A SURVEY OF HYGIENIC AND SANITARY PRACTICES OF VENDORS OF STREET FOODS IN KAYOLE AND DANDORA ESTATES, NAIROBI

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A thesis submitted in partial fulfilment for the degree of Masters of Science (Foods, Nutrition and Dietetics) of Kenyatta University

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University or any other award.

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DEDICATION

To my daughter Immaculate and my fiancée Lucy Kinanu.


My late grandmother Munanie Muinde.
ACKNOWLEDGEMENT

First and foremost I wish to express my gratitude and appreciation to my Heavenly Father, the Omniscient for enabling me to complete this study. Secondly to, my two supervisors Drs. Kuria and Onyango for their supervision, guidance and instruction. I am grateful to them for their hard work and faith in my abilities.

Thanks also to my friends Benard Murithi Kigunda, Veronica Ndungu and Eunice Njogu who helped me collect data and to Gerald Wangenge Ouma and Gabriel Mativo for their encouragement and support.

My appreciation also to my parents, Mr. Jonathan Muinde and Mrs. Magdalene K. Jonathan for giving me emotional, spiritual and material support during my studies. My brothers Kioko and Kyule with whom we have shared both good and difficult times. My daughter Immaculate and my fiancée Lucy for their encouragement and their everlasting passion and love.

Special thanks to my respondents the street food vendors, the street food consumers and the Public Health Officers for their co-operation during the study. I appreciate their sacrifice of time and the support they gave during the data collection.

Last but not the least my deep appreciation goes to Kenyatta University in particular the Department of Foods, Nutrition and Dietetics for granting me an opportunity to pursue my master’s degree and funding part of my graduate studies.
ABSTRACT

A study on the hygienic and sanitary practices of vendors of street foods in Kayole and Dandora estates in Nairobi was carried out using a descriptive survey design. A sample size of 80 street food vendors each selling mutura, roasted maize, chips, mandazi, fruit salads, githeri, fish and sausages in the two estates was selected. Data were collected using in-depth interviews and observation checklists. Sixty street food consumers and two Public Health Officers were interviewed in the area of study.

Data were analysed using statistical package for social sciences (SPSS), descriptive statistics such as means and frequencies were used, Chi Square and t-tests were used to establish relationships between sex and hygienic and sanitary practices and differences between sex and income from street food vending.

Information generated from the study showed that vendors had no training on food preparation skills. About 62% of the street vendors acquired preparation skills through observation while 33% were taught by their parents. The working surfaces used for preparation of raw foods were not washed regularly. Cooked foods were stored at ambient temperature in cupboards, plastic bowls and others were just left in the open uncovered. Vendors washed utensils using water in buckets and they were rinsed once, the rinse water was used severally before replacement. Eighty-five percent of the vendors had garbage and waste dirty beside the food stalls. Most of the vendors had no aprons, they handled food with their bare hands and their heads were not covered. When packaging the foods
vendors uses air from their mouth to blow the polythene bags to open them before placing the food in them.

Results showed that 7% of the consumers suffered from diarrhoea while 38% suffered from stomachaches due to the consumption of street foods. Sixty-five percent of the consumers believed that the street food vendors did not observe proper hygiene and sanitation.

Public Health Officers found it hard to inspect the vendors because no code of practice had been developed for street foods, by the authorities. They found the existing laws on food establishments inadequate for street vendors who operated under different circumstances. They indicated that street food industry is a new vocation, which provides job opportunities for urban dwellers hence the government should recognise it and give the necessary support for the improvement of the industry.

The results of this study suggest that there is a need to establish street food centres by the councils and to train street food vendors on hygiene and sanitation aspects. In addition, there is a need to establish a code of practice for street food industry and empowerment of public health officers.
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<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>FAO</td>
<td>Food Agriculture Organisation</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nation Children’s Fund</td>
</tr>
<tr>
<td>GOK</td>
<td>Government of Kenya</td>
</tr>
<tr>
<td>ITDG</td>
<td>Intermediate Technology Department Group Ltd</td>
</tr>
<tr>
<td>Ksh</td>
<td>Kenya shillings</td>
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CHAPTER 1

1.0 INTRODUCTION

The street food industry has an important role in the cities and towns of many developing countries in meeting the food demands of the urban dwellers. It feeds millions of people daily with a wide variety of foods that are relatively cheap and easily accessible. It offers a significant amount of employment, often to persons with little education and training (Latham, 1997). Street food vending provides food at the workplace in the city. The variety and form depend on the local eating habits, social-economic environment and trends in style of living. They are inexpensive compared to food from the formal sector and home cooked foods. Street foods have significant nutritional implications for consumers, particularly from middle and low-income sectors of the population who depend heavily on them (FAO, 1997a).

Urbanisation has changed lifestyles. People eat more often in food service establishments such as restaurant, canteens, kiosks and street foods. These are places where food is prepared in advance in large quantities and food-handlers are not necessarily aware of the special precautions required in such conditions. There is lack of education of food handlers both domestic and professionals. Their lack of knowledge and the use of raw food materials that are already contaminated increase the risk of contamination (WHO, 1988).
World Health Organisation (1992) reported that microbial, viral and parasitic diseases from contaminated food and water have continues to be serious health problems. Diarrhoea diseases related to poor food hygiene are a major cause of infant morbidity. Food borne diseases are perhaps the most wide spread health problems in the modern world. The economic and social consequences of food contamination may be catastrophic, especially in countries with limited resources. Food borne diseases cause great economic and social problem, such as loss of income, loss of manpower and increased costs of medical attention. The WHO (1996) report on food safety issues noted that there is perception among certain sectors of our community that street-vended foods may pose a risk to public health.

Street food sector symbolises the street life in Africa and it operates in an unstable and precarious state because the sector lacks legal recognition. Their tremendous unlimited and unregulated growth has placed a severe strain on city resources, such as water and sewage systems. They have also interfered with the city plans through congestion and littering, adversely affecting daily life (Canet and N’diaye, 1996; Chauliac and Gerbouin-Rerolle, 1996). According to Tansley and Worsley (1995) the authorities have often ignored street food activity or treated it with hostility. Street foods raise concern with respect to their potential for serious food poisoning outbreaks due to, improper use of additives, the presence of adulterants and environmental contaminants and improper food
handling practices amongst street food vendors (FAO, 1997c). Street food vendors are frequently unlicensed, blocking pedestrian or vehicular traffic.

In Kenya there exists an inadequate capacity in organisations involved in ensuring food safety and quality. As a result, minimal monitoring and surveillance is undertaken in the informal sectors. Consumer ignorance is a major concern which food producers take advantage of to market foods, which may be contaminated, adulterated, unsafe or unwholesome (Government of Kenya, 1994).

In Nairobi, the capital city of Kenya, street foods are consumed mostly during breakfast and lunch hours. Due to the ailing economy, urban dwellers find them cheap and convenient for their daytime meals. The foods sold by the street food vendors range from snacks to complete meals, which may include tea, mandazis, fruits and vegetable salads, chapatis, chips, meat and meat products and dairy products.

This study was conducted in Dandora and Kayole estates in Nairobi. Dandora and Kayole estates are situated at the east of Nairobi City. They are both in Embakasi constituency and division. According to population and housing census carried in 1999 (GOK, 2001) Kayole and Dandora have a population of 98,522 and 110,164 respectively. Kayole covers an area of 3.6 sq/kms while Dandora covers an area of 4 sq/kms. Most of the inhabitants of the two estates depend on casual jobs, hawking, brewing and other informal sector jobs. Street food vending is quite prevalent in the both estates.
1.1 Problem statement

There is noticeable increase of food vendors in Nairobi, who sell both raw and cooked food items. It has been instigated by rapidly growing and changing food demands along side the need to diversify and/or employ income sources in the face of declining incomes. Street food items are sold on the roadsides of the streets of Nairobi. Due to the enormous increase of street food vendors in Nairobi being sold close to sewers and garbage, there was a need to conduct a research to determine the hygienic and sanitary practices of vendors on street foods in Kenya.

1.2 Purpose

The purpose of this study was to determine the hygienic and sanitary practices of vendors of street foods in Kayole and Dandora estates in Nairobi. This was done to enable proper necessary recommendations be made to concerned authorities about the vendors conduct.

1.3 Objectives

The study was designed to:

1. Find out the social and economic characteristics of the street food vendors and consumers of street foods.
2. Determine the hygienic and sanitary practices of the vendors on street foods.
3. Find out the experiences consumers had with street foods
4. Establish the role played by Public Health Officers in ensuring hygienic and sanitary practices of vendors.

1.4 Significance

The findings of this study will provide useful information on hygienic and sanitary practices of vendors of street foods in Nairobi. The results are likely to be used to improve the current food policy in the area of food safety. This information is likely to be beneficial to the Ministry of Health; food producers, consumers and Non-governmental Organisations concerned with food safety. The findings may also form a basis for consumer awareness creation in order to enhance consumer discrimination of unsafe food.

1.5 Limitation

The researcher collected data from 8.00 a.m. to 6.00 p.m. hence what happened to the street foods before 8.00 a.m. and after 6.00 p.m. was not recorded.

1.6 Assumptions

The assumptions of this study were;

1. Public health officers inspected all street food vendors regularly.

2. Street foods were freshly prepared for the day.

1.7 Conceptual framework

Conceptual framework of this study is derived from the theory of functionalism. Functionalism is simply a view of society as a self-regulatory
system of interrelated elements with structured social relationships and observed regularities. Function approach is an attempt to understand social phenomena in terms of their relationship to some system. The elements of the systems are functionally interrelated. The normal generation of one element then requires the normal operation of other elements. Every element of the system has a function, which contributes positively to the continued operation of that system or negatively towards its disintegration and charge. The central focus of functionalism in the analysis of such contribution which are called eufunctions (positive), dysfunctions (negative) or "survival", that is an element which makes no contribution at all or has outlived it's purposes (Abraham, 1992).

There should be positive interrelation between elements, which are concerned with hygiene and sanitation in order to realise proper hygienic and sanitary practices of vendors. Elements that can ensure street food vendors observe hygiene and sanitary practices are; food hygiene and sanitation, Public Health Act, Public Health Officers, consumers and street food vendors. The Public Health Act influence food hygiene and sanitation, Public health officers have to enforce existing Public Health Act inspect street food vendors and educate the consumers on issues concerning hygiene and sanitation. The knowledge of the Public Health act by the street food vendor and the consumer will influence the street food vendor and the consumer on matters concerning food hygiene and sanitation. Street food vendor will affect the health of the consumer, if he/she follows food safety regulations he/she will sell safe food and vice versa.
If these elements interrelate positively good hygienic and sanitary practices will be enhanced. This will reduce the incidence of food borne diseases and save money for our economy. A model of these elements developed by the researcher is shown in Fig 1.1.

Figure 1.1 Conceptual framework on food hygiene and safety.
1.8 Glossary

1. Jua kali: Blue-collar jobs/manual/unskilled work
2. Jiko: Charcoal cooker
3. Githeri: Meal made of boiled mixed maize and beans
6. Mutura: Large intestines of a cow filled with small pieces of meat commonly referred to as African sausage
7. Kobole: Five Kenyan shillings
8. Chips: French fries
9. Sufuria: cooking pot

Chapter one has introduced the research stating the problem statement, objectives and the significance of the study. Chapter two reviews literature relevant to the study.
CHAPTER TWO

2.0 LITERATURE REVIEW

This section discusses various aspects as street foods, hygiene and sanitation, education and food hygiene and the role of Public Health Officers. This section has identified the gaps, which this study has filled.

2.1 Street foods

"Street foods may be defined as ready-to-eat foods and beverages prepared and sold by vendors especially on the streets and other similar public places" (FAO, 1997c). Street foods are mainly sold in urban areas, but they are also prepared and sold by vendors under similar circumstances in rural areas, and not strictly on the street. In developing countries, the street food phenomenon has greatly mushroomed in recent years (Latham, 1997).

