

**UNIVERSITY OF EDUCATION WINNEBA**  
**COLLEGE OF TECHNOLOGY EDUCATION – KUMASI**  
**DEPARTMENT OF CATERING AND HOSPITALITY EDUCATION**

**EVALUATING SANITATION PRACTICES AMONG STATIONARY STREET  
FOOD VENDORS WITHIN THE NIMA-MAMOBI COMMUNITIES OF  
AYAWASO EAST MUNICIPALITY OF GREATER ACCRA, GHANA**



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**2022**

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**SCHOOL OF GRADUATE STUDIES**

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AYAWASO EAST MUNICIPALITY OF GREATER ACCRA, GHANA**



**A THESIS SUBMITTED TO THE AKENTEN APPIAH-MENKA UNIVERSITY  
OF SKILLS TRAINING AND ENTERPRENEURIAL DEVELOPMENT IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF TECHNOLOGY IN CATERING**

**MARCH, 2022**

## DECLARATION

I hereby declare that this submission is my work towards the “Master of Technology in Catering” Degree and that, to the best of my knowledge and Belief, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due Acknowledgment has been made in the text’.

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Signature

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Certified by

Dr. Mrs Ellen Olu Fagbemi

(Supervisor)



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Signature

Date

## **DEDICATION**

This work is dedicated to my family.



## ACKNOWLEDGMENT

I would like to thank God for the health and wisdom given me. I am also very grateful to various people and institutions who contributed immensely to the successful completion of this dissertation. I highly acknowledged them for their invaluable contributions. First, my gratitude goes to Dr. Mrs Ellen Olu Fagbemi who provided academic guidance as a supervisor throughout this study.

I also express my appreciation to the Municipal Chief Executive, management staff, and Assembly Members of the Ayawaso East Municipal Assembly, and all respondents who willingly expressed views that constitute part of the field data for this dissertation.

My gratitude goes to Lara Anita Doku, Rhoda Yayra Doku and Bernard Bani for their endless encouragement, contributions, and support. I am indebted to Mr. Christian Kwame Kpotosu for challenging and urging me throughout the program. Mr. Prince Acquah Rockson was a personal conduit through whom I entered this planet. Finally, gratitude goes to my research assistants for their selfless contribution. I express my sincerest appreciation to every individual who has contributed directly or indirectly to the completion of this dissertation.

## ABSTRACT

Street food is any ready to eat food or beverage sold and sometimes prepared in outdoor public spaces which may include streets, squares, parks, open-air markets, and others by vendors or cooks on the move (hawkers) or stationary. Food and water-borne diarrheal diseases are estimated to cause between 450,000–700,000 deaths in Africa annually. This study adopted a quantitative and qualitative research approach using structured questionnaires with predetermined responses and Likert scale in the data collection and analysis. The non-probability sampling technique specifically convenience sampling was used to collect data from customers. Hence, 100 stationary street food vendors in Nima-Mamobi which is located in the capital city of Ghana were purposively selected to participate in the study using the Yamane formula. The target population for a survey is the entire set of units for which the survey data are to be used to make inferences. The data collection instrument is a questionnaire divided into sections a, b, c, and d. The analysis and debate are presented in this chapter. To answer the research questions, the discussion was done about the review of literature in chapter two. As a result, the study's findings were compared to the relevant ideas and concepts presented in the literature review. The findings are divided into eight sections, each of which focuses on one of the research issues. The study recommends that the waste management services should also be checked for punctuality and regularity, Owners of stray animals should be given occasional cautions and their animals given limited access to certain parts of the twin towns, there should also be research to determine the quality of food and water available at these vending areas. It was then concluded that the people of Nima – Mamobi did not express much knowledge about food safety practices as they did not perform proper sanitary practices.

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

According to the Food And Agriculture Organization (FAO) Of The United Nations (UN), street food is any ready to eat food or beverage sold and sometimes prepared in outdoor public spaces which may include streets, squares, parks, open-air markets, and others by vendors or cooks on the move (hawkers) or stationary, from an outlet with or without indoor space to accommodate consumers (e.g. Van, cart, bicycle, stall, kiosk, take-away shop with kitchen overlooking the street).

Per this definition, people actively involved in this business are here as known as street food vendors and there are two types; thus mobile street food vendors (MSFV) or hawkers and stationary street food vendors (SSFV). However, this study focuses on stationary street food vendors. Every corner in most parts of the world is fortunate to have stationary street food vendors who sell varieties of food making food availability easier at almost every time of the day. It is however very common in most developing countries since they are inexpensive, easy to get to, and also serves as a major way of generating income (Dewaal & Robert, 2005). However, in a developing country like Ghana, vendors who are into sales of street foods (or stationary street food vendors) essentially do not meet the required or necessary hygienic standards and these are one of the leading causes of food poisoning which may lead to indisposition and death due to food-related diseases, and associated effects on trade and development (Feglo & Sakyi, 2012). Food-related diseases are now global concerns concerning public health (Food and Agriculture Organization of the United Nations & World Health Organization, 2013). This may be referred to as a menace and could be disastrous in the sense that the

act of eating food sold by stationary street food vendors is on the increase while consuming food prepared from home is decreasing (World Health Organization, 2013).

The reported number of cases regarding foodborne diseases is on the increase in both developing and developed countries as reported by the World Health Organization (2013) however in the latter, the menace upsurges due to economic reasons, poverty, the lack of adequate health care facilities, and the scarcity of data regarding food-borne diseases. This significantly compromises the objective of achieving the millennium development goals (particularly MDG 1, 4, 5, And 6) (Food and Agriculture Organization of the United Nations & World Health Organization, 2013). It is due to this and other reasons why the safety of food prepared by stationary street food vendors needs to be looked at again and this time critically especially for a country like Ghana since it is a gateway leading to both social and public health effects. In Ghana, for instance, food contamination may be attributed to many factors which include traditional food processing methods, inappropriate holding temperatures, poor hygienic surroundings of both areas of food preparation and vending areas as well the poor personal hygiene of food handlers (Feglo & Sakyi, 2012). To add to this, the pervasiveness of food-borne illnesses in developing countries is entwined with other economic and developmental issues, namely, legislation, infrastructure, and enforcement mechanisms out of which include insufficiency of food safety laws, carelessness in regulatory enforcement, and the lack of education for food handlers (Dewaal & Robert, 2005). The incidence of food- and water-borne diseases is estimated at 3.3–4.1 episodes per child per year in Africa and food and water-borne diarrheal diseases are estimated to cause between 450,000–700,000 deaths in Africa annually, with many more sporadic cases going unrecorded (Santos et al, 2008). In most of these cases, pathogens such as *Escherichia coli*, *Bacillus cereus*, *Salmonella*, hepatitis, *Shigella*, *Brucella*,

*Staphylococcus aureus*, *Campylobacter*, rotavirus, and enteric bacteria are identified (Dewaal & Robert, 2005).

There is an abundance of national legislation in Ghana and other countries in the sub-Saharan African regions but inadequate resources to regulate street food safety (Dewaal & Rober, 2005). Ghana standards authority and the food and drugs board are two institutions of Ghana which are dedicated to the work of regulating food standards and training the general populace on food safety issues. Conversely, improvement in food safety systems has not been fully achieved and this is observed in recent reports of food-borne illness and/or contamination of street foods with enteric bacteria in various parts of the country (Todd, 1997). For example, Ghana news agency reported four persons died in Sheho (Upper East Region of Ghana) after eating contaminated meat. Also, Joy News (2012) reported a cholera outbreak in Atebubu (Brong Ahafo region) taking nine lives while another cholera outbreak resulted in the death of one person in Obuasi (Ashanti Region) and the hospitalization of over 50 (Joy News, 2012). There was another report by Graphic Online (2012) which estimated approximately 5000 children under five years of age die from diarrhea each year in Ghana.

Stationary street food vendors may be responsible for food contamination by poor personal hygiene, cross-contaminating raw and processed food, as well as inadequate cooking and improper storage of food (WHO, 2013). Maintaining high food safety levels in food services is very vital because any incidence can affect a high number of people (Osaili et al., 2008). This and other reasons instigated the objective of this study which was to evaluate the hygienic practices and sanitary conditions of stationary street food vendors in the Nima-Mamobi town which is/are suburbs of Ghana.

## 1.2 Statement of problem

The food sector in Ghana includes primary producers, food manufacturers, and processors which for the most part are small and medium size enterprises, retailers, and food vendors (stationary street food vendors). One of the food laws in Ghana is the food and drugs act PNDCL 305b of 1992 which engulfs food safety and handling prerequisites and penalties for breaching the law. The government of Ghana through local authorities actively control and monitor food safety practices of stationary street food vendors or vendors who are individuals or group of people who sell ready to eat foods at readily accessible areas including caterers, nightclubs, beer bars, chop bars, cold stores, hotels, and restaurant operators and bagged water processors. However, the ministry of food and agriculture and the World Bank (2007) reported 1 in every 40 Ghanaian suffer serious foodborne illness per year, 420,000 cases are reported with an annual death rate of 65,000 which cost the government us \$ 69,000,000.00 annually. This report could be an underestimate as the report rate is low and in the calculation of cost in developing countries only the cost borne by individuals through hospitalization and medication is considered whilst others in developed countries consider the cost to employers, institutional bodies like laboratories, surveillance, disability cost and cost from other family members who take care of the sick member and premature mortality (Abelson, Forbes, & Hall, 2006). Saba and Gonzalez-Zorn (2012) reported that studies on microbiological food safety are on the decline and highly centered in the capital city of the country, pesticides from agricultural products including fresh vegetables and fruits have been highlighted (Amoah, Abaidoo, & Ntow, 2006; Bempah et al., 2011, Feglo and Sakyi, 2012 and Mensah et al., 2002). There is minimal information on physical contaminants/hazards, food allergy, and injuries caused by these. It is against this background that the researcher took the initiative to investigate the sanitation practices of

stationary street food vendors within the commercial sector of the catering industry to determine if they practice good sanitation or not to have these shortfalls addressed.

### **1.3 Research objectives**

The main objective of this study is to evaluate sanitation practices among stationary street food vendors in Nima-Mamobi

The specific objectives;

- a. To assess the sanitary conditions of stationary street food vendors
- b. Determine the knowledge of safe food production among stationary street food vendors in Nima-Mamobi
- c. Examine catering staff practices of safe food production.

### **1.4 Research questions**

- a. What are the sanitary conditions of the stationary street food vendors in Nima-Mamobi?
- b. Do the stationary street food vendors in Nima-Mamobi have food safety knowledge?
- c. How well do the stationary street food vendors in Nima-Mamobi implement food safety?

