

## Factors Affecting Food Hygiene Practices in Rural Restaurants: A Case of Kawambwa District

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**Abstract:** Food borne diseases are major health problems in developing countries including Zambia. The objective of this study was to assess food handling practice and associated factors among food handlers working in food establishments of Kawambwa central part, in Luapula province of Zambia. Quantitative study design was conducted among 70 food handlers working in 13 food establishments (restaurants and lodges), and 10 members of regulatory bodies. Data were collected using face to face interview with pretested structured questionnaire and physical observation. In this study, poor sanitary conditions of restaurants, poor water and sewage systems around restaurant areas, lack of consistent health inspections, and inadequate knowledge about food hygiene were found to be the major contributing factors to poor food hygiene practices in Kawambwa central area. Based on the findings of the study, it was recommended that more studies on food hygiene practices should be carried out in other parts of Kawambwa district and also extended to other parts of Zambia as food safety is an important aspect which can help curb foodborne disease outbreaks. It is also recommended that health inspections should be scheduled and carried out more often by relevant authorities in the area.

**Keywords:** Sanitary, restaurants, health, inspection and hygiene

### ACRONYMS:

**CBD:** Centre Business District; **NGO:** Non- Governmental Organization; **WHO:** World Health Organization; **DHB:** District Health Management Board; **DHMT:** District Health Management Team

**Food:** is any nutritious substance that people eat or drink in order to maintain life and growth.

**Hygiene:** is a condition or practices conducive to maintaining health and preventing disease especially through cleanliness.

**Disease:** is any condition that causes one to not feel well.

## 1. INTRODUCTION

Hygiene practices are referred to as “a set of practices performed to preserve health(World Health Organization, 2015).” It also refers to conditions and practices that help to maintain health and prevent the spread of diseases.

Between 2015 and 2018 there has been 80% increase in a number of restaurants both in urban and rural areas in Zambia as a way of raising income for the families. However, 15,000 of the population, amount to 50% are not following the hygiene practices in most of the rural restaurants have to be done because the hygiene practices are below undesirable level and that, if it is left unchecked can cause communicable diseases such as cholera and dysentery (District Health Management Team, 2016).Thus, this study was carried out in order to assess the factors affecting food hygiene practices in order to help curb the outbreaks.

### 1.1. Background of the Study

The term food safety is increasingly being used in place of food hygiene and this encompasses a whole range of issues that must be addressed for ensuring the safety of ready to eat foods. Food hygiene therefore put too much emphasis on cleanliness while food safety requires much more than a clean premises (World Health Organization, 2017).

By 2018, 90% the general population has increased and this has led to increases in the demand of wide variety of food stuffs which include those that are often eaten away from homes. This demand has led to an increase in the establishment of many eating places such as hotel, lodges, restaurants and guest houses. The demand for a wide variety and convenient foods is also increasing the risk of food

borne diseases and infections on the consumers who mainly depend on these establishments. People are not following hygiene measures, they are failing to preserve, cook, or store food for human consumption, which eventually leads to food poisoning. If someone eats the food may suffer from stomach upset. 75% of people are failing to follow the measures of handling food properly (Albert, 2017). In Kawambwa district, several people have been suffering from water borne related ailment.

Thus, it is important that people handling food observe certain strict hygienic measures especially when it comes to cleaning, preserving, cooking or storing food for human consumption. This is because good health is dependent on the manner food is handled. This is because if one eats meat that was cooked a while ago, but was not refrigerated or stored properly, it could lead to an upset stomach resulting into food poisoning or other digestive problems. Therefore, it is absolutely essential for people of all ages to be aware of food safety measures and proper food handling practices (Albert, 2017). In the recent past, in Kawambwa district, many people have been suffering from water borne related ailments. For example according to the medical report (District Health Management Team, 2016), the district recorded about three cases of cholera which resulted in one death. About 105 cases of water borne diseases were also recorded. It was cited that among the causes of the cholera and water borne diseases in the district was the poor sanitation system in the area.

### **1.2. Statement of the Problem**

Kawambwa has various social-economic activities that have led to sharp rise in population especially within its central parts. This has resulted into a high demand for the provision of food services in public eating places. There are approximately 15 restaurants in the Centre business district (CBD) of Kawambwa that are accessed by civil servants from nearby Government offices, motorists, traders in transit, local marketers and the general public. The increased demand in the food service provision has led to the mushrooming of three different classes of food eating outlets. These are Guest Houses/Lodges for the high class, the better attractive restaurant for the medium class and the Low grade restaurants for the majority poor. The paucity of the studies on food safety among academics, in food science, has led to health administrative departments taking the evaluation of food safety and hygienic practices of food establishments (World Health Organization, 2015). The direct cost of food borne illness outbreak can approximate \$75,000 per food service establishment and these can include investigation clean-up, re-staffing, restocking, product loss, settlements and increased regulatory sanctions (Al-Goblan, 2010). In the CBD of Kawambwa, there has been public outcry on the individual health status and level of understanding of food safety regulations by the personnel who are handling food in restaurants. It is observed that food handlers are employed minus considering their qualifications background. Neither the Local Government Council nor District Health Board seems to have serious work plan for its inspection team to determine the hygiene practices there. Furthermore, the hygiene practice standards get compromised since water used in the restaurants is mostly not sourced from the running taps but from either shallow wells or rusty boreholes hundreds of meters away. In many cases, mad people or children between the age of seven and twelve are used to fetch water at a fee. The dishes are found to be cleaned in recycled or dirty water. Worse still, leftover food and other food waste are dumped at garbage points closer to the restaurants and remain uncollected for some days. This is because the Local Authority has only a single keep Zambia Clean Campaign truck that is usually taken to perform unintended purposes. This puts a health hazard not only to the general public visiting such food outlets but also the food handlers. And that may result in the perpetual disease outbreaks of cholera, dysentery, typhoid or any diarrhoea ailment. These factors have compounded this study to be undertaken in order to establish the factors that contributed to poor hygiene practice in Restaurants in Kawambwa district of Luapula province.

### **1.3. Aim of the Study**

The main aim of the study was to examine the factors affecting food hygiene practices in Kawambwa district.

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

The objectives of the study were:

- (i) To assess the demographic characteristics of food handlers in Kawambwa district.
- (ii) To examine the contributing factors to the poor hygiene practices among food service providers in restaurants of Kawambwa district.

- (iii) To assess the level of knowledge regarding food hygiene practices among food handlers in Kawambwa district.
- (iv) To assess food hygiene practices among food handlers in restaurants of Kawambwa district

#### **1.4. Research Questions**

- (i) What are the demographic characteristics of the food handlers in Kawambwa district?
- (ii) What are the contributing factors to the poor hygiene practices among food service providers in restaurants of Kawambwa district?
- (iii) Do food service providers have adequate knowledge on food hygiene practices in Kawambwa district?
- (iv) What are the common food hygiene practices among food handlers in Kawambwa district?

#### **1.5. Significance of the Study**

The importance of this study is to make available the information to be gathered to the relevant stakeholders like the food outlet operators, the personnel handling food in restaurants, the public populace that access food in restaurants as well as the mandatory service providers who include the District Health Inspection Team and the Local Government Authority. This will help the relevant regulatory authorities to address the numerous challenges they are facing in the hygiene practices such as testing the health status and determine the minimum qualifications of food handlers. The information obtained in this study will help administrative departments taking the evaluation of food safety and environmental health regulations and setting up the minimum operational requirements for food service providers.

#### **1.6. Limitations**

The study was done under the following challenges:

##### **Time Constraints:**

Being a serving teacher, the researcher had limited time. There was need to perform the responsibilities of HOD – Home Economics, Instructor – Design Cutting and Tailoring, house wife while at home and that of a researcher

##### **Financial Constraints:**

A large part of the researcher's earnings was spent on the self-sponsored distance learning programme alongside the much needed support towards the household upkeep. It was not easy to polish the project to maximum standards.

