

**ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE OF  
STREET FOOD VENDORS TOWARDS FOOD SAFETY AND HYGIENE IN  
ILALA MUNICIPALITY**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER OF ENVIRONMENTAL  
STUDIES OF THE OPEN UNIVERSITY OF TANZANIA**

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**CERTIFICATION**

The undersigned certifies that he has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation titled: **“Assessment of Knowledge, Attitude and Practice of Street Food Vendors Towards Food Safety and Hygiene in Ilala Municipality”** in partial fulfillment of the requirements for the degree of Master of Environmental Studies of the Open University of Tanzania.

.....

Dr. Leonard Fweja

(Supervisor)

.....

Date

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**DECLARATION**

I, **Reginald S. Mlay**, do hereby declare that this research work titled *Assessment of knowledge, attitude, and practice of street food vendors towards food safety and hygiene in Ilala Municipality* is my own work and I did it to the best of my knowledge, and it has been presented for an award of a Masters degree in Environmental Studies of the Open University of Tanzania (OUT). It has not been submitted for similar degree or examination in any other University or higher learning institution, and that all sources I have used or quoted, have been indicated and acknowledged by complete references.

.....

Signature

.....

Date

**DEDICATION**

This study is dedicated to my supervisor, Dr. Leonard Fweja for providing me with the support and encouragement to complete the research work. I wish to gratefully thank the Lord God for all His blessings, generosity and mercy upon me.

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## **ABSTRACT**

This descriptive cross sectional study was done to assess the knowledge, attitude and practice of street food vendors towards food safety and hygiene in Ilala Municipality. A total of 385 street food vendors were involved in this study and out of them 90% were female. The results also indicated that the food vending industry engage largely the active group, 20-30 years. In addition majority of them (68.6%) had no formal training on food safety, which is important for the consumer safe guarding. Furthermore, it was justified that 40% of food vendors were not aware of cross contamination, improper cooking and lack of cleaning and sanitizing equipment lead to food borne illnesses. About 3.6% of the street vendors were completely ignorant of all possible source of food contamination. In terms of food safety knowledge, the majority of food vendors (96.4%) were aware that poor or lack of hand washing and engagement of sick people in food handling (70.4%) could lead to food borne illnesses; that they were only partially and not completely ignorant of the very basic food hygienic practices. The results also indicate that the majority of food vendors could identify only 5 sources of food contamination out of eleven possible sources of food contamination. Despite the vendors positive attitude on food safety practices including hand washing it was physically observed that more than half (59.2%) did not have hand washing facilities, only 28.1% had access to portable water and 43% of the vendors did not wash their hands after toilet visit. The result generally indicates that attitude is contrary to the practice and more needs to be done to enhance food safety knowledge insisting the culture of good food safety practices.

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## LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BIS	Bureau of India Standards
CHMT	Council Health Management Team
DHIS	Demographic Health Information System
EHP	Environmental Health Practitioner
FAO	Food and Agricultural Organization of the United Nations
HACCP	Hazard Analysis Critical Control Point
MEO	Mtaa Executive Officer
MMOH	Municipal Medical Officer of Health
n	Number of respondents
RTE	Ready – to – eat
SPSS	Statistical Package for Social Solutions
StdDev	Standard Deviation
SVF	Street food vendors
TFDA	Tanzania Food and Drugs Authority
WEO	Ward Executive Officer
WHO	World Health Organization

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

The term “street food” refers to a wide variety of ready to eat foods and beverages sold and sometimes prepared in public places. Street food may be taken in the place where it is purchased or can be taken away and eaten elsewhere (WHO, 1996). The Street Food Vendors are small food retailers selling fresh food or beverage ready to eat (Muleta and Ashenafi, 2001). Street food may be taken away where it was purchased or can be consumed and eaten elsewhere (WHO, 1996).

Most of the time food preparation is done in unfavorable environment and street food vendors most cases are classified as informal food entrepreneurs. Food entrepreneurs are thus working in ambience and unfavorable temperature, unsafe water availability, unhygienic condition and pests. Food safety is fear free that consumed food will not bring any effect to the consumer in its preparation and when eaten as it has been planned. (BIS, 2012).

The street food vendors are an unofficial sector which still exists in both industrialized and unindustrialized countries. In our normal setting people believe that according to their nature street food to be unsafe is something which cannot be avoided, however many people are looking for it as nutritional source. Also there are some challenges regarding public health in urban residents because street food are readily unsafe and polluted with different sources and this will raise up the danger of diseases related to food borne. (Tambekar *et al*; 2008 and Maxwell *et al*; 2000). In

industrialized countries street food especially at home and to the individuals remain as the main important source of meals. But still street food has concern in public health due to unsanitary and hygienic practices of the food vendors particularly in countries with low income. As in other developing countries as well as Tanzania, street food vendors have formed fundamental part of the food supply system especially following the beginning of cities urbanization (Akintaro, 2012).

The contribution of street food business massively to human and economic growth according to the research conducted in other African countries such as Nigeria, Morocco and Kenya which have indicated that the majority of street food vendors generally gain higher of the countries lowest wage. (Omemu and Aderaju, .2008) The socioeconomic part of the street food industry in provision of its prospective for creation of employment yielding income for women and stipulation of food at reasonable cost to groups with low income in the cities as has been mentioned or outlined.(Tavonga, 2014).

The majority of urban settings in Tanzania the residence use more than half of their money allocated for food to buy food from street food. However, in Tanzania like in other countries the street food industry is faced with many difficulties. (Cohen and Garnet, 2002). These include insufficient supportive supervision and clear followup of food hygiene coordinators, weak low enforcement on food safety and hygiene guideline, be deficient in food safety preparation and hygiene among food handlers and poor food handling practices which altogether poses a possibility of being polluted frequently at different level of handling. (Oyeneho and. Hedberg, 2013).

Furthermore, street foods are not all the time kept at required and recommended temperature and rarely from a variety of business site of which it includes kiosk, building sites, industrial areas, streets, commercial areas and as well as petty cash business areas (FAO, 1990). Sometimes the food is prepared in unhygienic environment with waste water and refuse dumped nearby, making the area to be favorable for breeding site for pets, vermin and rodents. Also some areas, there is inadequate water supply for washing hands and food preparation and in some cases clients wash their hand in one bowl without soap (Barro et al., 2006). Additionally the condition of the place where street food is made readily available and sold is worsened by low accomplishment of required environment and related public health regulation.

In Ilala Municipal we have a great number of confined food customers, where a significant number of them are served daily. An increase in the patronage of ready to eat food vendors within the city has also been observed. However due to poor monitoring and poor regulation of operations by relevant authority raise serious questions about food safety and hygiene standards. In Dar es Salaam city and especially Ilala Municipal there is a fast growing population during working hours that is characterized by peoples' movements creating a suitable environment for the street food trade. Thus any unsanitary condition is possibly to raise the risk of food borne diseases. The diseases associated with food contribute to mortality from diarrheal, causing approximately 2.2 million death annually, mostly in children (WHO, 2008).

The epidemic of diseases associated with food has been reported in many food services e.g. restaurants, hospitals, schools, and day care centers. Food mishandling was found to be a main cause of food borne diseases a powerfully reason associated

with epidemics. Furthermore the behavior of food vendors that several times are correlated with diseases occurrences are insufficient hand washing practices, poor equipment and utensil hygiene, poor control of room temperature of ready to eat foods, meals prepared in advance too little cooking temperature and in adequate thawing (Greig *et al.*, 2007; Chan and Chan, 2008).

However, studies are conflicting regarding the poor results of educating on the issue of behavior of the food handlers. According to certain studies (Moris and McEven, 1997) training improves knowledge but further indicates disparity in knowledge, attitude – practice relationship which implies knowledge alone is not sufficient to change practice. Goswami and Mazumder (2011) in his study reveals that different approaches like lectures, demonstration and video can be used as a strategy which can be helpfully to food handlers to change and be transformative.

Food safety in connection with globalization and technological revolution is one of the key emerging issues in food quality regarding the implementation of health policy (Pinstrup, 1999). Customers are increasingly worry with the safety, integrity and wholesomeness of food products as food safety crises increase around the world (Covello, 2001).

Also Pillins *et al.*, (2008) considers food hygiene and safety as an important matter for both in industrialized and unindustrialized countries, particularly food borne illnesses contribute to great number of illnesses and death annually. Food vendors are attracting large community and bring a public health priority thus is why large group of inhabitants prefer to take their meal away from home. The result of this are exposing

them to food borne illness that begin from food outlets and restaurants, in general the food handlers become an important link between food and customers. In view of this WHO (2007) come up and prepare a guideline focusing five key areas to food safety and this include keeping at required temperature, keeping all preparation area and food at clean environment, separating cooked and raw foods, making sure that food is cooked thoroughly, ensure that food is kept at safe temperature and use safe raw material and water.

These areas are of great important especially for developing countries and Tanzania being among, and provide clear information to food vendors, which as a result impact consequences on food safety. Nevertheless, very slight if any has been documented about street food vendor perception and prioritizes of food protection regarding knowledge as well as practice. This study aimed at gathering the existing information of the food safety knowledge, attitude and practice among street food vendors in Ilala Municipality.

## **1.2 Statement of the Problem**

Regardless of many advantages obtained through street food vendors the evolving of unofficial food businesses associated with improper preparation and handling of foods cause food related health problems. Street foods are sometimes stored at improper temperature and sold to customers from a variety of vending sites which include kiosk, building sites industrial areas, street commercial and petty cash business areas (FAO, 1990). Bryan *et al.*, (1992) revealed that food sold uncovered and in unhygienic environment along the road side it is obvious may become unsafe either by spoilage or pathogenic microorganisms.