### **1.5 Significance of study**

This study reveals the knowledge that stationary street food vendors in Nima-Mamobi have concerning safe food production. The study consequently provides a general idea of knowledge and the practice of personal hygiene and safe food production among catering or food production staff in Nima-Mamobi a suburb in Accra, the capital of Ghana. This will help regulatory bodies like the FDA and GSA, Ministry Of Health, Ministry Of Food And Agriculture as well as the municipal heads to understand the possible causes

of food-borne disease incidents in the above-mentioned towns. It will also give hospitality educators an idea of where training and development deficits may be. They will therefore be able to develop programs, seminars, and other developmental projects to increase knowledge and practices of the best food hygiene and safety to reduce the occurrence of food-borne illness and diseases.

### **1.6 Limitations of the study**

The study faced several challenges just as every study would. But these limitations could not be eliminated. Primary data was gathered through questionnaires and therefore the willingness of the respondents to respond was a problem. Also, the lack of understanding of the questions of the questionnaires was a limitation to this study. The mood of the respondents is also likely to be influential in the responses given by the respondents.

Other limitations include money to finance transportation, typing, printing, binding as well as photocopying. The time frame within which the study is undertaken is also limited in the sense that much time is needed to gather information, distribute and collect questionnaires. These observable facts in the researcher's opinion could affect the findings and validity of the result

### **1.7 Organization of the study**

This study is divided into five chapters. Chapter one consists of the general introduction to the study, the problem statement, aims, and objectives of the study, research questions, significance of the study, the delimitations, and limitations of the study. Chapter two consists of the literature review and the conceptual framework. The methodology, as well as sources of data employed, is in chapter three, while chapter four is devoted to results and discussion of the findings. Finally, chapter five provides the summary, conclusion, and recommendations from the study.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Review of theoretical literature

Two main perspectives, namely the emic and etic perspectives, have dominated social research on health and hygiene behaviour. Other behavioural theories have attempted to explain people's/individuals' hygiene behaviour; however, their applicability appears to be limited in comparison to the emic and etic perspectives. The Emic perspective of hygiene tends to focus on socio-cultural factors that motivate hygiene behaviour or lack thereof among a group of people, whereas the Etic perspective of hygiene focuses on studying hygiene behaviour from a scientist's perspective (Rheinländer, 2006). During the 1950s and 1960s, the terms emic and etic were coined in the fields of linguistics and anthropology, and they have since been adopted by researchers in a variety of fields, including public health (Manko, 2018). Rheinländer (2006) described the perspectives as follows: the insider's view, also known as the emic perspective, focuses on understanding hygiene behaviour from the perspective of those who are involved. It aims to uncover the socio-cultural factors that influence hygiene practices among a group of people, arguing that hygienic motivations are socially based. The outsider's view, also known as the etic perspective of hygiene, focuses on observing and evaluating performed hygiene practices from the perspective of a scientist. It focuses on contamination sources and infection risks. Etic in this context, hygiene refers to the practice of keeping one's self and surroundings clean to prevent illness and infection. The Germ Theory of Louis Pasteur and others, which discovered the significance of microorganisms and their role in disease transmission, greatly influenced the etic perspective on hygiene (Manko, 2018). Those who hold this viewpoint believe that hygiene issues can be objectively investigated. People will replace unsanitary practices with better ones once they understand how water

and sanitation diseases are caused and transmitted, it is claimed. The etic perspective on hygiene behaviour had an impact on this study.

## **2.2 Concept of hygiene**

Hygiene is a concept that has long been connected with medicine, as well as self- and professional care activities in almost every part of life. Hygiene techniques are employed as a barrier to minimize the incidence and transmission of disease in medicine, the home (domestic), and everyday life contexts (Monney et al., 2013). Hygiene, according to Fosket and Ceserani (2007), is the science and practice of sustaining health and preventing diseases in all food-serving establishments. It is sufficient to state that a conscious effort must always be made to safeguard people and the environment from bacteria to eliminate contamination of people's food (WHO, 2010)

As a result, hygiene can be described as all of the required practices and conditions that persons exhibit in their daily activities to ensure illness prevention and good health.

## **2.3 Concept of food**

Food is any liquid or solid food that provides the body with all of the necessary materials for heat, energy, development, and repair, as well as for keeping body functions in check (Fosket and Ceserani, 2007). It is also any edible material containing health-promoting and nutritive components including carbohydrates, proteins, lipids, vitamins, and minerals that supports the body when consumed and digested (FAO/WHO, 2002). Food is also defined by Kitagwa, Bekker, and Onyango (2006) as a mixture of natural elements commonly referred to as nutrients, such as protein and carbohydrates that humans require for body upkeep. As a result, food satisfies a biological need, as exemplified by Abraham Maslow's well-known hierarchy pyramid (1954). Manko

(2018) argues that food consumption is viewed as a simple act of meeting biological demands and that as a result, every human being wants to satisfy this need.

## **2.4 Food safety**

Food safety is a critical concern in both industrialized and developing countries, as foodborne infections cause a great deal of suffering and hundreds of fatalities every year (Pilling et al, 2008). As a result, given the high number of individuals who eat their meals outside the home, food safety is becoming a major public health concern. Many people have been exposed to foodborne illnesses that come from food stands, restaurants, and other food outlets as a result of this lifestyle change. Employees in the foodservice industry are a vital link between food and customers. (Haapala and Probart, 2004). The World Health Organization (WHO) has established five important keys to safer food, including ensuring that hands are clean, separating raw food from cooked food, ensuring that food is cooked completely and carefully, keeping food at safe temperatures, and using safe water and raw materials (as identified by Nyarango et al., 2008). In underdeveloped countries, these five keys to safer food are critical, and equipping food vendors with this information could have a big impact on food safety (WHO, 2007). Food poisoning can occur in a variety of settings, including people's homes, businesses, schools, hospitals, and other catering services. Restaurants, hotels, finished items from shops, and food vendors all provided commercial catering services.

A microbiological foodborne illness is the most serious food safety issue. All persons who come into touch with food, including farmers, food producers, market workers, food service workers, and other food handlers, are required to maintain food as safe as possible (Fogli et al., 2005). Food handlers should clean their hands and food contact surfaces thoroughly, as well as segregate raw, cooked, and ready-to-eat meals; heat foods

to a safe internal temperature; chill perishable food promptly; and thaw food correctly to keep food safe.

The Food and Drugs Authority (FDA) is the ministry of health's national regulatory authority charged with enforcing food rules and ensuring the safety and wholesomeness of food for customers. Inspections of food production and processing facilities, licensing, product registration, and monitoring are among the FDA's responsibilities. They also make certain that food handlers have proper hygiene training. Despite these attempts, it appears that certain educational institutions' canteens continue to provide items that do not meet health standards. Several attempts have been made to divide food-borne disease outbreaks into those caused by home-cooked meals and those caused by street food. In the United States, for example, research has linked food from commercial or institutional institutions to (79%) and (20%) food-borne infections, respectively. Approximately 25% of these reports may have been avoided if safe food handling standards had been followed (Haapala and Probart, 2004). However, as many experts have suggested, determining the exact number of instances has been challenging because illnesses are frequently underreported (McCarthy et al., 2007).

## **2.5 Food borne diseases**

Various research on street foods in Africa has shown that their unbridled and uncontrolled growth has put a burden on city resources such as water and sewage systems, as well as interfering with municipal plans through congestion and littering, negatively impacting daily life (Oghenekohwo, 2015). According to the FAO, street foods are a source of significant food poisoning outbreaks because of incorrect additive use, the presence of adulterants and environmental pollutants, and poor food handling procedures among street food vendors (FAO, 1997). In the food industry, the food

handler has a critical role to perform in ensuring that the meals served are safe to eat. It is sufficient to state that purposeful or incidental contamination of such items puts customers at risk of contracting foodborne illnesses (Annor & Baiden, 2011). Salads, fresh vegetables, bakery products (e.g., cream-filled pastries), sandwich fillings, milk, dairy products, and chicken are commonly associated with foodborne infections. The majority of foodborne illnesses are caused by consuming faeces-contaminated food or water. Impurity in food is frequently caused by poor personal hygiene among food handlers (Esená & Owusu, 2013).

According to reliable statistical proof, food handlers are responsible for 70% of all bacterial food poisoning, with cross-contamination accounting for the other 30%. (Wilson, 1997). Food has been found to spread over 200 different diseases. Several factors have been recognized as contributing to the spread of foodborne illnesses.

According to Paiva de Sousa (2008), the primary ones are

- i. Insufficient food manipulation
- ii. Unsuitable holding temperatures
- iii. Insufficient cooking
- iv. Contaminated equipment (failure to clean and disinfect kitchen or processing plant equipment)
- v. Poor personal hygiene. Other factors that could cause foodborne disease include
- vi. Preparing food a day or more ahead of time with inappropriate storing and reheating
- vii. Cross-contamination (from raw to cooked items)
- viii. Adding infected ingredients to previously cooked food.

Food could be infected by a food service worker during the preparation stage or at the time of service. One of the most important activities in the prevention of foodborne infections is personal cleanliness, with a strong emphasis on hand washing. Poor hand hygiene has long been recognized as a major contributor to the rise in food-borne illnesses (Manko, 2018). In a separate study, Manko, 2018 discovered that food service workers had a high risk of transmitting infections to food with hands that are contaminated with organisms from their gastrointestinal system, resulting in foodborne disease. As a result, food service employees must take hand washing seriously in the fight against foodborne infections. It's vital to emphasize that food handlers' inadequate personal cleanliness and improper temperature management are the two most significant causes of foodborne disease (Center for Disease Control and Prevention, 2013). Bacteria are more likely than other pathogens to be identified as causative agents in rare cases where affected patients seek medical care and provide specimens. *Campylobacter*, *Salmonella*, and *Shigella* species are the most common bacterial agents found in patients with the foodborne disease, with significant variations depending on geographic location and season. In clinical practice, testing for viral etiology of diarrhoea is uncommon, but viruses are widely believed to be the most common cause of foodborne illness (CDC, 2013). This study corroborates Rheinländer's (2006) findings in Kumasi, which revealed that the lack of potable water, lavatory facilities, and dustbins hurt vendors' hygienic practices. Vendors observed hygienic measures such as hand washing after using the restroom, appropriate dish cleaning, and reheating cold food, among others. Stephenson (2002) claims that the comparatively high occurrence of parasites transmissible by faecal matter is indicative of high levels of ambient faecal contamination and low sanitation standards.