In the cities of developing countries, street foods provide a significant percentage of the total food intake of millions of people and employs people especially in the informal sector. However, the activities are largely unregulated and create risks to health and the environment. Street foods are popular as they provide an accessible source of relatively cheap food of a kind desired by busy urban people such as factory and office workers, students, shoppers and travellers. They are also convenience foods in that they save the homemaker or single person from cooking and from fuel gathering. They offer nutritionally balanced diets, sufficient in quantity and present options for variety and choice (Latham, 1997).
The street food trade offers an assured market for local agricultural products thus encouraging more production and contribution to the local economy. It provides a viable economic system in family circles because of division of labour among the family members such as purchasing raw foods, preparation, cooking, serving, clean up and above all, management of the trade. (FAO, 1997c).

In order to ensure safety of street foods in Thailand, the Department of Health Care developed a Code of practice and sanitary requirement for street food stalls and vendors. It emphasised the proper construction of food stalls, protection of foods and beverages from contamination, sanitation of the food stalls and training of the food handlers on personal hygiene and sanitary food preparation (Dawson, et al., 1996).

There is necessity to look into the nature and manner of operation of the street food industry in the Kenyan urban centres with a view to protect the welfare of consumer, while protecting the right to economic wellbeing of the vendors.

2.2 Food hygiene

Food hygiene means all conditions and measures necessary to ensure the safety and suitability of food at all stages of food chain. Food hygiene is concerned with the study of the causes and prevention of illness associated with consuming contaminated foods. Food may be visibly clean, with good smell and taste but may be poisonous because of pathogens, which might be on the food (Taylor and Taylor, 1990). Food that is prepared and served in dirty conditions is dangerous and not fit to eat. The aim of cooking food is to make food enjoyable. Food,
whether for domestic or commercial purposes, should be prepared in a clean environment by clean handlers to prevent contamination. Food handlers should work in clean kitchen and should clean every thing they use to cook (Hammond, 1978). It is essential that food processors take the utmost care to prevent their products from becoming contaminated and risk causing illness or even the death of consumers (ITDG, 1995).

Proper handling and preparation of food greatly reduces the risk of transmitting food borne illnesses. Food can be contaminated in the following ways; handling it with dirty hands, leaving it open and flies and dust which contaminate it, keeping the food in dirty containers, and keeping it in dirty places (UNICEF, 1992). To make sure that food is safe, rules of good hygiene must be followed at every stage of food handling.

Food can be kept clean by:

1. Preparing it only immediately before eating (the skin of fruits and vegetables are protective covers for these foods).

2. Covering food with a clean net or cloth or keeping it in cupboards to keep off flies and dust.

3. Washing fruit and vegetables before cooking or eating them.

4. Keeping food away from small children with dirty hands.

5. Washing hands before preparing or eating food.

According to WHO (2001) there are five aspects of hygiene which ensure safer food. These aspects are discussed below

2.2.1 Keep clean

Hands should be washed before handling food and often during food preparation. All surfaces and equipment's should be sanitised for food preparation. All kitchen areas should be protected from insects and pests. Cleanliness should be observed because dangerous microorganisms are widely found in the soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards. The slightest contact can transfer contaminants to food and cause food borne diseases.

2.2.2 Separate raw and cooked

Raw meat and poultry should be separated from other foods. Equipment and utensils such as knives and cutting boards for handling raw foods should be used separately. Food should be stored in containers to avoid contact between raw and prepared foods. Raw food should be separated from cooked food because they can contain dangerous microorganisms, which may be transferred onto other foods during food preparation and storage.

2.2.3 Cook thoroughly

Food should be cooked thoroughly, and they should be heated until they have reached a core temperature of at least 70°C. Reheated should also be done thoroughly. Proper and adequate cooking kills almost all-dangerous
microorganisms. Cooking food to a temperature of 70°C can help ensure it is safely for consumption.

2.2.4 Keep food at safe temperatures
Cooked food should not be left at room temperature for more than 2 hours. All cooked and perishable food should be refrigerated below 5°C. Cooked food should be kept piping hot at more than 60°C prior to serving. Food should not be stored too long in the refrigerator and food should not be thawed at room temperature. Food should be kept at safe temperatures because; microorganisms can multiply very quickly at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of microorganisms is slowed down or stopped.

2.2.5 Use safe water and raw materials

Safe or treated water in adequate qualities should always be used. Fresh and wholesome foods should always be selected. Fruits and vegetables should be washed thoroughly, especially if eaten raw. Raw materials, including water may be contaminated with dangerous microorganisms and chemicals. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.

If the five aspects to safer food are observed safe food will be prepared and sold. Latham (1997) acknowledged that foods prepared and offered for sale on the streets of many cities in many developing countries present health hazards. This is because most vendors handle the foods with dirty hands. They use dirty utensils
and the cooked foods are kept and served at the ambient temperature. The food is usually not protected from flies. Such unhygienic practices often lead to contamination hence rendering food unsafe.

2.3 Sanitation

Disposal of wastes without polluting the environment is one of the difficult tasks of food establishments. Adequate disposal of wastes must be a first consideration and sanitation demands adequate and proper disposal of waste materials. Pollution of any environment is the accumulation of some waste materials in a location where it is not found naturally. The accumulation of pollutants may lead to potential contamination of that locations environment (Guthrie, 1998). According to Latham (1997) street food vendors are often unable to dispose properly wastes and refuse. Further, Latham (1997) stated that, there are no good systems for disposal of garbage, which thus ends up in the streets with wastewater accumulating around the stalls.

2.4 Personal hygiene

According to Marriot (1985) human beings are the largest contamination sources for foods. People transmit diseases as carriers. A carrier is a person who harbours and discharges pathogens but does not exhibit the symptoms of the diseases. Such carriers are divided into two groups:
Convalescent carrier:—These are people who after recovering from an infectious disease, continue to harbour the causative organism for a variable length of time. The period is usually less than 10 weeks.

Chronic carriers:—These people continue to harbour a pathogen through close contact with an infected person but do not acquire the disease.

Some of the organisms, which people harbour includes Streptococcus, commonly found in the human throat and intestines. They are responsible for a wider variety of diseases compared to other bacteria. Staphylococci are found in the nasal cavities and wounds. Some people possess the pathogenic varieties of these organisms as part of their natural skin flora are a constant threat to consumer safety if they are allowed to handle food products. Intestinal microorganisms include Salmonella, Shigella, Escherichia coli, Vibrio, infectious Hepatitis and infectious intestinal amoebae (Marriot, 1985).

For employers and employees to assure personal hygiene the following practices should be adhered to:

- Physical health should be maintained and protected through practice of proper physical cleanliness.
- Illness should be reported to the employer before working with food so that work adjustments can be made to protect food from the employee’s illness or disease.
- Hygienic work habits should be developed to eliminate potential food contamination, during the work shift, hands should be washed often especially
after using the toilet, handling garbage or other soiled materials, handling uncooked muscle foods, egg product or dairy products, handling money, smoking, coughing and sneezing (Marriot, 1985).

Personal cleanliness should be maintained by daily bathing, washing hair at least twice a week, cleaning finger nails daily, use of a hat or hair net while handling food, wearing clean under clothing and uniforms. Employee hands should not touch food service equipment and utensils. Disposable gloves should be used when contact is necessary. Rules such as “no smoking” should be followed and other precautions related to potential prevention of contamination should be taken (Marriot, 1985).

The WHO (1992) reported that food handlers should also be educated on techniques for safe food preparation. Food handlers include professional cooks, domestic cooks and persons handling food in service establishments. The education of food-handlers is of special importance because in most cases the occurrence of food borne disease is attributed to poor methods of preparation and storage of foods. The interaction of food handlers and the street foods in the urban centres requires basic principles of preparation and control of hygiene in street food preparation and service. Personal hygiene is an important aspect of food preparation and service. This was done to find out whether the vendors observed personal hygiene.
2.5 Education, food hygiene and sanitation

Education of food processors, food handlers and consumers help to keep food safe throughout the production, marketing and consumption chain (Cody and Keith, 1991). Education of the staff is an important aspect in making the kitchen safe. If the food handler understands the mechanism of food infection, he can prevent it in his kitchen. Some one who has studied and understands the detailed hazards that underlie the preparation and distribution of food is in the best placed to provide safe food (Christie and Christie, 1972).

Government has a role in ensuring food safety to consumers. This is by educating consumers and food handlers on food handling practices that minimise food spoilage and avoid contamination. Both the food handlers and consumers should be made aware of food laws, regulations and standards. Education programmes should be directly towards economically disadvantaged food handler’s, farmers, educators and health professionals (FAO and WHO, 1992). Education and training of food handlers, vendors and consumers of street foods is a fundamental and most urgently needed. This is to make them aware of hygienic, sanitary and technological aspects of street food vending and consumption. Consumers who are aware of food hygiene and nutritional requirements become discriminating buyers and thereby not only protect themselves, but also place pressure on vendors to carry out good manufacturing practices (FAO, 1995a). This study was designed to find out whether both the vendors and consumers were aware of food hygiene and sanitation.
2.6 Role of Public Health Officers

Enforcement of food legislation is in the hands of local government authorities. They inspect, analyse and take legal action. Inspection is by the environmental health officers or the public health officers. It is the duty of these officers of the district councils to inspect regularly, all premises handling food in their districts. They should also obtain samples of foodstuffs offered for sale and have them analysed and to investigate complaints made by individual members of the public (Passmore and Eastwood, 1986).

According to FAO (1993) a system for monitoring food quality and all aspects of hygiene and safety should be set up with the help of Public Health Officers or Food Control Specialists. This should include a list of indicators to assess food quality and hygiene. Table 2.1 below adapted from FAO (1993) shows the indicators of poor quality food.
Table 2.1 Indicators of poor food quality

<table>
<thead>
<tr>
<th>Fresh foods</th>
<th>Dry foods</th>
<th>Canned foods</th>
<th>Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bad smell</td>
<td>Torn or unsealed packages</td>
<td>Swollen cans</td>
<td>Rancid</td>
</tr>
<tr>
<td>2 Unusual taste</td>
<td>Spillage</td>
<td>Rusty or badly damaged cans</td>
<td>Contains foreign materials</td>
</tr>
<tr>
<td>3 Unusual appearance</td>
<td>Rodent or insect damage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Bruising</td>
<td>Mould</td>
<td></td>
<td>Dark, unusual colour</td>
</tr>
<tr>
<td>5 Mould</td>
<td>Sweating or dampness</td>
<td>Holes in cans or leakage</td>
<td></td>
</tr>
<tr>
<td>6 Overripe</td>
<td>Dirt in food or package</td>
<td>Outdated cans</td>
<td>Off odours</td>
</tr>
<tr>
<td>7 Rodent or insect</td>
<td>Food mixed with other substances</td>
<td>Unlabelled cans</td>
<td></td>
</tr>
<tr>
<td>8 Limpness or shrivelling</td>
<td>Pulses are shrivelled</td>
<td>Content not as labelled</td>
<td></td>
</tr>
</tbody>
</table>


According to Kenya’s Public Health Act GOK (1974) safety of food is emphasised. In Section 131, people are prohibited from selling tainted, adulterated, and diseased or unwholesome food. In Section 132 Public Health Officers or medical officers are allowed to inspect and examine food and if they find this food unfit they are supposed to seize it and arrest the culprit. In Section 133, the person found guilty of selling unfit food is liable to a fine not exceeding two thousand shillings or imprisonment for a term not exceeding six months. Public Health Officers have an important role in ensuring food safety. The Public Health Act
shows clearly that the Government of Kenya recognises food safety. However when it was enacted, street foods were not considered, hence no regulations for their sanitary requirements for were put in place. This study was aimed at identifying whether the Public Health officers inspected street food vendors.

2.7 Summary

In developing countries street foods provide a large percentage of the total food intakes and it employs many people, they are cheap and nutritionally balanced diet. Contamination of street foods is possible because of conditions under which they operate, in unsanitary environment, lack of legal recognition and lack of inspection by the relevant personnel.

Food is the major source of exposure to pathogenic agents both chemical and biological. Human beings are the largest contamination sources of food and they transmit diseases. Hygiene is a key prerequisite to street food safety. Human beings harbour very many organisms, which can compromise the safety of food if hygiene is not taken care of.

