consumer's choice of food were influenced by cleanliness of the selling environment (44%). A clean environment is crucial in determining where to eat. A clean environment tends to attract many people to food vending site whereas unclean places usually do not encourage proper patronage. Aside these, people were influenced by food neatly displayed in their sieve (35). Food stored in neat places have the tendencies of minimising the risk of contamination which the possible consequences of leading to food poisoning. People are eager to eat from places where contamination are likely

minimised. Some respondents indicated they consider personal neatness of sellers before buying from them (21%). Personal hygiene practices by vendors is one of the most needed action needed to be taken seriously by sellers in their quest to promote good food safety and hygiene practices. (WHO, 2009) indicated that poor personal hygiene has been recognised as a significant risk factor of food contamination that leads to food poisoning.



**Figure 4.8: Factors consumers determine in their choice of food**

**Source: Field data, 2018**

**Food Handling Practices (Hygiene and Safety) by Food vendors in the Tamale Metropolis (Customers opinion)**

The researcher probed further to examine various food hygiene and safety practices by vendors within the Tamale Metropolis. Table 4.1 present responses which emanated from the respondents.

From Table 4.1, it was evidenced that exposure of food to insects and dust was the most dominating factor of unsafe hygiene practice by food vendors. Some vendors do not take appropriate measures to cover and prevent their foods from dust and flies. This makes the food prone to several contaminations. For instance, some vendors sweep where already prepared foods are kept and thereby subjecting it to contamination. WHO (2000) noted that one of the preventive measures in ensuring food hygiene and safety was through protection of food from insects, rodents and dust. The study further revealed that some vendors are involved in improper use of food additives. The use of some additives such as Maggie, Rhico were for instance overused and this poses health risk to consumers. In the quest of some food- vendors to improve the taste of their food add uncalculated amount of additives that turn out to cause harm than good to consumers. It was emphasized by Boateng (2014) that improper use of additives among food vendors has contributed to serious food poisoning.

Washed plates were often stored in an unclean corner or containers at some of the vending premises (RII = 0.052). Some food vendors stored their washed plates on tables, corners in their sieve and containers which are not healthy to talk of. This poses severe threat to the health of consumers. Richardson and Steven, (2007) reiterated that most people are not concerned of hygienic practices but focus on social relations to get best sales. Another worrying unsafe practice found from the study was some consumers washing their hands in the same buckets used for cleaning utensils (RII=0.045). Some vendors did not have adequate washing facilities to enhance customers in washing their hands after and before eating. It was found that, in some cases spoons used by some customers are not effectively cleaned or



washed. This poses severe health issues to consumers. Adebitan (2011) stressed that food and its related equipment's should be stored in a clean environment to improve safety.

The study further found that there was unsafe waste disposal (RII=0.039). The failure to get adequate disposal facilities affect food safety in the municipality. Unwashed fingers were used to feel foodstuffs which were not proper and hygienic. Bertin (2009) noted that some food vendors used unwashed fingers to feel foodstuffs to ascertain the adequacy for manual grinding.



**Table 4.1. Food Hygiene and Safety Practices by Food vendors (customer's opinion)**

Statement	Mean	RII	Ranking
Prolonged storage of cooked food without refrigeration	3.45	0.033	8 <sup>th</sup>
Undercooked food	3.68	0.033	8 <sup>th</sup>
Exposure of food to insects and dust	3.59	0.087	1 <sup>st</sup>
Unsafe waste disposal	3.83	0.039	5 <sup>th</sup>
Food vendors wear headgear and aprons	2.03	0.012	12 <sup>th</sup>
Wash their hands in the same bucket used for cleaning utensils	3.47	0.045	4 <sup>th</sup>
The use of unsafe water for washing utensils and limited access to safe water	3.95	0.030	9 <sup>th</sup>
Improper use of food additives	3.59	0.062	2 <sup>nd</sup>
Unwashed fingers are used to feel foodstuffs and ingredients for texture and to ascertain the adequacy of manual grinding.	3.89	0.038	6 <sup>th</sup>
Vendors do not have adequate washing facilities	3.79	0.037	7 <sup>th</sup>
Some vendors start their duties without taking a proper bath	2.12	0.023	10 <sup>th</sup>
Foods and ingredients are also subjected to repeated contamination from unwashed hands and the materials used for wrapping, such as leaves, old newspapers and reusable polyethylene bags	2.80	0.018	11 <sup>th</sup>
Washed plates are often stored in an unclean corner or plastic bowl	3.77	0.052	3 <sup>rd</sup>

Source: Field survey, 2018

### **Impact of food safety practices (Customers Opinion)**

It was found in Table 4.3 that poor hygiene practices by vendors could lead to food poisoning and other foodborne related diseases such as cholera, fever, diarrhoea and jaundice (RII=0.043). The use of too much additives and other chemicals close to foodstuffs can cause poison which can be detrimental to the health of consumers. Some vendors are not conscious of the need to store foodstuffs from chemicals. This situation sometimes cause contamination which brings about several illnesses to the affected consumers. Ifenkwe (2012) noted that some foodborne diseases arise out of poor storage of food by vendors or handlers. Ernest and Patino stressed that chemicals and additives in food causes headaches or alter energy levels. It was also emphasised by majority of respondents that lack of good hygiene and safety practices lead to disability cost and cost from other family members who take care of the sick member (RII= 0.038). It affects the financial capacity and status of affected victims since a lot ought to be spent on medical bills. These monies could have been channelled to more gainful activities that would yield positive outcomes for the individual in question. In some cases, people who take care of such charges other than the victims also suffer from financial stability. This poses stress on the people who undertake such responsibilities. This does not improve the quality of life as expected and increase cost of living as well. This increases the socio-economic burdens on communities and their health system in the form of medical costs. In the event of cholera, the government is forced to inject funds to curb the situation and all these factors hinder the progress and development of communities since infrastructure would be affected when more funds are sent to the health sector.

In severe cases, poor hygiene and safety practices can lead to premature mortality (RII=0.031). Severe sickness and diseases out of unsafe foods can lead to death of affected persons or consumers or the vendors themselves. There is also lost of productivity when

people are sick. It affects the overall productivity of other sectors of the economy that the sick person may be working be it formal or at the informal sector. It was submitted by WHO (2007) that some of the consequences of poor food safety and hygiene practices are high mortality rates and loss of productivity which are undesirable to countries such as Ghana.

**Table 4.2. Impact of food safety practices (customer opinion)**

<b>Statement</b>	<b>Mean</b>	<b>RII</b>	<b>Ranking</b>
Food poisoning and other food borne diseases could occur through poor hygiene practices	4.19	0.043	1 <sup>st</sup>
Disability cost and cost from other family members who take care of the sick member	2.85	0.038	2 <sup>nd</sup>
Premature mortality	4.12	0.031	4 <sup>th</sup>
Poor food safety practices pose substantial health burdens, ranging in severity from mild indisposition to fatal illnesses	4.28	0.023	6 <sup>th</sup>
Social and economic burdens on communities and their health system in the form of medical costs	3.64	0.033	3 <sup>rd</sup>
Lost productivity	3.98	0.029	5 <sup>th</sup>

**Source: Field survey, 2018**

### **4.3 Results of interview**

#### **4.3.1 Results of interview from food vendors**

##### **The Response Rate**

The one hundred and twenty-eight (128) questionnaires administered were all received. This represented a 100.0% response rate of the questionnaire which was intended to collect relevant information to address the research questions with a view of enhancing quality and safer food consumption outside home. This respond rate is in line with Arora (2003) who contended that, a questionnaire that produces above 75% response rate has done extremely well.