In Ghana, the constant hot heat and poor environmental conditions, such as the dusty roads along which food vendors operate, provide ideal circumstances for bacterial growth. The risk of food contamination is influenced by several factors. Food type, pH, preparation method, water availability, degree of handling, exposure temperature, and holding period are only a few of them (Campbell, 2011). Food service workers should avoid using textiles, cloths, dish towels, or aprons to dry their hands since they can quickly amass a huge population of microorganisms, especially when left damp and their use can increase food contamination rather than minimize it (Lah, 2016). In addition, long-term food preparation, storing at room temperature, improper cooling and reheating, tainted processed food, and undercooking have all been recognized as contributing factors to food poisoning outbreaks. Food poisoning outbreaks have been linked to keeping foods at high ambient temperatures for long periods (Rane, 2011). Traditional food processing methods, inadequate holding temperatures, and poor personal hygiene of food workers are among the causes of food contamination in underdeveloped nations, according to the WHO (2000). The pervasiveness of food-borne illnesses in less-developed nations is interwoven with other economic and developmental difficulties, such as legislation, infrastructure, and enforcement mechanisms, lending support to the above (Lah, 2016).

A study in Abeokuta, Nigeria, discovered that different parasites and the severity of worm infections were highly dependent on the region where food was marketed (Idowu, 2006). Given the similarities of climatic circumstances in Ghana and Nigeria, high humidity levels in both communities may contribute to the transmission and preservation of infective stages of these intestinal parasites in food (Ayeh-Kumi, 2009). In some of these areas where food testing revealed parasite contaminations, the presence of litter and domestic animals in and around vending areas has been noted. Food vendors that lacked

suitable waste disposal methods threw their trash in surrounding gutters, resulting in the abundance of flies at the vending location with insufficient food protection.

When it comes to the preparation of raw vegetables, it is well known that certain food vendors employ a vinegar or salt solution, but most of the time these veggies are simply washed with water or wiped clean with napkins. In such circumstances, the majority of disease-causing organisms remain on the fresh veggies and cause foodborne disorders if consumed. Most of the time, these food vendors have not had any training in food handling or hygienic food handling. This pattern of events could be explained by the fact that the bulk of food vendors was solely taught at home by their parents or guardians (Esen & Owusu, 2013). Furthermore, the source of infection was the transfer of germs from money to food, like vendors, to multitask, contaminated food with bacteria found on currency notes and coins (Ayeh-Kumi, 2009).

## **2.6 Food vending**

Food vendors are those who sell ready-to-eat foods or drinks in a public place, usually from a temporary stall. While some street cuisines are regional in origin, many are not. Any minimally processed meal offered on the street for instant consumption, according to Tinker (1997). "street-vendor foods" or its shorter counterpart "street foods" are ready-to-eat foods made and/or sold by vendors and hawkers, particularly in the streets and other public places, according to the FAO/WHO Codex Alimentarius Commission. Most street foods are both finger food and quick food, and they are generally less priced than restaurant meals. 2.5 billion People eat street food every day, according to the food and agricultural organization (FAO, 2007). People eat street food for a variety of reasons nowadays, including to get reasonably priced and flavourful meals in a social setting, to familiarize themselves with ethnic cuisines, and for nostalgia. Street sellers, both

internationally and locally, are an important source of low-cost food (De Waal and Rober, 2009). However, due to weak regulatory systems, insufficient food safety legislation, a lack of financial resources to invest in safer equipment, and a lack of training for food handlers, street meals frequently fail to satisfy necessary hygiene requirements. According to research on foodborne illness risk factors, restaurant workers' faulty food preparation procedures are to blame for the majority of outbreaks in food service facilities (Bryan et al., 1988).

Vending snacks and whole meals on the streets is a common source of income in most Ghanaian towns and cities, particularly among disadvantaged women. As a result, street cuisines in the country have a long history. This sector's importance in the urbanization process and the urban economy reflects the style of life and survival and coping mechanisms used in most African cities (Gnammon-Adiko 1996). Rapid urbanization is destroying traditional family bonds all across the world, and the street food industry is widely recognized as an inescapable consequence of urbanization. The demand for street food has increased as a result of urbanization and the attendant social and structural changes. Longer commutes between home and work are anticipated to increase demand even more. Accra, Ghana's capital, has a population of almost 3 million people and is handicapped by a poor transportation infrastructure that connects the suburbs to the commercial and industrial centres where men and women work. Even if the contribution varies, street food is a part of people's daily diet and helps them achieve their nutritional needs (Ayeh-Kumi, 2009).

## **2.7 Hygienic practices among food vendors**

Food hygiene refers to a collection of basic principles that are used to monitor environmental conditions during the manufacturing, preparation, sale, and serving of

food to ensure that the food consumed is of high quality. The personal hygiene standards of food vendors play a big role in food safety (Ifeadike et al., 2014). Gordon (2011) defines hygiene as "all steps that protect the safety and quality of food during its handling," identifying these measures as "appropriate storage of both raw and cooked meals, as well as the proper preparation and cooking techniques." according to Iragunima (2006), food hygiene refers to the variables that influence an individual's health and well-being. Observance of simple guidelines about health behaviours, such as cleanliness, is one of the variables. Bacterial translocation, as well as the growth and survival of bacteria and other pathogens, are abundant in foods cooked under unsanitary settings. The most essential issue that could have a detrimental impact on food quality is the component of hygiene and sanitation (Gordon, 2011).

According to Kok & Balkaran (2014), street food booths are made up of modest structures with limited access to running water, restrooms, and washing facilities in most nations. Hands, utensils, and dishes are frequently washed in bowls or pots of water. It's worth mentioning that disinfection is only done on occasion, which draws pests to vending machines, especially when waste disposal is inadequate (Kok & Balkaran, 2014). Furthermore, goods cooked at these locations are hazardous to consumers' health because they are frequently not chilled at the proper temperatures. According to Annor and Baiden (2011), despite the government's efforts to regulate the operations of vendors and other catering institutions, certain hotels in Accra were not following the rules. The microbiological count from the hotel with the worst food hygiene checks, that is, no food handlers wearing helmets or gloves, was the greatest, but it was the lowest in the hotel with the best food hygiene checks. This finding implies that if food hygiene checks are properly performed, contamination can be reduced, therefore the government's efforts in this area can be beneficial if followed. The majority of research done in Ghana over the

last decade on various elements of food hygiene has indicated inadequate food hygiene knowledge and attitudes among street food vendors, with personal cleanliness being the least observed by the least educated (Acheampong, 2005). Because the majority of the sellers have either no formal education or only a few years of schooling, they are simply unaware of basic food handling and so have a higher risk of transmitting infections (Mensah et al., 2002). It's difficult to establish the exact causes of food contamination-related incidents. According to Annor & Baiden (2011), caterers are responsible for 70% of all bacterial food poisoning cases. This is far more than any other food industry has revealed. The majority of these food poisoning events are caused by insufficient food time and temperature management, with cross-contamination accounting for the remaining 30%. (Annor & Baiden, 2011). According to several studies, such items are sometimes kept at inappropriate temperatures, or are mismanaged by food vendors and marketed in filthy environments (WHO, 2001; Muinde and Kuria, 2005; Ghosh et al., 2007). All of these factors contribute to disease-causing parasites infecting seemingly appetizing food.

Food handlers' hygiene practices, especially those of food vendors and catering businesses, be subpar. The hospitality industry has been studied mostly at hotels, restaurants, and street food vendors in Accra, Ghana's capital. Total bacterial counts in street vendor meals are much higher than the Ghana standards authority for ready to eat foods' permitted reference limits (Ababio & Lovatt, 2015). There are an estimated 60,000 ready-to-eat food sellers in Ghana's capital, the greater Accra region (Odonkor et al., 2011), with an estimated yearly revenue of roughly 100 million dollars and a profit of 24 million dollars (Odonkor et al., 2011; Manko, 2018).

## **2.8 Effects of hygienic practices of food vendors on food safety**

More often than not, street food sellers are blamed for the spread of food-borne diseases, primarily cholera epidemics, across the country, and are often temporarily prohibited as a desperate effort to control the epidemic (Ansah, 2014; Gadugah, 2014). Diarrhoeal disorders are frequently linked to street meals, which are caused by improper condiment use, the presence of pathogenic germs, environmental toxins, and a disdain for good manufacturing practices (GMPs) and good hygiene practices (GHPS) (Ansah, 2014). As a result, the importance of food vendors adhering to strict hygiene standards and maintaining clean vending environments cannot be overstated. Inadequate food hygiene can result in food-borne infections as a result of poor food handling methods, and in the worst-case scenario, a customer's death (Tavonga, 2014). Even though not all occurrences of foodborne disease are recorded or documented, the WHO's FBD' (foodborne disease) burden epidemiology reference group (Ferg) projected 582 million cases of 22 distinct enteric FBD's and 351,000 fatalities worldwide. The biggest FBD' load was found in African countries, followed by the Southeast Asian region (WHO, 2005). In India, the national centre for illness control's integrated disease surveillance programme (IDSP) recorded more than 200 instances of food poisoning until the 36th week of 2015, making it the second most common source of disease outbreaks in the last four years (Singh et al, 2016). Healthy eating requires avoiding foods infected with hazardous bacteria, viruses, parasites, poisons, and chemical and physical pollutants. Foodborne sickness can cause gastrointestinal symptoms such as nausea, diarrhoea, fever, vomiting, abdominal cramps, and dehydration, as well as more serious systemic illnesses like paralysis and meningitis (Fogli et al., 2006). Every year, around 76 million individuals in the United States fall unwell as a result of microorganisms in their food, with about 5,000 of them dying. Consumers, particularly at home, can take simple steps

to lower their risk of foodborne disease. According to Osei and Duker (2008), Africa accounts for 90% of the world's cholera cases. According to the Mayo Clinic (2014), all foods naturally contain small levels of bacteria, but incorrect food handling, cooking, or storage can lead to bacteria multiplying in big enough numbers to cause illness. Food contamination can also be caused by parasites, viruses, poisons, and chemicals. Around 70% of illness outbreaks have been linked to street-vendor foods, according to Chapman et al. (2010), and research offered by Mensah et al., (2002) points to the notion that street foods are likely sources of infections. The World Bank Food Safety Action Plan (2006) estimated that 420,000 people in Ghana are affected by foodborne illnesses each year, with a yearly death rate of roughly 65,000 people and a total cost to the Ghanaian economy of us \$ 69 million. They also stated that careful food handling procedures can prevent around 25% of reported food-borne disease outbreaks.

## **2.9 Training needs of vendors**

Nowadays, food safety is a critical issue that must be considered while discussing public health. The health ministries of developing nations have put in a lot of effort in the area of food safety and hygiene education for street food vendors. While these initiatives have resulted in an improvement in food safety and hygiene practices awareness and knowledge, this information is not always translated into actual practice (Apanga et al., 2014). Insufficient resources for evaluation and laboratory analysis, as well as a lack of consumer education resulting in a lack of public knowledge of the dangers posed by particular street foods, were noted by the WHO (1996) as contributing to the public health risk associated with street vendor food. Foodborne infections can be avoided by practicing good personal hygiene. Personal hygiene refers to any procedures taken to ensure the safety and quality of food while it is being handled (Jay, 2000).