Also, according to WHO (2001) sometimes these foods are held at an acceptable temperature, extremely handled by food vendors and sold at unhygienic environment. Ilala Municipal Council is every day highly populated especially during day time with people coming from different angles of Dar es Salaam city for official and commercial activities with an estimate of more than 2million people a day (MMOH report, 2014).

In this case the majority of the people take their meal away from home and as the end result they are at risk of getting food borne illnesses that in real sense start from the selling stall, street food vendors etc. The Municipal has experienced several reported diarrhea cases in its health facilities, though not all community members seek medical advice when they feel stomach pain, but according to the available information (DHIS 2 report, 2013) diarrhea is among the leading top ten for outpatient and inpatients attendance.

Several measures have been taken to ensure that street food sellers abide on hygienic practices during food handling and preparation e.g. through supervision, provision of health education, allocation of specific food vending areas for food vendors and enforcement of the law and by laws. Together with these interventions, yet there is no clear evidence which shows that there is an enhancement in food safety practices and hygiene standards.

It is therefore found that it is essential to carry out an assessment to review the street food industry on knowledge, attitude and practice towards food safety. This evidence gathered from this study would help the authorities to develop specific and effective programmes to address the problem.

### **1.3 Research Objectives**

#### **1.3.1 Main Objective**

The main objective of this study was to assess the knowledge, attitude and practice of street food vendors with regard to safety and food hygiene in Ilala Municipal.

#### **1.3.2 Specific Objectives**

The specific objectives of this study were

- (i) To assess food safety and hygienic knowledge of street food vendors.
- (ii) To determine the attitude of street food vendors towards food safety and hygiene.
- (iii) To identify food safety and hygienic practices of street food vendors.

### **1.4 Research Questions**

- (i) What is the level of knowledge of street food vendors with regard to food safety and hygiene?
- (ii) What is the attitude of street food vendors towards food safety and hygiene?
- (iii) What are the food safety and hygienic practices of street food vendors?

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 What is Food Safety?**

Food safety is a scientific discipline describing handling, preparation, and storage of food in ways that prevent food borne illness (Wikipedia). It is fundamental concerns in both industrialized and industrializing countries, known that food borne illness contribute to a great number of illness and death which occur annually (Pilling *et al.*, 2008). Therefore is a public health concern for the reason that most of the people in urban areas take their meal away from home. The problems of food safety that end up with food borne diseases raise a concern worldwide. (Van Tonder *et al.*, 2007). A number of food borne illness occurrence associated with unhygienic practices of food handlers have been reported and are increasing equally in developed and developing countries.

#### **2.2 Food Safety Knowledge of Street Food Vendors**

According to FAO (2007) in Sunyani Township in Ghana, revealed that 2.5million people eat street food every day. This reflects the importance of food safety in safeguarding consumers. However, the majority of the salesperson have not attended school or the attend few classes and for that reason they don't have knowledge on proper way of handling food and their responsibility to ensure that they control spread of pathogens (Mensah *et al.*, 2002).

A study done in Northern Rural Ghana revealed that majority (97.5%) of street food vendors are familiar with food borne illness and approximately all of them agreed on

benefits of hand washing and medical check up to avoid the outbreak of diseases. This was however not the case in Sudan, as only 30% of respondents were aware of food borne illnesses (Abdalla *et al.*, 2009).

Nevertheless this was not the same as the study in Sudan, where only 30% of the respondents were knowledgeable on food borne diseases. A study done by Block, J G, (1999) revealed that 5% of the food vendors were reported providing the services although they know that they are sick with diarrhea or vomiting diseases. As reported by Garbutt (1997), to avoid cross contamination street foods should not at all be prepared by using knife or chopping board which have been used for preparing raw meat if not clearly washed first.

On measuring the knowledge the significance of age to measure whether the respondents ensure that the knives, which were used for raw meat are not the one used again for cooked food was proven. Studies carried by FAO (1995) documented poor knowledge and practice in the food handling sold by vendors. Another study done in Ghana the results indicate that 60.5% of the street vendors had gained a little knowledge from the training and were actually trying to practice it (Donkar, 2011).

In addition a study done in Ghana (Mensah *et al.*, 2002) on application of WHO five key practices revealed that the general cleanliness of the surroundings and the individual hygiene of the vendors had poor scores of 16.5 and 4.7, respectively. Furthermore, Azanza *et al.*, (2000) documented on his study and shows that 54 food vendors who were studied the knowledge regarding food idea was well known particularly on areas that dealt with individual hygiene, good preparation procedures

and contamination of food. Even though the vendors prove that they are not knowledgeable in managing waste and the laws relating to food hygiene.

A study done in Thailand revealed that the great majority 90% of the street food vendors were aware on the disease symptoms of diarrhea as passing liquid stool more than three times a day. Very few 3% of the vendors were not knowledgeable about diarrhea disease. Most often 93% of the respondents understand that the five factors that is, polluted water, dirty food, unclean hands, soiled utensils and animal as factors facilitating the spread of pathogens that cause diarrhea diseases (Minami et al, 2010).

As reported by Kalua (2001) understanding absolutely influences attitude generation and the recipient intellectual capacity on essential health facts. Constructive attitude development results to helpful behavior. On differing, shallow knowledge results to misunderstanding and increase negative thoughts; as result harmful performance increase. In reality a lot of street food vendors have enough knowledge to make sure that proper and clean food handling as per knowledge of the risk regarding contamination, storage and food preparation in hygienic and safety manner.

Furthermore, Hines *et al.*, (1987) reported that both declarative understanding and procedure knowledge are important for behavior transformation. On the other hand knowledge was not translated in actual practice still to those street food vendors who had attained the proper training in food safety. Another study done in Thailand on food security focusing knowledge together with practice of suspended food vendors shows that hygiene as a pathetic area due to many factors including training facilities,

nature and quality of food sold and hygiene monitoring and follow up which raise alarm regarding the safety of foods vended.

Also diarrhea as one of the major cause of food illness was regarded as one of the problem in public health. About 120,000 cases were reported caused by food poison every year. Poor food handling and unhealthy practice of the suspended vendors may possibly be the source of pathogens comes closer to the vended food and result in food borne illness (Minami *et al.*, 2010). Contamination of food might be the outcome of pre and post cooking infectivity from the food handlers, vendors who are always not licensed, not trained in proper food handling, safety and hygienic and provide the service in unsanitary state.(FAO, 1990).

Omemu *et al.*; (2008) documented in their study at Abeokuta, Nigeria that a small number of vendors (12%) obtain knowledge of food handling and preparation through proper training. Hygienic practice during cooking and handling of street food is extremely essential.

According to FAO, (1997) handling food need to have the necessary knowledge and understanding to enable also proper handling of food in hygienic way. Another study conducted in Turkey revealed that the great part of the street food vendors were found to have no last training of issues regarding food safety and poor understanding of hygienic practices in food handling, storage, preparation and distribution (Bas *et al.*, 2006).

A study conducted by Rheinlander, (2012) revealed that apart from the vendors and customers to express their necessary knowledge on food safety, also the study did not

highlight on essential hygiene practices like hand washing, proper cleaning of utensils, way of preparing raw vegetable and good state of the ingredient. Alternatively the main four food selection condition could be well known and were linked, artistic appearance of food, how the food vendor look like, self trust of the vendor and sometimes consumer price priority and the way accept the food price not emphasizing on the food hygiene. Therefore the consumer relies on the strategies which avoid the risk by looking on neatness, appearance and credibility of the food vendor.

### **2.3 Food Safety Attitudes of Street Food Vendors**

The individual thoughts engage to assess the associated concepts with the manner people behave, think and feel (Keller, 1998). This include a cognitive, exciting and elements of behavior components involved on what was known, how you think and what you do(Keller, 1998). In addition also have been suggested that feelings may control one's aim to do a given behavior or carry it out (Rutter & Quine, 2002).

Microbial contamination is one of the most important health risk related with street vended foods. Several observational studies have indicated that street foods are occasionally held at unacceptable temperature, handled excessively by food vendors and sold at unhygienic environment. (WHO, 2001; Agbodaze *et al.*, 2005; Ghosh *et al.*, 2007) that make them prone to contamination.

### **2.4 Food Safety Practices of Street Food Vendors**

The danger of microbial contamination depends upon the type of vended food and the way it have been prepared. The possibility of food not to be safe depends upon the way it have been prepared, type of food, pH, availability of water, the way food was

handled, exposure to temperature, and holding time (Mathee *et al*, 1996). Burt, Volel and Finkel (2003), reported in a study done to assess the food handling practice of 10 processing movable food vendors to work in Manhattan, New York City and found out that more than half of all vendors (67%) contacted served food with uncovered hands.

In addition, some vendors were seen vending evidently with unclean hands or protective gears and no vendor remember to wash their hands or put on another gloves in planned time during observation, more so, four (4) vendors were evidently seen contaminating served food with meat which not yet cooked and poultry.

Chukuezi (2010) conducted a research to see how they apply the required precautions on food safety and hygienic practices at street food vendors in Owerri, Nigeria. The results showed that, the great majorities 90% handle money while serving, 24% prepare food in hygienic and safe environment, 42.7% were not using apron, 48% do handle food with unprotected hand and 52.4% did not cover their hair. In all, 28.6% puff air into plastic bag before use and 19.1% wore jewelry while serving foods.