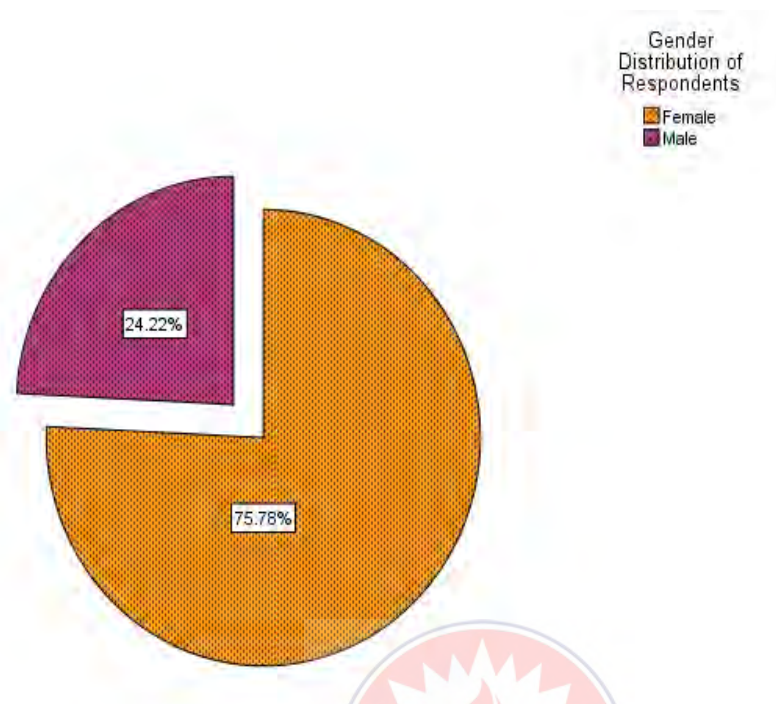
##### **Demographics Characteristics of Respondents**

The behaviour and perception of people are largely influenced by their socio-demographic background. This statement reinforces the widespread contention of sociological models that people emanate from and are influenced by their background (Mainoo & Kolla, 2011). Therefore, the researcher decided to give credence to the socio-demographic characteristics of the respondents. The socio-demographic variables measured included age, sex and level of education.

##### **Gender Distribution of food vendors**

The statistics shown in figure 4.9 indicates that 24.2% of respondents were males as against 75.8% of females. The sex of respondents was useful as the study was able to identify the sex balance to make constructive analysis devoid of sex inequality. Moreover, this finding gives credence to the popular perception that females are dominant in street food vendors

because most men (male) are not good cooks. This also confirms the emerging trend of women highly dominating street food vendors.



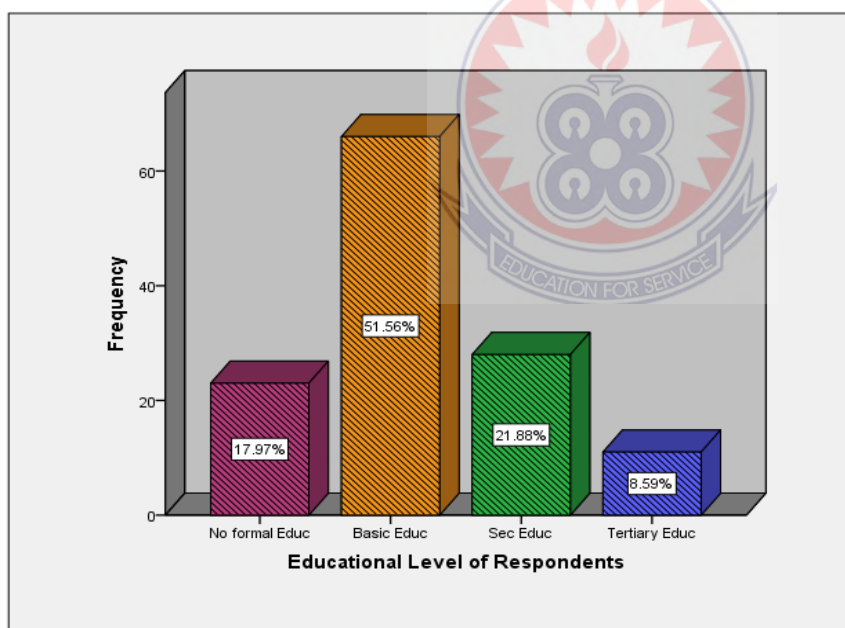
**Figure 4.9. Gender Distribution of food vendors**

**Source: Authors construct with field data, 2018**

## Level of Education of Respondents

One's educational level determines how knowledgeable the person is regarding how the person approaches life and issues such as food safety knowledge and attitude. The implication is that street food venders with high level of education mostly prepare street food under hygienic conditions. Irrespective of where a person belongs on the social ladder, they can still sell street food. In other words, street food is not the preserve of a particular class of people.

The level of education was generally spread across the variables with 51.56% having undergone basic education (at least nine years of schooling). Interestingly, 17.97% respondents had no education and 21.8% had received a secondary level of education with a further 8.59% having attained tertiary education.



**Figure 4.10. Educational Level of Respondents**

Source: Authors construct with field data, 2018

### Age Distribution of Respondents

Majority of the street food vendors (93.7%) were under 50 years of age. However, 39.4% of the respondents had been in the business for longer than 3 years, whilst 13.3% had been in business for a year or less. Just 16.4% were the sole operators with 18.8% creating a job opportunity for an additional person. 64.8% stated that the reason for participation in this type of business venture was unemployment.

**Table 4.3 Age Profile of Respondents**

Age	Frequency	Percentage
< 30	29	22.7
31-40	68	53.1
41-50	23	17.9
51-60	8	6.3
Total	128	100.0
Length in Business	Frequency	Percentage
≤1 yr	17	13.3
≤ 2yrs	31	24.2
≤ 3yrs	29	22.7
≥ 3rs	51	39.8
Total	128	100.0
Reason for Business	Frequency	Percentage
To increase Income	21	16.4
Unemployed	83	64.8
Business Opportunity	24	18.8
Total	128	100.0

Source: Authors construct with field data, 2018.



### **Factors vendors consider in selecting Food stuffs**

From table 4.3 food vendors were asked to indicate factors taking consideration before selecting food stuffs. It was found that cost was the most prevailing factor vendors consider before selecting type and kind of foodstuffs prepared and sold (37%). Before selecting any foodstuffs on the market, vendors first consider its cost before purchasing. If the cost is too high for them with potential curtailment of profit margins, most vendors are likely to ignore and buy affordable ones. Cost is an influential element in the choice of foodstuffs for vendors in the municipality. Quantity (32%) and quality (17%) were also factors vendors took before selecting foodstuffs. Food vendors take into account the ability to get required number or quantum of foodstuffs needed before purchasing.

Vendors are likely to select foodstuffs of required magnitude or number to others that cannot satisfy their needs. Aside this, the value attached to the foodstuff is also critical to the selection. Some authors like Rheinlander et al (2008) and Boateng (2014) were of the position that food vendors consider quality of raw food before purchasing and this was done to justify consumer needs. Few of the vendors indicated cultural background was a significant factor in the choice of foodstuffs by vendors (14%). In selecting a particular kind of food, it is always appropriate and prudent for vendors to consider cultural background of people living in the vending site. Rheinlander et al (2008) emphasized that cultural practices were a keen factor considered in food selection.