There are no set standards to which control the operations of the street vendors. This could be dangerous as far as the matters of health and food safety are concerned. Public health officers have a very important role in ensuring food hygiene and sanitation, they inspect analyse and take legal action to anyone who compromises the public health through provision of unsafe food. They are the
eyes of the government to matters concerning health so they are the people who are responsible for protecting the consumers against unsafe food.

In this chapter literature has been reviewed on street foods, hygiene and sanitation. Education of food handlers and the role of Public Health Officers in food industry have also been discussed. In the next chapter methods used in collection of data, population, sample selection and data analysis will be discussed.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research design

A descriptive survey design was used for this study. A descriptive survey design was used because it involved collecting data in order to answer questions concerning the current status (Gay, 1987; Mugenda and Mugenda, 1999). Through this design hygiene and sanitation was determined by interview schedule and observation checklist which were administered to the street food vendors. An interview schedule was also administered to the consumers of street foods and Public Health Officers in the two estates to determine their role in ensuring food hygiene and sanitation.

3.2 Location of the study

The study was carried out in Kayole and Dandora estates of Nairobi City. Nairobi City has been selected because of its cosmopolitan population and urban setting. Embakasi division was chosen, as it is the most populous division in Nairobi. Simple random sampling was done in low and medium class estates in Embakasi Division to select two estates. The Low and medium estates were chosen because most street food vendors are prevalent in these estates.

3.3 Population

The target population constituted all street foods vendors in Embakasi division, Nairobi. The accessible population was all street food vendors in
Dandora and Kayole estate in Nairobi. The researcher selected purposively vendors preparing and selling the commonly consumed foods in the two estates. The accessible population of the consumers was all people found consuming street foods in the area of study. The Public Health Officers in Embakasi Division were included in the study.

3.4 Sample selection

A survey conducted by the researcher found out that the following street foods are commonly sold in the two estates Mutura, sausages, mandazi, fish, chips, roasted maize, mandazi and fruit salads. Five street food vendors selling each of these foods were selected for the study. The total number of street food vendors included in the study was therefore forty in each estate, constituting 20% of the total street food vendors in the two estates. Thirty consumers were selected randomly in each of the two estates and interviewed. The two Public Health Officers in Embakasi division were also interviewed in this study.

3.5 Data collection instruments

An interview schedule was administered to the street food vendors, Public Health Officers and consumers in Appendix I, III, and IV respectively. They consisted of closed-ended questions to provide more structural responses and open-ended questions to provide for more in depth information. An interview schedule was chosen because it allows probing through which the researcher can get more in depth information. Observation checklist in Appendix II was used to
record what the researcher observed during data collection. According to Sproull (1988) observation is a method of data collection in which one observes phenomena and records the information about the characteristics of the phenomena.

3.5.1 Interview schedule of street food vendors

The interview schedule in Appendix I for the street food consumers consisted social-economic characteristics such as gender, marital status, income, age, and education level. Hygienic and sanitary practices such as acquisition of cooking skills, place of preparation, environmental conditions, methods of washing utensils and preservation methods were sought using the interview schedule.

3.5.2 Interview schedule of consumers.

The consumers interview schedule in Appendix IV was used to get the following information, social characteristics, experiences with street foods, when they take the foods, favourite street foods, whether they thought they were safe, and what should be done to improve the vocation.

3.5.3 Interview schedule of Public Health Officers

Using the interview schedule in Appendix III the following information was sought gender, whether they were trained, their roles, whether there is an Act dealing with street foods, how they inspected the street foods, and difficulties they faced in their duties.
3.5.4 Observation checklist for street food vendors

In this study, location of the street vendor, utensils used, environment surrounding the street food vendors, general processing of the food and hygienic practices were observed and recorded on the observation checklist in Appendix II.

3.6 Data collection procedures

The researcher and two-trained research assistant collected data using the constructed interview schedules and observation checklist. The research assistants were trained on how to interview and how to record what they had interviewed and observed. The researcher explained the purpose of the study to assure respondents of their confidentiality and anonymity of any information given.

The interviews for the street food vendors were done on their premises and they took a maximum of 15 minutes each. The research assistant used the checklist to record information.

The consumers were interviewed at the time they were found eating any street food and this also took a maximum of 15 minutes per consumer.

The Public Health Officers were interviewed at their offices in Umoja. It took approximately 30 minutes for both officers. A research assistant was used to record the proceedings of the interview.

3.7 Pre-testing the instruments

Pre-testing was done on 5 street food vendors from Dandora estate that were not used in the study. Data collection instruments were pre-tested and some
items were added in the observation schedule. The items added included materials used for the construction of the stalls and visibility of dust in the stalls.

3.8 Data analysis

Quantitative data was analysed using the Statistical Package of Social Sciences (SPSS) program. Descriptive statistics such as means and frequencies were used to describe the social and economic characteristics of the street food vendors and street food consumers in the study. Tables, graphs have been used to present data.

Significant differences were determined using independent t-test between the monthly income of the vendors and their gender. Chi-square was used to test the relationship between genders, education and some aspects of hygiene and sanitation such as state of the environment where the street food were prepared, storage of utensils, presence of flies and whether the street food vendor had direct conduct with street foods. Data was interpreted using significance value $p \leq 0.05$. If the $p$ value was less than it meant that there was a significant relationship or difference for chi-square and t-test respectively.

Responses of the Public Health Officers analysed qualitatively and transcribed into patterns and themes that addressed the objectives of the study. The findings of the observation checklist were triangulated with the rest of the data for emphasis and to explain unexpected phenomena.
3.9 **Operational definition of variables**

1. **Street Food**: Food and beverages prepared and sold by vendors in streets and other public places for immediate consumption or consumption at a later time without further processing or preparation. This was measured as raw, cooked/processed, snacks or whole meal.

2. **Street Food Vendor**: Person who sells food on the streets.

3. **Total Income**: This is the total estimate of money, which the street food vendor gets daily after sale of street food.

4. **Educational level**: This is the highest level of education a street food vendor has attained.

5. **Hygiene**: Conditions and measures necessary to ensure the safety of street food. This was measured by looking at conduct of the food handler when handling food, clothing, utensils and equipment used in the preparation of the street food.

6. **Sanitation**: Conditions and measures, which ensure proper disposal of wastewater and solid waste. This was measured by observing how both wastewater and solid waste was disposed.
CHAPTER 4

4.0 RESULTS AND DISCUSSIONS

This chapter presents the hygienic and sanitary practices of street foods in Kayole and Dandora estates in Nairobi. It discusses the social economic status of the street food vendors and hygienic and sanitary practices of the vendors. The experience the consumer had with the street foods is addressed. The role Public Health Officers play in the street food industry is also described.

4.1 Social-economic characteristics of the street food vendors

In order to determine the social-economic characteristics of the street food vendors, interviews were conducted using the schedule shown in Appendix I. This was conducted to obtain information on the background of the vendors, which is important to define the kind of people in street food vending vocation.

4.1.2 Demographic characteristics

Table 4.1 represents age, gender and marital status of the vendors.
Table 4.1 Gender and marital status of the street food vendors

<table>
<thead>
<tr>
<th></th>
<th>Kayole</th>
<th>Dandora</th>
<th>Dandora and Kayole</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Male</td>
<td>24(60)</td>
<td>24(60)</td>
<td>48(60)</td>
</tr>
<tr>
<td>Female</td>
<td>16(40)</td>
<td>16(40)</td>
<td>32(40)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40 (100)</td>
<td>40(100)</td>
<td>80(100)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>23(57.5)</td>
<td>23(57.5)</td>
<td>46(57.5)</td>
</tr>
<tr>
<td>Single</td>
<td>17(42.5)</td>
<td>16(40)</td>
<td>33(41.3)</td>
</tr>
<tr>
<td>Widowed</td>
<td>-</td>
<td>1 (2.5)</td>
<td>1 (1.3)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40(100)</td>
<td>40(100)</td>
<td>80(100)</td>
</tr>
<tr>
<td><strong>AGE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-20</td>
<td>4 (10)</td>
<td>5 (2.5)</td>
<td>9 (11.3)</td>
</tr>
<tr>
<td>21-25</td>
<td>14(35)</td>
<td>14(35)</td>
<td>28(35)</td>
</tr>
<tr>
<td>26-30</td>
<td>11(27.5)</td>
<td>8 (20)</td>
<td>19(23.8)</td>
</tr>
<tr>
<td>31-35</td>
<td>6 (15)</td>
<td>6 (15)</td>
<td>12(15)</td>
</tr>
<tr>
<td>36-40</td>
<td>4 (10)</td>
<td>4 (10)</td>
<td>8(10)</td>
</tr>
<tr>
<td>41-45</td>
<td>1 (2.5)</td>
<td>3 (7.5)</td>
<td>4 (5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40(100)</td>
<td>40(100)</td>
<td>80(100)</td>
</tr>
</tbody>
</table>

Over 35% of the vendors were aged between 21-25 years. Table 4.1 shows that the vendors varied in ages. It also shows that street food industry provides employment for people who are at their productive ages. Among the street food vendors, 60% were male while 40% were female. Both estates of study had similar percentage of male and female. The results of the study showed that the industry
provides employment for both males and females with the males being the majority.

Over half of the vendors, 57.5%, were married in the two estates; while the rest of the vendors were either single or widowed. The results reveal that the street food industry is considered as a vocation by most of the families in the areas of study because more than half of the vendors had families. This is an indication that the vocation provides families with income for their daily needs.

4.2.1 Income levels

The income levels of the street food vendors were established. The results for daily income are shown in Table 4.2.

<table>
<thead>
<tr>
<th>Daily Income</th>
<th>Kayole N (%)</th>
<th>Dandora N (%)</th>
<th>Kayole &amp; Dandora N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-100</td>
<td>14(35)</td>
<td>15(37.5)</td>
<td>29(36.3)</td>
</tr>
<tr>
<td>101-150</td>
<td>6 (15)</td>
<td>5 (12.5)</td>
<td>11(13.8)</td>
</tr>
<tr>
<td>151-200</td>
<td>8 (20)</td>
<td>9 (22.5)</td>
<td>17(21.3)</td>
</tr>
<tr>
<td>201-250</td>
<td>4 (10)</td>
<td>2 (5)</td>
<td>6 (7.5)</td>
</tr>
<tr>
<td>251-300</td>
<td>6 (15)</td>
<td>5 (12.5)</td>
<td>11(13.8)</td>
</tr>
<tr>
<td>301-350</td>
<td>2 (5)</td>
<td>-</td>
<td>2 (2.5)</td>
</tr>
<tr>
<td>351-400</td>
<td>4 (10)</td>
<td>4 (5)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40(100)</td>
<td>40(100)</td>
<td>80(100)</td>
</tr>
</tbody>
</table>

The results revealed that the daily income ranged from Ksh. 50.00 to Ksh. 400.
Independent t-test was done to determine whether there was significant
difference between gender, the two estates and daily income. The results are
shown in Table 4.3.

**Table 4.3. Daily income, gender and estate of the street food vendors**

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
<th>Mean</th>
<th>t-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>48</td>
<td>205.83</td>
<td>2.804</td>
<td>0.006*</td>
</tr>
<tr>
<td>Female</td>
<td>32</td>
<td>147.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estate</th>
<th>n</th>
<th>Mean</th>
<th>t-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kayole</td>
<td>40</td>
<td>180.25</td>
<td>-.210</td>
<td>0.834</td>
</tr>
<tr>
<td>Dandora</td>
<td>40</td>
<td>184.75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at $p \leq 0.05$ or at 95% confidence limits

There was a significant difference between sex and daily income. Males
earned more than females in street food vending. It was further found that there
was no significant difference between the daily income of the vendors in the two
estates.

The monthly average income for a street food vendor in the both estates
was Ksh. 5,475. According to GOK (2000 a) residents in the urban areas are
considered poor if they earn less than Ksh. 1,253.90 per adult per month.
According to these guidelines, most of the vendors earned above the cut-off for
poverty, hence the vocation help in alleviating poverty in the urban areas. GOK
(2000 b) reports that the private informal sector dominates other sectors in terms
of labour absorption. The private informal sector accounts for 77.3% and 60.9% of
those employed in poor and non-poor households respectively. This study concurs with Chauliac and Gerbouin-Rerolle (1996) that street food sector is an important source of income for many urban-dwelling individuals and families in the developing countries and it is widely recognised as an inevitable phenomenon tied to urban growth. Both the government and the communities should support street food industry, as it is a means of alleviating poverty.