A study done on safety and hygienic practices of street foods vendors by Muinde (2005) in Nairobi, Kenya. The result rely on observation revealed that, the majority 85% of the vendors they prepared their foods in unhealthy environment knowing that garbage and filthy waste were consciously within the business stalls. Also about 92.5% did not have refuse receptacles; therefore they dispose off their waste just close to the stalls. In all, 92% of vendors threw garbage and waste water just nearby the stalls making the unhygienic surrounding of the eaters quite dirty.

The research done by Musa & Akande (2003) reveals that among 185 respondents, premedical practice was high 141 (76%) but the scheduled medical checkup was low 30 (16%). More than 61 (33%) and 72 (39%) of the vendors were found prepared food above the required standard and reheated food prior to be served to the consumer. Also vendors were observed with poor care of utensils, which is the major unhygienic practice among food vendors. More than half 100(57%) use dirt water for cleaning and washing, no apron for covering 128(69%) and lack of immediate hand washing basin, unavailability of soap and water to clean their utensils, even though others 100 (57%) use unhygienic methods to clean their utensils.

Another study done by Radiers (2008) revealed that vendors all together decided that to take bath should be done and ensure that they put on clothes which are clean together with apron and hair to be covered with nets. Although the results indicated that 80% did not put on the apron, 37% of vendors were observed with jewelry, 27% did not cover their hair and 23% had unclean nails. To keep them away from all kind of decorations it is important to assess good practice of individual hygiene at a specific period of time.

The cleaning of hands, utensils and dishes and other kitchen facilities are always carried out in dishes or water container. As mentioned by Mensah et al. (2002) in his result, it indicates that thorough cleaning is rarely done and these attract insects to the vending area if there is improper waste water disposal. The water used for cleaning and washing the appliances was seen to be unclean. Unhygienic practices in food industry may bring a lot of consequences on a considerable number of those who utilize their services. When we talk on the issue of faecal oral diseases like cholera,

typhoid, and polio and among others and the quantity that the individual and government spend for the treatment of these illnesses the most key source of causes of diseases is food if not water. Nearly all diseases are due to avoidable mistakes in food assortment. It was recommended by WHO that member countries should make sure that street food vendors are regulated and proper measures are done to ensure that health education to street food vendors in sanitary principles for food preparation (WHO, 1996).

## **2.5 Food Borne Diseases**

The most food borne microbial pathogens frequently identified in street vended foods are *Bacillus cereus* which usually causes vomiting and diarrhea, *Clostridium perfringens* causes abdominal discomfort and diarrhea, *Staphylococcus aureus* causes vomiting, diarrhea, loss of appetite, severe abdominal cramps and mild fever and *Salmonella* species causes typhoid food poisoning and irritation and inflammation in the gastrointestinal tract (Masupye and Von, 1999). In Ghana, in a study that examine the microbial quality of street foods sold in Accra, *Shigella sonnei*, enteroaggregative *Escherichia coli* and *Salmonella arizonae* were the pathogens were detected in some of the food samples (Mensah & Ablordey, 2002).

Study on the microbial safety of street foods; like meat pastry, beef sausage roll and egg roll, peeled orange, walnut and apple vended on main roads; Onitsha, South east, Nigeria, revealed the contamination of these foods by pathogens which include; *Salmonella* spp., *S. aureus*, *E. coli*, *B. cereus*, *Shigella* spp., *Enterococci*, *A. niger* and *Pseudomonas* (Oranusi and Braide, 2012).

According to WHO (2010) many people become sick and sometimes because die due to consumption of contaminated foods. Food safety has appeared as an essential worldwide issue with international trade and public inference. Food safety is “assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use”(BIS 2012). In India, the period of 1984 -89, there were seven thousand and twenty one outbreaks associated with food borne and one thousand nine hundred and ninety nine random cases of food borne documented in the cities of Hyderabad and Secunderabad alone.(Henson 2003).

Furthermore a national study done in India revealed that 37% of adult and 42% of children reported consuming fast food on one or both days of the survey (WHO 2006). Food borne bacterial pathogens commonly notified in street vended are bacillus cereus causes vomiting and diarrhea, clostridium perfringens causes abdominal cramps and mild fever and salmonella species causes typhoid, food poisoning and irritation and impatience in the gastrointestinal tract(Mosupye and Von, 1999).

In addition a research done in Kolkata India found that an a standard street meal contain almost 180 grams of carbohydrates, about 30gramsof protein and range of 15 grams of fat (FAO 2010). With this positive development, there are also some public health challenges for the urban population (Maxwell at al 2000) because street foods are readily contaminated from different sources and it will increase the risk of food borne diseases (Tambekar *et al* 2008).

A study done in Ghana regarding diseases inclination from food-related diseases revealed that two of the food related illnesses as a report from the treatment centers

mentioned diarrhea among children and tuberculosis in adults as one of the top the five leading causes of death. Any unawareness or sometimes not careful on the part of food handlers may cause the spread of microorganisms which are infectious, such as *Vibrio cholera*, *Salmonella typhi*, and *Escherichia coli*, (Clarke, 2005).

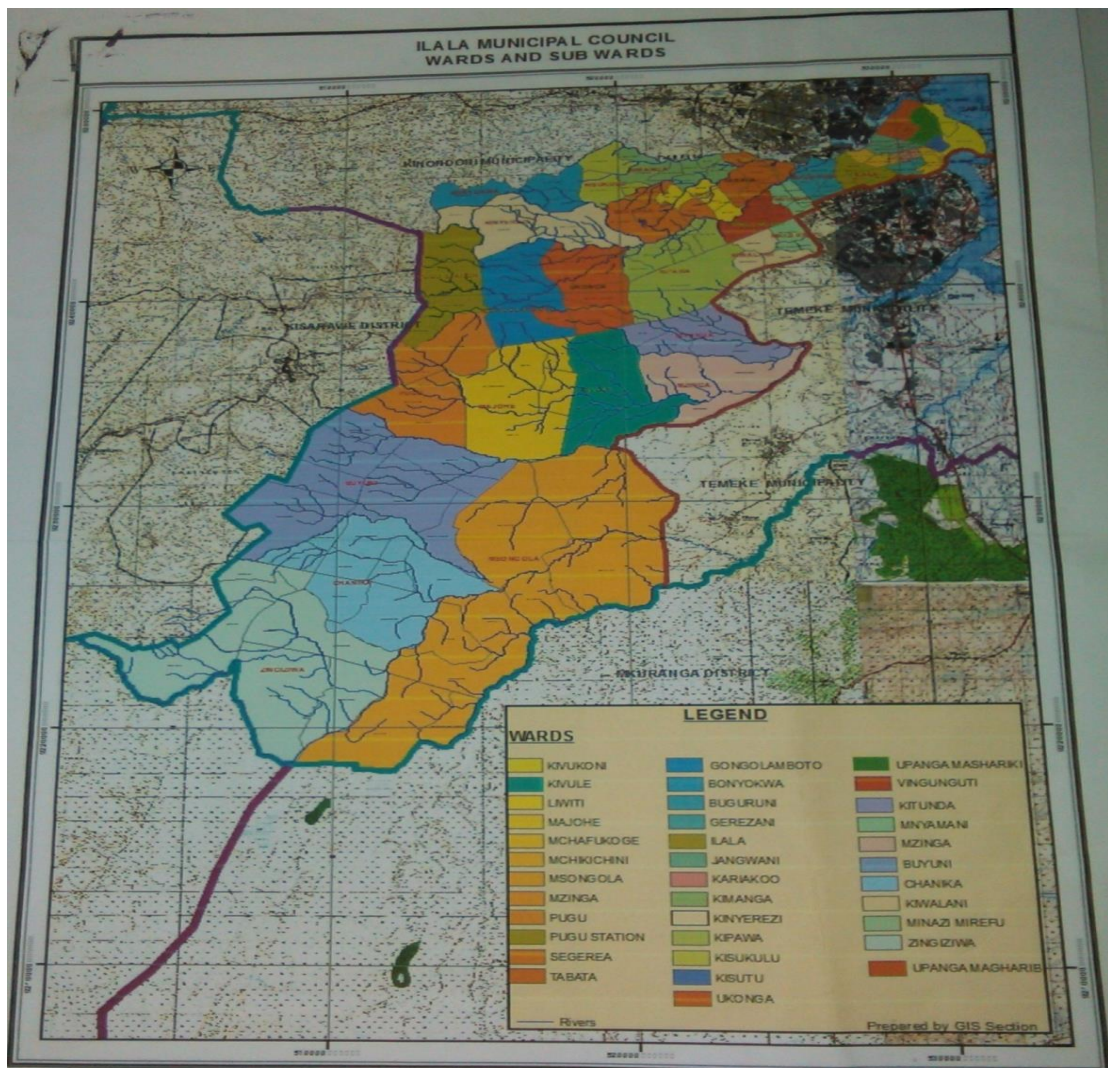
The risks of illness may be reduced by taking recommended measures to minimize contamination which may occur during preparation in the kitchen, transporting or during storage<sup>ll</sup> (FAO, 2004). Ready-to-eat foods are always available and readily it is not expensive and contains the essential nutritive value, also is one of the source which provide income for the food vendors.(Dawson and Canet, 1991, Ekanem, 1998; Swanepoel *et al.*, 1995).

## CHAPTER THREE

### MATERIALS AND METHODS

#### 3.1 Description of the Study Area

Ilala Municipal is one of the three Municipals of the Dar es Salaam City Council. Others are Kinondoni which, forms the Northern boarder and Temeke Municipal in the South border. Indian Ocean is in the East and Kisarawe District (Coast region) in the West.