Foodservice personnel requires training to become aware of the hazards associated with foods and the food safety standards that must be followed to prevent foodborne illness (Bryan, Caroline & Madelon, 2003). The safety of street-vendor food can be enhanced if the bulk of the vendors receive basic hygiene training or receive it. According to a study, one of the most effective ways to prevent foodborne disease is to educate and train food handlers (Clayton & Griffith, 2008). Gettings and Kiernan's (2001) study backs up prior studies by emphasizing the critical role educators may play in food safety education and expanding the implications to the high-risk group (Finch & Daniel, 2005). However, Lynch, et al. (2005) found no correlation between the number of hours of training and improvements in food safety practices in Oklahoma County.

According to numerous studies, the majority of food-related illnesses and deaths might have been prevented or averted if proper food handling procedures had been used (Hapala & Probart, 2004). As a result, food vendors must complete basic food hygiene training before being licensed, as well as additional training as required by the competent authorities (FAO/WHO, 2006; and Chukuezi, 2010). The inability of regulated institutions or authorities to ensure that food service employees or providers obtain proper training in basic sanitary procedures will unavoidably put the lives of individuals who consume street meals in jeopardy. Foodborne infections are caused by inadequate personal hygiene, cross-contamination, and temperature abuse, necessitating the requirement for food safety and sanitation training to be conducted, monitored, and maintained regularly in foodservice companies (Pilling, Brannon, Shanklin, Howells, & Roberts, 2008). Barro et al. (2007), citing the aforementioned, claimed that street food sellers are typically uneducated, unlicensed, and unskilled in food hygiene, and they work in filthy surroundings with little or no awareness of the causes of foodborne illnesses.

## 2.10 Review of empirical literature

This section examines several studies on hygienic food management undertaken both within and outside the country to learn what other researchers have already done on the subject. According to a study by Singh and Marwaha (2017), Mumbai has over 250,000 street vendors, whereas Delhi has 200,000, Calcutta has more than 150,000, and Ahmadabad and Bangalore have about 100,000. The study also discovered that women make up the majority of food vendors. The study also discovered that a majority of the vendors (67 percent) offered food with their bare hands.

Similarly, a study conducted by Burt, Volel, and Finkel (2016) examined the food handling practices of ten processed street food vendors operating in Manhattan, New York city, and discovered that more than half of the sellers (67%) approached served food with bare hands.

In their study, Addo et al (2007) discovered that most food vendors have little or no formal education, which important factors are contributing to foodborne diseases because they are considered to have little or no educational background and thus have a low understanding of food safety issues. As a result, there is a need for food vendor training on proper food handling techniques to prevent food contamination. Other experts, on the other hand, argue that while training increases food safety knowledge, it does not always imply good food handling behaviour (Apanga, 2014). Nurudeen et al. (2014) discovered that several food vendors did not apply hygienic measures during food serving, despite knowing what they should have done. Despite the absence of epidemiological data, most African street meals appear to constitute a public health risk because they are made and supplied in unsanitary conditions (Ekanem, 1998).

Over the last decade, studies in Ghana on many areas of food hygiene have found that most food sellers have insufficient food hygiene knowledge and attitudes, which impair

the vendors' cleanliness (Annor and Baiden, 2011). The study discovered a considerable disparity between knowledge and practice in these areas, which was linked to street food vendors' proclivity to compromise food safety for financial reasons. This implies that to address issues of unsanitary food vending on the street or in particularly built or designated spaces, food vendors must be educated on proper hygiene standards.

Bacteria from dirty dishwashing liquids and other sources on utensil surfaces pose a danger of contamination during food vending, according to studies undertaken by Bhaskar, Usman, Smitha, And Bhat (2004) And Mosupye And Holy (2000). Singh, Dudeju, Kaushal, And Mukherji (2016) conducted a similar study in India on the impact of a health education intervention on food safety and hygiene of street vendors, finding that only a tiny percentage of street food sellers (12%) used soapy water for utensil washing. Vendors have also witnessed washing utensils in buckets of water, although the utensils were not clean. According to a study by Nee et al. (2011), in Malaysia, a lack of food safety awareness is a major cause of the rising number of foodborne diseases. According to a study conducted by Afolaranmi et al (2015), even though food vendors were trained in food hygiene, some of the food vendors did not follow these hygiene measures. This necessitates reinforcing training requirements and making an effort to teach food vendors the importance of this training to their business.

Azanza (2009) studied the food safety knowledge and practices of street food sellers on a representative urban university campus in Quezon City in 2009. The unclean water was used to wash the kitchenware regularly. Certain foodborne germs could be spread and cause cross-contamination in such circumstances. According to a study conducted by Thakur, Mehra, Narula, Mahapatra, And Kalita (2013), just 36% of vendors utilized soapy water to clean their utensils. These findings are consistent with prior research that

show street food is produced in filthy environments, with wastewater and garbage disposed of nearby, providing fertilizer and breeding habitat for mice and vermin.

Monney et al., (2013) found that almost 86.7 percent of food vendors in Ghana's educational institutions got their trading skills from their intuition and informal education from friends and parents, while 13.3 percent got their skills formally from vocational institutions and senior high school in their study on hygienic practices among food vendors in Ghana's educational institutions using Konongo as a case study. The majority of food sellers (65%) said they had received on-the-job food hygiene training from the food and drugs authority and the municipal assembly, while 35% said they had received no such training. The researchers did note, however, that given the varied methods through which the majority of food sellers (86.7 percent) acquire their selling abilities, there is a need for additional training in the Philippines. According to the findings, concepts were developed among the 54 street foods, with a focus on health and personal cleanliness, food contamination, and good production methods. Despite this, sellers appeared to be uninformed about food legislation and waste control. The study discovered a considerable disparity between knowledge and practice in these areas, which was linked to street food vendors' proclivity to compromise food safety for financial reasons. This implies that to address issues of unsanitary food vending on the street or in particularly built or designated spaces, food vendors must be educated on proper hygiene standards.

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that only a tiny percentage of street food sellers (12%) used soapy water for utensil washing. Vendors have also witnessed cleaning utensils in buckets of water, but only once rinsing the kitchenware. The unclean water was used to wash the kitchenware regularly. Certain foodborne germs could be spread and cause cross-contamination in such circumstances. According to a study conducted by Thakur, Mehra, Narula, Mahapatra, And Kalita (2013), just 36% of vendors utilized soapy water to clean their utensils. These findings are consistent with prior research that show street food is produced in filthy environments, with wastewater and garbage disposed of nearby, providing fertilizer and breeding habitat for mice and vermin.

Monney et al (2013) found that the cleanliness of vendors' fingernails, as well as the adequacy of food protection from flies, are associated with food vendor training on food hygiene and safety, as evidenced by a statistically significant difference in the chi-square test. To summarize, food vendors who have been taught food hygiene and safety are more likely to keep their fingernails clean and properly shield their food from insects and dust. The study also found that food vendor training on food hygiene and safety was linked to important food hygiene and safety behaviours such as medical examination, hand hygiene, and food protection from flies and dust. This emphasizes the significance of food seller training to guarantee that best practices in the street food selling business are maintained, hence preserving public health. Monney et al (2013) reasoned that local food vendor associations are needed and that these groups will ensure that food sellers follow suitable street food selling norms of practice, as well as serve as a vehicle for efficiently training and relaying information to food vendors.

The failure of government entities to enforce rules requiring food vendors to comply with high hygiene standards is sometimes the source of foodborne disease outbreaks. For example, the FAO performed research in the capital cities of four West African countries

(Bamako, Abidjan, Freetown, and Accra) between 2011 and 2012 and discovered that while there are some regulations governing street food sales operations, they are rarely enforced. As factors leading to insufficient enforcement of bye-laws and regulations, the study identified overlapping functions and unclear advice on functions across regulatory organizations, as well as cumbersome and complex procedures for acquiring licenses. Furthermore, it was discovered that most vendors operated without proper licenses and certifications to operate as food sellers as a result of these issues (83 percent in Abidjan and 8 percent in Accra).

There are numerous epidemiological research findings on the occurrences of foodborne diseases in destinations with popular street vending foods (Ekanem, 1998), and these findings also imply that the foods prepared and sold by street vendors were responsible for the spread of zoonosis (diseases transmitted from animals to humans), especially in developing countries (King, Awumbila, Canacoo, & Ofosu-Amaah, 2000). According to Rheinländer et al. (2008), the rise in popularity of street food poses public health challenges because food safety is difficult to practice at the street level. For example, the food and drug administration of Taiwan's department of health reported 4460 occurrences of foodborne disease between 1981 and 2009. (Sun et al., 2012). According to the Taiwan FDA, from 1981 to 1990, residences were the primary source of foodborne diseases, but from 1991 to 2009, food vending establishments such as restaurants and food markets, among others, became the primary source of food poisoning.

A large body of study on street food vending has identified a lack of sanitary vending environments, a lack of food preparation knowledge, and a lack of food safety monitoring as critical issues (Lucca, & Ferraz Da Silva Torres, 2006; Lues, Rasephei, Venter, & Theron, 2006; Toh & Birchenough, 2000). According to studies, the majority of government bodies lacked clear regulations for the safety of street food vendors

(Muinde & Kuri, 2005; Omemu&Aderoju, 2008). The majority of street food vendors and handlers in Africa and other developing countries were mostly unaware of basic food safety issues, unlicensed, and untrained in food hygiene while working in filthy conditions, vending unregulated food items, and operating without any oversight of the foods they sold (Shu-Tai, Yi-Mei, And Kuo-Wei, 2012)

According to research conducted in Taiwan by Shu-Tai, Yi-Mei, And Kuo-Wei (2012), only 19.2 percent of food vendors had formal training, while the majority (41.7 percent) learned their skills from family enterprises. Vendors with legitimate health certificates, food-related credentials, or chef licenses were also found to have superior hygienic knowledge and practices than those who did not.

Foodborne diseases cause an estimated 48 million illnesses (approximately 1 in 6 Americans), 128,000 hospitalizations, and 3,000 fatalities in the United States each year, according to the Missouri Department of Health And Senior Services (2016). Developing countries should strengthen the role of street food sellers by providing training, rules, regulation, and infrastructure to promote food security and nutrition, to reduce the burden of food-borne illnesses (Ababio and Adi, 2012). Diarrhoeal illnesses, which are caused primarily by foodborne microbial infections, are the main cause of illness and death in underdeveloped nations, killing an estimated 1.9 million people each year (Schlundt et al., 2004).