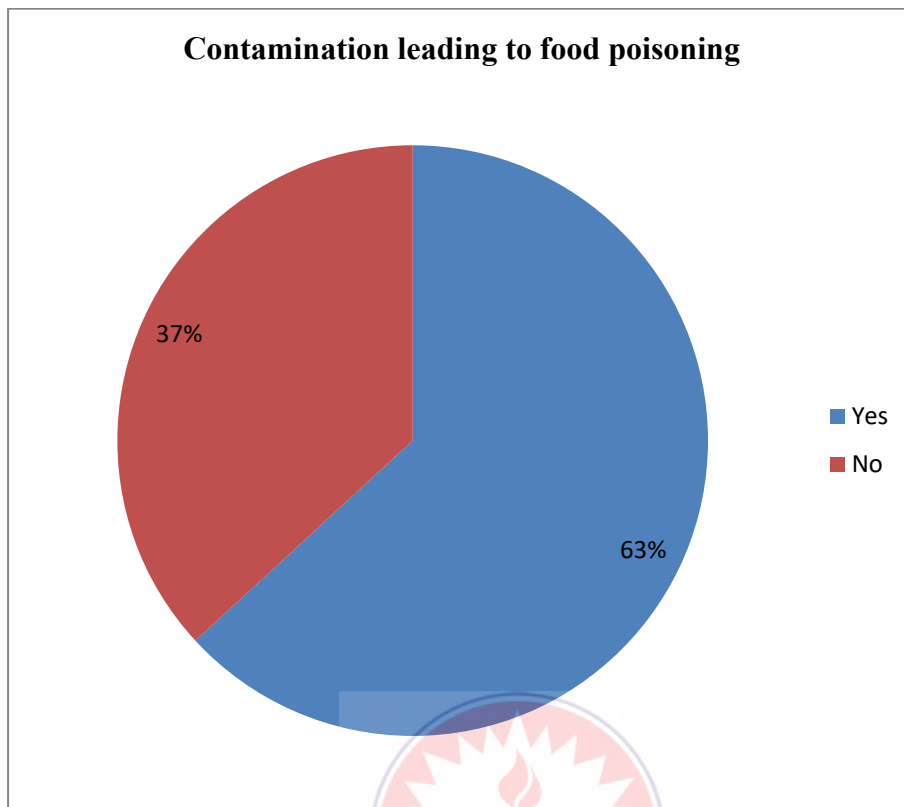
**Figure 4.11. Consideration taken by Vendors before selecting food stuffs**

**Source: Field data, 2018**

#### **Vendors knowledge on Contamination leading to food poisoning**

Food vendors were probed further to ascertain whether they had knowledge on contamination which leads to food poisoning. Responses shown in Figure 4.11 indicate 63% are conversant that contamination of food leads to food poisoning whilst 37% indicated otherwise. The results imply that although most food vendors are conversant with the need to prevent food from contamination but fails to do so based on bad attitude and behaviour towards ensuring food hygiene and safety. This is line with the views of Subratty et al. (2004) who indicated that most food vendors in Mauritius were aware of hygienic conditions but were not putting their knowledge into practice as required of them. FAO (2013) emphasised that most vendors do not translate the acquired basic hygiene knowledge into safe food practices. From the interview, one of the vendors stated that:

*‘I am aware of the need to ensure that my selling environment is clean especially free from refuse. The health inspectorate officers from the metropolitan assembly have been keen on this, just that they do not come regularly’*



**Figure 4.12. Vendors knowledge on Contamination leading to food poisoning**

**Source: Field data, 2018**

### **Challenges of Food Safety Practices by vendors in the Tamale Metropolis**

The responses from Table 4.2 indicate that one of the most hindering factors affecting food hygiene and safety practices was unhygienic surroundings. Most prepared and sold foods are usually not situated at environment free from dirt. It was observed that some of the vendors are positioned near gutter and by the roadside and some of these roads are untarred which brings a lot of dust to the vending premises. This makes food prone to contamination and consumers' risk of getting foodborne related diseases and its complications. Omojokun (2013) opined that many food vendors do not ensure that foods are prepared at good hygienic environment. Unsanitary waste disposal and overcrowding was another challenge to effective

hygienic and safety practices among food vendors in the municipality. It was observed that most of the vendors did not have adequate waste disposal and there was overcrowding at the vending premises. This can easily lead to outbreak and spreading of foodborne disease since most of them have not cultivated the habit of proper safety and hygienic measures in handling food. A study Pragl et al. (2007) also noted that unsanitary waste and overcrowding of food vendors was a tremendous hindrance to food hygiene and safety.

Lack of facilities for food protection emerged as the third most dominating factor challenging food hygiene and safety practices among vendors. The situation of poor food protection due to inadequate and lack of needed logistics by food vendors affect quality and safety. Logistics to protect food from flies, dust and other unwholesome particles are usually absent and this do not auger well for ensuring food safety. Adegboye (2009) noted that prevalence of flies and lack of facilities for food protection suggest a high potential of contamination. Improper preparation and cooking of food was another issue in contention. Some vendors did not take into consideration good cooked foods to the public. It was observed that some vendors do not cook some food items such as rice (“anwamoo”) to the fullest and this has digestion implications for consumers. There were poor water and drainage system in some of the vending premises. This easily attracts flies and contaminates food. Some of the gutters were choked and this prevented free flow of disposed water. This has the tendency of causing serious outbreak of diseases.

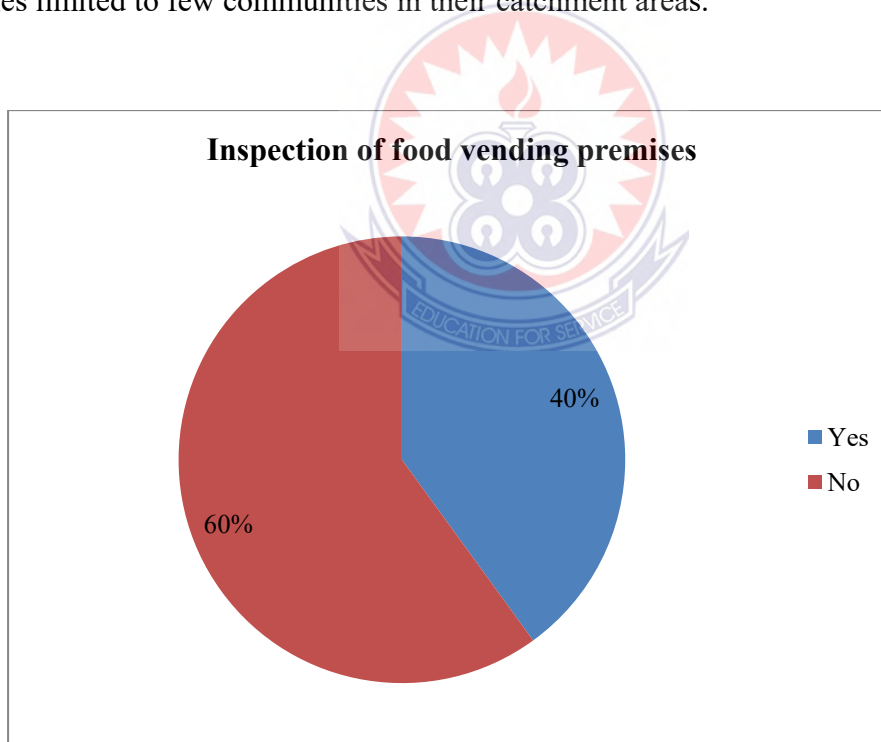
### **Inspection of food vending premises by Government Agencies**

From Figure 4.12, it was realized that majority of food vendors indicated government agencies in charge of inspecting food vending have not been regular. This assertion was backed by 60% of food vendors who responded whilst 40% indicated otherwise. Through the

observation, it was found that some food vendors were located at road side, near gutters and close to bush. This has the potential of contaminating food by flies. The failure of state agencies such as the municipal assembly to inspect hygiene and safety practices of food vendors is alarming and ought to be given the needed attention by concerned stakeholders. This assertion was buttressed by a statement made by one of the health inspectorate during the interview that:

*“We do face alot of challenges in embarking on regular inspection on many vending sites since the assembly do not provide adequate resources to enhance our operations”*

Dzwolak (2014) emphasized that local authorities are weak in terms of human resources and logistics to monitor and inspect activities of food vendors and makes their activities limited to few communities in their catchment areas.

