IRASS Journal of Applied Medical and Pharmaceutical Sciences Abbriviate Title- IRASS J App Med Pharm Sci ISSN (*Online*) 3049-0901 <u>https://irasspublisher.com/journal-details/IRASSJAMPS</u> Vol-1, Iss-1(November-2024)



# Knowledge and Practical measures Employed by Food Vendors in the Implementation of Food hygiene at the Moveg-Betsi Market, Yaounde Cameroon

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#### **Corresponding Author Bourinyuy** Abstract: Food hygiene is a vital part of everyday life everywhere, impacting both Sandra Ngalim producers and consumers. In most low- to middle-income countries, it has become one of the most challenging issues to deal with. A 2015 World Health Organization Holy infant university institute of health sciences yaounde-cameroon, research estimates that 420,000 people die from food-borne illnesses each year, and nursing sciences. that the global burden of food-borne illnesses is over 600 million cases, or over one in Article History ten individuals. The goal of this study was to assist in improving food-related disease prevention measures at the Ministry of Public Health and Community level. A Received: 12/11/2024 community-based cross-sectional study using systematic random sampling was the Accepted: 23/11/2024 design of the investigation. Mvog-Betsi Market, one of the food vending marketplaces Published: 26 / 11 / 2024 in Cameroon's Center Region, served as the study region. A semi-structured questionnaire including four sections of closed and open-ended questions with predetermined objectives served as the data gathering method. SPSS (Statistical Package for Social Sciences) version 20 statistical software was used to analyze the data, which was then displayed as a frequency distribution table, pie charts, and bar charts. 81.8% of the 110 respondents that were enlisted for the study were female, and 18.2% were male, according to data collection and analysis. Given that they make up the majority, women are in charge of handling matters pertaining to food. Sixty-seven percent of the food vendors knew what food hygiene was. In terms of practice, the current study reveals that just 25.6% of respondents follow good food hygiene, while 74.4% do not. The majority of food vendors had poor food hygiene practices, although having strong knowledge of food hygiene, it may be concluded. The government should regulate vending activities and create training programs to educate sellers about food safety and hygiene, according to this finding. Keywords: Food hygiene, foodborne diseases, Practical measures, Mvog-betsi market, food vendor.

# Introduction

# 1.1 Background of the Study

#### 1.1.1 Global Background

At every level of the food chain, food hygiene encompasses all the conditions and actions required to guarantee the food's safety, appropriateness, and wholesomeness. In 2023, Emmanuel et al. A 2015 World Health Organization (WHO) research estimates that

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420,000 people die from food-borne illnesses each year, and that the global burden of food-borne diseases (FBD) is over 600 million cases, or over one in ten individuals. With 125,000 deaths annually, children under five account for 40% of the burden of food-borne illness, with low- and middle-income nations bearing the most burden. Many developing nations consider the sale of street food to be a major boost to their economies. As a result of rapid urbanization, many people now eat outside the home, increasing the importance of food establishments (Feldman et al., 2015). According to the Center for Disease Control and Prevention (CDC), (2010), good hygiene procedures include protecting supplies from microbiological, chemical, and physical hazards that may arise during the processes of food preparation, handling and serving. Customer's health is jeopardized due to lack of wholesome food production, and sadly, majority of street food is becoming one of the most common hazards linked to the rise in outbreaks of food borne illnesses in developing countries. Having meals away from home increases your risk of contracting a foodborne illness, according to Gangi, Mustilli, and Varrone, (2018).

Poor sanitary conditions and highly contaminated food were discovered in a study conducted among food truck workers in Brazil by Auad et al., (2019). According to a study conducted in China among street food vendors, the respondents had poor behavior patterns and little awareness of food safety (Teffo & Tabit, 2020). Over 60% of South African respondents were adequately aware of food safety and hygiene practices (Lema et al, 2020).

#### 1.1.2 Africa

In Sub-Saharan Africa (SSA), food safety is still a serious problem that has been made worse by people's lack of knowledge about food hygiene, despite government efforts through the National Agency for Food and Drug Administration and Control (NAFDAC) to improve the safety of the food supply. Unsafe food greatly impedes socioeconomic development and public health by causing a vicious circle of diseases including diarrhea and hunger. Population migration and shifts in consumer demand and behavior—urban dwellers seeking cheaper foods in the face of harsh economic realities—have led to an increase in the number of people purchasing and consuming food produced in public spaces. As a result, food safety issues increase the risk of food-borne illnesses, particularly in areas where sufficient funding has not been set aside for food safety management and intervention initiatives (Iwu et al., 2017).

#### 1.1.3 Cameroon

According to a survey conducted by Nguendo (2014), eating street food from vendors in big cities like Douala and Yaoundé is linked to 70% of food-borne illness incidents in Cameroon. Antibiotics are the primary tool utilized in the treatment of various illnesses. According to research conducted in Fako, a large number of food vendors were not using hygienic food handling procedures, which resulted in vegetable items becoming contaminated with bacteria (Akoachere et al., 2018). The urban poor in Cameroon rely on street food as a source of food energy and as a source of work and revenue. In Africa, the number of street food vendors has increased due to poverty, unemployment, and poor national economic performance. This is the situation in Cameroon, where there has been a discernible rise in food vendors despite the fact that their methods and the food they make are not controlled. (Kaptso and others, 2021).

Up to 45% of street food sellers in Yaoundé were found to have feco-orally transmissible parasites, indicating that most of them had poor personal hygiene standards (Blaise, 2014).