##### **Respondents' Attitudes:**

There were hindering aspects since some respondents wanted to be paid in exchange for information. As such, some intended respondents, especially from the market and bus station could not participate.

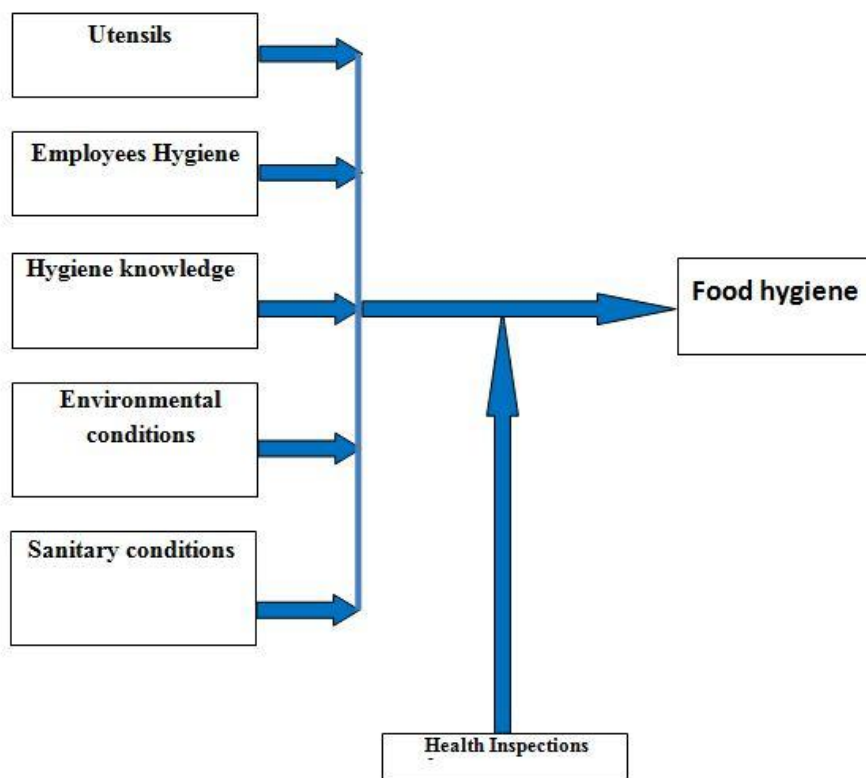
##### **Transport Constraints:**

The researcher did not reach all the target population as the transport costs were higher than the researcher could afford during the collection of data from respondents.

## **2. LITERATURE REVIEW**

This chapter introduces the literature related to the matters of hygiene practices within the restaurants located in the central parts of a rural district in Zambia. The researcher looked at what others say on the topic at hand and compared their opinions so as to attain a deeper understanding. The paucity of the studies on food safety among academics, in food science, has led to health administrative departments taking the evaluation of food safety and hygienic practices of food establishments (World Health Organization, 2012).

## 2.1. Conceptual Framework



**Figure1.** *Conceptual Framework on Food hygiene practices*

## 2.2. Global Perspective Studies

In Africa poverty is the underlying cause of consumption of unsafe food. Lack of access to potable water, poor government structural arrangement, communicable diseases, trade pressure, and inconvenient environmental conditions are notable reasons (Tessema et al., 2014). High incidence of diarrheal diseases among children is an indication of the food hygiene situation in the African region. There are many factors associated with food handling practices. A study done in Ankara, Turkey, Mekelle town, and Bahir Dar town, Ethiopia indicated that knowledge of food handling is significantly related with food handling practices, whereas, a study done on central India, Bangladesh, and Nigeria indicated that food handling practices was related with educational status of food handlers. More ever, a study done in Nigeria and Kenya in 2009 showed that type of premise, unclean equipment and work responsibility was factors affecting food handling practices (Tessema et al, 2014). Gender was also found to be associated with food handling practices of vendors of street foods in Nairobi, Kenya. In addition to socio demographic factors, environmental factors such as temperature, solid waste storage, solid waste disposal, latrine condition and hand washing facilities of the food and drink establishment were associated with food handling practices. Food borne diseases are common in developing countries including Zambia because of the prevailing poor food handling and sanitation Practices, inadequate food safety laws, weak regulatory systems, lack of financial resources to invest safer equipments, and lack of education for food handlers (Tessema et al., 2014).

## 2.3. Factors Contributing to Poor Hygiene Practices among Food Service Providers

### 2.3.1. Equipment

According to Centers for Disease Control and Prevention (2015) contaminations of equipment occurs during production, as well as when the equipment is idle. Even with hygienic design features, equipment can collect microorganisms and other debris from the air, as well as from employees and materials. A recommended way of reducing contamination of equipment is through improved hygienic design and more effective cleaning.

### 2.3.2. *Employees*

Santacruz (2016) affirm that employees are the largest source of all the viable means of exposing microorganisms to food. Employees who do not follow sanitary practices contaminate food that they touch, with spoilage and pathogenic microorganisms that they come in contact with through work and other parts of the environment. The hands, hair, nose, and mouth harbor microorganisms that can be transferred to the food during processing, packaging, preparation, and service by touching, breathing, coughing, or sneezing (Santacruz, 2016). Because the human body is warm, microorganisms proliferate rapidly, especially in the absence of hygienic practices. According to Ward et al. (2007) the spread of bacteria from one location to another can be prevented after the chain of infection is broken. Generally, the mishandling of food by people perpetuates the chain of infection until someone becomes ill or dies before corrective actions are taken to prevent additional outbreaks (Santacruz, 2016). If every person that handles food could achieve appropriate personal hygiene, food contamination could be minimized. Every employee involved with food manufacturing can play a very important role in preventing food contamination by adhering to recommended food safety practices.

### 2.3.3. *Air and Water*

Ward et al. (2007) postulates that water serves as a cleaning medium during the cleaning operation and is an ingredient added in the formulation of various processed foods. It can also serve as a source of contamination. If excessive contamination exists, another water source should be obtained, or the existing source should be treated with chemicals (such as ultraviolet units) or other methods (World Health Organization, 2012). Contamination can result from airborne microorganisms in food processing, packaging, storage, and preparation areas. This contamination can result from unclean air surrounding the food plant or from contamination through improper sanitary practices. The most effective methods of reducing air contamination are through sanitary practices, filtering of air entering the food processing and preparation areas, and protection from air by appropriate packaging techniques and materials.

### 2.3.4. *Sewage*

Raw, untreated sewage can contain pathogens that have been eliminated from the human body, as well as other materials of the environment. Examples are microorganisms causing typhoid and paratyphoid fevers, dysentery, and infectious hepatitis. Sewage may contaminate food and equipment through faulty plumbing (Ward et al., 2007). If raw sewage drains or flows into potable water lines, wells, rivers, lakes, and ocean bays, the water and living organisms such as seafood are contaminated. Santacruz (2016) opines that privies and septic tanks should be sufficiently separated from wells, streams, and other bodies of water in order to prevent this contamination. In his study of use of municipal-treated sewage for irrigation purpose in Canada, Ward et al (2007) notes that raw sewage should not be applied to fields where fruits and vegetables are grown.

### 2.3.5. *Insects and Rodents*

Flies, rodents and cockroaches are associated with living quarters, eating establishments, and food processing facilities, as well as with toilets, garbage, and other filth. According to Ward et al (2007) these pests transfer filth from contaminated areas to food through their waste products; mouth, feet, and other body parts; while the regurgitation of filth onto clean food during consumption. Centers for Disease Control and Prevention (2015) recommend that serving areas should be protected against the entry of in order to stop contamination.