4.2.2 Educational level

Educational level is important because it impacts significantly on hygiene. Table 4.4 summarises the education levels of the vendors in the area of study.

<table>
<thead>
<tr>
<th>Table 4.4. Education levels of the street food vendors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kayole Dandora Kayole &amp; Dandora</td>
</tr>
<tr>
<td>N  (%)  N  (%)  N  (%)</td>
</tr>
<tr>
<td>Primary and below</td>
</tr>
<tr>
<td>23(57.5)  27(67.5)  50(62.5)</td>
</tr>
<tr>
<td>Secondary and</td>
</tr>
<tr>
<td>Above</td>
</tr>
<tr>
<td>17(42.5)  13(32.5)  30(37.5)</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>40(100)  40(100)  80(100)</td>
</tr>
</tbody>
</table>

Sixty-two percent of the vendors interviewed had primary education and 37.5% had secondary education. Most of the vendors had gone through primary school, which offers basic education in Kenya. They were able to communicate in fluent Kiswahili, which assists them in conducting their business transactions.
4.2.3 Reasons for street food vending

The research established some reasons for vending. Table 4.5 gives out the reasons why the vendors chose street food vending.

Table 4.5. Reasons for street food vending

<table>
<thead>
<tr>
<th>Reason</th>
<th>Kayole</th>
<th>Dandora</th>
<th>Kayole &amp; Dandaora</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of employment</td>
<td>35(87.5)</td>
<td>40(100)</td>
<td>75 (93.8)</td>
</tr>
<tr>
<td>Interest</td>
<td>2 (5.0)</td>
<td>-</td>
<td>2 (2.5)</td>
</tr>
<tr>
<td>Vocation</td>
<td>1 (2.5)</td>
<td>-</td>
<td>1 (1.3)</td>
</tr>
<tr>
<td>Idleness</td>
<td>2 (5.0)</td>
<td>-</td>
<td>2 (2.5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40(100)</td>
<td>40(100)</td>
<td>80 (100)</td>
</tr>
</tbody>
</table>

Among the street food vendors interviewed 93.8% indicated that they ventured in food vending as result of lack of employment in the formal sector. A minority had reasons that included interest in vending street foods, idleness and source of livelihood.

4.2.4 Duration of street food vending

The duration of time vendors had spent in street food industry was found to range between below 2 months to more than 6 years. The results are summarised in Table 4.6
Table 4.6. Duration of street food vendors in the street food enterprise

<table>
<thead>
<tr>
<th>Time spent in Vending</th>
<th>Kayole</th>
<th>Dandora</th>
<th>Kayole&amp;Dandora</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N(%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Below 2 months</td>
<td>8 (20.0)</td>
<td>4 (10.0)</td>
<td>12 (15.0)</td>
</tr>
<tr>
<td>3-6 months</td>
<td>8 (20.0)</td>
<td>7 (17.5)</td>
<td>15 (18.75)</td>
</tr>
<tr>
<td>7-12 months</td>
<td>9 (22.5)</td>
<td>11 (27.5)</td>
<td>20 (25)</td>
</tr>
<tr>
<td>2 years</td>
<td>6 (15.0)</td>
<td>6 (15.0)</td>
<td>12 (15)</td>
</tr>
<tr>
<td>3 years</td>
<td>5 (12.5)</td>
<td>-</td>
<td>5 (6.25)</td>
</tr>
<tr>
<td>4 years</td>
<td>1 (2.5)</td>
<td>5 (12.5)</td>
<td>6 (7.5)</td>
</tr>
<tr>
<td>5 years</td>
<td>1 (2.5)</td>
<td>2 (5.0)</td>
<td>3 (3.75)</td>
</tr>
<tr>
<td>6 years and above</td>
<td>2 (5.0)</td>
<td>5 (12.5)</td>
<td>7 (8.75)</td>
</tr>
<tr>
<td>Total</td>
<td>40(100)</td>
<td>40(100)</td>
<td>80(100)</td>
</tr>
</tbody>
</table>

Twenty five percent of the street food vendors had been vending street foods for a period ranging from 7 to 12 months while only 3.8% had vended for at least 5 years. In a similar study on street foods carried out in Calcutta, India showed that vendors had vended street foods for a duration ranging from 6 months to 10 years (Chakravarty and Canet, 1996). This shows that street food industry plays an important role in providing a means of employment for the urban dwellers.

4.3 Hygienic and sanitation practices of the street food vendors

Hygienic and sanitary practices such as food preparation skills, place of preparation, cooking and handling, water supply, cooking and serving utensils,
physical location of the vendors, personal hygiene, methods of preservation of leftovers, and public health inspection are discussed in this section.

4.3.1 Food preparation skills

Vendors were asked how they acquired their food preparation skills. It was important to know where the vendors acquired their cooking skills to establish whether they had enough knowledge on food hygiene. Fig 4.1 shows how vendors acquired food preparation skills in Kayole and Dandora estates.

![Bar chart showing food preparation skill acquisition in Kayole and Dandora estates]

**Figure 4.1.** Acquisition of food preparation skills in Kayole and Dandora estates

Sixty percent of the vendors acquired cooking skills from observation, 33.3% were taught by their parents while 6.3% gained the skills by trial and error.
In Kayole and Dandora estates, 55% and 60% of the vendors respectively acquired their cooking skills through observation. They indicated that they observed other vendors preparing the foods and then started their own business.

The study found that all the vendors were not trained in food preparation though they prepared foods. Vendors who are not well trained on cooking skills lack essential skills in food safety. FAO (1999) suggested that, every vendor/helper of food handler should undergo a basic training in food hygiene before licensing. According to FAO (1997b) food handlers should have the necessary knowledge and skills to enable them to handle food hygienically. Systems should be put in place to ensure that food handlers remain aware of all procedures necessary to maintain the safety and suitability of food.

4.3.2 Place of preparation of street foods

The places where the street foods were prepared were observed. This is vital because it gives a picture of the conditions under which the street foods are prepared. The results are shown in Fig. 4.2
Figure 4.2. The percentage of vendors preparing food at home or stalls

Findings show that vendors prepared the foods either at home or at the stalls, which were located, by the roadsides. Vendors selling mutura, fish, fruit salad, roasted maize, mandazi and chips prepared their foods in the stalls. Forty-percent of the vendors of the sausages prepared them at home and 18% of vendors of githeri prepared it at home.

Most of the stalls were made of polythene bags and wood. Such materials can not be able to protect the food from dust and smoke from cars. Dust carries
several microorganisms that may be pathogenic if left to settle on prepared foods. The FAO (1995b) notes that foods should be prepared in a place set aside exclusively for that purpose, 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). Vending stalls should be designed and constructed so that they are easily cleaned and maintained. The Ministry of Local Government should therefore set standards for designing appropriate food vending stalls.

4.3.3 Environmental surrounding of the street food vendors

The environment under which the street foods were prepared was observed. About 85% of the vendors interviewed prepared their foods under dirty environment. Garbage and wastewater beside the food stalls was quite conspicuous. Of the vendors interviewed 92.5%, had no garbage receptacles, they disposed their garbage just beside the stalls. Ninety-two percent of the vendors threw wastewater beside the stall this made the environment quite filthy.

A study done in Bangkok, Thailand on street food vendors found out that wastewater was emptied directly to the surrounding pools and also dumped directly on the road without treatment causing environmental pollution (Dawson, et al., 1996). This discloses that wastewater disposal is a common problem in other countries in the world and that it causes environmental pollution. According to FAO (1999) adequate drainage and waste disposal systems and facilities should be provided for the street food industry. They should be designed properly to reduce
the risk of contamination of food and water. In Kayole and Dandora estates some foods were prepared beside drainage systems as shown in Plate 4.1

Plate 4.1: Chips being prepared beside a drainage system in Kayole

A chi square test was done to test the relationship between education and the state of the environment where the street foods were prepared. Table 4.7 below shows the results of the chi-square.
Table 4.7. Relationship between education of the street food vendor and state of the environment surrounding the stalls

<table>
<thead>
<tr>
<th></th>
<th>Clean environment</th>
<th>Unclean environment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N(%)</td>
<td>N(%)</td>
<td>N(%)</td>
</tr>
<tr>
<td>Primary &amp; below</td>
<td>7(8.8%)</td>
<td>43(53.8%)</td>
<td>50(62.5%)</td>
</tr>
<tr>
<td>Secondary level</td>
<td>5(6.3%)</td>
<td>25(31.3%)</td>
<td>30(37.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>12(15%)</td>
<td>68(68%)</td>
<td>80(100%)</td>
</tr>
</tbody>
</table>

$\chi^2$ value 0.105  
Degree of freedom 1  
Significant value 0.746*  
* Not significant at $p \leq 0.05$ or at 95% confidence limits

The results indicated that there was no significant relationship between education and state of environment. This shows that despite some of the vendors having secondary education they had unclean environment like their counterpart who had primary education. This indicates the need for training in food hygiene for all vendors.

Houseflies were present in most of the stalls. Fig 4.3 shows the presence of flies in Kayole and Dandora estates.
Vendors selling different food

☑ Flies present  ■ Flies not present

Figure 4.3. Percentage of vendors selling food surrounded by flies

Flies were not present where vendors sold sausages, chips and mandazi. However for those who prepared fruit salad, mutura and fish, flies were abundant. This is because these foods attract flies because of their odour, if proper hygiene is not observed they attract a lot of flies. Presence of flies is an indication of poor hygiene and sanitary practices.

4.3.4 Cooking and handling of street foods

Vendor’s behaviour during handling and cooking street foods was observed. This was important because it is the primary method through which food
gets contaminated. When hygiene is not observed then food contamination may occur during cooking and handling the foods. It was found that vendors did not wash fresh foods comprehensively. Vendors who sold fish and chips washed their raw materials only once. It was noted that the vendors did not have enough water to enable them to wash their raw materials thoroughly. Vendors selling fruit salads prepared the fruit salads without washing them. Foods to be eaten raw should be prepared with special attention to cleanliness; these foods should be washed with safe water in an effort to reduce contamination on their surfaces.

It was observed that the preparation surfaces used by the vendors were dirty. Different foods were prepared at the same surfaces, which could promote cross contamination. FAO (1995b) states that surfaces that are in contact with food should be scrubbed with soap, water and detergents after every operation to prevent recontamination of the food in-case the product previously in contact with the surface was contaminated. Working surfaces must be made of hygienic, impermeable material that is easy to clean and in good condition. Equipment and surfaces used for food preparation should be such that they can be cleaned easily and should preferably be made or covered with impervious materials. Preparation should not be carried out on or near the ground as this will increase the chances of food contamination (FAO, 1995b).

The oil used for deep-frying fish, chips, and mandazi was used over and over again without changing. The oil was dark in colour and vendors just topped up the volume with fresh oil for purposes of economy. This practice made the
mandazis, chips and fish have dark colours and unpleasant odours. There is also polymerisation of fatty acids if heated over and over, the high molecular weight polymers so formed have been shown to cause cancer in experimental animals.

4.3.5 Storage of street foods

Cooked foods were stored in different ways. In the stalls, fish was displayed in the open; chips were placed in cupboards, next to their stalls. Fruit salad was kept in an open plastic bowl on the wheelbarrows in which raw fruits were also carried. Roasted maize was kept at the end of the jiko were there was less heat while mandazis were kept in the cupboard. Sausages were kept in a specially built pushing cart as shown in Plate 4.2. Githeri was kept in big sufurias and placed on jikos on low heat as shown in Plate 4.3.

Plate 4. 2 sausages kept in a pushcart in Kayole

Plate 4. 3 Ready githeri kept at low heat in Dandora
Most of the foods were not covered; thus flies and dust had easy access to them as shown in Plate 4.2. If food is not served immediately it should be kept in a cool, in a well-ventilated place or refrigerated. However it should never be kept in the open or exposed to the sun because germs proliferate easily in food that is not kept cool (FAO, 1995b). The utensils in which the food is displayed for sale must be kept clean, covered and protected as they easily become contaminated if left dirty or unprotected (FAO, 1995b). Kinton and Ceserani (1992) recommended that foodstuffs of all kinds should be kept covered as much as possible to prevent contamination by microorganisms in dust and flies. This is in contrast with results of this study that showed that vendors did not cover the utensils or protect them in any way.