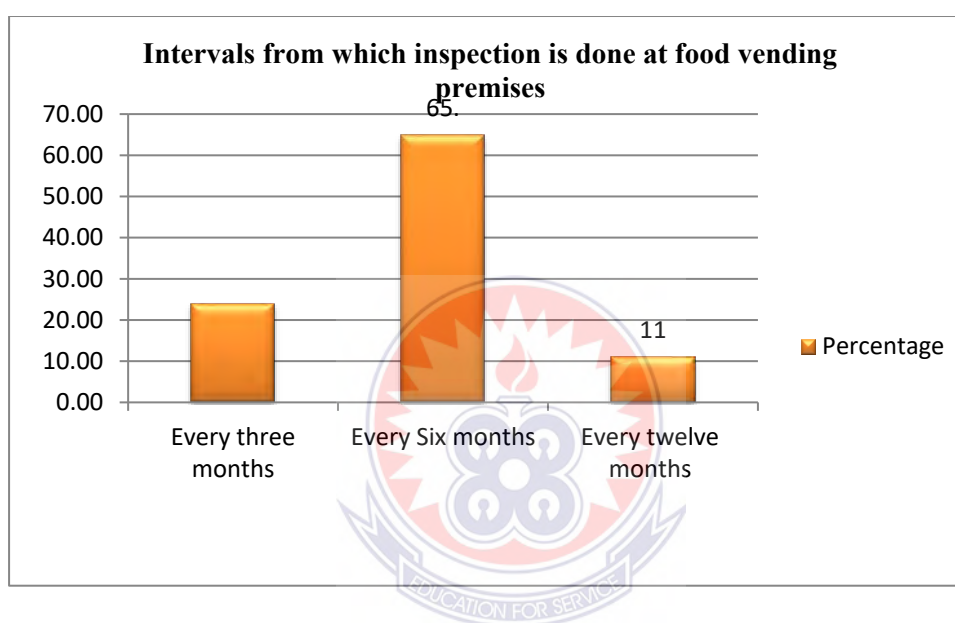


**Figure 4.13. Inspection of food vending premises by Government Agencies**

**Source: Field data, 2018**

### Intervals from which inspection is done at food vending premises

Respondents who indicated there was inspection and monitoring at their vending premises were asked to give intervals from which inspection were done by the assembly. The result shows that inspection was mostly done in every six months (65%), every three months (24%) and twelve months (11%). This implies that inspections are not done at regular and close intervals and this does not promote effective supervision and monitoring of food hygiene and safety practices by food vendors in the municipality.



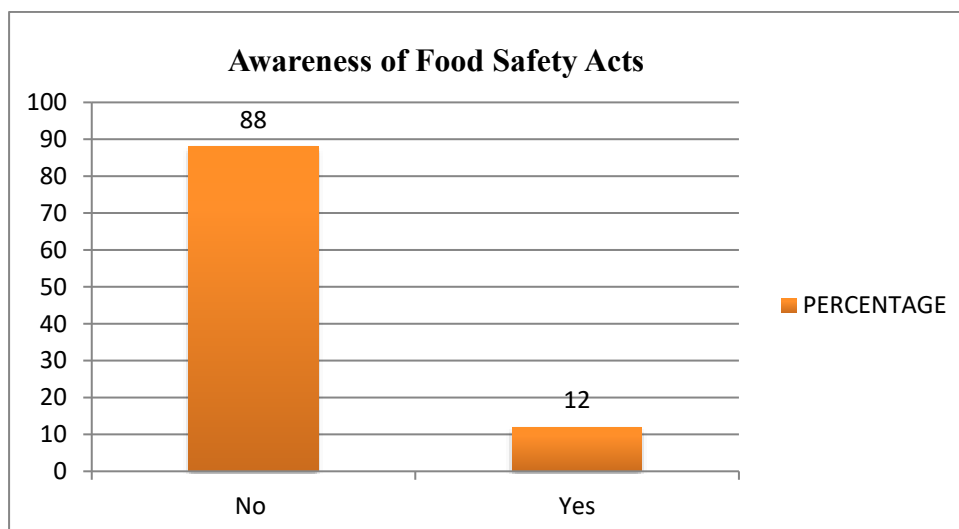
**Figure 4.14. Intervals from which inspection is done at food vending premises**

**Source: Field data, 2018**

### Vendors awareness of any Food Safety Act

The researcher in the quest to ascertain awareness of food vendor's knowledge on existing Food Safety Acts probed them further to give out any law/regulation they know. It was realized in Figure 4.14 that 88% of food vendors did not have any clue on any Food Safety Act and 12% indicated otherwise. The ignorance of the law by many food vendors makes it difficult for effective compliance and enforcement. The FAO (2013) and WHO

(2009) posited that legal instruments as well as institutional frameworks for ensuring food hygiene and safety have not been able to achieve its intended purposes and this can be partly attributed to ignorance of the law on the part of food vendors.

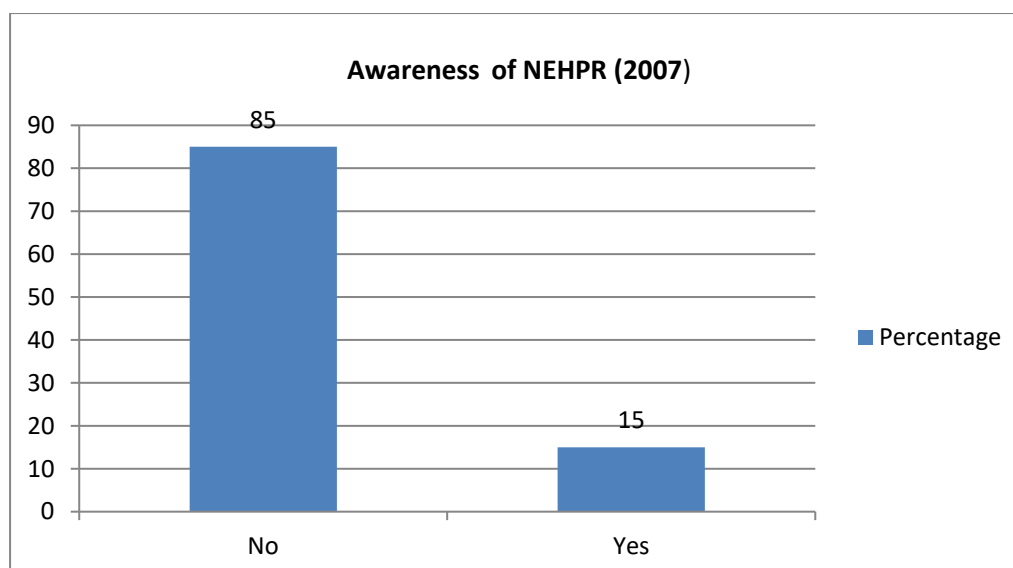


**Figure 4.15. Vendors awareness of any Food Safety Act**

**Source: Field data, 2018**

#### **Vendors awareness of National Environmental Health Practices Regulations (2007)**

From Figure 4.15, majority of food vendors were not aware of the existence of NEHPR (2007) and constituted 85%. However, 18% indicated they were conversant with the existence of this regulation. This again amplifies the level of ignorance of laws and regulations among food vendors in the municipality. WHO (2000) noted that it is important to have an understanding of the interaction on prevailing food safety beliefs, knowledge and practice of food handlers in order to minimize foodborne outbreaks.