### 2.3.6. *Litter and Garbage*

The food industry generates a large volume of wastes: used packaging materials, containers, and waste products. Refuse should be placed in appropriate containers for removal from the food area so as to reduce contamination. The preferred disposal method (required by some regulatory agencies) is to use containers for garbage that are separated from those for disposal of litter and rubbish (Santacruz, 2016). Clean, disinfected receptacles should be located in work areas to accommodate waste food particles and packaging materials. According to Jacob and Powell (2009) these receptacles should be seamless, with close-fitting lids that should be kept closed except when the receptacles are being filled and emptied. Plastic liners are inexpensive and provide added protection. Santacruz



(2016) recommends that all receptacles be washed and disinfected regularly and frequently, usually daily. Containers in food processing and food preparation areas should not be used for garbage or litter, other than that produced in those areas.

#### 2.4. Public Health Aspects

Food safety is a priority for consumers and customers as they want safe health food, which keeps them strong and healthy. Major case for food contamination with pathogens is unsanitary practices during product handling, processing and distribution. Food poisoning agents (infection and intoxication), that are associated with foods include *Escherichia coli*, *Salmonella*, *Vibrio cholera*, *Staphylococcus aureus*, *Bacillus cereus*, *Listeria monocytogenes* and *Clostridium perfringens* (Madigan, 2011). *Staphylococcus aureus* is a human associated bacterium isolated from the human skin and nasal membrane and its presence in food indicates lapse in the maintenance of personal hygiene.

Salmonellosis is one of the major food-borne health hazards and is associated with animal food such as poultry, meat, milk, eggs and fish (Madigan, 2011). They produce enzymes that degrade carbohydrates, fats and proteins thus resulting in softening and flavor deterioration of foods. Under favorable conditions during harvesting, processing and storage of food commodities, moulds produce toxic metabolites called mycotoxins which are a concern to global food safety because of their effects on human health. Most mycotoxins are heat stable and capable of producing diseases of acute or chronic nature when ingested with food. They can affect organs like the liver, the kidney and nervous systems, endocrine and immune systems. Uses of an integrated management system of risks that reflects the HACCP concepts and emphasizes on good manufacturing practices have been recommended. New challenges to Zambian food supply have prompted public health authorities to consider adopting a HACCP- based food safety system on a wider basis, because of the increasing number of new food pathogens (World Health Organization, 2012). HACCP focuses on identifying and preventing hazards from contaminating food, is based on sound science, permits more efficient and effective government oversight, places responsibility on the food manufacturer or distributor, helps food establishments compete more effectively in the world market and reduces barriers to international trade (Albert, 2007).

#### 2.5. Food Handling Practices

Many studies on food handling have been undertaken in different parts of the world especially among street food vendors and kitchen staff working in hotels and fast food outlets. The importance of the cleanliness of the food contact surface has been recognized. However the cleanliness of non-food contact surface such as menus is thought to be under estimated. The role of foodservice workers in upholding food safety cannot be over emphasized. Mishandling of food as well as unhygienic or unsanitary conditions may result in food poisoning and foodborne disease outbreaks (Tavonga, 2014). It is thus the onus of food handlers to ensure that food is prepared under sanitary and hygienic conditions using appropriate food handling techniques. Risky food safety practices such as the holding of food under unsuitable temperature zones; use of unclean utensils and cutting boards; and failure to put in place measures aimed at preventing cross contamination of pathogens have been observed in many studies (Santacruz, 2016). More so, some studies revealed found that the implementation of food safety training programs is an important step in promoting safe food handling practices among food workers. However, other studies highlight the need to develop food safety risk perception skills among food workers (Ward et al., 2007).

Danniels *et al* (2014) in their study of pathogenic microorganisms associated with food contact surfaces including menus revealed that regular cleaning and sanitization of both kitchen and dining work surfaces is fundamental. Dining tables for instance are easily contaminated by guests who come to buy. If food handlers fail to effectively clean the surfaces, there is likely to be cross contamination of pathogens. (Santacruz, 2016) postulate that managers of food establishments should not take for granted the importance of correct hand washing procedure. In fact, Centers for Disease Control (2015) recommend the design and implementation procedures on hand washing. Similarly, training on correct hand washing cannot be overemphasized. In fact, one study found higher bacterial counts on tabletops in restaurants and bars that had already been cleaned with a dishcloth than before they were cleaned. Hence, surface sampling has become important in determining the sanitary condition of

environmental, food and hand contact surfaces (Santacruz, 2016). Several studies have found microbiological contamination in foodservice kitchens.

A study by Annor *et al* (2011), which investigated the cleanliness kitchen utensils and equipment such as knives, spoons, cutting boards, sinks and handles of pots, refrigerators and ovens showed that a significant number appeared clean but failed the hygiene swab test done in the laboratory. A similar study by Moore and Griffith (2013) in a cheese production company concurred with the findings of the preceding study. In this study, it was revealed that 90% of hygiene surface swabs had pathogens that suggested inadequate cleaning, sanitization and hand washing among employees. Another study of the cleanliness of surfaces in a hospital kitchen showed that there was need for improvement in cleaning and disinfection of kitchen equipment and working surfaces (Annor *et al.*, 2011). The series of cleanliness and sanitization studies that were undertaken by different researchers around the world generally support environmental microbiological monitoring in addition to routine inspections by environmental health officials.

The notion of having food safety training as a stand-alone measure was struck down by a study of food handlers' performance in Wales that proved that even food workers that had received training and knowledge on food safety also deviated from proper and safe food handling procedures (Hass, 2015). Bean and Griffin (2013) in their review of over 7000 reports on foodborne disease outbreaks that occurred between 1973 and 1987 came up with epidemiologic facts on the causes or drivers of the outbreaks. The two researchers attributed the outbreaks of foodborne diseases to contamination by either pathogenic microbes or chemical substances. The study also implicated human error and in some cases absolute negligence by food service workers.

## **2.6. Haccp and Food Safety**

Hazard Analyses Critical Control Point (HACCP) has been endorsed by the National Academy of Sciences Commission which is an international food standard setting organization, and the National Advisory Committee on microbiological criteria for foods (ICMSF, 2012). It is the best system available for designing programmes to assist food firms in producing foods that are safe to consume. The biggest advantage of HACCP over the other systems is that it pre-empts all the activities in the food process thus reducing risks in food-borne diseases. According to Manning *et al.*, (2013), the hazard of any material is determined by chemical, physical and biological properties.

The system employs several principles to meet the stated goals. These principles include hazard analysis, CCP identification, establishing critical limits, monitoring procedures, corrective actions, verification procedures and record keeping and documentation. When organizing and setting up HACCP programme, each step is important and necessary for the assurance of a safe, high quality finished products (Kuchennuller, 2013). The significant role of food safety in the economic and health development of the nation, in enhancing tourism, national and international trade is acknowledged (Albert, 2017). While food safety systems based on HACCP principle have been successfully applied in food service operations and have been universally accepted by government agencies, trade associations and the food industry around the world, little is known of the hygiene practices of urban restaurants.

Studies on food safety have tended to focus on regulations and measures required to develop and enforce the food safety regulations, education and technical sophistication to be applied by food processors (Martins, 2012). This may suggest a need for a study to determine if urban restaurants are ready to introduce a HACCP system of food safety assurance. The need to investigate the possibility of introducing a HACCP system, for restaurants, aroused from the fact that a HACCP system must be developed by each sector, such as urban food establishments and tailored to their individual products, processing and distribution conditions

The food safety development (FSD) strives to reduce the serious negative impact of food-borne diseases worldwide (Rosander, 2012). Food and waterborne diarrhoeal diseases are leading causes of illness and death in less developed countries, responsible for affecting 1.8 million people annually. Recent trends in global food production, processing, distribution and preparation are creating an increasing demand for food safety research in order to ensure a safer global food supply. WHO works closely with FAO (2012) to address food safety issues along the entire food production chain by the use of HACCP system? These methods provide efficient, science-based tools to improve food safety, thereby benefiting both public health and economic development.