Prepared foods were kept at room temperature. Food was not heated at high temperatures before serving as shown in Plate 4.4
Vendors, who sold cold foods such as fruit salads did not keep them under cold temperatures, they stored the fruit salad in plastic bowls; held at ambient temperatures and it was sold from there. By contrast, FAO (1992) stated that, if food cannot be served immediately, it should be kept hot or cooled down rapidly and reheat the food completely to a temperature of at least 70°C before eating. This is to make sure that microorganisms will not thrive on the food because they flourish well between 5°C and 63°C. Food to be served cold should be served at 7°C and below (FAO, 1999). Very few pathogenic microbes can thrive at less than 7°C hence cold foods should be served at these temperatures. Based on this study, vendors should be instructed on safe temperatures for keeping their foods. In
addition street food centres should be established in the estates with storage facilities to ensure that foods are stored in the correct temperatures to avoid microbial contamination that will result in harming the consumer.

4.3.6 Water supply

All the vendors indicated that they did not have water problems. They ferried water from their homes. It was observed that the vendors carried water to their business premises in containers in amounts ranging from 5 to 20 litres. However, the water was not sufficient for their needs such as washing raw materials, utensils and the consumer’s hands. Without enough water, hygiene and sanitary practices cannot be met. World Bank (1995) asserts that safe water is an essential pillar for health. Latham (1997) emphasised that personal hygiene can only be achieved if adequate water is available. Therefore, vendors should have sufficient potable water for drinking, preparation of all kinds of foods and sufficient running water for all washing operations.

4.3.7 Methods vendors used in washing utensils

Utensils used by the vendors were made from plastic, metal, enamel and disposable polythene bags. Methods of washing utensils were observed and it was found that vendors used different methods for washing their utensils such as warm soapy water, cold soapy water and cold water only. Fig 4.4 shows different food products and methods vendors used to wash utensils in Kayole and Dandora estates
Most of the vendors used cold soapy water or cold water for washing utensils. Only a few vendors used warm soapy water. The wash water was contained in buckets, vendors washed utensils and rinsed them in another bucket. Utensils were rinsed once and the rinse water used for several batches of utensils. This is contrary to recommendations by FAO (1995b), which states that utensils should be washed with detergent and running water. The use of water from buckets that is not thrown away immediately after use should be discouraged. This is because if the same water is used twice it may lead to contamination and recontamination of the utensils washed in it. Bulleid, A, Coulthard, Foote, Klaasen, Rabone, and Wane (1999) reported that utensils need to be kept very clean, as they are a major cause of cross contamination. Water used for washing
utensils, food and hands should be safe and should not be re-used. As far as possible, running water should be available for these purposes, if this is not feasible, a bucket or similar container can be used for washing, but it should be emptied and cleaned after each washing.

4.3.7.1 Relationships between gender, education and how utensils were kept

Eighty eight percent of the vendors were using utensils for both cooking and serving. The roasted maize vendors did not use any utensils for serving their maize, but rather, used maize cob leaves to serve their product. Only 40% of the vendors covered their utensils while 60% did not cover them. Table 4.8 shows the relationship between gender and how the utensils were kept.

Table 4.8. Relationship between gender and how the utensils were kept

<table>
<thead>
<tr>
<th>Covered</th>
<th>Not covered</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N(%)</td>
<td>n(%)</td>
<td>n(%)</td>
</tr>
<tr>
<td>MALE</td>
<td>9 (12.9%)</td>
<td>29 (41.4%)</td>
</tr>
<tr>
<td>FEMALE</td>
<td>17 (24.3%)</td>
<td>15 (21.4%)</td>
</tr>
<tr>
<td>Total count</td>
<td>28 (37.2%)</td>
<td>44 (62.9%)</td>
</tr>
</tbody>
</table>

Chi-square value ($\chi^2$) 5.63398

Degree of freedom 1

Significant value (p) 0.01762*

* Significant at p ≤ 0.05 or at 95% confidence limits
A chi-square test was performed to test the relationship between gender and how utensils were kept. It was found that there was a significant relationship between gender and how the utensils were kept. About 68% of women, vendors covered their utensils compared to 32% of the men, indicating that women are generally more careful in covering their utensils than men. Cleanliness is an important aspect of hygiene. If cleanliness of utensils is maintained then hygiene can be enhanced. Table 4.9 shows the relationship between education level and coverage of utensils.

Table 4.9. Relationship between the education levels of street food vendors and how the utensils were kept

<table>
<thead>
<tr>
<th></th>
<th>Covered</th>
<th>Not covered</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n(%)</td>
<td>n(%)</td>
<td>n(%)</td>
</tr>
<tr>
<td>Primary &amp; below</td>
<td>13(18.6%)</td>
<td>30(42.9%)</td>
<td>43(61.4%)</td>
</tr>
<tr>
<td>Secondary &amp; above</td>
<td>42(60%)</td>
<td>13(18.6%)</td>
<td>27(38.6%)</td>
</tr>
<tr>
<td>Total count</td>
<td>27(38.6%)</td>
<td>43(61.4%)</td>
<td>70(100%)</td>
</tr>
</tbody>
</table>

Chi-square value ($\chi^2$) 3.27176
Degree of freedom 1
Significant value (p) 0.07048*

* Not significant at $p \leq 0.05$ or at 95% confidence limits

A chi-square test was done on the educational level of the vendors and how the utensils were kept. There was no significant relationship between education level and how the utensils were kept. However, according to the test above the vendors who had attained secondary education (60%) were more careful
on covering the utensils than the ones who had attained primary level education (18.6%). This shows the importance of training in food hygiene for food handlers by Ministry of health with collaboration with local authorities before vendors are allowed to start street food vending.

4.3.8 Personal hygiene of the vendors

Personal hygiene of the vendors was observed. Table 4.10 below shows how vendors observed various aspects of hygiene.

<table>
<thead>
<tr>
<th>Table 4.10. Various aspects of personal hygiene</th>
<th>N(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hair</td>
<td></td>
</tr>
<tr>
<td>Covered</td>
<td>28(35)</td>
</tr>
<tr>
<td>Not covered</td>
<td>52(65)</td>
</tr>
<tr>
<td>Apron</td>
<td></td>
</tr>
<tr>
<td>Used</td>
<td>15(18.8)</td>
</tr>
<tr>
<td>Not used</td>
<td>65(81.2)</td>
</tr>
<tr>
<td>Jewellery</td>
<td></td>
</tr>
<tr>
<td>Worn</td>
<td>8(10)</td>
</tr>
<tr>
<td>Not worn</td>
<td>72(90)</td>
</tr>
<tr>
<td>Fingernails</td>
<td></td>
</tr>
<tr>
<td>Short and polished</td>
<td>7(8.8)</td>
</tr>
<tr>
<td>Short and not polished</td>
<td>70(87.4)</td>
</tr>
<tr>
<td>Long and polished</td>
<td>3(3.8)</td>
</tr>
</tbody>
</table>

It was found that 81.2% of the vendors did not use aprons or any form of protective clothing (apron and hats). An apron is normally used to prevent contamination from out door clothing. Hair should be covered when handling food
because vendors hair can fall on the food resulting to contamination of food. A chi-square test was done to test whether there was any significant relationship between education and handling of food with bare hands. Table 4.11 shows the results of the chi-square.

**Table 4.11. Relationship between education and handling of food by bare hands**

<table>
<thead>
<tr>
<th></th>
<th>Used bare hands</th>
<th>Did not use bare hands</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N(%)</td>
<td>N(%)</td>
<td>N(%)</td>
</tr>
<tr>
<td>Primary</td>
<td>34 (42.5%)</td>
<td>16 (20%)</td>
<td>50 (62.5%)</td>
</tr>
<tr>
<td>Secondary level</td>
<td>14 (17.5%)</td>
<td>16 (20%)</td>
<td>30 (37.5%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48 (60%)</strong></td>
<td><strong>32 (40%)</strong></td>
<td><strong>80 (100%)</strong></td>
</tr>
</tbody>
</table>

Chi square value $\chi^2 = 3.556$
Degree of freedom = 1
Significant value (p) = 0.059*

* Not significant at $p \leq 0.05$ or at 95% confidence limits

The results showed that there was no significant difference between education and handling of food with bare hands. From the results in Table 4.11 vendors who had attained primary education level handled food with bare hands more than those who attained secondary education. A total of 60% vendors handled cooked food with bare hands. According to FAO (1999) cooked street food should not be handled with bare hands. Clean tongs, forks, spoons or disposable gloves should be used when handling, serving or selling food. Handling with bare hands may result to introduction of microorganisms on safe food.
The person handling money should not handle food, money has been found to have microorganisms which can be transferred to safe food (FAO, 1999). Most of the vendors who sold chips, mandazi, githeri and fish packaged the foods in polythene bags for their customers. When packaging the foods they blew air from their mouths to the polythene bags to place food inside. This is against hygienic practice as the vendor may introduce microorganisms to the food through saliva. Observing personal hygiene is vital for any food establishment. Any food handler, who observes other forms of hygiene but not personal hygiene, will definitely contaminate food. Training should therefore be conducted for the street food vendors on various aspects of personal hygiene.

4.3.9 Methods for packaging and storage of leftovers

Thirty-five percent of the vendors interviewed said that they usually have leftovers. Out of those who had leftovers, 32.1% ate them and the rest stored them for sale the following day. Various methods used by the vendors to package and store the leftovers are shown in Fig 4.5
According to WHO (1996) leftovers, should be stored under either hot (near or above 60°C) conditions or at cool temperatures below 5°C. This rule is of vital importance if foods are to be stored for more than four or five hours.

Only 21% of the vendors store their leftovers at the recommended temperatures. This is quite risky because safety from contamination by pathogenic organisms was not assured and the maintenance of optimal qualities of colour, texture and nutritive value were not put into consideration. It is recommended that the street food vendors prepare enough food for the day, to avoid leftovers, as most of them do not have good storage facilities.
4.3.10 Public Health Officers inspection

Eighty percent of the vendors interviewed said that Pubic Health Officers had not inspected them. Only 20% of the vendors indicated that they had been inspected. Out of the 20% vendors inspected 62.5% indicated they were inspected after six months. The remaining 37.5%, were inspected after two months. Vendors reported that Public Health Officers usually checked general hygiene observed by the street food vendor and medical examination cards.

Among the vendors interviewed only 11.3% had gone for medical examination, the rest indicated that they did not need to go for medical examination. One vendor said: "I believe I am healthy, I only go for medication when I am sick, I don't need to go for medical examination when I am not sick." This shows the vendors did not understand the aim of going for medical examination when preparing foods.

Most vendors, except one did not have operating licences. When asked why, one vendor had this to say: "The government has allowed all the owners of small scale businesses to operate without a license". According to FAO (1995b) the issuing of license would bring a measure of confidence to the vendors, this measure of security could motivate them to improve food handling practices through introduction of appropriate and simple practices and technologies suiting there specific operation. There is therefore a need for the city council to give licenses for all the vendors so as to keep their record and also to control their movements.
4.4 Street food vendors views on street food vending

The vendors were asked to give their views on street food vending. Interviews were done using the schedule shown in Appendix I

4.4.1 Consumers of street foods

Vendors said indicated many consumers especially the *Juakali* workers liked their foods. About 79% *Juakali* workers ate street foods. Fig 4.6 presents the consumers of street food.

![Pie chart showing consumers of street foods]

*Figure 4.6. Consumers of street foods*
This shows that street food is very popular amongst the *juakali* workers. The vendors sold the foods in the estates where the *juakali* workers pursued their endeavours. The *juakali* workers probably preferred them because their products are cheap compared to the foods sold at the restaurants. Street food consumers come from all levels of society.

### 4.4.2 Problems faced by street food vendors

Vendors experienced various problems, which affected their industry. Table 4.12 shows the problems cited by the vendors.