**Figure 4.16. Vendors awareness of National Environmental Health Practices Regulations (2007)**

**Source: Field data, 2018**

**Table 4.4 Causes of lack of food safety knowledge**

Variable	Frequency	Percentage (%)
Illiteracy/Ignorance	34	26.6
Inadequate in-service training	23	17.9
Low enforcement of food safety regulations	42	32.8
No or little background on hygiene practices	29	22.7
<b>Total</b>	<b>128</b>	<b>100.0</b>

Source: Authors construct with field data, (2018)

Low enforcement of food safety regulations (32.8%) and Illiteracy (26.6%) are the main causes of lack of food safety knowledge. Other causes include little background on hygiene practices among street food vendors (22.7%) together with inadequate in-service



training (17.9%). The cause of lack of food safety knowledge is at times influenced by regulatory bodies in the food chain industry and also by consumer perception and reaction to the activities of the vendors.

#### 4.4 Results of Observation

##### 4.4.1 Results of observation at zogbeli

The researcher observed at zogbeli that some vendors were selling food on pushing trucks. The truck was dirty and unhygienic the vendor did not wear apron, though she wore Ga hedger, it was dirty.

The seller managed to cover the Aluminium container with plain plastics. There were flies all over the place. The water in which she washed her hands, was full of dead flies. This has the tendency of causing diseases outbreak due to the existence of flies on food premises. Osali et al (2011) shared the view that street food was mostly exposed to unpleasant environmental conditions which easily lead to foodborne illness.



**Figure 4.17. Results of observation at zogbeli**

### **Results of observation at choggu**

The researcher observed at choggu that some food sellers were sited close to gutters with dirty running water inside. There was also poor drainage of water as stagnant waters were found in front of vendors.

A porridge seller was resting her metal pots on lorry ties very close to the stagnant water. There was also a metal garbage container close to the porridge seller. This thread was worrying since it does not portray good environmental hygiene among vendors. The garbage could easily attract flies which can lead to food contamination with its associated consequence on the health of consumers.



**Figure 4.18. Results of observation at choggu**

### **Results of observation at lamashegu**

The researcher observed at lamashegu that most food vendors did not have organised structure and equipment for serving food.

People gather round the vendor with everybody shouting at the vendor to be served food. This could lead to drops of saliva deposits in the food. Women also used bare hands to serve food. Drained spaghetti water was using for washing dishes and hands. This means that hand washing properly done and this could lead to food contamination.



**Figure 4.19. Results of observation at lamashegu**

**Table 4.5. Results of Observation on Attitude, Knowledge and Practices towards Food hygiene and safety**

<b>Item</b>	<b>Yes (%)</b>	<b>NO (%)</b>
Physical appearance: neat	52	48
Sanitation of place of selling: clean and neat	43	57
Garbage and dirty waste close to the place of selling	65	35
Availability of dust bins to keep waste	53	47
Availability of covered dustbins	39	61
Presence of houseflies in the stalls or shade where food is sold	73	27
Regular wiping of eating table	34	66
Availability of portable water	41	59
Use of clean water for washing hands and plates	54	46
Water container covered	63	37
Use of the same hand to serve and collect money	68	32
Availability of hand washing soaps	74	26
Talking while serving food	65	35
Customers allowed making contact with food sold before making a choice	38	62
Availability of napkins	70	30
Availability of place of convenience	27	73

Source: Field data, 2018

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter presents summary of key findings conclusion drawn from the findings as well as recommendations given based on the findings. It also presents suggestions for future studies.

#### 5.2 Summary of Findings

- The study revealed majority of food vendors do not wear proper hair cup and aprons and this makes food contamination highly possible. There were poor washing facilities for most of the vendors and foods were contaminated through unwashed hands and unsafe serving equipment.
- The hygiene condition on vending premises were not impressive and this affect the quality of food prepared and served to customers. There were instances flies were found in containers and sieves meant to protect food from flies.
- Most vendors were conversant with the issue that contamination leads to food poisoning.
- There was poor inspection and monitoring by health inspectors.
- The study also revealed inadequate refuse disposal and waste bins, poor supply and drainage system, lack of facilities for food protection among others as challenges facing food vendors.



- Some vendors lacked food safety knowledge and this was due to low enforcement of food safety regulations, illiteracy/ignorance.

### **5.3 Conclusion**

The issue of food hygiene and safety practices have become major issue of concern to stakeholders in Ghana. The safety and hygiene practice by food vendors in the Tamale Metropolis has not been the best. These have been partly being attributed to poor awareness creation on safety regulations and acts. Most food vendors are not enlightened on effective safety practices due to poor logistics and welfares to motivate health inspectorate officers. These has led to poor inspection and monitoring of food vendor's activities. Most of the vendors who have undergone training on ways of handling food fail to practice them and this has led to poor handling of food to the general public at the municipality. Vendors do not take adequate steps to improve on the sanitation and safety measures at vending premises and this leads to food contamination with its related diseases such as cholera, fever and jaundice. It is appropriate to state that vendor's attitudes and behaviour towards food safety has major influence in the quality of healthy life enjoyed by public who buy from them. Vendors who have knowledge on food safety only few translate the knowledge into action.

### **5.4 Recommendations**

The following recommendations are given based on the findings:

- There should be adequate training programme organized for food vendors on safe handling of food techniques. This would help in equip skills in them to effectively deal with hygiene and safety measures.

- It is appropriate for government of Ghana to initiate steps in providing adequate logistics and welfare facilities to health inspectorate offices to discharge their mandate effectively. This would enhance the enforcement of hygiene and safety practices on vendors.
- It is prudent for adequate awareness on the need to ensure safety of food to the public. Adequate awareness forestalls quality in adhering to rules and regulations.
- Punitive measures like sanctions, prosecutions should be adopted by the municipal assembly to recalcitrant vendors to serve as a deterrent to potential offenders who do not abide by rules and regulations.
- Vendors must ensure that they cultivate right attitude and behaviour towards effective food hygiene and safety to improve health of consumers and themselves.

### **5.5 Suggestions for future studies**

The study focused on food vendor knowledge on hygiene and safety practices in the Tamale Metropolis. It is advised that future studies concentrate on assessing the impact of food safety practices on productivity and health of people in the Northern Region.