**Figure 3.1: Ilala Municipal Council Wards and Boundaries**

The Municipal is within the low zone which lies within 200-1200 meters above sea level with an average temperature of 28 - 32°C. Administratively the Municipal is divided into 3 Division, 26 Wards, 101 Mitaa and 305,153 Hamlets with an average of 4.3% growth rate.

### **3.2 Population of the Study**

The study population consisted of street food vendors whose business is in Ilala Municipal council. The street food vendors also constituted the study unit of this study.

### **3.3 Sample Size**

The sample size was determined using the following method which was adapted from Scott (2012).

$$\text{Sample size} = (Z - \text{score})^2 \times \text{StdDev} \times (1 - \text{StdDev}) / \text{Margin of error}^2$$

Where,

Marginal error  $\pm$  5%

Confidence level – Z score = 1.96

Thus, the sample size is equal to

$$= (1.96)^2 \times 5(5) / (0.5)^2$$

$$= (3.8416 \times 25) / 0.025$$

$$= 9604 / 0.25$$

$$= 384.16$$

From this formula the sample size was found to be 385 respondents (street food vendors)

### **3.4 Sampling and Sampling Technique**

Simple random sampling was employed in this study, this is a method in which each unit in the population has a definite non – zero chance of selection in the sample following some objective statistical rule (Easwaran & Singh, 2010). Multistage sampling was used in the first instance in order to randomly obtain the three wards from the three Divisions, the names of the wards were written on individual pieces of paper. The papers were folded and shaken in a container.

Thereafter, a paper was withdrawn. The container was re-shaken and a further paper withdrawn. The process was repeated to select the other ward. From each division one ward was selected to make a total of 3 wards which were included in the study, namely Mchikichini, Buguruni and Ukonga. Two streets (administrative area) were randomly selected from the three wards to make a total of 6 streets using the same procedure as done for wards, namely Madenge, Mnyamani, Ilala Kota, Misheni Kota, Mwembemadafu and Mazizini. A total of 385 food vendors were randomly selected and interviewed from these streets.

### **3.5 Data Collection Techniques**

#### **3.5.1 Questionnaires**

Data collection was done using structured questionnaire with closed and open ended question and each individual was asked to answer to the same set of questions in a predetermined order. The questionnaire was arranged into four parts covering personal and socio-demographic particulars, food safety and hygiene knowledge, food safety attitude of street food vendors and consumer. Section I was arranged cover the street

food vendors' socio-demographic characteristics including age, sex and educational requirements, section II was on understanding covering food safety and included 10 multiple-choice questions with Yes', No and Don't know options. These questions covered general food safety knowledge such as training of food hygiene and safety; personal circumstances leading to food borne illnesses, source of food contamination, food borne illness, cross contamination. Section III of the questionnaire covers 7 questions to assess the street food vendors' attitudes toward food safety. Section IV of the questionnaire includes 17 questions to assess the street food vendors' practices of food safety and hygiene with scale rating "strongly agree", agree, disagree and "strongly disagree".

### **3.5.2 Pre Testing the Questionnaire**

The data collection tool was pre-tested to see the applicability of the questionnaire and methodology to the study. Also the pretesting was done to check whether the tool could collect the information needed and whether tools are reliable. The pre testing was conducted to 20 respondents with similar characteristics to the study population.

### **3.5.3 Data Analysis**

The collected information was proved, verified and then entered into the computer. The analysis was carried out using SPSS (Statistical Package for Social Sciences), version 16.0.

## CHAPTER FOUR

### RESULTS

#### 4.1 Demographic Information

This chapter presents the results of the present study, which focus at assessing the on knowledge, attitude and practice of street food vendors towards food safety and hygiene in Ilala Municipality. The study involved 385 street food vendors where 92.7% were female and 7.3% were male (Table 4.1). The majority of the street food vendors were under 30 years of age, and the dominant age group was that from 20 to 30 years. With regard to the level of education 83.1% of the street food vendors had primary level education while only 3.6% attended tertiary education.

**Table 4.1: Demographic Characteristics of Street food Vendors n = 385**

Study parameter	Variable	Frequency(%)
Sex	Female	357(92.7)
	Male	28(7.3)
Age group	>20years	81(21.0)
	20-30years	174(45.2)
	31-40 years	113(29.4)
	>50 years	17(4.4)
Marital status	Single	166(43.1)
	Married	191(49.6)
	Divorced	17(4.4)
	Widow	11(2.9)
Level of education	Primary school	320(83.1)
	Secondary school	51(13.2)
	Tertiary	14(3.6)
Time for vending	Less than 12 month	80(20.8)
	1-3 years	180(46.8)
	Over five years	125(32.5)

Source: Field Data, 2017

In terms of marital status, almost half of them were married, 43% were single and the remaining percentages were widows and divorcee. In terms of vending experience, the majority (46.8%) had 1-3 years while 20.8% had worked for less than 12 months. Furthermore the majority of them 68.6% had not attended any training on food safety and hygiene (Table 4.1).

#### 4.2 Food Safety and Hygienic Knowledge

In order to assess the food safety and hygienic knowledge of street food vendors, they were asked about their knowledge of the situation that lead to food borne diseases (Table 4.2), diseases transmitted through foods (Figure 4.1) and sources of food contamination (Table 4.3).

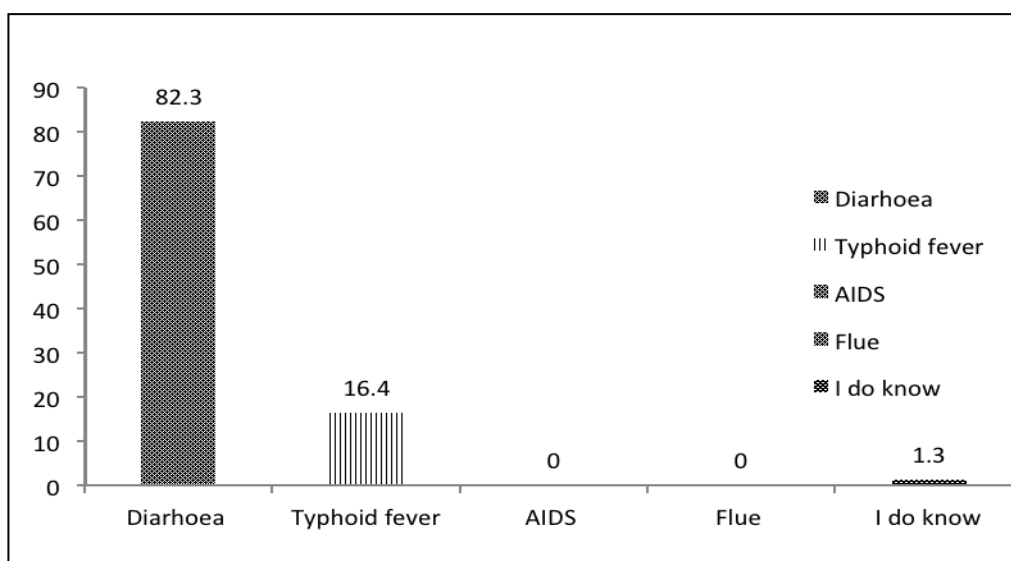
**Table 4.2: Street Food Vendor's Knowledge Regarding Food Borne Illness**

Response (n = 385)	Frequency	%
<b>Circumstances that can lead to food contamination</b>		
Eating undercooked or raw meat		
Yes	161	41.8
No	196	50.9
Don't know	28	7.3
Not washing hands before handling food		
Yes	371	96.4
No	14	3.6
Cutting meat, fish and vegetable on the same cutting board		
Yes	225	58.4
No	149	38.7
Don't know	11	2.9
The way food is cooked at home		
Yes	198	51.4
No	187	48.6
Not washing and sanitizing utensils		
Yes	168	43.6
No	189	49.1
Don't know	28	7.3
Allowing sick person to cook food		
Yes	271	70.4
No	114	29.6
Vendors with Formal Food Safety and hygiene training		
Yes	121	31.4
No	264	68.6

Source: Field Data, 2017

The majority 96.4% indicated that handling food without washing hands can lead to food borne illness and 70.4% know that allowing sick person to cook food can also be a cause of food borne illness.

On the other hand, half of them (50.9%) did not know that eating undercooked food can cause same problem. In terms of cross-contamination, 58.4% knew cutting raw food like meat, fish and vegetable can also cause food borne illness. Furthermore, 51.4% indicated that the way food was prepared at home can trigger the problem and 49.1% did not know that not cleaning and sanitizing equipment can cause food borne illness as compared to 43.6% who were aware. In addition to further gauging their knowledge, street food vendors were asked to identify diseases transmitted through food. The results (Figure 4.1) show that all of them knew of some of the diseases which resulted from food contamination. The well known diseases are diarrhoea which was identified by the majority of food vendors (82.3%) and typhoid (16.4%). Few of the respondents (1.3%) were totally ignorant of any disease



**Figure 4.1: Respondents' Knowledge About Food-Borne Diseases**

Source: Field Data (2017)

In order to further assess respondent's knowledge about food borne illnesses, respondents were asked to categorize the feasible sources of food contamination that can lead to food borne illnesses (Table 4.3). Of the 11 possible sources of contamination, the majority of respondents' was able to identify only 5 sources, and could not identify the remaining 6 possible sources of contamination with the exception of the few minority. A reasonable fraction of the respondents (3.6%) was completely ignorant of all the possible sources of food contamination.