## 2.7. Summary of Literature Review

Since the publications of various editions, journals and articles on food safety and sanitation, the science of food safety has changed tremendously both internationally and locally. In the developed and developing countries, the barriers to consumer participation on food safety are far too many thus ranking Zambia to be number eight next to India and Nepal (WHO, 2012). Global trends in food chain have created an increasing demand for food safety research to ensure safe food supply. Consumers well-informed are able to fight for their rights and ensure that they are provided with good quality products and services.

Food service workers continue to violate the basic principles of food protection with the result that food-borne illness outbreaks have not substantially decreased in the developing countries. An outbreak of E-coli was associated with bloody diarrhea and hemolytic uremic syndrome from hamburger. To deal with the aspects of public health, use of integrated management system of risks that shows the HACCP concepts and emphasizes on GMPs have been recommended (FAO, 2002). Hotels, restaurants, cafes, and roadsides stands in the commercial sector will all need to be advised, trained and certified as compliant (WHO, 2012).

## 3. METHODOLOGY

This chapter covers the research arrangement for data collection and analysis, description of the study area, target population, research instruments, validity and reliability of the instruments as well as data collection methods. Others include data collection procedure, sampling procedure, methods of data analysis, and ethical considerations.

### 3.1. Research Design

A research design is a systematic approach that a researcher uses to conduct a scientific study. For this particular study, a qualitative design was used. This design was deemed appropriate for the study as it aimed at getting opinions from respondents then code them into themes.

### 3.2. Study Area

The study was done within the Centre Business District and the surrounding parts of Kawambwa District which is located on the Northern plateau area of Luapula province of Zambia with a total population of 300 000 people. The Town Centre is busy with hyper of activities in heavy goods and public transportation around the bus station to the Southern direction while Government and NGO offices are to the North. The industrial area is on the East whereas trading of different goods and services is done within the hub of the town. Several residents from the stated work places and the visiting populace access food from restaurants around the market and bus station or guest houses within reach. The high standard restaurants are found in Lodges/Guest Houses dotted around and on the outskirts of the town which are accessed by dignified people and tourists while the better attractive restaurants scattered around the CBD are accessed by most of the middle income civil servants or the middle class like shop owners. Moreover, Low Grade restaurants which are mostly located around the main market and bus station areas are for the Low income civil servants or the Low class.

### 3.3. Sample and Sampling Technique

For this study, the target population was 250 and the population relies on the 15 low standard rural restaurants for their need. Hence, the sample size of 80 was calculated using an online sample size calculator with 95% confidence interval level and 5% margin error. Out of 80 respondents, 10 members from regulatory bodies and 70 food handlers were randomly selected to participate in answering the questionnaires and interview questions. A total of 13 restaurants and lodges were observed.

### 3.4. Research Instruments

These are measurement tools designed to obtain data on a topic of interest from research subjects such as case logs, surveys, interview schedules, focus group schedules and psychometric tests. However, for this study, questionnaires, structured interviews and observational checklists were used to obtain data.

### 3.5. Validity and Reliability

Validity is described as the degree to which a research study measures what it intends to measure while reliability refers to the consistency of a measure (Gliner & Morgan, 2000). The validity and



reliability of data was assured by proper designing and pre-testing of the questionnaires before actual data collection. Hence, the study was able to measure what it intended to and there was a degree of consistency in the data collected from different categories of respondents.

**3.6. Ethical Consideration**

Written consent was obtained from owners/managers of the restaurants before administering the questionnaire. Each respondent was assured that the information provided by him or her was kept confidential and used only for the purpose of this research.

**3.7. Data Collection**

Depending on the required data for the study, questionnaires were administered to the selected respondents while with the other respondents; structured interviews were conducted.

**3.8. Data Analysis**

The questionnaires were checked for competence, assessed and edited for corrections. Complete items were coded and entered onto excel and transported to Statistical Package for the Social Science (SPSS) version 20 software packages for analysis. The results were presented in tables, figures and texts using descriptive statistics such as mean, standard deviation and percentage to describe the study population in relation to relevant variables.

**4. PRESENTATION AND INTREPRETATION OF DATA**

This chapter presents the findings of the study. It details background information on the participants, emerging themes from the study which include examining the contributing factors to the poor hygiene practices among food service providers in restaurants of Kawambwa District, assessing the level of knowledge regarding food hygiene practices and assessing food hygiene practices among food handlers in restaurants in Kawambwa district.

**4.1. Demographic Characteristics of Respondents**

This section presents background information of the respondents from the regulatory bodies and food service providers who were involved in the study. These characteristics include gender, age and education level.

**Table1.** Gender of respondents (n=80)

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	6	60.0	60.0	60.0
	Female	4	40.0	40.0	100.0
	Total	10	100.0	100.0	
Members of regulatory bodies	Male	30	42.9	42.9	42.9
	Females	40	57.1	57.1	100
	Total	70	100.0	100.0	

**Source:** interview with food handlers and members of regulatory bodies, 2018.

Table 1 above indicates that of the participants, 6 males and 4 females were members of regulatory bodies while 30 males and 40 females where food handlers from various food establishments. The study shows that Kawambwa district has more female food handlers compared to males. This might be associated to the fact that food handling jobs are mostly associated to females. Thus, gender is a factor in food handling practices as this is in sync with the findings of a similar study that was carried out in Nairobi, Kenya (Tessema et al., 2014)

**Table2.** Age of Respondents (n=80)

AGE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Members of regulatory bodies	21-30 years	3	30.0	30.0	30.0
	31-50 years	5	50.0	50.0	80.0
	51 years and above	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

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Food handlers	18-25 years	35	50	50	50
	26-45 years	28	40	40	90
	46 years and above	7	10	10	100
	Total	70	100	100	

**Source:** interview with food handlers and members of regulatory bodies, 2018.

As shown in table 2 above, of the 10 members of regulatory bodies, 3 were between the age ranges of 21-30years, 5 between 31-50 years, and 2 were at least 51years and above. Out of the 70 food handlers, 35 were between 18-25 years, 28 between 26-45 years and 7 were at least 46 years and above. This implies that the majority of food handlers in this area are between the age ranges 18-15years and very few individuals above the age of 45years pursue food handling jobs.

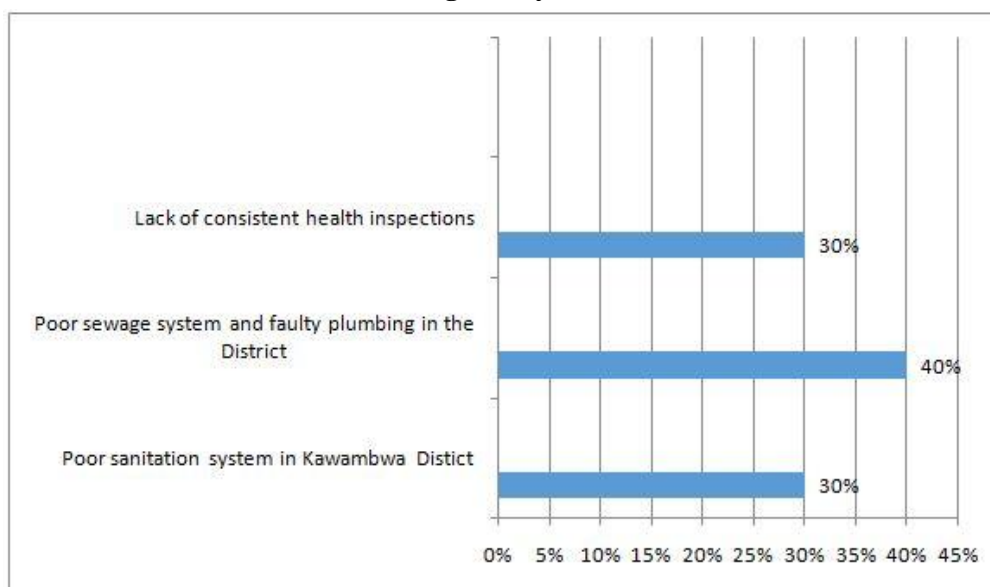
**Table3.** Education level (n=80)