<table>
<thead>
<tr>
<th>Problem</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of enough capital</td>
<td>26(32.5)</td>
</tr>
<tr>
<td>Lack of enough customers</td>
<td>16(20)</td>
</tr>
<tr>
<td>Poor weather</td>
<td>16(20)</td>
</tr>
<tr>
<td>Lack of fuel</td>
<td>7 (8.8)</td>
</tr>
<tr>
<td>Harassment by Local Government authorities</td>
<td>3 (3.8)</td>
</tr>
<tr>
<td>Security</td>
<td>3 (3.8)</td>
</tr>
<tr>
<td>No problem cited</td>
<td>9 (11.3)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>80(100)</td>
</tr>
</tbody>
</table>

The percentage of vendors who lacked enough capital was 32.5%, whereas 3.8% complained of harassment by Local Government authorities. Some vendors said poor weather was the major hindrance to their business. They said that during rainy and sunny days they faced many problems because their stalls were not covered. One vendor who sold roasted maize said: “*during sunny days we cannot*
sell enough roasted maize because customers prefer maize when the weather is cool". Other vendors indicated that during rainy seasons they could not sell their foods because their stalls could not withstand heavy rainfall. Fuel was the major problem to some of them. They bought fuel (charcoal and firewood) from other dealers and sometimes could not get them due to lack of supplies. The major problem that many customers revealed was the lack of sufficient capital. Vendors indicated that they did not have sufficient funds to buy raw materials for preparation of the foods, hence they could not expand their businesses.

4.4.3 Future plans in street food vending

Vendors were asked about their future plans and their responses are summarised in Table 4.13 were given.

<table>
<thead>
<tr>
<th>Future plans</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extend into a café</td>
<td>30(37.5)</td>
</tr>
<tr>
<td>Expand the same business in different places</td>
<td>30(37.5)</td>
</tr>
<tr>
<td>Start butchery</td>
<td>9 (11.25)</td>
</tr>
<tr>
<td>Start another business</td>
<td>5 (11.25)</td>
</tr>
<tr>
<td>No plan</td>
<td>2 (2.5)</td>
</tr>
<tr>
<td>Total</td>
<td>80(100)</td>
</tr>
</tbody>
</table>

Most of the vendors had plans to expand their business, 37.5% indicated the desire to expand it to a café. About 37.5% said that they would expand the same business in different selling point, while 2.5% had no future plans. Some of
the vendors were not interested in the street food vending business. One vendor said:

"I am not interested in selling fruit salad in the streets; I want to acquire enough capital so that I can start selling electrical and household goods".

The majority of the vendors indicated that they wanted to pursue the street food business. This therefore shows that the vendors have interest in the vocation despite the problems facing them. Success would be realised with proper support from government and interested bodies.

Vendors had several suggestions on what can be done to improve street food vending. Vendor's responses are summarised in Table 4.14.

Table 4.14. Vendors suggestions on what to be done to improve street food vending

<table>
<thead>
<tr>
<th>Suggestions</th>
<th>N(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to credit facilities</td>
<td>62(77.5)</td>
</tr>
<tr>
<td>Access to land</td>
<td>4 (5.0)</td>
</tr>
<tr>
<td>Improvement of roads</td>
<td>2 (2.5)</td>
</tr>
<tr>
<td>No suggestions given</td>
<td>12(20)</td>
</tr>
<tr>
<td>Total</td>
<td>80(100)</td>
</tr>
</tbody>
</table>

Five percent of the vendors interviewed suggested that given land where they would build their stalls this could improve there industry while 77.5% believed accessibility to credit facilities could improve their business. About 2.5% thought that if the roads could be constructed properly customers could trust their foods. A mandazi vendor lamented:
"The roads are very dusty: they need to be constructed properly. I know it is not good to sell food beside this dusty road because dust flies into our food. Once customers see dust in our stalls they don't even buy our mandazis hence I lose a lot of customers".

Twenty percent were satisfied with the way things are. Most of the vendors are facing difficulties because of lack of sufficient capital. If money could be loaned to them, their industry would expand enormously. Credit facilities should be made available to the vendors so as to expand their business.

4.5 Social economic status of the street food consumers

Using the schedule in Appendix IV the social, economic status and experiences consumers had on street foods were sought.

4.5.1 Age, marital status and educational level of street food consumers

The consumer’s age ranged between 14 to 51 years with a mean of 28 years. Of these, 55% were married while 45% were single. Among them, 43.3% had primary education. Table 4.15 shows the marital status and education levels of the consumers.
Table 4.15. Age, marital status and education level of street food consumers

<table>
<thead>
<tr>
<th>Age</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-15</td>
<td>2 (3.3)</td>
</tr>
<tr>
<td>16-20</td>
<td>11 (18.3)</td>
</tr>
<tr>
<td>21-25</td>
<td>14 (23.3)</td>
</tr>
<tr>
<td>25-30</td>
<td>12 (20)</td>
</tr>
<tr>
<td>31-35</td>
<td>9 (15)</td>
</tr>
<tr>
<td>36-40</td>
<td>8 (13.3)</td>
</tr>
<tr>
<td>41-45</td>
<td>2 (3.3)</td>
</tr>
<tr>
<td>46-50</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>51-55</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Total</td>
<td>60 (100)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital status</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>27 (45)</td>
</tr>
<tr>
<td>Married</td>
<td>33 (55)</td>
</tr>
<tr>
<td>Total</td>
<td>60 (100)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational level</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary and below</td>
<td>26 (43.3)</td>
</tr>
<tr>
<td>Secondary ‘O’ level only</td>
<td>27 (45)</td>
</tr>
<tr>
<td>Secondary ‘A’ level only</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Secondary ‘O’ level and certificate college</td>
<td>2 (3.3)</td>
</tr>
<tr>
<td>Secondary ‘O’ level and diploma college</td>
<td>2 (3.3)</td>
</tr>
<tr>
<td>Total</td>
<td>60 (100)</td>
</tr>
</tbody>
</table>

4.5.2 Occupation of the street food consumers

Consumers had different occupations, most of them had blue-collar jobs.

Table 4.16 shows a summary of consumer’s occupation in the area of study.
Table 4. 16. Occupation s of street food consumers

<table>
<thead>
<tr>
<th>Occupation</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shop keepers</td>
<td>13 (21.7)</td>
</tr>
<tr>
<td>Dress makers and tailors</td>
<td>11 (18.3)</td>
</tr>
<tr>
<td>Carpenters</td>
<td>6 (10.0)</td>
</tr>
<tr>
<td>Green grocers</td>
<td>5 (8.3)</td>
</tr>
<tr>
<td>Jobless</td>
<td>5 (8.3)</td>
</tr>
<tr>
<td>House wives</td>
<td>4 (6.7)</td>
</tr>
<tr>
<td>Students</td>
<td>3 (5.0)</td>
</tr>
<tr>
<td>Drivers</td>
<td>3 (5.0)</td>
</tr>
<tr>
<td>Barbers</td>
<td>3 (5.0)</td>
</tr>
<tr>
<td>Mason's</td>
<td>3 (5.0)</td>
</tr>
<tr>
<td>Cobblers</td>
<td>3 (5.0)</td>
</tr>
<tr>
<td>Charcoal dealers</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Watch men</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Airport employees</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Plumbers</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>House girls</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Hairdressers</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60 (100)</strong></td>
</tr>
</tbody>
</table>

Most of the consumers for the street foods interviewed of this study were residing within the estates. The shopkeepers and people dealing with tailoring constituted the biggest percentage of street food consumers. The consumers represented different juakali sectors, and most of them conducted their business within the estates. The availability of street food is very important to them, as they constitute their daytime meal.
4.6 Consumers perceptions of street foods

The favourite street foods, reasons for consuming street foods and favourite times for consuming street foods were sought.

4.6.1 Consumer’s preferred street foods

Consumer’s desired street foods are shown in Fig 4.7.

![Pie chart showing street food preferences]

Figure 4.7. Food preferences by the consumers of street foods.

Of the consumers interviewed, 29% liked *githeri* while 2% liked sausages. *Githeri* was found to be the most preferred street food by the consumers. This is because it is their staple food and also is considered to be a filling food. Most of the consumers were *juakali* workers and they normally carry out jobs and activities.
that require a lot of energy hence their preference. Chips were very popular food among the females.

4.6.2 Reasons for consuming street foods

Street food consumers had various reasons for consuming street foods. Fig. 4.8 shows the various reasons why street food consumers ate these foods.

![Reasons for consuming street foods](image)

**Figure 4.8. Reasons for consuming street foods**

The consumers reported that they ate street food because they lacked time to prepare food for lunch. Others indicated that they ate street foods because they are cheap as compared to the foods in hotel and restaurants.
The consumers cited lack of time for preparation of food as the common reason for consuming street foods. Consumers said they lacked time to go to prepare lunch hence they opted for street food. One consumer said:

"I cannot be able to go home for lunch, where I live is far from here. I prefer eating githeri on the streets because it is a readily available heavy food, and I will get satisfied".

Others said that they ate them because the foods were cheap as compared to the foods in hotels and restaurants. FAO (1995a) noted that street foods are less expensive as compared to foods from the formal sector. They are often less expensive when compared to home cooked foods. Another consumer said:

"I like chips, they are very sweet. I consume chips on the streets every day. They are cheap; I can even get za kobole (of five shillings). I will always eat chips from the streets".

These foods play a very important role in the diets of the people of the low social economic status in these estates who depend on them for their meals. The street food vending should be encouraged as consumers like them.

4.6.3 Consumer's favourite times for consuming street foods

Consumers were asked when they liked eating street foods. They gave different times that are summarised in Fig 4.9
Figure 4.9. Times for street food consumption

Consumers revealed that they consumed street food at different times of the day. Majority (42%) consumed the food during lunch. Most consumers said they ate the foods during lunch this is because of lack of time to prepare lunch as discussed in 4.6.2. Street foods play an important part in the diet of the interviewed consumers. From the results, street foods account for a part of the daily diet and contribute towards meeting nutritional requirements, although contribution varies and they are rarely quantified.

4.6.4 Perceptions of consumers on hygienic and sanitary handling of street foods

Consumers of street foods were asked to comment on the hygienic and sanitary practices of the vendors. Sixty-five percent reported that vendors did not
observe hygienic and sanitary practices while 35% did observe hygiene. The responses of the consumers who reported that vendors did not observe hygiene and sanitary practices are shown in Table 4.17.

Table 4.17. Consumers views on hygienic and sanitary practices of the vendors

<table>
<thead>
<tr>
<th>Reasons</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepared in unsanitary conditions</td>
<td>31 (79.5)</td>
</tr>
<tr>
<td>Environment dirty</td>
<td>3 (7.7)</td>
</tr>
<tr>
<td>Not properly stored</td>
<td>3 (7.7)</td>
</tr>
<tr>
<td>Vendors don’t observe hygiene</td>
<td>2 (5.1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>39 (100)</strong></td>
</tr>
</tbody>
</table>

Among the consumers 65% indicated that street foods were not safe for human consumption. There various reasons were given which attributed to the street foods not being safe. About 80% of the street food consumers indicated that unsanitary conditions of preparation were the main reason.

One consumer said:

"I eat this food only because I don't have enough money to eat from a restaurant. The stalls where the vendors prepare and sell their food are very dirty. The vendors themselves are very dirty. We only survive under the mercy of our Lord”

The consumers noted that almost all the vendors did not observe hygiene.

One consumer lamented:

"The vendors don’t clean their utensils properly, they just dip in and out of cold water without any detergent. Their stalls are full of houseflies. I know we eat dirty foods, but somewhat we survive. The vendors should be trained on hygiene and sanitation".
The results obtained in this study are in agreement with those obtained in a similar study done in calculta, India that revealed the quality of food; neatness, hygienic situations and set-up of the stalls was inadequate (Chakravarty and Canet, 1996). The results obtained in this study revealed that street food vendors lacked proper hygiene and sanitary practices. Those who alleged that the vendor observed hygienic and sanitary practices are believed not to be aware of, and hence not unduly concerned about, the safety of the street foods. This is emphasised by Tansley and Worsley (1995) indicated that, street food consumers tend to have low to medium level incomes, relatively little education, and little knowledge of good hygiene. For them street food is the right food in the right place at the right price. FAO (1995a) asserts that the majority of consumers are not aware of the safety of street foods. It is the taste; variety, appearance, and price that play a major role in the selection of street foods by consumers.