**Table 4.3: Respondents Knowledge about Possible Sources of Food Contamination n = 385**

Parameter	Response (n,%)		Total (n,%)
	Yes	No	
Unclean equipment	371(96.4)	14(3.6)	385(100)
Poorly cooked food	80(20.8)	291(75.6)	371(96.4)
Foreign matter	213(55.3)	172(44.7)	385(100)
Stale food	156(40.5)	229(59.5)	385(100)
Food Handler	344(89.4)	41(10.6)	385(100)
Poor storage/Uncovered	316(82.1)	69(17.9)	385(100)
Food additives	129(33.5)	256(66.5)	385(100)
Polluted water	318(82.6)	67(17.4)	385(100)
Uncooked food	27(7.0)	358(93.0)	385(100)
Dish towel	66(17.1)	319(82.9)	385(100)
Cooking well in advance	13(3.4)	372(96.6)	385(100)
Don't know	0	0	14(3.6)

Source: Field Data 2017

#### **4.3 Attitude of Food Vendors Towards Food Safety and Hygiene**

Results in Table 4.4 show the attitude of street food vendors towards food safety and hygiene. Attitudes are important for performing certain behaviour, so in order to

assess respondent's attitude towards food safety, they were asked to respond on whether they strongly agree, agree, disagree and strongly disagree with various parameters considered to affect food safety. The majority of the street food vendors (SFV) indicated that they either strongly agreed or just agreed with the importance of various parameters ranging from personal hygiene, cross-contamination, food holding temperatures, health status of food handlers and thawing procedures as very important in ensuring food safety. Responses for "strongly agree" ranged from 13.2 to 79.5% and for "agree" from 17 to 89.9 %. The summative responses for the two which is that "strongly" and "agree" had a range of 77.4 to 99% which implies a positive attitude of street vendors towards food safety.

**Table 4.4: Attitude of Street Food Vendors Towards Food Safety n = 385**

Parameter	Response				Total(n,%)
	Strongly agreed (n,%)	Agree (n,%)	Disagree (n,%)	Strongly disagree (n,%)	
Food safety is an important component of food catering services	25(6.5)	346(89.9)	13(3.6)	1(0.3)	385(100)
Proper hand hygiene can prevent food borne illness	259(67.3)	122(31.7)	3(0.8)	1(0.3)	385(100)
Thorough hand washing is important and necessary after every toilet visits	306(79.5)	73(19)	2(0.5)	4(1)	385(100)
Raw and cooked foods should be stored separately to reduce the risk of food contamination	51(13.2)	253(65.7)	75(19.5)	6(1.6)	385(100)
It is necessary to check temperature of refrigerator/freezer periodically to reduce the risk of food contamination	54(14)	244(63.4)	78(20.3)	9(2.3)	385(100)
The health status of workers should be evaluated before employment	70(18.2)	271(70.4)	39(10.1)	5(1.3)	385(100)

The best way to thaw a chicken is in a bowl of cold water      156(40.5)    220(57.1%)    2(0.5%)    7(1.8%)    385(100%)

Source: Field Data 2017

#### 4.4 Food Safety and Hygienic Practices of the Street Food Vendors

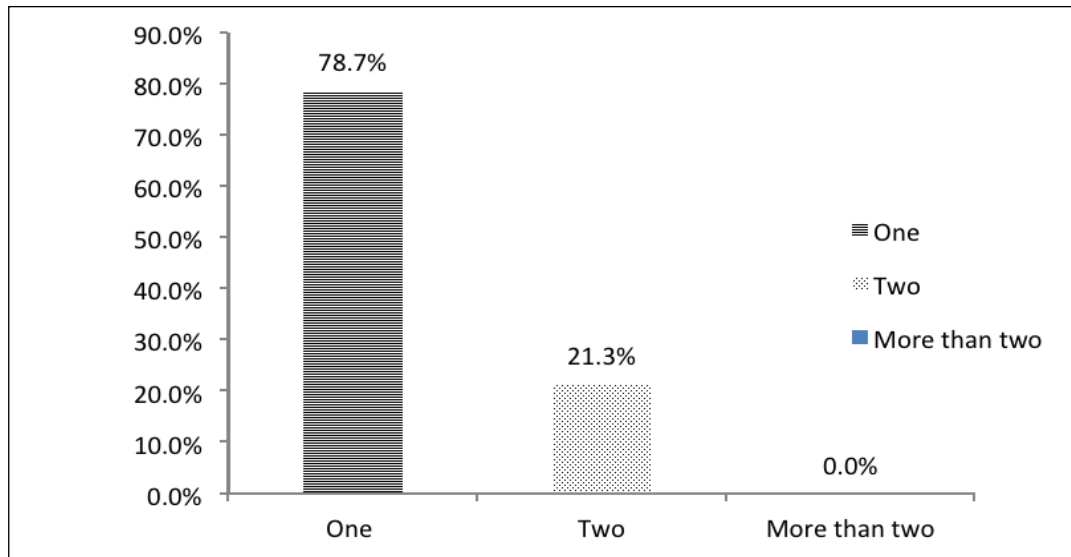
Food safety and hygienic practices are important aspect, for preventing food contamination and hence food borne illnesses. Table 4.5 depicts personal hygiene and food safety practices of street vendors in the course of handling and serving foods. The positive responses for all parameters under consideration ranged from 71.2 to 97.4.

**Table 4.5: Food Safety and Hygienic Practices of the Street Food Vendors**

Parameter	Response (n = 385) (n,%)		Total
	Yes	No	
Cover Hair	321(83.4)	64(16.6)	385(100)
Culture of wearing protective clothing	346(89.4)	39(10.1)	385(100)
Water access point at food vending point	277(71.9)	108(28.1)	385(100)
Wash hand after every toilet visit	274(71.2)	111(28.8)	385(100)
Maintain finger nail short and clean	332(86.2)	53(13.8)	385(100)
Do not smoke while working	375(97.4)	10(2.6)	385(100)
Cover food during storage	360(93.5)	25(6.5)	385(100)

Source: Field Data 2017

Apart from the question regarding availability of water, street food vendors on safety and safety were asked on water access points they have. The figure below shows the results.



**Figure 4.2: Number of Water Access Points Per Vendors Catering Centre**

The issue of waste disposal is of great importance in food hygiene and safety. In order to assess the practice of street food vendors were asked to indicate the type of method they were using for the disposal of waste in the vending points. Table 4.6 shows the method of waste disposal at vending site/stall. Results in Table 4.6 indicated that the majority of the street food vendors (81.8%) used Municipal waste disposal services for waste disposal whereas composting and burning were the most rarely used method for waste disposal.

**Table 4.6: Method of Waste Disposal at Vending Site/Stall n = 385**

Method	Response		Total (n,%)
	Yes (n,%)	No (n,%)	
Burning	14(3.6)	371(96.4)	385(100)
Composting	14(3.6)	371(96.4)	385(100)
Damping	212(55.1)	173(44.9)	385(100)

Municipal Council	315(81.8)	70(18.2)	385(100)
Plastic bag/Bins	304(79.0)	81(21)	385(100)
Non	0(0)	0()	0(0)
Don't know	0(0)	0()	0(0)

Source: Field Data 2017

It was revealed that 79% of the street food vendors were had at least one refuse bin. In real practice, wastes were piled in open receptacles (plastic bag or plastic bins) and were placed just close to the vending area. The waste were generally disposed of at using Municipal system, of which 81.8% of the vendors indicated that they were using it. The vendor did not cover their receptacle therefore caught the attention of pest and other insects to make the opportunity for cooked food to be contaminated. Slightly more than half (55.1%) of the street food vendors sometimes used damping method probably due to lack of receptacles or disposal fees. They disposed their garbage in the canal and caused environmental problem.

**Table 4.7: Methods used to Ensure Safe Drinking Water at Vending Points, n = 385**

Parameter	Response		Total (n,%)
	Yes (n,%)	No (n,%)	
Clean storage equipment	330(85.7)	55(14.3)	385(100)
Covering during storage	316(82.1)	69(17.9)	385(100)
Boiling	123(31.9)	262(68.1)	385(100)
Use chemical	11(2.9)	374(97.1)	385(100)
Filtration	39(10.1)	346(89.9)	385(100)

Source: Field Data 2017

Table 4.7 presents the methods used by vendors to ensure safe drinking water. While the majority of them (85.7%) used clean water storage facilities and also further

protected them through covering (82.1%), boiling, chemical applications and filtration were rarely used in water treatment. This implies both vendors and their customers were sensitive with the water caloricity but care little about microbial contamination. Clear water is not necessarily free of microbial contamination.

Table 4.8 further presents the food safety and hygienic practices by street food vendors with regard to cleaning of kitchen equipments and handling and storage of selected foods. Almost half of the respondents indicated sanitization of knife and cutting surfaces and about 66% were cautious of the risks of abrasion and cuts in contaminating foods. In terms of storage, two-third of the respondents is aware of cross-contamination and the need for separating cleaning products and food products during storage. Over two-thirds of respondents are ignorant of the effects of re-freezing defrosted foods and 41% did not know the importance of storing meat in the bottom shelf of the refrigerator.