EDUCATION					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First degree	2	20.0	20.0	20.0
	Diploma	6	60.0	60.0	60.0
	Secondary Education	2	20.0	20.0	20.0
Members of regulatory bodies	Total	10	100.0	100.0	100.0
Food handlers	Diploma	11	15.7	15.7	15.7
	Secondary (10-12)	18	25.7	25.7	41.4
	Grade 8-9	20	28.6	28.6	70.0
	no Education attained	21	30.0	30.0	100.0
	Total	70	100.0	100.0	

**Source:** interview with food handlers and members of regulatory bodies, 2018.

From the table above, 2 members of regulatory bodies had attained their first degree, 6 had attained their diploma, and 2 had only reached secondary level of education. Of the 70 food handlers, 11 had attained their diploma, 18 had reached secondary level (10-12), and 20 had reached grades 8-9, while 21 had not attained any form of academic education.

### 4.2. Data Presentation from Members of Regulatory Bodies

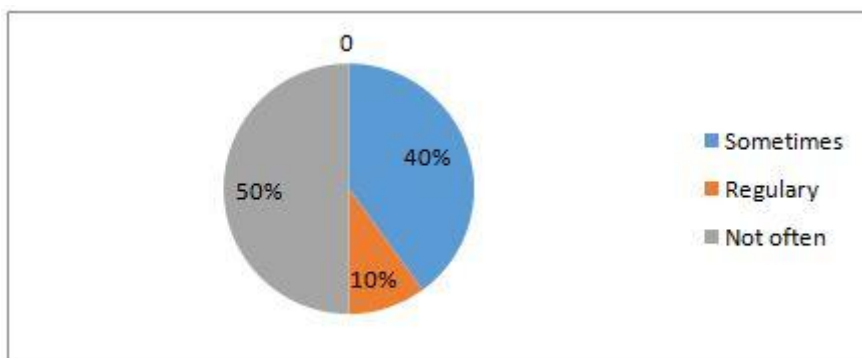


**Figure2.** Contributory factors towards poor hygiene practices among food service providers in Restaurants in Kawambwa District according to regulatory authorities

**Source:** regulatory bodies in Kawambwa District, 2018

From data provided by members of regulatory bodies, it was noted that lack of consistent health inspections, poor sewage system, faulty plumbing and poor sanitation are the factors that highly contribute to the poor food hygiene practices in Kawambwa district.

**4.3. Health Inspections**



**Figure3.** Frequency of health Inspections

**Source:** Centers for Disease Control, 2015

Figure 3 above clearly presents the frequencies of health inspections carried out in Kawambwa central. 50% of the members of regulatory authorities stated that health inspections are not carried out often, 40% stated that health inspections are only carried sometimes, and only 10% stated that health inspections are carried out regularly.

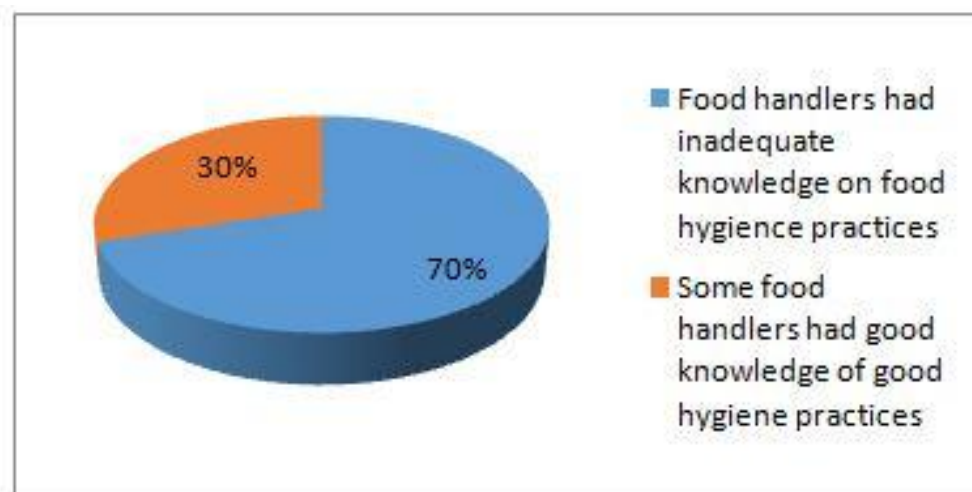
**Table4.** Data from Observation sheet (n=13 restaurants/lodges)

Status	Frequency	Percentage
Piped water	7	54%
Do not have piped water	6	46%
Total	13	100%

**Source:** survey from restaurants and lodges in Kawambwa District, 2018.

Table 4 presents data on the number of restaurants that use piped water in Kawambwa District (13 Restaurants and lodges sampled). It shows that 7 restaurants/lodges use piped water, while 6 use water from other sources other than piped water. In addition, the 70 food handlers were interviewed on the methods of water treatment they used. 35 food handlers stated that they used chlorine to treat their water, 25 stated that they boiled their water, and 10 stated that they never treated their water using any method.

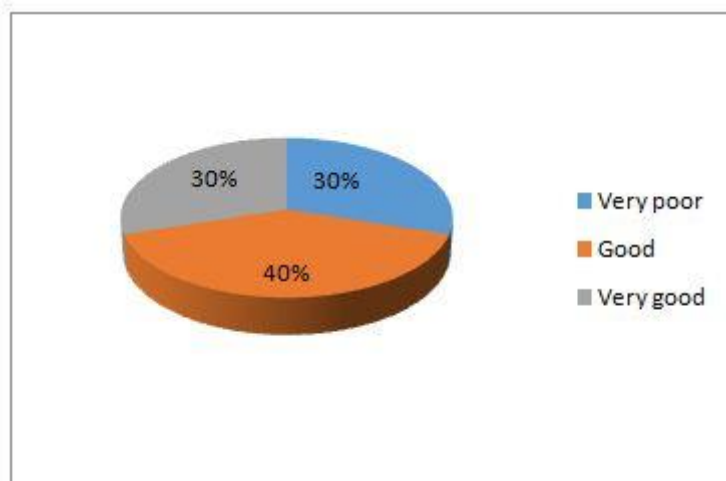
**4.4. Knowledge of Hygiene Practices**



**Figure4.** Assessment by regulatory health inspectors on the knowledge of hygiene practices by food handlers

**Source:** MoH: ZFETP, 2015

The chart above shows the views of regulatory authorities on the knowledge of good hygiene practices of food handlers in Kawambwa District. 70% of the respondents indicated that food handlers had inadequate knowledge on food hygiene practices while 30% indicated that some food handlers had good knowledge of food hygiene practices.