## REFERENCES

- Abdalla, M.A., Siham, E.S., Alian, Y.Y.H.A. & Amel, O.B. (2008). Food safety knowledge and practices of street food-vendors in Khartoum city. *Sudan J. Vet. Sci. Anim. Husb.* 47, 126–136.
- Adegboye, A. O. (2009). Overview of Food Safety Situation in Africa – Country Position, National Agency for Food and Drug Administration and Control (NAFDAC) Lagos, Nigeria
- 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 and Nutrition Sciences*, 2011, 2, 830-836
- Ashley, D., Walters, C., Dockery-Brown, C., McNab, A., & Ashley, D. E. (2004). Interventions to prevent and control food-borne diseases associated with a reduction in traveller's diarrhoea in tourists in Jamaica. *Journal of Travel Medicine*, 11(6), 364-369.
- Bas, M., Ersun, A.S. & Kıranc, G. (2004). The evaluation of food hygiene knowledge, attitudes and practices of food handlers in food businesses in Turkey. *Journal of Food Control* 17: 317-322.
- Bryan, F.L. (1993). Aplicação do método de análise de risco por pontos críticos de controle, em cozinhas industriais. *Revista Higiene Alimentar*. 7(25):15–22.
- Burt, B. M., Volel, C., & Finkel, M. (2003). Safety of Vendors-Prepared Foods. Evaluation of 10 Processing Mobile Food Vendors in Manhattan. *Public Health Rep.* 118 (5) 470-6. *Indian Journal of Microbiology*, 51(1):100–106.
- Castillo, J. (2009). *Research Population*, Retrieved March 10, 2018 from <http://www.experimentresources.com>.



- Centre for Food Safety and Applied Nutrition (2006). *Managing Food Safety: A Manual for the Voluntary Use of HACCP Principles for Operators of Food Service and Retail Establishments*, US
- Chukuezi, C.O. (2010). Food safety and hygienic practices of street food vendors in Owerri, Nigeria. *Studies in Sociology of Science. 1(1): 50–57.*
- Coleman, P. & Roberts, A. (2005). Food hygiene training in the UK: A time for change. *Journal of Food Service Technology 5: 17-22.*
- Cusato, S., Tavolaro, P., & Fernandes de Oliveira, C. A. (2012). *Implementation of Hazard Analysis and Critical Control Points System in the Food Industry: Impact on Safety and the Environment*, University of São Paulo, Pirassununga, Brazil
- Dzwolak, W. (2014). HACCP in small food businesses e the Polish experience. *Food Control, 36(1), 132e137*
- Effler, E., Isaäcon, M., Arntzen, L., Heenan, R., Canter, P., Barrett, T., Lee, L., Mambo, C., Levine, W., Zaidi, A., & Griffin, P. M. (2001). Factors contributing to the emergence of *Escherichia coli* O157 in Africa. *Emerg Infect Dis, 7(5): 812–819.*
- Ehiri, J.E.; Azubuike, M.C.; Ubaonu, C.N.; Anyanwu, E.C.; Ibe, K.M.; Ogbonna, M.O. (2001). Critical Control Points of complementary food preparation and handling in eastern Nigeria. *Bull. World Health Organ. 75, 423–433.*
- Ekanem, E. (1998). The street food trade in Africa: safety and socio-environmental issues. *Food Control 211–215.*
- EU (2004). Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs. *Official Journal of European Union, L139, 1e54.*
- European Union Food Information Council, (2006). *Food Safety*. Retrieved September 13, 2017, from <http://www.eufic.org/article/en/expid/basics-food-safety>

FAO (2013). *Food for the cities: street foods*, viewed March 2018 from

<http://www.fao.org/fcit/food-processing/street-foods/en/>

Feglo, P., & Sakyi, K. (2012). Bacterial contamination of street vending food in Kumasi, Ghana.

*Journal of Medical and Biomedical Sciences*, 1(1), 1-8.

Gadugah, N. (2014). Cholera epidemic: GHS call for ban on food vending. Available online:

[http://www.myjoyonline.com/news/2014/September-2nd/cholera-epidemic-ghs-call-](http://www.myjoyonline.com/news/2014/September-2nd/cholera-epidemic-ghs-call-formationwide-ban-on-food-vending.php)

[formationwide-ban-on-food-vending.php](http://www.myjoyonline.com/news/2014/September-2nd/cholera-epidemic-ghs-call-formationwide-ban-on-food-vending.php) (Accessed 10<sup>th</sup> March, 2018).

Gaibani, P., Ambretti, S., Berlingeri, A., Cordovana, M., Farruggia, P., Panico, M. (2011). Outbreak of NDM-1-producing Enterobacteriaceae in northern Italy, July to August 2011.

*Eurosurveillance*, 16(47), 2-18.

Garayoa, R.M., Cordoba, I., Garcia-Jalon, A., Sanchez-Villegas, A., & Vitas, A.I. (2005).

Relationship between consumer food safety knowledge and reported behaviour among students from health sciences in one region of Spain. *Journal of Food Protection* 2005; 68(12): 2631–2636.

Giraudon, I., Cathcart, S., Blomqvist, S., Littleton, A., Surman-Lee, S., & Mifsud, A. (2009). Large outbreak of salmonella phage type 1 infection with high infection rate and severe illness associated with fast food premises. *Public Health*, 123(6), 444-447.

Greig, J. D., Todd, E.C., Bartleson, C.A. & Michaels, B. S. (2007). Outbreak where food workers have been implicated in the spread of foodborne disease. Part 1. Description of the problem, methods and agents involved. *Journal of Food Protection*, 70(7): 1752-1761.

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.

- Howes, M., McEwen, S., Griffiths, M. & Haris, L. (2006). Food handler certification by home study: measuring changes in knowledge and behaviour. *Dairy Food Environmental Sanitation* 3: 208-214.
- King, L.k, Awumbila, B., Canacoo, E.A, & Ofosu-Amaah, S. (2008). *An assessment of the safety of street foods in the Ga district, of Ghana; implication for spread of zoonoses*. *Act Trop.* 76:39-43
- MacArthur, R. L. (2007). *Compliance with Food Safety measures by traditional caterers in the Cape Coast Municipality*. University of Cape Coast
- Mamun, M., Rahman, S. & Turin, T. (2013). Microbiological quality of selected street food items vended by school-based street food vendors in Dhaka, Bangladesh. *International Journal of Food Microbiology*, 413–418.
- Mensah, P., Yeboah-Manu, D., Owusu-Darko, K. & Ablordey, A. (2002). Street foods in Accra, Ghana: how safe are they? *Bulletin of the World Health Organization*, 80 (7): 546-554.
- Ministry of Food and Agriculture and World Bank (2007). Revised Food Safety Action Plan, International Cocoa Organization
- Mosupye F.& Holy A.(1999). Microbiological quality and safety of ready to-eat street vended foods in Johannesburg, South Africa. *Journal of Food Protection*, 1278-1284.
- Mudey, A.B., Kesharwani, N., Mudey, G.A., Goyal, R.C., Dawale, A., & Wagh, V. (2010). Health status and personal hygiene among food handlers working at food establishment around a rural teaching hospital in Wardha district of Maharashtra, India. *Global Journal of Health Sciences*, 2(2):198-204.
- Muinde, O.K. & Kuria, E. (2005). Hygienic and Sanitary Practices of Vendors of Street Foods in Nairobi, Kenya. *African Journal of Food Agriculture and Nutritional Development*, 5(1), 11-24.