**Table 4.8: Food Safety Practice of Street Food Vendors, n = 385**

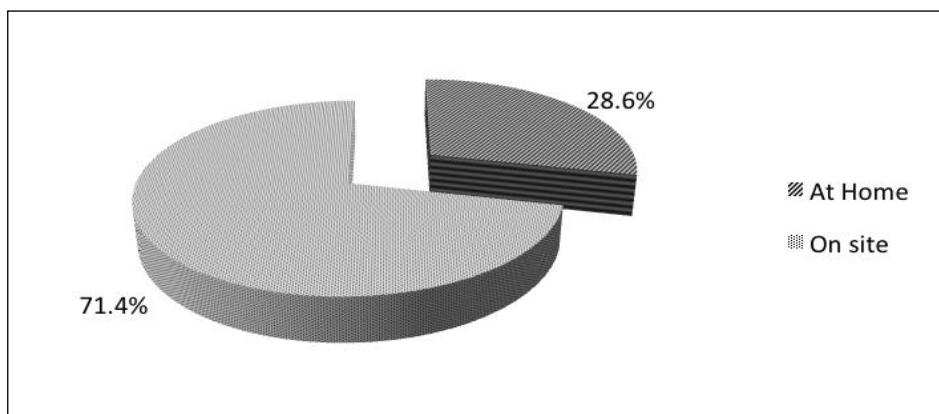
Parameter	Response	
	Yes (n,%)	No (n,%)
Knife and cutting surface sanitized	194(50.4)	191(49.6)
Food handler with an abrasion/cut on hands should not touch food without wearing gloves	255(66.2)	130(33.8)
Closed can of cleaning product be stored together with a closed can of food	127(33.0)	258(67)
Defrosted foods can be refrozen	268(69.6)	117(30.4)
Ideal place to store meat in Refrigerator is in the bottom shelf	227(59)	158(41)
Eggs must be washed before used	25(6.5)	360(93.5)

Source: Field Data 2017

#### 4.5 Observed Facilities and Food safety Practices of Street Food Vendors

Observing personal hygiene, facilities and food safety practices is very important for all food project initiated. Any food handlers who observe other forms of hygiene other than personal hygiene and facilities will absolutely contaminate food. In order to confirm the responses of the food vendors in terms of knowledge, hygienic and safety practices an observation was also carried and the results of which are presented in.

It was also important to identify whether food are prepared on site or at home and then moved on site for selling purposes. Preparation site is very important in ensuring safety and hygiene of the prepared food including the time lapse from preparation to serving. Figure 4.3 indicates that 71.4% of vendors are preparing foods on site and the rest at home. This implies that for the majority vendors' food is served while is hot.



**Figure 4.3: Numbers of Vendors Preparing Food both on site and Off Site (at Home)**

Source: Field Data 2017

The characteristics of the food vending stall was also observed (Table 4.9), which indicated more than three quarters (76.9%) were protected from the sun, , and almost

three quarters 71.9% did not have access to potable water and 59.9% did not have adequately hand washing facility. In addition 72.7% of the stall did not have clean surrounding environment that is, being far from rubbish, waste water and open drains. Also for around 69.6% of the stall animals, flies and insect were indeed evidently seen around.

**Table 4.9: Observed Physical Environment of the Food Vending Stalls, n = 385**

Parameter	Observation	
	Yes (n,%)	No (n %)
Stall protected from sun	296(76.9)	89(23.1)
Animal and pests found around the vending	268(69.6)	117(30.4)
Vending stall maintained in clean condition	91(23.6)	294(76.4)
Portable water available	108(28.1)	277(71.9)
Hand washing facility available	157(40.8)	228(59.2)
Waste water and disposal Facility available	155(40.3)	230(59.7)
Environment around the stall clean	105(27.3)	280(72.7)

Source: Field Data 2017

In addition, there were other food handling habits observed, only 29.9% were observed to wash their hands in clean portable water each time before handling, preparing and serving food (Table 4.10). This was not verified as the researcher did not go behind the vendors into the wash room. Also 67.5% of the vendors were observed to be wearing clean and presentable clothes. Only 39% actually wore an apron while handling, preparing and serving food.

The great majority (90.9%) handled food with bare hands and most(81.8%) handled money while serving food. The hair of 86.2% of the vendors was covered whilst 85.7% had clean and short nails. Additionally, it was observed that 59.2% of the stall did not have hand washing facilities; instead they used bowl and small dish for hand washing.

**Table 4.10: Observed Food Hygiene and Food Handling Habits, n = 385**

Personal hygiene/food handling habit	Observation	
	Yes (n,%)	No (n,%)
Operator wash hand each time handling, preparing and serving food	115(29.9)	270(70.1)
Operator wash hand each time after visiting toilet	165(42.9)	220(57.1)
Clothes clean and presentable	260(67.5)	125(32.5)
Waste water and food disposal facility available	155(40.3)	230(59.7)
Hand washing facility available	157(40.8)	228(59.2)
Use an apron when handling, preparing and serving food	150(39)	235(61)
Handling food with bare hands	350(90.9)	35(9.1)
Nails of operator clean and short	330(85.7)	55(14.3)
Hair covered when preparing, handling and serving food	332(86.2)	53(13.8)
Handle money when serving food	315(81.8)	70(18.2)

## **CHAPTER FIVE**

### **DISCUSSION**

#### **5.1 Discussion of Findings/Results**

This chapter is about discussion on findings of the study conducted in Ilala Municipality.

#### **5.2 Demographic Background of Street Food Vendors**

The results of this study show that food vending is one of the most popular businesses in urban settings, which employs a substantial fraction of the population of the urban dwellers. Of the 385 respondents involved in this study, over 90% were females which indicates that food vending was one of the popular businesses among women and the best choice for them (Table 4.1).

A similar observation was documented by JevSnik *et al* (2007) who revealed that a big proportion of the street food vendors were female. However, the present observation was contrary to the findings of Muinde and Kuria (2005) that conducted a similar study in Nairobi, Kenya and found that 60 percent of the vendors were male while 40% were female. The findings of this study reflect the African culture in which women are largely involved in preparation and serving of food from their young age. Thus, their predominance in the food vending industry is not surprising.

The results further indicate that the food vending industry engages largely the active age group of young people (20-30 years), which could be attributed to the running nature of the business itself. This is mostly done on site not at their own homes or in the vicinity of their places of residence. A more or less similar observation is documented by Muinde and Kuria (2005) who indicated that over 35 percent of the vendors belonged to the age category of 20-25 years.

Similarly, the majority of food vendors had primary schooleducation and only a small number of them had tertiary education, which implies their marginalization in the formal sector. This is further justified by the fact that the majority of them (68.6%) had no any formal training on food safety and hygiene, which is an important requirement for safe guarding consumers. Studies in other developing countries have also consistently shown that low levels of education and lack of employment are the most significant aspect, contributing to street vending entrepreneurship. The educational profile of street food vendors documented in the present study is similar to those documented by other researchers in other countries (Chukuezi, 2010; Mensah *et al*, 2002; Donkor *et al* 2009; Muinde & Kuria, 2005; Omemu & Aderoju, 2008; Choudhury *et al*, 2010; Abdalla *et al* 2009). This further implies that the industry is dominated with unskilled labourers, which could be a challenge to food safety. On the other hand, the industry also seems to be continuously absorbing new comers as the majority of the food vendors almost half (47%) had an experience of only 1 – 3 years.

### 5.3 Food Safety and Hygienic Knowledge

The knowledge of street food vendors about the situations that guide food borne diseases and the sources of food contamination were used in assessing their knowledge and awareness about food safety (Figure 4.1 and Table 4.2). This is due to the fact that lack or poor knowledge of food safety and hygiene is associated with lack of awareness and hence poor hygienic and food safety practices. The findings of this study indicated that the majority of food vendors (96.4%) were aware that poor or lack of hand washing could lead to food borne illnesses and also the engagement of sick people in food handling (70.4%). This implies food vendors are only partially and not completely ignorant of the very basic food hygienic practices. This is supported by the findings that only 31.4 % had formal training in food safety and hygiene.

However, a significant fraction of them, over half did not know that eating undercooked food could cause same problem. This observation further necessitates the need for formal training on food safety and hygiene. The need for such training is further justified by the fact that over 40% of food vendors were not aware of cross-contamination, improper cooking and lack of cleaning and sanitization of equipment in triggering food borne illnesses (Table 4.2). Uncooked food particularly meat, poultry and sea foods and their juices, may have unsafe microorganisms, which may be transmitted into other foods during food preparation and storage (WHO, 2006). Street food should not be prepared by using a chopping board or knife, that have been used to prepare raw meat, if not clearly washed first (Garbut, 1997).

As documented by Hines *et al.*, (1987), both declarative (knowledge of issues) and procedural knowledge (knowledge of action strategies) are necessary for behaviour

change. Nevertheless, they also observed that knowledge was not turned into safe practices, not even by those vendors who had obtained formal training in food safety. Rheinländer *et al.*, (2008) on the other hand indicated that neither the vendors' knowledge nor gender of vendors about health and hygiene is closely associated to safe food practices. They also found that the wider social, cultural, and everyday context seemed to have a greater influence on handling of food threat and hygiene. This implies that unsanitary amenities can influence the existing hygienic practices of food vendors.

Training on food safety and hygiene plays an important role in ensuring that quality foods are produced. Street food vendors require such training on regular basis to ensure that their food meets standards required of them. Even in situations where there is modern facility such as potable water, many routine traditional or normative practices affect the quality of food sold by food vendors WHO (2001). As documented by FAO (2008), food handlers should have the required knowledge and skills to enable them to handle food in good and safe manner. In addition, it is recommended that basic training on food hygiene to every food vendor/helper is very important before they have been licensed. Chouthury (2011) further insists that food vendors should be well trained on food hygiene and safety.

On the contrary, another study done by Chukuezi (2010) reveal that there is a positive association between knowledge of food safety and hygiene practice. This may be due to training, which facilitates development of the general food vendors practice on food safety. Findings of the same nature were observed in other studies done in Nigeria

(Omemu & Aderoju, 2008), South Africa (Martins, 2006), Thailand (Cuprasitrit et al. 2011) and the Philippines (Azanza *et al.*, 2000), Brazil (Hanashiro *et al.* 2005, Soares *et al.* 2012).