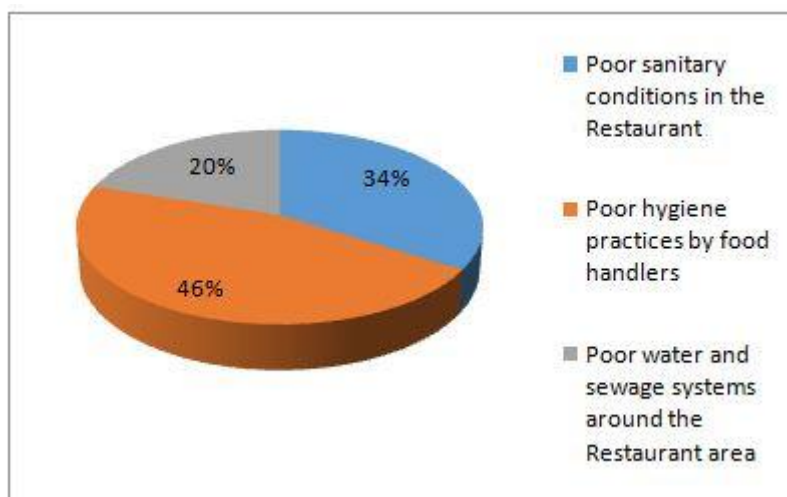


**Figure5.** Assessment of regulatory bodies on the hygiene practices of food handlers (source: Assessment by regulatory bodies on food hygiene practices,2016).

Figure 5 above shows the views of regulatory bodies on hygiene practices of food handlers in Kawambwa District (rating them as very good, good and very poor). 30% of the respondents indicated that the hygiene practices were very poor while 40% indicated that the hygiene practices were good. Lastly, 30% indicated that in some restaurants the hygiene practices were very good.

#### 4.5. Data Presentation from Food Handlers

##### 4.5.1. Factors Contributing to Poor Food Hygiene Practices



**Figure6.** Views of Food handlers on the factors contributing to poor food hygiene practices among food service providers

**Source:** interviews with food handlers, 2018

The chart above shows the views of food handlers on the contributory factors towards poor hygiene practices among food service providers. 34% of the respondents indicated that poor sanitary conditions in the Restaurants contributed to poor hygiene while 40% indicated that poor hygiene practices by food handlers contributed to hygiene problems in Restaurants. Lastly, 20% of the respondents indicated that poor water and sewage systems around the Restaurant area contributed to hygiene problems.

4.5.2. Understanding of Food Hygiene

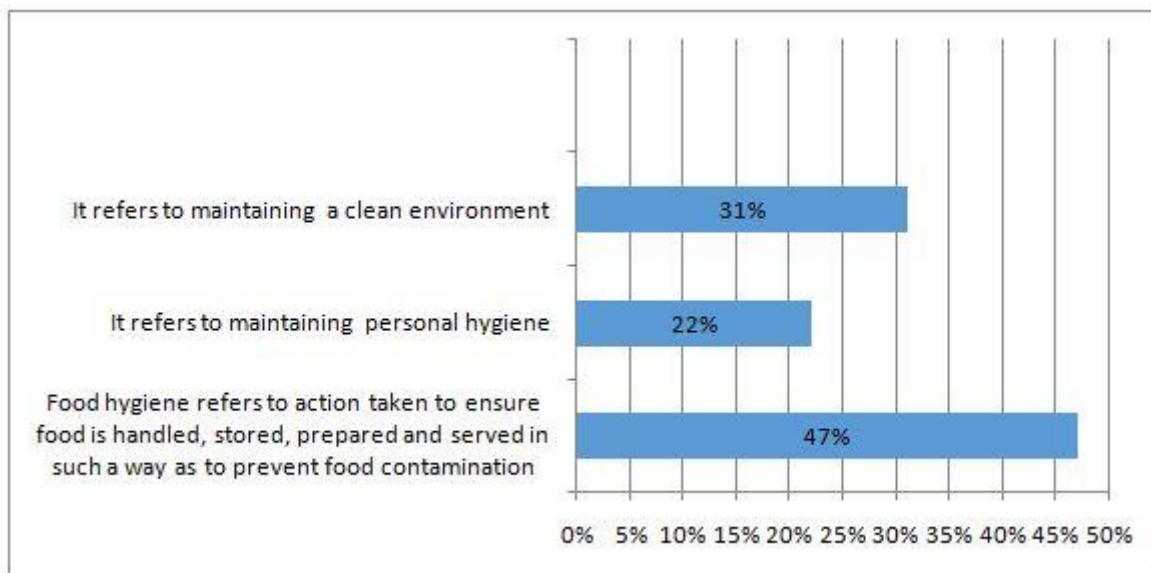


Figure 7. Definition of food hygiene by food handlers (source: interview with food handlers, 2018).

Figure 7 above shows the knowledge of food handlers on the definition of food hygiene, 47% of food handlers indicated that food hygiene refers to actions taken to ensure that food is handled, stored, prepared and served in such a way to prevent contamination of food, 22% indicated that it is a way of maintaining personal hygiene and 31% referred it as a way of maintained cleanliness of the environment.

4.5.3. Food Hygiene Knowledge and Practices

Table 5. Knowledge of food handlers on Food Hygiene Practices (n=70)

	Frequency	Percentage
Posting of food hygiene information sheet	39	56
No Posting of food hygiene information sheet	31	44
<b>Importance of food Hygiene Training</b>		
Important	27	39
Not Important	43	61
<b>Cross Contamination</b>		
Poor hygiene can cause cross contamination	25	36
Poor hygiene cannot cause cross contamination	45	64
<b>Prevention of foodborne diseases</b>		
Aware	23	33
Not aware	47	67
<b>Good hygiene practices Prevent diarrhea</b>		
Prevent	31	44
Does not prevent	39	56

Source: interview with food handlers, 2018.

Table 5 above shows knowledge levels of food handlers on food hygiene practices. 56% of food handlers had information sheets on the wall especially on hand washing while 44% did not have information sheets on walls in their restaurants. On the importance of food hygiene training, 39% of respondents indicated that food hygiene training was important while 61% indicated that it was not important. 36% of respondents knew that poor hygiene can cause cross contamination while 64% did



not know. 33% knew that foodborne diseases are preventable while 64% of respondents were not aware on the prevention of foodborne diseases.

**Table 6.** Hygiene Practices of Food handlers (n=70)

	Frequency	Percentage
<b>Wash hands before handling food</b>		
Wash hands before handling the food	10	14.28
Do not wash hands before handling food	60	85.71
<b>No of times when hands are washed</b>		
Once a day	25	35.71
Three times a day	26	37.14
After every procedure	19	27.14
<b>Wash hands with soap</b>		
Wash with soap	17	24.28
Does not wash with soap	53	75.71
<b>Covering hair</b>		
Covered	21	30
Not covered	49	70
<b>Protective clothing</b>		
Wear protective clothing	19	27
Do not wear protective clothing	51	73
<b>No of times when nails are cut</b>		
Once a week	30	18.57
Twice a month	27	38.56
Once a month	13	42.86
<b>No of times when working area is cleaned</b>		
Once	10	14.29
two times	45	64.29
Every after a procedure	15	21.43

**Source:** interview with food handlers, 2018.

Table 6 above presents the common hygiene practices considered by food handlers. These include, hand washing, covering of hair, use of protective clothing, maintenance of nails, and cleaning of work area among others. Considering the percentages in the table above, it was concluded that most of the food handlers in restaurants of Kawambwa district are not aware of the food hygiene practices that are important in prevention and control of foodborne diseases.

## 5. DISCUSSION OF RESULTS

This chapter discusses the findings of the study and compares with published literature. It also includes the conclusion and recommendations based on the findings. The findings of this study provide information on the demographic characteristics, knowledge and practices of food handlers in Kawambwa rural restaurants.

### 5.1. Demographic Characteristics of Food Handlers

This study aimed at assessing the factors affecting food hygiene practices in rural restaurants of Kawambwa central area involved 80 respondents of which 70 were food handlers and 10 were government workers. Based on demographic characteristics, 36 were males and 44 females. The study revealed that the majority of food handlers were between the age ranges 18-25 years. Besides that, it also revealed that out of the 70 food handlers, 11 had attained tertiary education, 18 grades 10-12, and 20 grades 8-9 while 21 had not attained any form of academic education.