- Muyanja, C., Nayiga, L., Brenda, N., & Nasinyama, G. (2011). Practices, knowledge and risk factors of street food vendors in Uganda. *Food Control*, 22(10), 1551–1558.
- Nee, S. O., & Sani, N. A. (2011). Assessment of Knowledge, Attitudes and Practices (KAP) Among Food Handlers at Residential Colleges and Canteen Regarding Food Safety, *Sains Malaysiana* 40(4), 403–410
- Nel, S., Lues, J.F.R., Buys, E.M. & Venter, P. (2004). The personal and general hygiene practices in the deboning room of a high throughput red meat abattoir. *Journal of Food Control* 15: 571-578.
- Nigusse, D. & Kumie, A. (2012). *Food hygiene practices and prevalence of intestinal parasites among food handlers working in Mekelle University Students' Cafeteria, School of Public Health, Adisa Ababa, Ethiopia* **Okojie, O. H., Wagbatsoma, V. A., & Ighoroge, A. D.** (2005). An assessment of food hygiene among food handlers in a Nigerian university campus, **Niger Postgrad Med J.** 2005 Jun;12(2):93-6.
- Omemu, A. & Aderaju, S. (2008). Food safety knowledge and practices of street food vendors in the city of Abeokuta, Nigeria A.M. *Food Control*, 396–402.
- Osagbemi, G.; Abdullahi, A. & Aderibigbe, S. (2010). Knowledge, attitude and practice concerning food poisoning among residents of Okene Metropolis, Nigeria. *Res. J. Soc. Sci*, 1, 61–64.
- Osaili, T. M., Abu Jamous, D. O., Obeidat, B. a., Bawadi, H. a., Tayyem, R. F., & Subih, H. S. (2013). Food safety knowledge among food workers in restaurants in Jordan. *Food Control*, 31(1), 145–150
- Pichler, J., Ziegler, J., Aldrian, U., & Allerberger, F. (2014). Evaluating levels of knowledge on food safety among food handlers from restaurants and various catering businesses in Vienna, Austria 2011/2012. *Food Control*, 35(1), 33-40.

- Rheinländer, T.; Olsen, M.; Bakang, J.A.; Takyi, H.; Konradsen, F.; Samuelsen, H. (2008). Keeping up appearances: Perceptions of street food safety in urban Kumasi, Ghana. *J. Urban Health*, 85, 952–964.
- Scott, E. (2003). Food safety and foodborne disease in 21st century homes, US, 14(5): 277–280
- Shindano, J & Himoonga, B. M. (2010). *Report on the Food Hygiene of Food outlets in Lusaka*. University of Zambia. School of Agricultural Sciences Department of Food Science and Technology. Lusaka, Zambia.
- Sneed, J., Strohbehn, C., & Gilmore, S. A. (2004). Food safety practices and readiness to implement hazard analysis critical control point (HACCP) programs in assisted-living facilities in Iowa. *Journal of the American Dietetic Association*, 104, 1678-1683.
- Soares, L.S.; Almeida, R.C.C.; Cerqueira, E.S.; Carvalho, J.S.; Nunes, I.L. (2012). Knowledge, attitudes and practices in food safety and the presence of coagulase-positive staphylococci on hands of food handlers in the schools of Camaçari, Brazil. *Food Control*, 27, 206–213.
- Subratty, A., Beeharry, P. & Chan, S. (2011). A survey of hygiene practices among food vendors in rural areas in Mauritius. *Nutrition & Food Science*, 203 – 205.
- Taylor, E. (2003). *HACCP and SMEs: problems and opportunities*. In: Mayes T, Mortimore S, editors. Making the most of HACCP: learning from others' experience. England: Woodhead; 13–31.
- Tonder.V., Lues. J.F. & Theron. M.M. (2007). The personal and general hygiene practices of food handlers in the delicatessen sections of retail outlet in South Africa. International perspectives Report *Journal of Environmental Health*, 70(4): 33-8.
- Umoh, V.& Odo M. (2011). Safety and quality evaluation of street foods sold in Zaire, Nigeria. *Food Control*, 9–14.

- WHO (2000). Foodborne Disease: A Focus for Health Education. Retrieved from <http://bookorders.who.int> (Accessed 10<sup>th</sup> March, 2018).
- WHO (2002). *Office for the South East Asia Region*, “Health situation in the South East Asia Region.
- WHO (2006). *Health surveillance and management procedures of food-handling personnel*. Geneva: 7–36. Technical report series no. 785
- WHO (2007a). Initiative to Estimate the Global Burden of Foodborne Diseases. Retrieved from [http://www.who.int/foodsafety/foodborne\\_disease/ferg/en/index.html](http://www.who.int/foodsafety/foodborne_disease/ferg/en/index.html) (Accessed 10<sup>th</sup> March, 2018).
- WHO (2007b). Food Safety and Foodborne Illness. Fact sheets No. 237. World Health Organization, Geneva.
- WHO (2008). A guide to developing knowledge, attitudes and practices survey. World Health Organization, Geneva
- WHO (2009). *Evidence of hand hygiene to reduce transmission and infections by multidrug resistant organisms in health-care settings*. In WHO Guidelines on Hand Hygiene in Health Care; Clean Care is Safer Care Team, Ed.; WHO: Geneva, Switzerland, 2009.
- WHO (2015). Food Safety; WHO: Geneva, Switzerland, 2015. Available online: <http://www.who.int/mediacentre/factsheets/fs399/en/> (accessed on 09 June, 2018).
- Yapp, C., & Fairman, R. (2006). Factors affecting food safety compliance within small and medium-sized enterprises: implications for regulatory and enforcement strategies. *Food Control*, 17(1), 42-51.
- Zeru, K., & Kumie, A. (2007). Sanitary conditions of food establishments in Mekelle town, Tigray, North Ethiopia. *Ethiop. J. Health Dev*, 2(1):1-9.

## APPENDIX A

### QUESTIONNAIRE FOR CUSTOMERS

#### UNIVERSITY OF EDUCATION, WINNEBA, KUMASI CAMPUS

#### DEPARTMENT OF CATERING AND HOSPITALITY EDUCATION

I am a graduate student of Master of Technology Education (Catering and Hospitality Education) Winneba, Kumasi Campus. I am talking to several people like you to ascertain your views on *'food safety knowledge, attitude and practice of street food vendors in Tamale metropolis*. Your opinions are very important and they will help us to improve upon food safety among consumers in Tamale and Ghana in general. There is no right or wrong answer. Your response is valuable. In this exercise, you will be required to respond to some questions about the subject matter at your own convenience. You are free to participate or not. However, I encourage you to help me so we can together improve food safety in Tamale. THANK.

#### Socio-Demographic information

1. Sex (a) male [ ] (b) Female [ ]
2. Age(years)
  - (a) Below 30 [ ] (b) 31 – 40 [ ] (c) 41 – 50 [ ] (d) 51 – 60 [ ]
3. Level of Education (a) No formal Education [ ] (B) Basic Education [ ] (C) Senior High School [ ] (d) Tertiary Education [ ]
4. How is your food served?
  - a. In an open plastic bowl [ ]
  - b. In an ice chest [ ]
  - c. In a saucepan [ ]
  - d. In a plain rubber suck [ ]



Specify if others .....

5. Will you buy food by the gutter. No/Yes

If No, why?.....

6. What kind(s) of foreign material have you found in vended food?.....

7. 'Home made food and street food which one do you prefer and why?.....

8. Why do you eat food?

- a. For nutrition value
- b. To satisfy hunger
- c. For fun

Please tick [] to indicate your level of agreement or disagreement in the following statement regarding **Perceived Food Safety Practices**

N	STATEMENT	RESPONSES				
		1	2	3	4	5
1	Prolonged storage of cooked food without refrigeration					
2	Undercooked food					
3	Exposure of food to insects and dust					
4	Unsafe waste disposal					
6	Food vendors wear headgear and aprons					
7	Wash their hands in the same bucket used for cleaning utensils					
8	The use of unsafe water for washing utensils and limited access to safe water					
	Improper use of food additives					
	Unwashed fingers are used to feel foodstuffs and ingredients for texture and to ascertain the adequacy of manual grinding.					
	Vendors do not have adequate washing facilities					



	Some vendors start their duties without taking a proper bath					
	Foods and ingredients are also subjected to repeated contamination from unwashed hands and the materials used for wrapping, such as leaves, old newspapers and reusable polyethylene bags					
	Using dirty utensils and cutting boards etc. in preparation of food					
	Serving food in dirty plates					
9	Washed plates are often stored in an unclean corner or plastic bowl					

9. How does the food vendor handle money and serve food?.....

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

- a. Personal neatness and appearance of seller
- b. Cleanliness of selling environment
- c. Neatly display of food item

Other (specify).....