The food contamination by dust and microbes is the result of vendors not covering cooked food and the utensils. Therefore, all utensils used for food display should be kept clean all the time, covered and looked with care because they may become contaminated easily if they are left unclean or not protected. Kinton and Ceseran (1992) recommended that to prevent any kind of food staffs contamination with flies and dust, should be as much as possible be covered all the time.

With regard to the sources of contamination, the results indicate that out of the 11 listed sources of contamination, the majority of food vendors could identify only 5 sources (dirty equipment, foreign matter, food handler, poor storage / uncovering and contaminated water) but failed to identify the other 6 sources of contamination (poorly cooked food, stale food, food ingredients, raw food, dish towel and cooking well in advance) with an exception of the few minority.

A reasonable fraction of the food vendors (3.6%) was completely ignorant of all the sources of food contamination (Table 4.3). The findings indicate that the problem could be even bigger than thought and thus further justifying the need for the training intervention to promote the knowledge and awareness of food vendors about the causes of food contamination.

The findings of the present study regarding vendors knowledge of the possible sources of food contamination compares well with previous studies in some of the sources of contamination. Cambell (2011) in his study found that 89% knew about cross-contamination and its prevention. Thus proper storage is very important as no matter how safely foods are prepared, if is not stored well and under right temperature, it can be predisposed to contamination. Normally food vendors prefer to display food items for easily access to speed customer's decision making process on what to choose and also attract them to buy.

#### **5.4 Attitude of Food Vendors towards Food Safety and Hygiene**

Food vendors' attitude towards food safety and hygiene is an important element for performing practicing food safety and hygiene and thus an important element to assess. The findings of the study indicated that the majority of the street food vendors (SFV) either strongly agreed or just agreed with the importance of the various listed parameters (ranging from personal hygiene (proper hand hygiene and thorough hand washing), cross-contamination (storing separately raw and cooked foods), monitoring food holding temperatures, evaluating health status of food handlers and proper thawing procedures) in ensuring food safety. Responses for strongly agree ranged from 13.2 to 79.5% and for agree from 17 to 89.9 %. The summative responses for the two, that is, strongly agree and agree ranged from 77.4 to 99% which implies a positive altitude of street vendors towards food safety (Table 4.4). According to WHO (2008) should never unfreeze food at room temperature to avoid the growth of unsafe bacteria and a larger risk of food spoilage.

Despite the vendors positive attitude on hand washing, it was observed that more than half (59.2%) do not have hand washing facilities and also only 28.1% had access to potable water (Table 4.9). It was further observed that about 43% of the vendors did not wash their hands after toilet visit (Table 4.10). Though hand washing is a simple and effective way to cut down on cross contamination its implementation by street food vendors is still poorly done though the attitude is positive. The hand of food handler can be the source of spreading the foodborne illness because of cross contamination and poor hygiene (Bas *et al*, 2006). The need and importance of food handler to ensure proper cleaning of hands with soap and water after every activity which are possible to bring in physical hazards, biological and chemical (e.g, after handling raw food or animal origin, after using the toilet, after handling unhygienic substance like refuse containers, after touching animal and after contact with toxic matter such as pesticides and sanitizer is well documented by WHO (1996).

### **5.5 Food Safety and Hygienic Practices of Street Food Vendors**

The findings on food safety and hygienic practices are summarized and presented in Table 4.5. The findings depict personal hygiene and food safety practices of street vendors in the course of handling and serving foods. Their practices as indicated by positive responses for all the parameters under consideration (covering hair, wearing protective clothing, availability of water access point, washing hands after toilet visits, maintaining short nails, not smoking while working and covering food during storage) ranged from 71.2 to 97.4%. Results from the researcher's observation (Table 4.10) indicate that hand washing at each time during handling, preparing and serving foods and after toilet visits was exercised by 29.9 and 42.9%, respectively. This contradicts

their responses (Table 4.5) and reflects the reality on ground. Furthermore the findings indicate that the handling of food with bare hands stands at 90.9% (Table 4.10). Muinde and Kuria (2005) indicated that clean equipment like forks, spoons or tongs are supposed to be used during handling of already cooked food. Because handling without using required utensils may cause cross contamination and as a result bring in microbes on safe food. Experience from developed countries (Burt, Volel and Finkel (2003) in the study conducted to assess the food handling practice of 10 processing mobile food vendors operating in Manhattan, New York City and found out that over half of all vendors (67%) contacted served food with bare hands. Also 79 some vendors were observed vending with visibly dirty hands or gloves and no vendors once washed his or her hands or changed gloves in the 20 minutes observation period. The vendor practice minimal personal hygiene, which is very important as human beings are the largest contamination sources of food (Marriot, (1985). According to WHO (1989) and Pether and Gilbert (1971) hands are the main and essential vehicle for the transmissions of organisms like *Compylobacterspp*, *non typhi Salmonella*, *Salmonella typhi* and *E. coli* which can stay alive on tip of the fingers and other surfaces for different periods of time and in some cases after hand washing.

The physical observation in the present study also indicated that 59.2 % of the vending sites had no hand washing facilities (Table 4.10). Musa and Akunde (2003) also found that some food vendors lacked hand washing basin for immediate cleansing, soap and water to clean their utensils, while 54% used unhygienic method to clean their utensils. Proper hand and bowl washing should be done with soap under running water. In situation where dishing bowls are not washed regularly, it creates an

environment for insects such as flies to hover around to contaminate food when it gets the chance.

The importance of water cannot be sidelined when talking about the food vending industry. It is therefore a very important raw material numerous street vended operators use. Water when polluted can cause a public threat when used for washing of foods, drinking, included in the food as a constituent and used in preparation of food or cleaning of utensils, equipment and hands. Therefore, it is a well known medium for enteropathogens like *E. coli*, *Salmonella ssp* and *Comphlylobacterssp* amongst others (Rane, 2010). In study done by Latham (1997), the attention should be given that personal hygiene without adequate water cannot be achieved. For that reason adequate and portable water should be available for drinking, food preparation and enough for washing activities of all kind.

Such studies done in various regions of Asia, Africa and South America have always indicated the availability of potable water for different activities at the vending site as a major concern. The problem of inadequate clean water for numerous vendors makes them to re-use the water particularly for washing equipment and used dishes (Chekuezi, 2010). As it has been revealed in this study, 82.6% of street food vendors reported that contaminated water could be the source of food contamination. Absence of potable water may create a situation where unwholesome water may contaminate food.

The study also sought to find out the methods used by food vendors to ensure safe drinking water at their vending sites. The results showed that though the

overwhelming majority of food vendors claimed to use clean storage equipment (85.7%) and covering the containers during storage (82.1%), less than 50% treated water by boiling, use of chemicals and filtering (Table 4.7). This further signifies the risk consumers are exposed to on their visits for meal services at those vending sites.

The vendors (81.8%) were also observed to be handling money while serving food (Table 4.10). This suggests that it is a common practice among food vendors. Chukuezi (2010) in his study on food safety and hygiene practices on street food vendors in Owerri Nigeria showed that 61-90% of street food vendors handled money while serving food. Money passes through several hands which have been exposed to all sorts of environments that could suggest a high degree of dirtiness and the greatest possibility of being a potential contaminant of safe food.

Waste disposal at the vending sites is achieved by using different methods mostly through Municipal Council arrangements (81.8%), using plastic bags (79%), dumping (55.1%) and a few through burning and compositing, which accounts for 3.6% each. The findings show that a considerable fraction of street vendors are poorly disposing the wastes from their vending activity, that is, through dumping which is likely to contaminate the surrounding vending environment and become a source of contamination. From the researchers personal observation (Table 4.10) waste water and food disposal facility were lacking at 59.7% of the vending sites, which further supports the improper disposal of waste materials. It is a requirement that the place of preparation should be kept clean at all times and should be far from any source of contamination (rubbish, waste water, dust and animals) (FAO, 2008). It is further

documented that adequate drainage and waste disposal system and facilities should be provided in the street food industry and designed so that the risk of contamination of food and potable water is reduced to the minimum level.

## **CHAPTER SIX**

### **CONCLUSION AND RECOMMENDATIONS**

#### **6.1 Conclusion**

This study aimed at carrying out an assessment of the knowledge, attitude and practice of street food vendors towards food safety and hygiene in Ilala Municipality. The results of this study show that food vending is one of the most popular businesses in urban settings which employ a substantial fraction of the population of the urban dwellers. Similarly, the majority of food vendors had primary school education and only a small number of them had tertiary education, which implies their marginalization in the formal sector. This is further justified by the fact that the majority of them had no any formal training on food safety and hygiene, which is an important requirement for safe guarding consumers.

The findings of this study indicated that the majority of food vendors (96.4%) were aware that poor or lack of hand washing could lead to food borne illnesses and also the engagement of sick people in food handling, which implies food vendors are only partially and not completely ignorant of the very basic food hygienic practices. This could also be attributed to the findings that they had formal training in food safety and hygiene. However, over half did not know that eating undercooked food can cause same problem. Also, food vendors were not aware of cross-contamination, improper cooking and lack of cleaning and sanitization of equipment's in triggering food borne illnesses.

The results also indicate that the majority of food vendors could identify only 5 sources of food contamination (dirty equipment, foreign matter, food handler, poor storage / uncovering and contaminated water) and could not identify the other 6 sources of contamination (poorly cooked food, stale food, food ingredients, raw food, dish towel and cooking well in advance) except the few minority. The other food vendors were completely ignorant of any source of food contamination.