4.6.5 Consumer’s experiences with street foods

Some of the bad experiences consumers experienced included diarrhoea and stomachache. The results are shown in Fig 4.10
Figure 4. 10. Consumer’s experiences with street foods

About 55% of the consumers did not suffer from any disease due to the consumption of street foods. However, 45% had suffered from either diarrhoea or stomachache. This large number reveals that most of the street foods are not safe for human consumption. The consumers could have suffered from both diarrhoea and stomachache because vendors did not observe hygienic and sanitary practices as indicated in Table 4.17. An interview conducted with authorities in the city council health centres in Kayole and Dandora revealed that there were cases of abdominal pains reported in the health centres. Kayole reported around 20 cases of abdominal pains from the 200 patient the health centre treats per day. In the two city council health centres in Dandora abnormal pains were not prevalent. It
was also noted that most of the patients treated in the health centres were children under five years old. In Kayole the cases of abdominal cases were associated to poor health care practices and also the prevalence of street foods in the location according to the authorities in the health centre. It was noted that most of the adults were not seeking medical attentions in the health centres. This concurs with data collected during this study. When the consumers who had suffered from any abdominal disorder due to consumption of street food asked on what measures they took, only 3(11%) seeked for treatment in hospitals as shown in Figure 4.11.

```
Figure 4. 11. Action taken by consumers who had abdominal disorders due to consumption of street foods
```

```
4.6.6 Consumers suggestions on street food vending improvement

Street food consumers had different suggestion on the improvement of street food vending. The suggestions are presented in Table 4.18
```
Majority of the consumers 60% indicated that street food vendors should observe general hygiene, while 1.7% said that they should prepare the foods where every one can see. One consumer was very concerned about where foods were prepared. He suggested that:

“They should prepare the food where we can all see. I don’t trust the foods which they are prepared hidden in some place. Some one can even serve us on dirty utensils”.

Another consumer who was dissatisfied by the vendors’ unhygienic practices suggested:

“The government should inspect the vendors regularly. Any vendor found endangering consumer’s life by not observing hygiene should not be allowed to sell food on the streets. Life is more important than money”.

The consumers felt that the vendors needed to take hygiene as a priority when preparing the foods. The Public Health Officers should inspect the street food vendors regularly to ensure that they observe hygienic and sanitary practices.

### Table 4. 18. Consumer’s suggestions on how to improve street food vending

<table>
<thead>
<tr>
<th>Suggestions</th>
<th>N(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observe general hygiene</td>
<td>36(60)</td>
</tr>
<tr>
<td>Build good stalls</td>
<td>9 (15)</td>
</tr>
<tr>
<td>Observe personal hygiene</td>
<td>9 (15)</td>
</tr>
<tr>
<td>Cover cooked food properly</td>
<td>5 (8.3)</td>
</tr>
<tr>
<td>Prepare the foods where every one can see</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>60(1000)</td>
</tr>
</tbody>
</table>
4.6.7 Consumers views on government role in street food vending

Street food consumers suggested that the government has a very important role in ensuring hygienic and sanitary practices. The consumers indicated what the roles of the government should be as presented in Table 4.19

Table 4.19. Consumers views on government role in street food vending business

<table>
<thead>
<tr>
<th>Government Role</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build stalls for the vendors</td>
<td>17 (28.3)</td>
</tr>
<tr>
<td>Inspect vendors regularly</td>
<td>13 (21.7)</td>
</tr>
<tr>
<td>Give the vendors loans</td>
<td>13 (21.7)</td>
</tr>
<tr>
<td>Teach vendors hygiene</td>
<td>6 (10.0)</td>
</tr>
<tr>
<td>Take action against unclean vendors</td>
<td>4 (6.7)</td>
</tr>
<tr>
<td>Come up with regulations to control street food vending</td>
<td>3 (5.0)</td>
</tr>
<tr>
<td>Give vendors land</td>
<td>2 (3.3)</td>
</tr>
<tr>
<td>Collect garbage</td>
<td>2 (3.3)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60 (100)</strong></td>
</tr>
</tbody>
</table>

Among the consumers interviewed 28.3% reported that government should build stalls for them whereas 21.7% said that the government should ensure that vendors are inspected regularly. The consumers felt that the government had left the vendors to operate on their own without being regulated. The consumers felt also that the government did not tackle the issue of hygiene properly. They felt that the government should ensure that all the vendors are trained on hygiene.
4.7 Public Health Officers role in street food industry

Public health officers are important in any food industry because they are trained to ensure that food sold to public is safe for consumption. There were two male Public Health Officers in the whole of Embakasi division. They were in charge of Public Health in the areas of study, Kayole and Dandora estates in Nairobi. They have their office at Umoja Health Centre in Umoja estate. Both the Public Health Officers were trained in Kenya Medical Training Centre (KMTC) and had obtained a Diploma in Public Health. One of them had worked for three years while the other one had worked for one year as Public Health Officers in Embakasi division.

Using the interview schedule in Appendix III, the role of Public Health Officers in the area of study was established. Public Health Officers have different roles. Their roles are; inspecting food-producing establishments such as hotels, restaurants and butcheries to establish whether they are operating in hygienic manner. This is to check whether there is presence of latrine, the surrounding environment is clean, and the kitchen and serving area are clean and orderly. Checking whether the food establishments have an operating license and checking to see that all employees have medical certificates.

According to them there is no Act in Kenya specifically for the street food industry. One of them said: "We rarely inspect the street food vendors because we cover a wide area." They said that they mainly inspected established food service
places such as hotels, restaurants, cafes and butcheries. One Public Health Officer said:

“*We tend to ignore the street food vendors because they prepare food on a small scale very few people take the foods for complete meals hence they do not pose a risk to many consumers*”

According to the Public Health officers there are no set requirements for the street food industry, but one of them emphasised that:

“All food handlers should observe general hygiene, sanitation and personal hygiene so that they can prepare safe foods for the consumers in order to avert any food borne outbreak”.

One of them insisted: “*observing personal hygiene as a very important aspect in making sure that safe food is prepared*”. Some of the aspect of personal hygiene they emphasised were, wearing protective clothing, washing hand regularly and being smart.

The Public Health Officers admitted that the street food industry is growing rapidly in urban areas and it requires to be regulated so that incidents of food poisoning are reduced. They said the street food industry plays an important role in providing employment and meals for the urban dwellers. One said:

“The street food vending should be encouraged and proper training should be done for the vendors to ensure that they produce quality foods so that they can get consumer confidence”.

They argued that it has been difficult for them to inspect the street foods because there are no regulations for street foods. They believed that it is difficult to use the regulations for the established food industries in inspecting the vendors. The Public Health Officers suggested that the government should come up with
regulations for the street food industry. Vendors should be registered, operating licenses should be issued to them, and appropriate stalls should be built for the vendors. A permanent place should be set aside for the vendors to ensure that they do not cause congestion in the estates.

It is clear that from this study that the Public Health Officers played minimum role in ensuring hygienic and sanitary practices of the street food business in the area of study. This is because they concentrated on inspecting large food establishments such as hotels, restaurants and butcheries. These results are in agreement with those of a study carried out by (Canet and N’diaye 1996). These authors observed that public health authorities had failed to carry out their regulatory and educative responsibility. This is because of poor institutional capacity, lack of co-ordination, shortage of personnel and funds and unsuitable structures and operating methods.
CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Methodology

A descriptive survey design was employed to determine the hygienic and sanitary practices of vendors of street foods in Kayole and Dandora estates in Nairobi. Hygiene and sanitation was determined by interview schedule and observation checklist which were administered to the street food vendors. An interview schedule was also administered to the consumers of street foods and Public Health Officers in the two estates to determine their role in ensuring food hygiene and sanitation.

5.2.1 Social-economic characteristics of the street food vendors

The age of the street food vendors ranged between 16 to 45 years old, with majority ranging between 21 and 25 years. The results showed that the vendors were at their most productive age. Both men and women were involved in street food industry although men were slightly more than women. About 60% of the vendors were married, indicating that the vocation provides income for families in the locations of the study.

The average monthly income for both men and women vendors was about Ksh. 5,500, in the two estates. The men had a significant income higher than women but it because an independent T test run had a t value of 2.88 and observed significance P≤ 0.05. The monthly income of the vendors was higher than the minimum income set by the government of Ksh 1,253.90 per month. This shows
that the street food industry is important in creating employment in the urban areas.

Vendors had different reasons why they started the vocation 93.8% of them revealed that they started the vocation because they lacked employment in the formal sector. Therefore street foods industry offered alternative source of income for the residents of the locations of the study. The vendors had been on the street for periods ranging from less than 2 months to more than 6 years, 20% these had been in the street for a period between 7 and 12 months. Vendors were contented with the vocation that is why they had stayed long in the streets. There were a variety street foods sold in the study areas but only the commonly sold foods which included chips, sausages, roasted maize, mutura, githeri, mandazi, fish and fruit salads were included in the study.

5.2.2 Hygienic and sanitary practices of the vendors

All the vendors interviewed did not have any training on food preparation skills. About 62% obtained food preparation skills through observation while 33.3% were taught by their parents. Food preparation is a very important aspect in ensuring food hygiene. Food preparation skills cannot be attained effectively through observation. Training is a very important aspect in ensuring that people acquire the necessary skills for food preparation so as to prepare both quality and safe foods.

Street food vendors prepared their foods either at home or at their stalls. Vendors who sold mandazi, chips, mutura, fish, roasted maize and fruit salads
prepared their foods at the stalls while 40% and 18% of the vendors selling sausage and *githeri* respectively prepared the foods at home and then they carried them to the stalls for sale. The stalls were poorly constructed as they were made on wood and polythene bags. The materials used for the construction of the stalls were not able to protect the food from dust, given that all the stalls were built just beside the roads, which were dusty.

The street food vendors did not observe hygienic and sanitary practices. It was noted that the vendors did not have enough water to enable them to wash their raw materials thoroughly. The preparation surfaces for raw food preparation were not kept in good conditions, they were not washed regularly and that different food was prepared at the same surfaces. This practice could promote cross contamination.

The oil used for deep-frying fish, chips, *mandazi* and sausages was used over and over again without changing this made the chips and fish to have unpleasant tastes, colour's and odours. The foods were cooked for the right time and sufficient time to ensure the destruction of any pathogenic microorganisms. After cooking the food was stored at ambient temperatures in cupboards, plastic bowls and others were just left in the open. Most of the vendors used cold soapy water or cold water in washing their used utensils; only few vendors used warm soapy water. The utensils were washed using water in buckets. They were rinsed only once and the water was used for a long time before it was replaced. Both the waters for washing and rinsing the utensils were seen to be dirty. Garbage and
waste dirty water beside the food stalls was quite conspicuous because most of the vendors never had garbage receptacles hence these became a breeding ground for houseflies.

The vendors did not observe personal hygiene. They did not have protective clothing and handled food with their bare hands. They also did not wash their hands. When packaging the foods they blew the polythene bags so that they could put the food in them. This is against hygiene because the vendor may introduce microorganisms to the food through saliva.

5.2.3 Street food consumers experiences with street foods

About 7% and 38% of the consumers suffered from diarrhoea and stomachaches respectively due to the consumption of street food. Most consumers believed that the street food vendors did not observe hygienic and sanitary practices. However, they consumed the street foods because they had no alternative due to their low economic status. They believed that the government had a duty to play in ensuring that the vendors sold safe street food to them.

5.2.4 Public Health Officers role in street food vending

Public Health Officers said it was hard to inspect the vendors because there is no code of practice, for street foods vending or preparation. They believed that they could not use the existing laws on food establishments because vendors operated under different circumstances hence, street foods require their own code
of practice. Health officers also lacked sufficient manpower to effectively patrol all areas where foods are sold on the streets.