### 5.2. Contributing Factors to Poor Hygiene Practices

In this study, poor sanitary conditions of restaurants, poor water and sewage systems around restaurant areas, lack of consistent health inspections, and inadequate knowledge about food hygiene were found to be the major contributing factors to poor food hygiene practices in Kawambwa central area. A similar study conducted in North West Ethiopia by Tessema et al. (2014) also revealed that poor sanitary conditions and inadequate knowledge about food hygiene were the major contributing factors to poor hygiene practices.

### 5.3. Knowledge and Food Hygiene Practices of Foodhandlers

Generally, it was found that 70% of the food handlers had less knowledge on food hygiene. That is, most of the food handlers were unaware of the various food hygiene practices that exist including hand washing, general cleaning, covering of hair and maintenance of nails. However, not all of them followed the hygiene practices as required. The study revealed that 85.71% of food handlers never washed their hands before handling food, and only 24.28% of them used soap while 75.71 % used soap. Other than that, 19% admitted to wearing protective clothing while handling food and 51% did not use protective clothing.

## 6. CONCLUSION

Good food hygiene practices are very important in preventing food borne diseases. As shown in the study. However, it has been observed that Kawambwa district has more female food handlers compared to males. It has further been noticed that this is linked to the nature of the society's attitude that food handling jobs are mostly associated to females. In addition, it has also been examined that among the leading factors contributing to poor food hygiene are poor water and sewage systems around restaurant areas, poor sanitary conditions of restaurants, lack of consistent health inspections, and inadequate knowledge about food. Based on the findings of the study, it can thus be argued that most of the food handlers also had less knowledge on food hygiene.

Thus, comprehensive health education and promotion through continuous training on food hygiene and safety, with promotion of gown during food handling, regular medical checkups of food handlers are promising strategies for promoting proper food handling practices.

## 7. RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

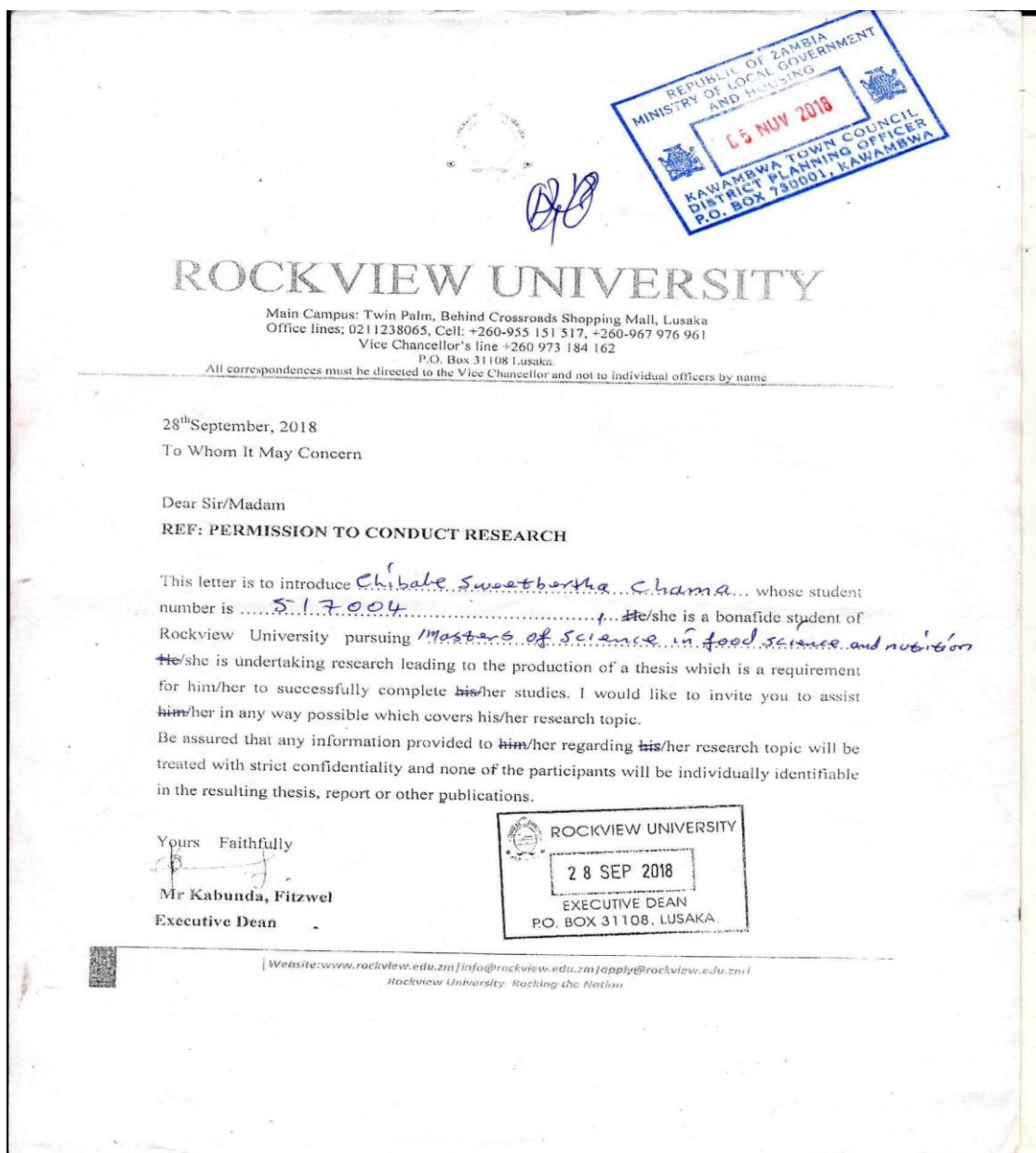
- It is recommended that more studies on food hygiene practices should be carried out in other parts of Kawambwa district and also extended to other parts of Zambia as food safety is an important aspect which can help curb foodborne disease outbreaks.
- It is also recommended that health inspections should be scheduled and carried out more often by relevant authorities in the area in order to monitor the conditions of food establishments and ensure that the sanitary conditions are as required.

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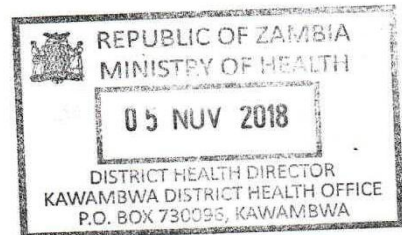
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APPENDIX 1 A



APPENDIX 1 B



# ROCKVIEW UNIVERSITY

Main Campus: Twin Palm, Behind Crossroads Shopping Mall, Lusaka  
Office lines; 0211238065, Cell: +260-955 151 517, +260-967 976 961  
Vice Chancellor's line +260 973 184 162  
P.O. Box 31108 Lusaka.

*Mija*

All correspondences must be directed to the Vice Chancellor and not to individual officers by name

28<sup>th</sup> September, 2018  
To Whom It May Concern

Dear Sir/Madam

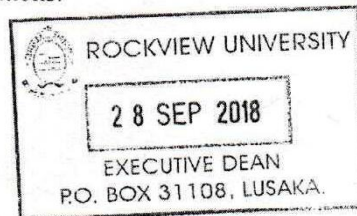
**REF: PERMISSION TO CONDUCT RESEARCH**

This letter is to introduce *Chibale Sweetbertha Cham* whose student number is *517004*. He/she is a bonafide student of Rockview University pursuing *Masters of science in food science and nutrition*. He/she is undertaking research leading to the production of a thesis which is a requirement for ~~him~~/her to successfully complete ~~his~~/her studies. I would like to invite you to assist ~~him~~/her in any way possible which covers ~~his~~/her research topic.