Regarding vendors' attitude to good safety practices, the responses strongly agree indicates that most often of the responses and for agree indicate the majority of the responses. The summative responses for both strongly agree and agree ranged to the great majority, which implies a positive attitude of street vendors towards food safety. Despite the vendors positive attitude on those parameters including hand washing, it was physically observed that more than half of the respondents did not have hand washing facilities and also only few had access to portable water. It was further

observed that about less than half of the vendors did not wash their hands after toilet visit.

In terms of good food safety and hygienic practices, their responses in terms of covering hair, wearing protective clothing, availability of water access point, washing hands after toilet visits, maintaining short nails, not smoking while working and covering food during storage, majority greatly adhered to the good practices. Nevertheless the responses were contrary to the actual practices as from the researcher's observation which indicates that hand washing at each time during handling, preparing and serving foods and after toilet visits was exercised by only less than half of the respondents respectively which contradicts their responses. Furthermore the findings indicate that the handling of food with bare hands was practiced by great majority of the respondents.

## **6.2 Recommendations**

Based on the findings of this study the following are the recommendations for improving the knowledge, altitude and practices of food vendor

- (i) The Government through Ministry of Health Community Development, Gender, Elderly and Children and Ministry of Local Government develop a code of practice for street food vending.
- (ii) Make food safety training mandatory to street food vendors.
- (iii) Health officers be proactive in enforcing the existing laws and policies to ensure safe and clean working environments.

- (iv) Municipal councils should provide guidance and standards for the vending sites.
- (v) Health education and promotion which focuses personal hygiene and food safety to food vendors and consumers can be organized quarterly by the Municipal Council in collaboration with other health partners.
- (vi) The Municipal Council introduces competition on food safety and hygiene to street food vendors by zone and award winners twice a year.

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## **APPENDICES**

### **Appendix I: A Questionnaire for Street Food Vendors**

#### **I: Demographic information**

1. Sex: Female ☐ Male ☐
2. Marital status: Single Married ☐ Divorced ☐
3. Age group: (a) < 20 years ☐ (b) 20 – 30 years ☐ (c) 31 – 40 years ☐

(d) > 50 years ☐

4. Highest Education level: (a) Primary school ☐ (b) Secondary School ☐  
(c) Tertiary level ☐

## II: Food safety & hygiene knowledge of street food vendors

5. For how long have you been vending food? (a) less than 12 months ☐  
to 3 years (c) 4-5 years ☐ (d) over 5 years ☐
6. Have you received any formal training in food preparations? (a) Yes ☐ (b) No ☐
7. Have you ☐ undergone any training on food safety and hygiene (a) Yes ☐ No ☐
8. If yes in Qn 7, what aspects did you learn in the course / training?

(a).....  
(b) ..... (c) .....

9. Which of these circumstances do you think can lead into food borne illnesses?

Sn.	Cause	Yes	No	Don't know
1	Eating undercooked or raw meat			
2	Not washing hands before handling food			
3	Cutting meat, fish and vegetables on the same cutting board surface			
4	The way food is cooked at home			
5	Not cleaning and sanitizing equipments			
6	Allowing sick persons to cook food			

10. Which of the following disease (s) can be transmitted by food?(choose more than one answer) (a) Blood diarrhea ☐ (b) Typhoid fever ☐ (c) AIDS ☐ (d) flue ☐ (e) I do know ☐

11. Eating and drinking in the work place increase the risk of food contamination?

(a) Yes ☐ (b) No ☐

12. Which of these do you think could be the sources of food contamination?

Sn	Source	Yes	No
1	Dirty equipment's / utensils		
2	Poorly cooked food		
3	Foreign matter		
4	Stale food		
5	Food handler		
6	Poor storage /uncovered		
7	Food ingredient		
8	Contaminated water		
9	Raw food		
10	Dish towels		
11	Cooking well in advance		
12	Don't know		

13. *Staphylococcus aureus* and *Bacillus cereus* are among the food borne pathogens? (a) Yes ☐ (b) No ☐

14. Mention two common food borne illness symptoms

(a) \_\_\_\_\_ (b) \_\_\_\_\_

### III: Food safety attitudes of street food vendors and consumers

15. Food safety is an important component of food catering service

(a) Strongly agree ☐ (b) agree ☐ (c) disagree ☐ (d) strongly disagree ☐

16. Proper hand hygiene can prevent food-borne diseases (a) Strongly agree

(b) agree ☐ (c) disagree ☐ strongly disagree ☐

17. Thorough hand washing is important and necessary after every toilet visit?

(a) Strongly agree ☐ (b) agree ☐ (c) disagree ☐ (d) strongly disagree ☐

18. Raw and cooked foods should be stored separately to reduce the risk of food

contamination. (a) Strongly agree ☐ (b) agree ☐ (c) disagree ☐ (d) strongly disagree ☐

19. It is necessary to check the temperature of refrigerators/freezers periodically to

reduce the risk of food contamination (a) Strongly agree (b) agree ☐ (c) disagree ☐ (d) strongly disagree ☐

20. The health status of workers should be evaluated (screened) before employment

(a) Strongly agree ☐ (b) agree ☐ (c) disagree ☐ (d) strongly disagree ☐

21. The best way to thaw a chicken is in a bowl of cold water

(a) Strongly agree ☐ (b) agree ☐ (c) disagree ☐ (d) strongly disagree ☐

#### **IV: Practices of Food hygiene and safety**

22. Do you cover your hair (wear a cap) during working? (a) Yes ☐ (b) No ☐

23. Do you have a culture of wearing protective clothing (e.g. apron) during work hours? (a) Yes ☐ (b) No ☐

24. Do you have water access points at your food vending point? (a) Yes ☐ (b) No ☐

25. How many water access points do you have? (a) one ☐ (b) two ☐ (c) more than two ☐

26. Is there a provision of hand washing after toilet visit? (a) Yes ☐ (b) No ☐

27. Do you wash your hands after every toilet visit? (a) Yes ☐ (b) No ☐

28. How do you maintain your finger nails? (a) Keep long nails ☐ (b) keep short nails ☐

29. Do you cover food during storage? (a) Yes ☐ (b) No ☐

30. Do you smoke while working? (a) Yes ☐ (b) No ☐

31. Which of the following methods of waste disposal do you use?

Sn	Disposal method	Yes	No
1	Burning		
2	Composting		
3	Dumping		
4	Municipal council		
5	Plastic bags / bins		
6	None		
7	Don't know		

32. Which of the following methods do you use to ensure safe drinking water?

Sn	Method	Yes	No
1	Clean storage equipment		
2	Covering during storage		
3	Boiling		
4	Use chemicals		
5	Filtration		
6	None		
7	Don't know		

33. Should knife and cutting boards cutting boards should be properly sanitized to prevent cross contamination (a) Yes ☐ (b) No ☐

34. Food handlers with abrasions or cuts on their hands should not touch foods without wearing gloves (a) Yes ☐ (b) No ☐
35. Can a closed can/jar of cleaning product be stored together with closed cans and jars of food products? (a) Yes ☐ (b) No ☐
36. Defrosted foods can be refrozen (a) Yes ☐ (b) No ☐
37. The ideal place to store raw meat in the refrigerator is on the bottom shelf (a) Yes ☐ (b) No ☐
38. Eggs must be washed before used, preparation or storage (a) Yes ☐ (b) No ☐

## **Appendix II: Observational Check List Street Food Vendors**

### **Facilities and observed food safety practices of street food vendors**

1. What material is the structure made of where the food is sold/ prepared?
  - a) Container ☐ Wooden table ☐ (c) ☐ on table ☐ ☐ nopy ☐
2. Where is the food prepared?
  - a) At home ☐
  - b) On site ☐
3. Is vending stall protected from sun and or rain ☐ (a) Yes ☐ (b) No ☐

4. Are the animals or pests flies etc. evident around the vending stall? (a) Yes ☐ (b) ☐  
No ☐
4. Is the vending stall maintained in a clean condition? (a) Yes ☐ (b) No ☐
5. Is potable water available at the site or close to the site? (a) Yes ☐ (b) No ☐
6. Are there adequate hand washing facilities available? (a) Yes ☐ (b) No ☐
7. Are there adequate waste water or food disposal facilities available? (a) Yes ☐  
(b) No ☐
8. Is the environment around the stall clean i.e. far from rubbish, waste water, toilet facilities, open drains and animals (a) Yes ☐ (b) No ☐

### **Personal hygiene**

9. Does the vendor wash hands before handling, preparing and serving food (a) Yes ☐  
(b) No ☐
10. Does the vendor hands after each toilet visit? (a) Yes ☐ (b) No ☐
11. Are the operators' clothes clean and presentable? (a) Yes ☐ (b) No ☐
12. Does the operator use an apron when handling, preparing and serving food?  
(a) Yes ☐ (b) No ☐
13. Does the vendor handle food with bare hands? (a) Yes ☐ (b) No ☐
14. Are the nails of the vendor clean and short? (a) Yes ☐ (b) No ☐
15. Is the hair of the vendor covered when handling, preparing and serving of food?  
(a) Yes ☐ (b) No ☐
16. Does the vendor handle money while serving food? (a) Yes ☐ (b) No ☐

**Appendix III: Picture showing the Street Food Vendors in the Study Area**



P1: A dirty food preparing equipment



P2: A food vendor serving with no apron but hair covered



P 3: Dirtywater used for rinsing eating equipment



P4: A food vendor well dressed an apron and hair gear



P6:A poorly constructed eating/kitchen along road side



P5:Dirty water storage facilities at vending point