## **2.11 Conceptual framework**

On the University Of Ghana campus, a study investigated food vendor sanitary standards and their impact on customer food safety. Several studies were undertaken in Ghana and elsewhere (Mensa et al, 2002; Manko, 2018; Manko, 2018) have all found three

important characteristics that determine the quality of street foods. The regulatory dimension, the food vendor's dimension, and the consumers dimension are the three.

In terms of the regulatory dimension, local institutions such as municipal environmental units, health service units, and the food and drugs authority, among others, are mandated to provide training, issue permits, and standards, as well as regulate and monitor food vendors to ensure that they comply with all necessary health requirements when vending food and food products. Local governments are also expected to provide necessary social amenities such as drinkable water, bathroom facilities, and even serene and hygienic vending sites so that food vendors can put their understanding of sanitary food practices into effect after gaining sufficient expertise.

Dimensions of food vendors: food vendors can improve street food cleanliness by putting in place the essential systems to avoid food contamination. Good and sanitary food preparation and vending settings, good and effective food management and handling systems, and prioritization of vendors' cleanliness are some of the mechanisms that vendors can put in place to prevent contamination. It has also been discovered that factors such as the vendors' knowledge and awareness of good sanitary practices, their degree of formal education, and other similar circumstances influence how vendors approach and implement good hygiene during their food preparation and vending operations (Wuliyeng, 2013).

Dimension of the consumer: consumers are also recognized to play a big role in determining whether or not food providers would implement hygienic standards. Because consumers are the clients who will be served by these vendors, they can choose not to eat the food of unclean vendors, forcing the vendors to either engage in hygienic standards or close their doors. As a result, it has been hypothesized that when consumers are fully aware of the negative effects of unsanitary food on their health, it will have a

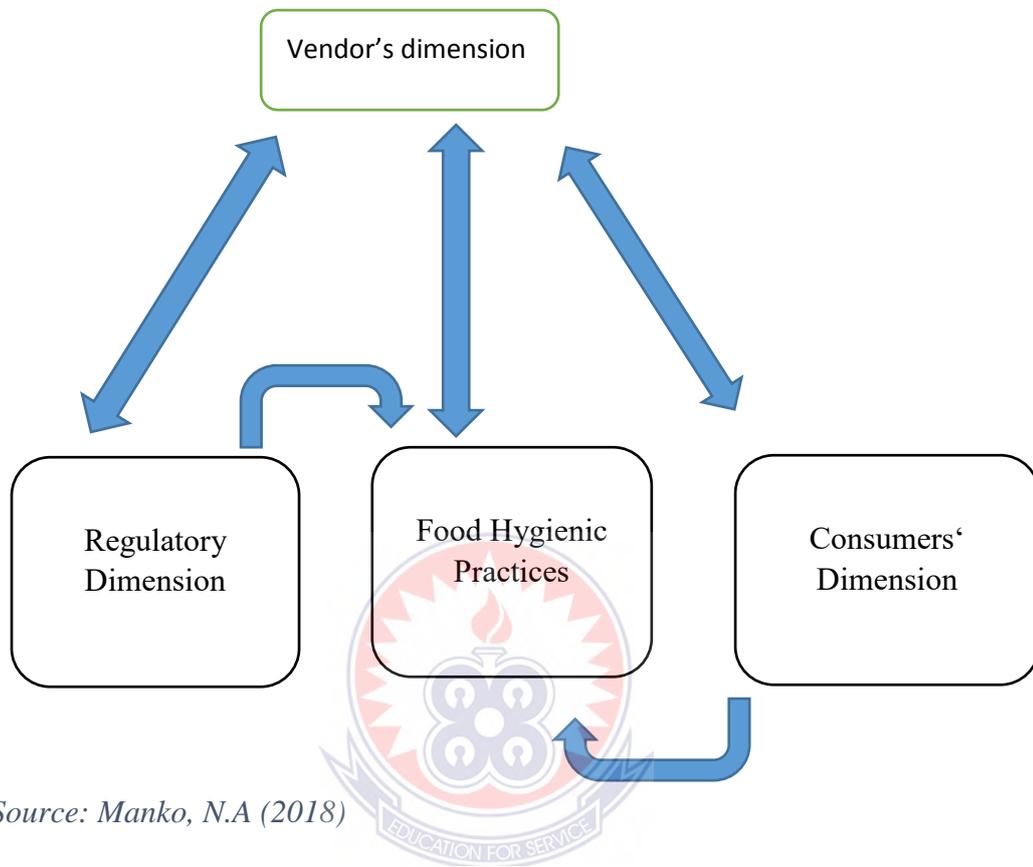
significant impact on their level and kind of interaction with food vendors, as well as their demand for high-quality food.

The interaction of these three dimensions can determine whether people practice excellent or bad hygiene. Good cleanliness behaviour can be ensured if each dimension fulfills its job successfully. Likewise, the inverse is true.

As a result, any effort to maintain hygienic food practices and management must take into account all three (3) dimensions that influence food management and vending in the country. Figure 2.1 illustrates this. 1 extra leaf



**Figure 2. 1: diagram showing various stakeholders/dimensions in hygienic food management**



Source: Manko, N.A (2018)

## **2.12 Food handling, hygiene, and sanitation practices**

Between the years of 2001 and 2006, diarrheal episodes caused 50 per 10,000 US young children (under the age of five) to be hospitalized, 180 per 10,000 young children to attend the emergency room, and 1,332 per 10,000 young children to visit the outpatient clinic (Cortes et al., 2009). There is a well-established link between child-care attendance and an increased risk of acute gastrointestinal sickness (AGI). According to Lu et al. (2004), children who are cared for in child-care facilities are 2.3 to 3.5 times more likely to have AGI than children who are cared for at home. Because of the rising number from the US who were enrolled in out-of-home child-care facilities (CCFs) as a result of the expanding number of mothers working outside the home, AGI in child-care facilities is becoming a significant concern. Between 1975 and 2008, the percentage of working moms with children under the age of six rose from 39% to 63.6 percent, according to the Bureau of Labor Statistics (bureau of labor statistics, 2009). In 2005, CCF spent an average of 35 hours per week with 73 percent of the 19.6 million US children under the age of five who were not in kindergarten (National Association Of Child-Care Resource & Referral Agencies, 2010; US Census Bureau, 2010). In 2010, a quarter of the population of the United States was under the age of 25. Children under the age of five attended two or more child-care arrangements on a regular basis, which could increase their risk of developing an AGI because to increased exposure to other children (US Census, 2011; Morrissey, 2012).

## **2.13 Knowledge and practices of food hygiene and safety of caterers**

The bulk of outbreaks in small food enterprises, canteens, residential residences, and other sites where food is produced for human consumption are caused by practices during food preparation, according to analyses of food-borne disease notifications around

the world (Seaman & Eves, 2006). Food mishandling is linked to 97 percent of all food-borne illnesses in catering operations (Egan et al., 2007; Ehiri, Morris, & McEwen, 1997). Food handlers' hygiene practices, primarily those of food vendors and catering services, have been noted to be subpar (Addo, Mensah, Bonsu, & Akyeh, 2007; Afoakwa, 2005; Feglo & Sakyi, 2012; Tomlins et al., 2002). In Ghana, study on the hospitality business has primarily focused on hotels, restaurants, and street food vendors in Accra, the capital (Ackah et al., 2011; Addo et al., 2007; Donkor, Kayang, Quay, & Akyeh, 2009). Foodborne disease outbreaks have been linked to restaurants and individual food vendors. Schools are another likely source of food hygiene problems among institutional catering services, according to the research. According to a report by the Ghana News Agency (Ghana News Agency, 2013), schools account for a quarter of all food facilities in Ghana, and they are responsible for 77 percent of all traceable food borne infections. There have been several reports of kids rejecting meals, food contamination, and, in some cases, the hospitalization of dozens of students as a result of food poisoning from meals supplied by caterers in Senior High School (SHS) (Ababio & Lovatt, 2015; Der et al., 2010; Citifm Online 2013; Daily Guide, 2007; Ghana Health Services, 2007; Joy News, 2008;). The majority of research undertaken in Ghana over the last decade on various elements of poor hygiene knowledge and attitudes have focused on street food vending caterers; however, the safety and quality of meals served by institutional catering units in the country have not been recorded (Ababio & Lovatt, 2015). When students eat tainted food, they are more likely to get sick, which can lead to absence and poor academic performance. Because food poisoning can affect a large number of kids, having a high level of understanding and upholding strong food safety standards in school food services is a critical concern (Monney, Agyei, & Owusu, 2013; Osaili, et al., 2013).

## **2.14 Chapter summary**

This chapter reviewed several pieces of literature about hygiene, food safety, and the training needs of food vendors. A conceptual framework was designed to guide the study. Component of the conceptual framework includes; food vendor's dimension, regulatory dimensions, and consumers dimension which was explained to better understand the purpose of the study.



## CHAPTER THREE

### METHODOLOGY

#### 3.1 Research design

This study adopted a quantitative and qualitative research approach using structured questionnaires with predetermined responses and Likert scale in the data collection and analysis. This approach is similar to previous studies addressing similar research objectives (Makasi et al., 2014; Collange, 2015). The mixed method research approach was chosen for varied reasons. A quantitative approach to corroborate the findings of the qualitative approach would be beneficial for this study. Research bias is also reduced to a large extent when the quantitative approach is used (Malhotra, 2007). It is equally good for testing hypotheses or theories.

This study primarily adopts the descriptive approach which is more formalized and typically structured with clearly stated hypotheses and questions (Cooper & Schinder, 2004). This is about the stationary street food vendors and their hygienic practices. Also, the design was specific to ascertaining if stationary street food vendors are well vexed with the food safety knowledge as well as implementing them. According to Robson (2002), descriptive research is characterized by giving accurate profiles of people, events, or situations or the said phenomenon. Studies with similar research objectives adopted the descriptive approach (Angelillo, Viggiani, Greco, And Rito, 2001; Walker Et Al. (2003); Çakiro\_Glu And Uçar (2008); Tokuç Et Al. (2009); Sanlier (2009); And Giritlioglu, (2011)) in addressing the varied research objectives. This research is mixed method research approach and adopts the survey approach in collecting the data; specifically, with a structured questionnaire. This study found the survey strategy appropriate because the data of this was cross-sectional data from the specialty catering

industry. In addition, cross-sectional studies usually employ the survey strategy (Robson, 2002).

The first research question was analyzed using a quantitative approach and it employed the use of the researchers observation and intuition while the rest of the questions were analyzed using a qualitative approach.

### **3.2 Population of the study**

The target population for a survey is the entire set of units for which the survey data are to be used to make inferences. Thus, the target population defines those units for which the findings of the survey are meant to generalize (Cox, 2008). The target population for this study represents the stationary street food vendors in Nima - Mamobi.