Be assured that any information provided to him/her regarding ~~his~~/her research topic will be treated with strict confidentiality and none of the participants will be individually identifiable in the resulting thesis, report or other publications.

Yours Faithfully

*[Signature]*  
**Mr Kabunda, Fitzwel**  
Executive Dean



[Website: [www.rockview.edu.zm](http://www.rockview.edu.zm)] [info@rockview.edu.zm] [apply@rockview.edu.zm]  
Rockview University- Rocking the Nation



**Questionnaire for Regulatory Bodies and Food Service Providers**

Dear respondent,

This questionnaire is aimed at investigating factors that lead to poor hygiene practices in restaurants of the central parts of Kawambwa. Being one of the stakeholders who promote food safety among people in this area, you have given the opportunity to respond to this study in which you are expected to give correct information. Your response will be treated with the highest confidentiality during and after the study.

Thanks in advance.

Yours faithfully,

CHIBALE SWEETBERTHA CHAMA

Rockview University.

**DO NOT WRITE YOUR NAME IN THIS QUESTIONNAIRE.**

INSTRUCTIONS: Please answer all the questions by ticking according to your response or by providing a short written response accordingly.

**1. Age group.**

<input type="checkbox"/> 15 – 20 years	<input type="checkbox"/> 31 – 40 years	<input type="checkbox"/> 51 – 20 years
<input type="checkbox"/> 21 – 30 years	<input type="checkbox"/> 41 – 50 years	<input type="checkbox"/> 66 and above years

**2. Highest level of academic qualification.**

<input type="checkbox"/> Grades 1 - 7	<input type="checkbox"/> Grades 8 - 9	<input type="checkbox"/> Grades 10 - 12
---------------------------------------	---------------------------------------	---

**3. Highest level of professional qualification.**

<input type="checkbox"/> Trade Test	<input type="checkbox"/> Diploma	<input type="checkbox"/> Masters Degree
<input type="checkbox"/> Certificate	<input type="checkbox"/> First Degree	<input type="checkbox"/> Doctor or Professor

Others, specify .....  None or Nil

**4. Where do you store utensil**

<input type="checkbox"/> Washing basket	<input type="checkbox"/> Drawers
<input type="checkbox"/> Shelves	<input type="checkbox"/> None

**5. How many types of knives do you have**

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
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6. When are food service providers supposed to wash their hands?

Immediately before and after reporting for work and eating food, after handling raw products , money, telephone or restroom.

Not true

7. Do the individuals handling food in restaurants go for medical check-ups?

Regularly       Sometimes       Not done       Not sure

8. Method of garbage disposal that you use.

Rubbish bin  Rubbish pit disposal point  open garbage disposal

9. Do restaurants have piped water taps or bucket taps for customers to wash their hands?

Yes       No (If the answer is 'No', state how customers wash their hands.)

.....

APPENDIX 3

INTERVIEW FOR FOOD OUTLET CUSTOMERS

Dear respondent,

This interview is aimed at investigating factors that lead to poor hygiene practices in restaurants of the central parts of Kawambwa. Being one of the customers who access food in this restaurant you have been given the opportunity to respond to this study in which you are expected to give correct information. Your response will be treated with the highest confidentiality during and after the study.

Thanks in advance.

Yours faithfully,

CHIBALE SWEETBERTHA CHAMA

Rockview University

INSTRUCTION:The respondent is not supposed to provide his or her name.

1. Age group.

15 – 20 years  31 – 40 years  51 – 20 years   
 21 – 30 years  41 – 50 years  66 and above years

2.Level of academic qualification?

Grades 1 - 7  Grades 8 - 9  Grades 10 - 12

3. Level of professional qualification?

Trade Test  Diploma  Masters Degree  
 Certificate  First Degree  Doctor or Professor  
 Others, specify .....  None or Nil

4. Do the individuals handling food in restaurants go for medical check-ups?

Regularly  Sometimes  Not done  Not sure?

5. Do restaurants have piped water taps?

Yes  No

No (If the answer is ‘No’, state how customers wash their hands.)

.....

6. Group of people who collect water from the bore hole?

10-15 yrs  21 yrs and above  Not sure   
 16-20 yrs  Mad people

7. Method of garbage disposal

Rubbish bin                       Open garbage disposal     Rubbish pit   
 Rubbish sack                       Heaped nearby the restaurant   
 Communal disposal point     Not sure

8 Type of ablution block (toilet) present for use by food handlers and customers of this restaurant?

Private and water-borne connected to utility company (LWASCO)

Private and water-borne connected to self-installed septic tanks

Public VIP toilet             Mobile toilet             Pit latrine   
 Private VIP toilet             Open bush   
 Not sure

APPENDIX 4

**OBSERVATION SCHEDULE SHEET**

**Research Title:** Factor Afecting Hygiene Practices In Restaurants Of The Central Parts Of Kawambwa

**KEY FOR TICKING:** On the Schedule Sheet: OS = Outstanding, VG = Very Good, G = Good, L = Low, VL = Very Low and N = None

TOPIC	SPECIFIC CONTENT FOR COMMENT	OS	VG	G	L	VL	N
COMPANY OPERATION	essence of Certificate of Operation on the wall						
	Update of Certificate of Operation						
	knowledge on Statutory Instrument No. 303 – Zambia Law						
	Level of knowledge & skills of Company Manager						
	category to which the Restaurant belongs						
	classification in which the restaurant is found						
KNOWLEDGE ON HYGIENE PRACTICES	average qualifications of personnel handling food						
	level of awareness by Head Cook						
	sequence of inspection by District Health Board						
	sequence of inspection by Local Government Authority						
	sequence of medical tests by personnel handling food						
	signs of abiding by good hygiene practices						
	essence of affiliation to National Board						
CUSTOMER SERVICE	level of reception to customers						
	access by International Tourists						
	access by Local Tourists						
	access by Civil Servants and NGO Staff						
	access by Shop owners and Shop Keepers						
	access by Marketers, Taxi and Bus drivers						
access by Call boys or surrounding Local							

	Entrepreneurs.						
WATER AND SEWARAGE SUPPLY	level of piped water supply system						
	level of provision of sewerage system						
	essence of hand washing facilities in toilets or nearby						
	essence of hand washing facilities inside restaurants						
	cleanliness of water storage facilities						
	cleanliness of water for dish washing						
	standard of dish washing facilities						
	essence of antiseptic detergents for dishes/hand						
<b>TOPIC</b>	<b>SPECIFIC CONTENT FOR COMMENT</b>	<b>OS</b>	<b>VG</b>	<b>G</b>	<b>L</b>	<b>VL</b>	<b>N</b>
INTERNAL ENVIRONMENT	standard of tables, chairs and serving dishes						
	standard of Air Ventilation and spacing of dining tables						
	standard of Restaurant floor and wall						
	general personal presentation by food handlers						
EXTERNAL ENVIRONMENT	essence of drainage system around the food outlet facility						
	essence of garbage disposal means around the food out let						
	appearance and smell released from the disposed garbage						
	level of outside cleanliness or the Landscape appearance						
	essence of enclosed garbage bin/s for left-over food						
	level of attractiveness of neighboring trading facilities						

**Citation:** Malvern Kanyati et al. "Factors Affecting Food Hygiene Practices in Rural Restaurants: A Case of Kawambwa District": Crisis and Schism on the Cameroon Cooperative Credit Union League (Camccul), 2006-2020" *International Journal of Humanities Social Sciences and Education (IJHSSE)*, vol 9, no. 3, 2022, pp. 31-52. doi: <https://doi.org/10.20431/2349-0381.0903003>.

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