5.3 Conclusions

The following conclusions were made

a) Street food vendors were not aware of hygienic and sanitary practice because:

i) They were not offered any form of training on food preparation.

ii) Water for street food preparation was not enough. This resulted in vendors using little water for washing utensils compromising hygiene.

iii) Stalls were poorly constructed. They could not give proper protection to the street foods from dust and smoke from vehicles.

iv) The street food vendors deposited their food and wastewater beside the stalls. This resulted to a dirty environment that attracted vermin such as houseflies and cockroaches. The presence of such vermin's compromises sanitation.

v) Personal hygiene was not also observed because the vendors never covered their heads, handled money and food at the same time, handled food with bare-hand and they did not wear an overcoat/aprons.

b) Consumers in the area of study liked street foods. They preferred street foods than restaurant foods because they were cheap and available at their work place.

c) Seven percent and 38% of the street food consumers had suffered from diarrhoea and stomachache respectively due to the consumption of street food.
d) The Public Health officers never inspected the street foods. Only a few vendors said they saw them. The Public Health officers only inspected established food establishments.

5.4 Recommendations of the study

Based on this study the following suggestions and recommendations are made.

5.4.1 Street food vendors

- Training in basic food preparation and hygiene should for all street food vendors. This will ensure that vendors follow the required rules for proper hygiene and sanitation.

- Street food vendors should be licensed to operate.

5.4.2 Street food consumers

- Consumers should be informed through posters, media and publicity campaigns about hazards associated with street foods and steps it requires street food vendors to take to minimise those hazards by the Ministry.

- The public should be educated on food safety issues by consumer organisations because most consumers are not aware of the relationship between contaminated food and food borne diseases. Once consumers become aware of food safety issues they will be more discriminating in what they consume, and commence on insisting on improve hygiene,
sanitation and food handling practices, they could greatly influence vendors to improve their food handling practices.

5.4.4 Public Health Officers

- Code of Practice for street foods based on risk analysis, taking into consideration both potential hazards and the possible control measures should be developed by the Ministry of Health for the Public Health officers.

- Adequate Public Health Officers should be deployed in the city to ensure that inspection is done to all food establishments.

- Technical guidance in organising, monitoring and educational programmes of Public Health Officers, vendors and the consumers should be provided by the Public Health department under the city council to bring about measures of food safety and hygiene within the street food industry.

5.4.5 Policy

- Licensing/registration should be used as a vehicle to provide training to the street food operators. The City Council should license and register vendors. Licensing/registration is desirable as a long-term measure to control street food vending in the relation to space and activities. Efforts should be made to register the existing eligible vendors immediately.
Street food centres with adequate facilities and utility services should be provided by Local Government Ministry. Such centres will:

- Provide an environment for storing, preparing and serving safe food.
- Provide the necessary utilities such as potable water, adequate light, and drainage and solid/water disposal.
- Provide conducive environment for consumers to be served safe food.
- Provide good setting for the relevant authorities to conduct information, education and training programmes for vendors and consumers.

5.4.5 Recommendations for further research

Based on the results of the study the following recommendations are made for further research.

1. A similar study could be replicated in the other cities and major towns of this country.

2. Establishment of the presence of metals and food contaminants in street foods due to motor vehicle exhaustion pollution can be carried out.

3. Research to establish the nutritive value of street foods can be done.

4. A study could be done to establish microbial safety of street foods.
REFERENCES


Appendix I: Interview guide for the street food vendors

I am a student from the School of Pure and Applied Science, Department of Food, Nutrition and Dietetics at Kenyatta University. I am carrying out a research on “Hygienic and sanitary practices of street food vendors in Nairobi”. You have been selected as one of the participants in the study. This study is aimed at promoting your business by clearing the doubts of the safety of your foods. Please assist me by answering the following questions as accurately as possible. You are assured of confidentiality of any information you give. It will be used for academic purposes only. Thank you.

ESTATE

STREET FOOD VENDOR CODE

Part I Demographic Characteristics

1. Gender
   1. male 2. female

2. Marital status
   1. Widowed 2. Divorced

3. How many children do you have?
   1. One 2. Two
   3. Three 4. Four 5. Five and above

4. What is your daily income from street food selling?

5. a) Is the income from street food vending enough to run your family?
   1. Yes 2. No
6. How old are you?
   1. Below 18
   2. 19 – 28
   3. 29 – 38
   4. 39 and above

7. What is your highest level of education you attained?
   1. Primary and below
   2. Secondary ‘O’ level only
   3. Secondary ‘A’ level only
   4. Certificate College
   5. Diploma college
   6. University

6. a) What made you start selling food on the street?
   1. Lack of employment
   2. Interest
   3. Inheritance
   4. Employment

b) How many years have you sold food on the streets?
   1. Below one year
   2. 1 – 3 yrs
   3. 4 – 6 yrs
   4. 7 – 9 yrs
   5. 10 yrs and over

7. a) What kind of foods do you sell?
   ________________________________

a) Why do you sell such kind of foods?
   ________________________________

Part II: Hygienic and sanitary practices

1. a) Where do you get the raw foods you use in your business?
   1. Market
   2. Farm
   3. Supplier
   4. Other specify

b) How is the raw food transported to your stall?
   1. Cart
   2. Wheelbarrow
   3. Vehicle
   4. Bicycle
   5. Human transport
   6. Other specify
c) How do you store the raw foods?

1. Refrigerator  
2. Cartoons  
3. Shelves of the vendors kiosk  
4. Transport home  
5. Other ___

2. a) Do you prepare all the food here on the stall?
1. Yes  
2. No  
b) If ‘No’ where do you prepare the food?
1. Home  
2. Butchery  
3. Hotel  
4. Other specify ________

c) Do you prepare the food alone?
1. Yes  
2. No  
d) If ‘No’ who helps you?
1. Relatives  
2. Hired help  
3. Other specify _______

3. a) Do you sell all the food that you prepare?
1. Yes  
2. No  
b) If No how do you manage the leftovers?
1. Give to street children  
2. Carry home  
3. Throw away  
4. Preserve for the next day  
5. Other specify __________________________

c) If you preserve for the next day how do you do it

4. a) Have you undergone any cookery training?
1. Yes  
2. No  
b) If yes where, and what level? ____________________________

c) If no where did you acquire the skills of cookery?
1. Observation  
2. Parents  
3. Trial and error  
4. Other specify __________________________

5. a) Who are the major consumers of your food?
1. Students  
2. Children

b) Which gender consumes the food most?
1. Females  2. Males

6. a) Where do you get your water from?

b) Do you have enough water?
1. Yes  2. No

c) If No, how do you cope with water shortage?

7. List some of the problems that you encounter in your business?

8. What would you like to be done by the government in order to improve your business?

9. What are your future plans in relation to street food vending?

10. a) Do you have a license?
1. Yes  2. No

b) If yes how much do you pay?

11. a) Do the Public Health Officers inspect your food products?
1. Yes  2. No

b) If yes, how often do they inspect your product?
1. Once a month  2. After two months  3. After six months  4. Once a year  5. Other specify

c) Once the public health officers come what do they inspect?
12. a) Do you go for medical examination?
   1. Yes  
   2. No 

b) If yes, how often?
   1. Once a month  
   2. After two months 
   3. After six months  
   4. One a year 
   5. Other specify ________________________________

c) When did you last go for medical examination?
   ________________________________

d) If no, why not? ________________________________
## Appendix II: Observation guide for the street food vendors

**Estate**

Street food vendor code

1. Location of the street food vendor
   1. Near the roadside
   2. Far from the road

2. a) Stand where the food is sold
   1. On the ground
   2. Off the ground
   b) Material is used for the construction of the stall.
   1. Timber and polythene papers
   2. Timber alone
   3. Iron sheet and timber
   4. None
   c) Visibility of dust inside the stall?
   1. Yes
   2. No

3. Hair
   1. Covered
   2. Uncovered

4. Apron/dust coat
   1. Used
   2. Not used

5. Jewellery
   1. Worn
   2. Not worn

6. Finger nails
   1. Short
   2. Long
   3. Polished
   3. Not polished

7. a) Garbage receptacles
   1. Present
   2. Not present
   b) If present are they covered?
   1. Yes
   2. No

8. a) Is the person handling the money the same one serving the food?
   1. Yes
   2. No
   b) If yes when serving the food does he/she put on gloves, use tongs or other equipment to prevent direct contact with the food?
c) Kind of packaging material used
1. Plastic paper bags  2. Used newspapers
3. Cement papers  4. Used flour papers

9. Are the prepared foods protected by suitable covering?
1. Yes  2. No

10. a) Kinds of utensils are used
1. Plastic  2. Metal
3. Enamel  4. Disposable paper plate

b) Kind of water is used for cleaning utensils
1. Warm soapy water  2. Cold soapy water
3. Warm water  4. Cold water

c) Is the water used for cleaning utensils dirty?
1. Yes  2. No

d) Are the utensils looking clean?
1. No  2. Yes

e) Utensils kept above the ground and covered
1. Yes  2. No

11. Whether containers for food additives covered
1. Yes  2. No

12. Method of water drainage
1. Sewer  2. Tunnel  3. Thrown beside the stall

13. Is the environment free from refuse disposal?
1. Yes  2. No

14. Presence of latrine
1. No  2. Yes

15. a) Presence of sitting area
1. Yes  2. No

b) Is the sitting area dusty?
1. Yes  2. No
Appendix III: Interview schedule for the Public Health Officers

I am a student from the School of Pure and Applied Science, Department of Foods Nutrition and Dietetics at Kenyatta University. I am carrying out a Research titled “Hygienic and sanitary practices of street food vendors on street food in Nairobi”. You have been selected as one of the participants in this study. This study is aimed at determining your experiences with street foods. Please assist me by answering the following questions as accurately as possible. You are assured of confidentiality of any information you give. It will be used for academic purposes only. Thanks

ESTATE  

CODE  

1. Gender  

2. Have you been trained as a Public Health Officer?  

3. How long have you been working as a Public Health Officer?  

4. How long have you worked in this estate?  
5. What is your role as a Public Health Officer?

6. Is there an act, which deals with the safety of street foods in Kenya?
   1. Yes  
   2. No

7. If yes, how adequate

8. How regularly do you inspect the street food vendors?

9. What are the requirements of food safety for the street foods?

10. What do you look for when inspecting the street food vendors?

11. What do you do when you find street food vendors who do not meet the requirements for food safety?

10. What are some of the difficulties you face as a Public Health Officer?

11. Give your comments about street foods?

Thank you for your co-operation
Appendix IV: Interview schedule for the street food consumers

I am a student from the School of Pure and Applied Sciences, Department of Foods Nutrition and Dietetics at Kenyatta University. I am carrying out a Research titled “Hygienic and sanitary practices of street food vendors on street food in Nairobi”. You have been selected as one of the participants in this study. This study is aimed at determining your experiences with street foods. Please assist me by answering the following questions as accurately as possible. You are assured of confidentiality of any information you give. It will be used for academic purposes only. Thank you.

ESTATE

STREET CONSUMER CODE

PART ONE: DEMOGRAPHIC CHARACTERISTICS

1. Gender
   1 Male  2 Female

2. Marital status
   1 Widowed  2 Divorced
   3 Single  4 Married

3. How old are you?
   1 Below 18  2 19-28
   3 29-38  4 Over 39

4. What do you do for your living?
5. What is your highest level of education you have attained?

1. Primary and below
2. Secondary ‘O’ level only
3. Secondary ‘A’ level only
4. Certificate college
5. Diploma college
6. University

PART TWO: EXPERIENCES WITH STREET FOODS

1. a) When did you start eating street food?

b) Why do you eat street foods?

c) Which street foods do you eat?

d) Which is your favorite street food and why?

d) When do you eat these street foods?

1. Breakfast
2. Lunch
3. Supper
4. Snacks

2. a) Do you think street foods are safe?

1. Yes
2. No

b) If yes, way?

c) If no, why?
3. a) Have you ever had a bad experience with street foods?
   1 Yes  2 No

   b) If yes what was it?

   __________________________________________________________
   __________________________________________________________

   c) What did you do?

   __________________________________________________________
   __________________________________________________________

4. What would you like the street food vendors to improve on their foods?

   __________________________________________________________
   __________________________________________________________

5. What would you like the government to do for street food vendors to ensure better services to consumers?

   __________________________________________________________
   __________________________________________________________

6. Give any comments you like or dislike on street foods and street food vendors

   __________________________________________________________
   __________________________________________________________

Thank you for your co-operation.