### **3.3 Sampling procedure and sample size**

The non-probability sampling technique specifically convenience sampling was used to collect data from customers. Hence, 100 stationary street food vendors in Nima- Mamobi which is located in the capital city of Ghana were purposively selected to participate in the study using the Yamane formula. The Yamane simplified formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where  $n$  is the sample size,  $N$  is the population size and  $e$  is the level of precision/error margin was used to select a representative sample of 100 stationary street food vendors for the survey. Therefore, the population size ( $N$ ) for residents is 53,004 with an error margin ( $e$ ) of 0.10.

$$N = 99.81$$

Which is approximated to 100

### **3.4 Data collection**

#### **3.4.1 Types and sources of data**

Primary data and secondary data have been analyzed for the study. The secondary data was derived from journals, students' papers, and websites for the introduction and the literature review. The primary data was collected using questionnaires from the participants. The primary data was used for the analysis from which reports and conclusions were drawn.

#### **3.4.2 Methods of data collection**

Data collected for the study was via the distribution of questionnaires in person to the participants to respond to. Permission was sought from the respondents and their confidentiality and anonymity were ensured before they responded to the questionnaire. Those who wished not to respond to the questionnaire were not forced but rather excused. Those who agreed to respond were guided through it by explaining those portions they found difficult to understand.

#### **3.4.3 Instruments for data collection**

The data collection instrument is a questionnaire divided into sections a, b, c, and d. The first section looked at the socio-demographic profiles of the caterers. The second section determined the level of their knowledge on food safety. Section c determined the caterers' practices relating to safe food production. The caterers were asked to respond to some items. The final part assessed the caterers' practice of personal hygiene. There was an e part which was answered by the researcher after observation

### **3.5 Data analysis**

The data collected from this study were analyzed with the help of SPSS (version 21). All 100 questionnaires were entered into SPSS (version 21) for further analysis. Data were coded and screened for outliers or any other variation in the data set. Data entered into the SPSS was used to generate frequencies for the demographic profile of the respondents.

The demographic data of the respondents were analyzed using frequencies and percentages. Research questions one, two, and three were analyzed frequencies, percentages, and charts.

### **3.6 Validity and reliability**

Mugenda and Mugenda (2002) defined validity as “the degree to which a test measures what it is intended to measure. The research design addressed specific research questions. The instrument was approved by supervisors to establish its validity. Reliability is “the extent to which results are consistent over time and an accurate representation of total population under study”. The Cronbach alpha of 0.78 showed that the instrument is reliable and consistent with the research objectives.

### **3.7 Ethical considerations**

According to the oxford dictionary, ethics refer to the “moral principles that control or influence a person’s behaviour”. In light of this, the researcher applied for ethical approval at the ethical review board of the university as the researcher is aware of the psychological harm, financial harm and social harm respondents could face if ethical considerations are not made. All participants were assured that any information given was going to be treated with utmost confidentiality and anonymity. The researcher

ensured that participation was voluntary in the collection of data and also ensured that the consent of participants was sought before data was taken.

### **3.8 Profile of study area(s)**

Nima is a zongo residential town in the greater Accra region of Ghana. The town is popular because of its market – the Nima market (Brady & Hooper, 2019). The name Nima has its etymology from the Ga language which means the "city of the king". Nii means king in the Ga language, while the word city in the same language is ~~m~~ann". (wikipedia, 2019) there have been a few contrasting views about the name, however, with some pointing to the town's Muslim community to say Nima was a reference to the Arabic word, "Nima", which means blessings. Nima is considered the largest and one of the oldest zongo communities in Ghana with origins as far back as 1836. The settlement is often referred to as one-half of the twin community, Mamobi- Nima, though it is mostly used to refer to the two adjoining towns. Nima is a Muslim-dominated area. Like most zongo communities, though, it exhibits great diversity in religion and ethnicity

Nima and its environs developed as a settlement for traders from the northern regions of Ghana and those from neighbouring countries such as Togo and Burkina Faso. It is a major trading hub in the capital. The Nima market, known locally as Kasoa Mamudu, is one of the largest and busiest markets in Accra; it is located along the Al-Waleed Bin Balal highway. Saturdays are market days, and the market is bustling with traders dealing in cereals, grains, vegetables, and livestock. The Nima market is a great destination for spice lovers. It also has several vendors dealing with traditional medicines. People looking for fowls with unique or single colours for special rites often visit the Nima market to make their selection. The streets leading to the market from Mamobi are lined with shops selling groceries and fashion items. There is also a huge

contingency of forex traders on the street, with many black market sellers operating on both sides of the street. Another market dealing mostly in vegetables is located a mile away in the twin town of Mamobi.

In 1931, zongo leaders negotiated with the government for the use of land northeast of the city which would become Nima zongo (Quayson, 2014). Not yet incorporated into Accra's city limits, Nima resultantly experienced little government scrutiny and evolved into a melting pot of residents in a densely settled, largely unplanned neighbourhood that continues to exist today (Allman, 1991). Nima Mamobi currently has a population of 53004, this according to the population and housing census (2021)



## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.1 Introduction

The analysis and debate are presented in this chapter. To answer the research questions, the discussion was done about the review of literature in chapter two. As a result, the study's findings were compared to the relevant ideas and concepts presented in the literature review. The findings are divided into eight sections, each of which focuses on one of the research issues.

According to Pallant (2010), data coding, screening, and cleaning are recommended to eliminate errors that would likely influence the outcomes throughout the analysis. For additional analysis, the coded data was verified for outliers, missing values, or scores that were possibly out of range, as well as incorrect inputs. A total of 240 questionnaires were found to be legitimate and were used in the study.

#### 4.2 Demographic Distribution of the Nimo respondents

Table 4.1 showing the demographic distribution of the Nima Mamobi respondents

	item	F	%
Name of town	Nima	55	55.0
	Mamobi	45	45.0
	Total	100	100.0
Gender	Male	5	5.0
	Female	95	95.0
	Total	100	100.0
Marital status	Married	51	51.0
	Single	9	9.0
	Divorced	17	17.0
	Widowed	23	23.0
	Total	100	100.0
Level of education	Basic	43	43.0
	Secondary / technical	17	17.0
	Tertiary	2	2.0
	None	38	38.0
	Total	100	100.0

Source: survey, 2022

Key:

F - Frequency

% - percent

A hundred respondents were interviewed. 55 of them which represents 55% were from Nima and the rest (45%) are from Mamobi. Out of the 100, only 5 of them which make up 5% of the respondents. 95 of them (95%) are females. With marital status, 51 of the respondents (51%) were married, nine of them (9%) were single as the divorced respondents number 17(17%). There were 23 widowed respondents who make up 23% of the respondents. With level of education, there were five categories, ranging from none to tertiary and below are the details. 43 of interviewees, were only educated up to the basic level and they are 43%. Those who ended at the secondary or technical level numbered 17 and are 17% as only 2 of the thus 2% of them have had tertiary education. 38 of respondents had never received any formal education and they are 38%.

#### **4.3 What are the sanitary conditions of the stationary street food vendors in Nima-Mamobi?**

Whereas you could find junk yard animals like cats and dogs even in some of the spots. This was a hotspot for lots of flies. And because of their love for the trade of livestock, the population of flies was very dense. Stationary street food vendors did observed hygienic measures such as hand washing after using the restroom, appropriate dish cleaning, and reheating cold food.

**Table 4.2 showing the observed sanitary conditions of the stationary street food vendors in Nima- Mamobi**

Statement	Observations					
	Yes		No		Total	
	F	%	F	%	F	%
Is the environment around the spot where the food sold tidy	11	11.0	89	89.0	100	100.0
Are sanitary items like brooms and bin kept well positioned	30	30.0	70	70.0	100	100.0
Was the food spot being kept tidy periodically	14	14.0	86	86.0	100	100.0
Are waste/leftovers disposed of immediately	6	6.0	94	94.0	100	100.0
Is there any clean hand washing facility available and easily accessible?	44	44.0	56	56.0	100	100.0
Is there any washroom	14	14.0	86	86.0	100	100.0
Are the vendors and their co-workers well dressed?	12	12.0	88	88.0	100	100.0

Source: survey, 2022

Key:

F - Frequency

% - percent

Qualitative studies was done here by virtue of observation and each of the stationary street food vendors were subjected to this tests. It was observed that 89 of the 100 thus 89% of respondents did not have a tidy environment for selling food as usually expected in a typical Ghanaian zongo or a densely populated area as mentioned by Allman (1991). There were animals like sheep and goats loitering around the food sites. Whereas you

could find junk yard animals like cats and dogs even in some of the spots. This was a hotspot for lots of flies. And because of their love for the trade of livestock, the population of flies was very dense.

70 of the stationary street food vendors thus 70% of respondents did not keep sanitary items like brooms, collectors, trash bins and others at appropriate places but rather in the open as Iragunima (2006) mentioned that food hygiene refers to the variables that influence an individual's health and well-being and as such cleanliness is one of the variables.

The spot where the food is sold was also checked and it was realized that 86 out of the 100 (86%) kept an untidy spot for selling food and thus did not mind if the place was tidy or not. Gordon (2011) argued that the most essential issue that could have a detrimental impact on food quality is the component of hygiene and sanitation. And that, pathogens develop well under unsanitary conditions.

Left over foods/ food wastes were also not disposed immediately as 94 of the interviewees did not dispose them off immediately. Checking for a clean hand washing facility, 56 of them had it (making 56%). This claim buttresses the point made by Manko(2018) that in some of these areas where food testing revealed parasite contaminations, the presence of litter and domestic animals in and around vending areas has been noted. Food vendors that lacked suitable waste disposal methods threw their trash in surrounding gutters, resulting in the abundance of flies at the vending location with insufficient food protection.

86 of them (56%) had no washroom or any place of convenience. 88 of the stationary street food vendors and/or their coworkers were neatly dressed and appeared very well and is similar to reports by Rheinländer (2006) in Kumasi, which discovered that the lack of potable water, lavatory facilities, and dustbins interfere vendors' hygienic practices.

Stationary street food vendors did observed hygienic measures such as hand washing after using the restroom, appropriate dish cleaning, and reheating cold food, among others. Stephenson (2002) also identified that the relatively high incidence of parasites infectious by faecal matter is indicative of high levels of ambient faecal contamination and low sanitation standards.

#### 4.4 Do the stationary street food vendors in Nima-Mamobi have food safety knowledge?

This claim buttresses the point made by Manko(2018) that in some of these areas where food testing revealed parasite contaminations, the presence of litter and domestic animals in and around vending areas has been noted. Food vendors that lacked suitable waste disposal methods threw their trash in surrounding gutters, resulting in the abundance of flies at the vending location with insufficient food protection.