11. What sickness have you or others suffered from eating vended foods?.....

12. What do you have to say about the napkin's vendors provide for cleaning hands after eating?.....

13. Please tick [√] to indicate your level of agreement or disagreement in the following statement regarding

14. **Challenges of Food Safety Practices** in the Tamale Metropolis

N	CHALLENGES	RESPONSES				
		1	2	3	4	5
1	Lack of refuse disposal and lack of toilet facilities for the customers.					
2	Poor water supply and poor drainage systems					
3	Unsanitary waste disposal and overcrowding					
4	Improper use of agrochemicals by traders of food commodities					
5	Poor handling and storage of products					
6	Unhygienic surroundings and limited water supply					
7	Lack of facilities for food protection					
8	Lack of information and economic factors contributes to unsafe food practices					
9	Lack of better training and greater awareness of the food vendors on safety practices					
10	Catering activities are usually unregulated					
11	Inadequate storage of food and drinks					
12	Improper preparation and cooking					

15. Please tick [] to indicate your level of agreement or disagreement in the following statement regarding **IMPACT OF FOOD SAFETY PRACTICES**

N	STATEMENT	RESPONSES				
		1	2	3	4	5
1	Food poisoning and other food borne diseases could occur through poor hygiene practices					
2	Disability cost and cost from other family members who take care of the sick member					
3	Premature mortality					
4	Poor food safety practices pose substantial health burdens, ranging in severity from mild indisposition to fatal illnesses					
5	Negative health complications and implications on individuals, families and the society					
6	Social and economic burdens on communities and their health system in the form of medical costs					
7	Lost productivity					

16. What is your general view about vendors in the metropolis?.....

16 In what way(s) can food safety knowledge and practices be improved in Tamale?.....

**APPENDIX B**  
**UNIVERSITY OF EDUCATION**  
**INTERVIEW SCHEDULE FOR FOOD VENDORS IN THE TEMALE**  
**METROPOLIS**

I am a graduate student of Master of Technology Education (Catering and Hospitality Education) Winneba, Kumasi Campus. I am talking to several people like you to ascertain your views on *‘food safety knowledge, attitude and practice of street food vendors in Tamale metropolis.’*

Your opinions are very important and they will help us to improve upon food safety among consumers in Tamale and Ghana in general. There is no right or wrong answer. Your response is valuable. In this exercise, you will be required to respond to some questions about the subject matter at your own convenience. You are free to participate or not. However, I encourage you to help me so we can together improve food safety in Tamale. THANK YOU

**Section A: Socio-Demographic Information**

1. Sex a). male [ ] b). female [ ]
2. Age (years)
  - a). below 30 b). 31-40 [ ] c). 41-50 [ ] d). 51-60
3. Length in business
  - a) ≤ 1 yr    b) ≤ 2 yrs    c) ≤ 3 yrs    d) > 3rs
4. Level of Educational). No formal Education [ ] b). Basic Education [ ]
  - c). Senior High School [ ] d). Tertiary Education [ ]
5. Have you had food safety orientation? a. Yes [ ] b. No [ ]
6. Why do you engage in this business? .....

7. In your opinion, are you aware that poor handling of food lead to contamination? Yes [  ]  
No [  ]

Give reasons for your answer in Q 8

.....  
.....

8. Are you aware of the need to wear clean and appropriate clothes? .....

9. Are you aware that foods cooked for a long time and eaten hot are safe?.....

10. Are you conversant that street foods are the major source of many food borne diseases in the metropolis?.....

Give reasons for your answer in Q 11

11. Are you aware of any Food Safety Act (for example, FSA, 1990)?  
Yes [  ] No [  ]

12. Are you aware of the National Environmental Health Practices Regulations (2007)? Yes  
[  ] No [  ]

13. What intervention do you also take to control cross contamination of foodborne diseases?.....

14. Keeping food at safe temperatures is an important consideration in controlling foodborne diseases? a) Agree [  ] b) disagree [  ]

15. Does any government agency come to inspect your vending premises?

Yes [  ] No [  ]

If answer to question above is yes, which of the agency or agencies come?

16. How often does/do the agency/ agencies come to inspect the premises? .....

a) Every month [  ]

b) Every three months [  ]

c) Every Six months [  ]

d) Every twelve months [  ]

Others (please specify).....

17. In your opinion, what do you think is causes of lack of food safety knowledge?

.....  
.....

18. Can effectiveness of food safety knowledge contribute to the performance of quality of food service in the metropolis? a) Yes [  ] b) No [  ]

19. If yes to question 14, what measures can be adopted to enhance food safety knowledge?

.....  
.....

20. Do you have any questions/comments/suggestions? a) Yes [  ] b) No [  ]

If yes, specify:

.....  
.....



## APPENDIX C

### INTERVIEW GUIDE FOR SANITARY INSPECTORS

1. What are your specific duties in terms of being a sanitary inspector?
2. How many times in a month do you specifically visit food vendors in the streets?
3. In your own opinion and from your expertise, do you think sanitary inspectors are effectively controlling food vending malpractices in the metropolis?
4. What percentages of vendors that you visit have operating licenses?
5. What are the factors working against your inspection duties?
6. What recommendations would you make to improve the monitoring of food vendors in this metropolis?



**APPENDIX D****OBSERVATIONAL GUIDE**

Check list for evaluating food vendors hygiene and safety practices among food vendors in relation to the food they sell.

<b>YES</b>	<b>NO</b>		
1. Physical appearance: neat		{ }	{ }
2. Location of stall or shade where food is sold			
Roadside		{ }	{ }
Near gutters		{ }	{ }
Close to bush		{ }	{ }
None		{ }	{ }
3. Sanitation of place of selling: clean and neat:		{ }	{ }
4. Garbage and dirty waste close to the place of selling		{ }	{ }
5. Availability of dust bins to keep waste		{ }	{ }
6. Availability of covered dustbins		{ }	{ }
7. Presence of houseflies in the stalls or shade where food is sold		{ }	{ }
8. Regular wiping of eating table		{ }	{ }
9. Availability of portable water		{ }	{ }
10. Use of clean water for washing hands and plates		{ }	{ }
11. Water container covered		{ }	{ }
12. Prepared foods are stored in ;			
Flytrap sieve		{ }	{ }
Glass sieve		{ }	{ }
Open bowl		{ }	{ }



Plain rubber suck	{ }	{ }
Ice chest	{ }	{ }
13. Hair covered	{ }	{ }
14. Vendor having apron on	{ }	{ }
15. Use of the same hand to serve and collect money	{ }	{ }
16. Regularly washing bowls	{ }	{ }
17. Availability of hand washing soaps	{ }	{ }
18. Talking while serving food	{ }	{ }
19. Method of serving:		
Hands covered with polythene	{ }	{ }
Bare hands	{ }	{ }
Ladle	{ }	{ }
20. Wearing of jewellery during serving	{ }	{ }
21. Fingernails are;		
Kept short	{ }	{ }
Polished	{ }	{ }
22. Availability of napkins	{ }	{ }
23. Use of cloth /dress /apron as napkins	{ }	{ }
24. Availability of place of convenience	{ }	{ }
25. Customers allowed making contact with food		