**Table 4.3 showing knowledge levels of food safety among stationary street food vendors in Nima- Mamobi**

Statement	Agree		Disagree		Total	
	F	%	F	%	F	%
Tidying up around your food cooking / selling area is your duty	80	80.0	20	20.0	100	100.0
paying for waste management staff to clear stagnant water in the gutter/ drainage will improve hygienic conditions at your cooking/ selling spot	35	35.0	65	65.0	100	100.0
Cooking/ selling food in an untidy environment can lead to food poisoning	50	50.0	50	50.0	100	100.0
Cooking and serving materials should always be kept clean	96	96.0	4	4.0	100	100.0

Source: survey, 2022

Key:

F - Frequency

% - percent

In determining the knowledge levels stationary street food vendors have concerning food safety, they were subjected to a Likert. And here, they were measured on four items. The first is tidying up around your food cooking / selling area is your duty and 80% of the 100 stationary street food vendors who were interviewed agreed. As suggested by the etic perspective that when people tend to understand that unsanitary practices cause water and sanitation diseases, they are going to go by sanitary practices. (Manko, 2018)

The next is, paying for waste management staff to clear stagnant water in the gutter/ drainage will improve hygienic conditions at your cooking/ selling spot and 65 out of 100 thus 65% of them disagreed. Because a massive 80% believe it is their duty to clean their spot, it is not surprising that these vendors find it unusual to pay the waste management services to bear those responsibilities for them. However as a zongo community, their reason may be far from what has been stated above. Because Zongos are usually slums and densely populated and these are areas that hardly care about hygiene and environmental cleanliness (Brady & Hooper, 2019)

The item that followed was cooking/ selling food in an untidy environment can lead to food poisoning and only 50% agreed thus 50 out of 100 stationary street food vendors.

The final item was cooking and serving materials should always be kept clean and 96 of them, 96% agreed. Janie and Marie (2010) having already mentioned that, the people's awareness to the etic perspective has an influence on their thoughts however, Allman, mentioned that zongo is a slum and densely populated place with respect to Ghana and hence it could be concluded , their environment and their thoughts battle against each other. As in though they believe unsanitary practices can lead to serious water and sanitation diseases, they will still not do it because of where they find themselves.

#### 4.5 How well do the stationary street food vendors in Nima- Mamobi implement food safety?

And this is shown in the chart below. One way of ensuring food safety is by checking the health status of the vendors and their co-workers. In some corporate organisations, medical check-ups are mandatory as requirements to gaining employment. This is not so usually among the self-employed as vendors may be harbouring disease like typhoid, cholera and microbes like coliforms.

**Table 4.3 table showing how often co-workers of stationary street food vendors go for medical check up**

Measure	F	%
Never	90	90.0
Once a year	10	10.0
Total	100	100.0

Source: survey, 2022

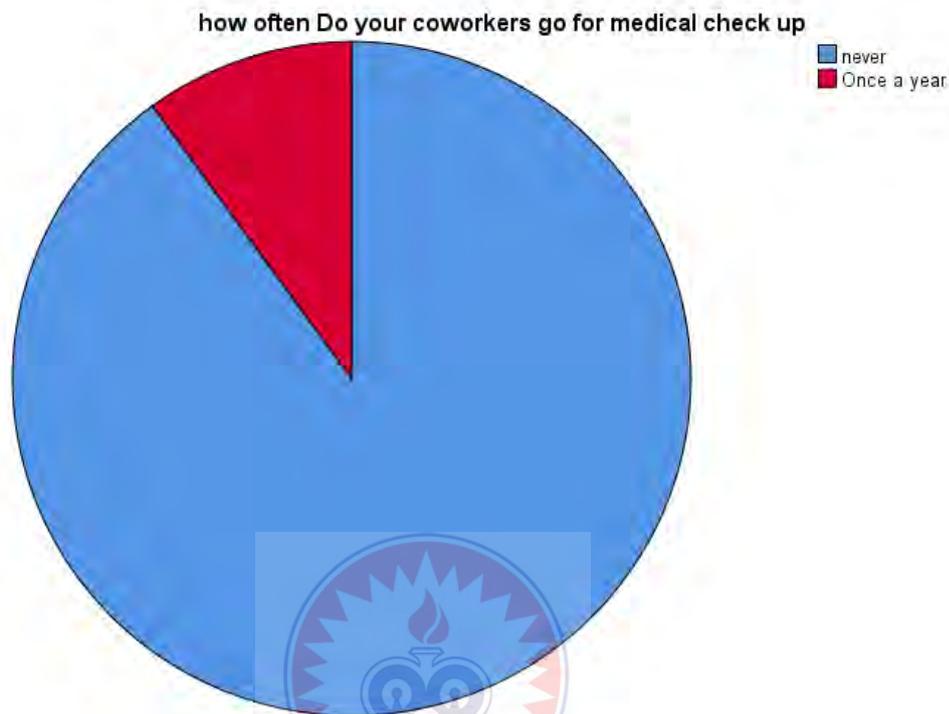
Key:

F - Frequency

% - percent

90 of the respondents, representing 90% of them, mentioned they never go for medical check-up. And this is shown in the chart below. One way of ensuring food safety is by checking the health status of the vendors and their co-workers. In some corporate organisations, medical check-ups are mandatory as requirements to gaining employment. This is not so usually among the self-employed as vendors may be harbouring disease like typhoid, cholera and microbes like coliforms. Hygiene as defined by who (2010) is sufficient to state that a conscious effort must always be made to safeguard people and the environment from bacteria to eliminate contamination of people's food. Fosket and Ceserani (2007) adds that hygiene is the science and practice of sustaining health and

preventing diseases in all food-serving establishments. And one way of doing this is by checking your status any dealing with any food related microbes a food vendor may be carrying



**Figure 4. 1 graph showing the frequency at which coworkers of stationary street food vendors go for medical check up**

**Table 4.4 table showing the last time stationary street food vendors last had a medical check up**

When was last medical check-up?		
Item	F	%
Never had one	85	85.0
Only when i started this trade	15	15.0
Total	100	100.0

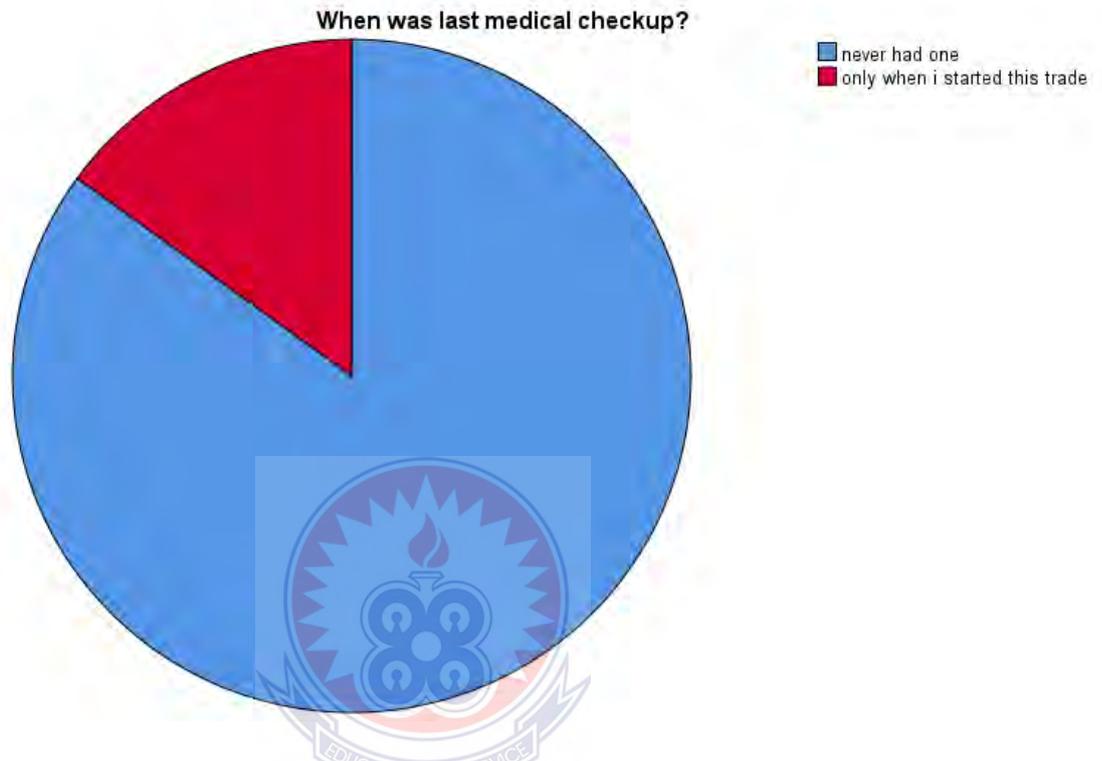
Source: survey, 2022

Key:

F - frequency

% - percent

85 of the 100 respondents (85%) have never had a medical check-up with reference to their trade and this is represented in the figure below. This is similar to that of their co-workers as their roles are usually not distinct.



**Figure 4. 2 a chart showing the distribution of when last had a medical check-up**

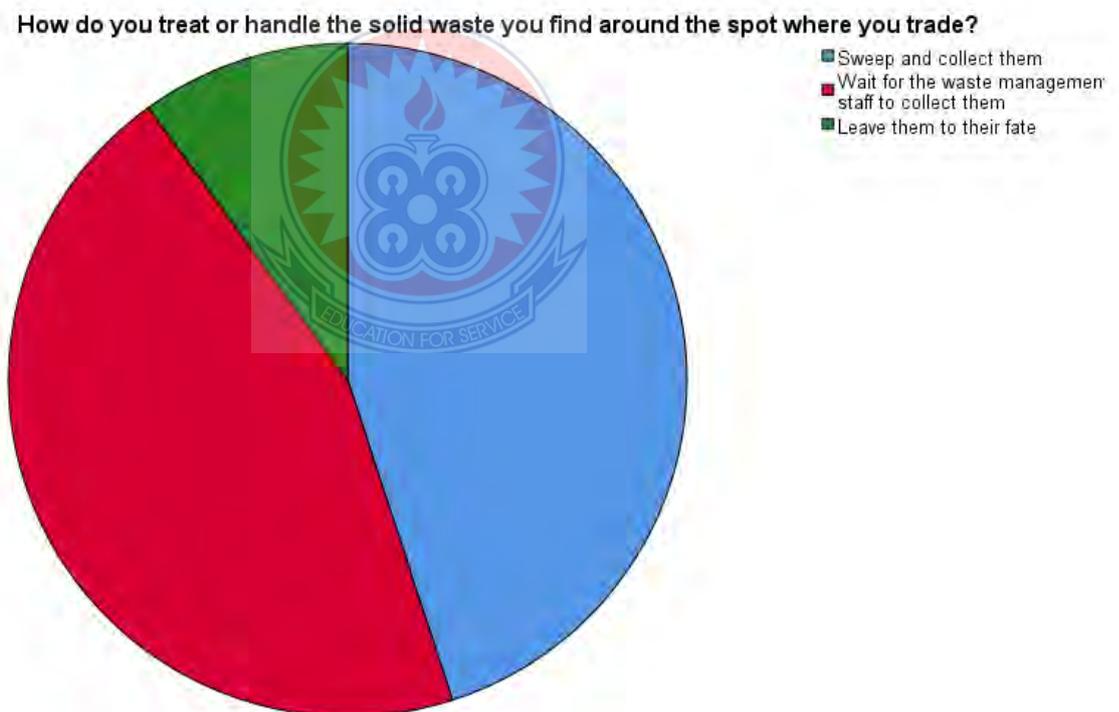
**Table 4.5 showing distribution of method of handling waste around spot where they ply their trade**

How do you treat or handle the solid waste you find around the spot where you trade?		
Item	F	%
Sweep and collect them	45	45.0
Wait for the waste management staff to collect them	45	45.0
Leave them to their fate	10	10.0
Total	100	100.0

Source: survey, 2022

Key:  
 F - Frequency  
 % - percent

In finding out how vendors handle solid waste found around the spot where they trade, 45% of them each mentioned that they either sweep and collect them or wait for the waste management staff to collect them. This is shown in the chart below. The surroundings of most of the spots where trade goes on is enough evidence that whoever is responsible for collecting the wastes either delays in coming to collect them or is not regular in collecting them. Food vendors did not also have convenient waste disposal bins. This makes the place a hotspot for infection as food vendors that lacked suitable waste disposal methods threw their trash in surrounding gutters, resulting in the abundance of flies at the vending location with insufficient food protection (Manko, 2018)



**Figure 4. 3 chart showing distribution of method of handling waste around spot where they ply their trade.**

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

#### 5.1 Summary of findings

This section of this chapter presents a summary of the findings of the study. The results of this study was an evaluation of the sanitation practices among stationary street food vendors in the Nima – Mamobi Township which is a largely densely populated slum located in the capital of Ghana. Specifically, the study successfully assessed the sanitary conditions of the street food vendors, determine their knowledge of safe food production and examine the catering practices of safe food production and trade.

##### 5.1.1 Sanitary conditions of stationary street food vendors

It was observed that the people of Nima Mamobi had a very poor environment which also influenced the setup of their food production sites or where they sell their food. There were flies at most of the food sites. Animals such goats, sheep, cats and dogs were found in close proximity to where food was sold and/or prepared.

In addition to this, the personal hygiene of the food vendor was not holistically observed as they did not keep sanitary items in place. In some sites, the researcher noticed items such as brooms very close to cooking utensils and even slaughtered animals. There were also almost no proper bins for them to collect waste or food left overs and left these wastes at the mercies of the stray animals, flies, the wind and the weather.

Unsurprisingly, most of these vendors and their coworkers did not show any concern towards these unsanitary practices whether they would cause problems or not.

Waste and left over foods were not collected immediately. Waste especially, could wait till the following day to be swept. As for collection of bins, most of these vendors left them unattended till the waste management services came for them. They were not

properly covered and some even threw their rubbish around or even in gutters. Talking of waste water, it looked like a difficulty as waste water was poured on the streets and other choked gutters.

Washrooms/ restrooms seemed alien, as most of them had none. Those who were fortunate to have some shared them with other facilities or had a public facility in close proximity. Customers who needed to wash hands did so by washing hands in bowls or on the floor with usually soap with low quality. The vendors themselves did not dress properly as in most were shabbily. And as well did not observe safe hygiene practice like washing of hands after holding brooms etc. Some were even nursing mothers who were nursing their kids alongside doing their daily activities.

### **5.1.2 The knowledge of safe food production among stationary street food vendors in Nima-Mamobi**

In determining the knowledge level of stationary street food vendors concerning food safety, various questions were asked. The first is, their agreement to who is responsible for cleaning around their environment and their food spots and 80% of them agreed that was their responsibility hence just a few of the engaged the services of third parties to do clean ups for them. This may explain the reason for the unkempt environment

The next was; cooking/selling food in an untidy environment can lead to food poisoning and there was a tie with level of agreement. This may be due to the fact that they believe that eating good food is paramount and that no condition can affect that. The follow up question was about the cleanliness of their serving dishes and utensils. They agreed those items always need to be kept clean.

### 5.1.3 Implementation of food safety practices by stationary street food vendors

As mentioned earlier, a good way of ensuring food safety is by staying healthy, however, the vendors did not even care about their health status as majority of them have never had a medical checkup and those that have even had medical checkups last had one when they were beginning the work or elsewhere.

There was almost always rubbish gathered at one point or the other for each of the vendors that were visited. When asked who was responsible for collecting the waste there was a tie; 45% said that the vendors themselves were responsible while another 45% mentioned that the waste management services were responsible for the waste. It had already been ascertained that that whoever was responsible was not doing a punctual and regular work.

## 5.2 Recommendations

For policy:

- Trainings should be mandatory for all stationary street food vendors. Successful ones should be awarded certificates prior to obtaining a yearly permit to operate
- Authorities that grant these vendors should check their certificate for a successful food safety training before handing over to them a permit
- The same authorities should randomly and often visit these vendors to make sure they are actually practicing what they have been trained for
- It must be ensured vendors have access to a good toilet and handwashing facility before allowing to operate
- Each of the vendors must be enrolled unto an afford waste management scheme so that the waste management services will handle their collected waste



- The waste management services should also be checked for punctuality and regularity
- Owners of stray animals should be given occasional cautions and their animals given limited access to certain parts of the twin towns

For academic purpose

- There should be a research on why stray animals are left not herded with some of the effects these actions could bring
- There should also be research to determine the quality of food and water available at these vending areas.

### **5.3 Conclusion**

The research which sought to evaluate sanitation practices among stationary food vendors in Nima Mamobi and it could be concluded that, Nima Mamobi is a hotspot for food poisoning as sanitary conditions of the twin towns are very poor. In addition to that the vendors lack food safety knowledge and the little they have is not even practiced.

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## APPENDIX A

### QUESTIONNAIRE ADMINISTERED TO STATIONARY STREET FOOD VENDORS

The questionnaire is designed with the purpose of seeking information from stationary street food vendors on sanitation practices within the catering industry. The Nima and Mamobi towns have been chosen for this study. Please your kind corporation is being sought to complete this work. This study is for academic purpose and so all information given will be treated as confidential.

#### SECTION A: Bio Data

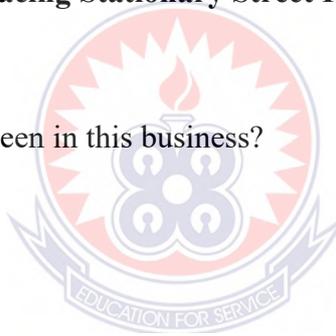
1. Town
  - a. Nima
  - b. Mamobi
2. Gender
  - a. Male
  - b. Female
3. Marital status
  - a. Married
  - b. Single
  - c. Divorced
  - d. Widowed
4. Age
  - a. Below 20
  - b. 21-30
  - c. 31-40
  - d. 41-50
  - e. 51+



5. Level of education
  - a. Basic
  - b. Secondary / technical
  - c. Tertiary
  - d. None
  
6. Area of food specialization
  - a. ....
  - b. ....
  - c. ....

**SECTION B: Challenges Facing Stationary Street Food Vendors with regards To Waste**

7. How long have you been in this business?
  - a. 1-5years
  - b. 6-10
  - c. 11-15
  - d. 16-20
  - e. 21+
  
8. Where did you learn your trade?
  - a. From parents
  - b. From friends/ peers
  - c. From academic training
  - d. Others. Specify .....



9. Do you have a permit or license to cook and sell food to the general public

- a. Yes
- b. No

10. How do you get your spot where your trade is operated cleaned?

- a. Myself and my coworkers
- b. Waste management
- c. Others. Please specify .....

11. Have you received any training on food hygiene and sanitation before

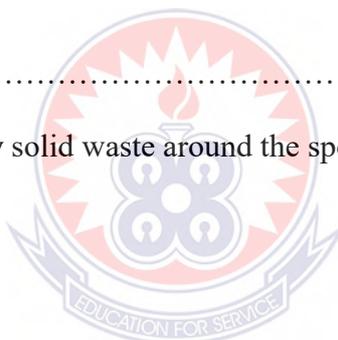
- a. Yes
- b. No

12. If yes kindly state the

institution.....

13. Have you noticed any solid waste around the spot where you are trading?

- a. Yes
- b. No



14. If yes, kindly give a brief on how it was created.

.....  
.....

15. How do you treat or handle the solid waste you find around the spot where you trade?

- a. Sweep and collect them
- b. Wait for the waste management staff to collect them
- c. Leave them to their fate
- d. Others. Please specify

.....

16. Do you pay any fees to the metro assembly for the waste management in the metropolis?

- a. Yes
- b. No

**SECTION C: What can be done to improve conditions under which Stationary Street Food Vendors Operate?**

17. Where do you cook before coming to sell at this spot?

- a. Home
- b. At the spot
- c. Others. Specify .....

18. How often do you go for medical checkup?

- a. Once a year
- b. Twice a year
- c. Thrice a year
- d. never
- e. Others. Specify.....



19. When was last medical checkup?

Please

specify.....

20. If yes , how often Do your coworkers go for medical check up

- a. Once a year
- b. Twice a year
- c. Thrice a year
- d. Seldom
- e. Others. Specify.....

21. How often do environmental health officers visit your food preparation spot and selling spots?

- a. Once a year
- b. Twice a year
- c. Thrice a year
- d. never
- e. Others. Specify.....

**SECTION D: please indicate your level of agreement to the following statement by checking the boxes**

Statement	SA	A	D	SD
22. Tidying up around your food cooking / selling area is your duty				
23. Paying for waste management staff to clear stagnant water in the gutter/ drainage will improve hygienic conditions at your cooking/ selling spot				
24. Cooking/ selling food in an untidy environment can lead to food poisoning				
25. Cooking and serving materials should always be kept clean				

**SECTION E: Observations**

s/n	Item	YES	NO
1	Is the spot where the food sold tidy		
2	Are sanitary items like brooms and bin kept well positioned		
3	Was the food spot being kept tidy periodically		
4	Are waste/leftovers disposed of immediately		
5	Is there any clean hand washing facility available and easily accessible?		
6	Is there any washroom		
7	Are the vendors and their coworkers well dressed?		