# **1.2 Statement of the Research Problem**

Food hygiene is a vital component of daily living on a global scale, impacting both producers and consumers (Boeck et al., 2019). In the majority of low- to middle-income nations, including Cameroon, it has become one of the most challenging societal issues to deal with. Millions of people are afflicted annually by the illnesses associated with eating tainted food, particularly in developing nations (WHO 2021). According to WHO estimates, 420,000 people die annually and 600 million become unwell after consuming tainted food.

According to research, a large number of food vendors in Cameroon do not handle food hygienically, which has led to bacterial contamination of vegetable products (Akoachere et al., 2018). Up to 45% of the street food sellers in Yaounde were found to have feco-orally transmissible parasites, indicating that the majority of them had poor personal hygiene standards (Blaise, 2014).

The researcher was interested in learning the reason behind the frequent occurrences of diarrhea and typhoid since she saw that many patients were hurried to the clinic and diagnosed with these illnesses while volunteering at a clinic across from Mvog-betsi market. After evaluating a few of the customers, the investigator discovered that every customer had eaten at least one item from the Mvogbetsi market. This led the investigator to evaluate the food vendors' practical food hygiene practices and level of understanding. To guarantee food safety, the World Health Organization suggested five tactics. These include using safe raw materials and water, preparing food completely, maintaining food at safe temperatures, keeping clean, and separating raw and cooked food. Many street food seller training programs, particularly in developing nations, have used these tactics. Despite all of these efforts, there are still gaps in the laws and regulatory bodies that oversee food safety, food sellers' understanding of safe food practices, and their methods for handling food. This study sought to evaluate the knowledge and hygienic practices used by food vendors in the study region in light of these issues.

#### **1.3 Research Questions**

#### **1.3.1 Main Research Question**

What knowledge and practical measures do food vendors in the Mvog-besti market employ in the implementation of food hygiene?

#### **1.3.2 Specific Research Questions**

- 1. How much do food vendors at the Mvog-besti market know about the application of food hygiene?
- 2. What practical measures do food vendors employ in the implementation of food hygiene?
- 3. What are the challenges faced by food vendors in the implementation of food hygiene?

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# **1.4 Research Objectives**

# 1.4.1. General Objective

To evaluate the food vendors' practical food hygiene practices and level of expertise at the Mvog-besti market.

# 1.4.2. Specific Research Objectives

- I. To assess the knowledge of food vendors in the implementation of food hygiene.
- 2. To assess the practical measures, employ by food vendors in the in the implementation of food hygiene.
- 3. To identified the challenges faced by food vendors in the implementation of food hygiene.

# 1.5 Significance of the Study

From the recommendations made after this research,

- The Ministry of public health will create centers where food vendors will be educated on good hygiene practices.
- Food vendors of the Mvog-besti market will gain or add more knowledge in the prevention of food borne diseases and thus reduces the morbidity and mortality rate of the population.
- It serves as a guide for other researchers to come in and carry out more research on food hygiene

# **1.6 Limitations**

The limitation of this work is that some socio demographic variables such as income of food handlers, supervision and inspection have not been considered.

#### **1.7 Delimitations (Scope of the Study)**

This work was limited to the food vendors of the Mvog-besti market (aged 18years and above) who sell any ready to eat item.

# 1.8 Conceptual Model/ Conceptual Framework

# **1.8.1 Conceptual Model**

- 1. The conceptual model that was used in this study is that of Nola Penders Health Promotion Model which was developed in 1982. This model defines the following.
- 2. Health as the state of physical, mental and social wellbeing and not just the absence of disease.
- 3. Wellness as the attitude and decisions made by an individual that results in positive behaviors and health outcome.
- 4. Health promotion as the process of powering individuals and communities to make healthy lifestyle choices to improve overall health and wellness.

# 1.8.2. Conceptual Framework



#### Figure 1: conceptual framework

Source: Nola Pender Health Promotion Model

# **Definition of Terms**

- 1. Knowledge is defined as facts, information, and abilities gained from education, experience, or theoretical or practical comprehension of a subject. (Aiken and others, 2013).
- 2. At every level of the food chain, food hygiene encompasses all the conditions and actions required to guarantee the food's safety, appropriateness, and wholesomeness. In 2023, Emmanuel et al.
- Practice refers to doing an activity or training regularly so that you can improve your skills. (Monney et al., 2013).
- 4. The circumstances and precautions required during food production, processing, storage, distribution, and preparation to guarantee that it is safe, healthy, and suitable for human consumption are known as food safety. WHO, 2021.
- 5. Any material that an organism consumes for nourishment is considered food. Ahaji (2013).
- 6. Food vendor is someone who prepares and sells ready-toeat food to the public. (Osaili et al., 2018).
- 7. Foodborne illness is defined as a disease usually caused by ingestion of food. (WHO, 2015).

# **Literature Review**

# 2.1 Theoretical Review

For humans to survive, they must consume food. However, foodborne illnesses are a huge global public health concern and a large source of economic loss since they spread around the world as a result of eating contaminated food. Throughout the food preparation process, food handlers are essential to maintaining food safety. According to estimates, tainted food causes millions of illnesses and thousands of deaths annually as a result of inadequate food handler safety procedures (Galgamuwa et al., 2016).

When food is handled, prepared, and stored improperly, intestinal parasites and harmful bacteria can contaminate the food, causing food poisoning and other food-related illnesses. More than half of diarrheal illnesses in developing nations are caused by eating tainted food. Millions of people are afflicted annually by the illnesses associated with eating tainted food, particularly in underdeveloped nations. These illnesses affect children and other vulnerable groups, including the elderly and pregnant people (WHO 2021a).

Over the years, a number of studies have tried to look into the knowledge and practices of food vendors in different settings. For instance, research by Asmawi et al. (2018) in Malaysia found that food vendors' handling practices were adversely affected by their ignorance of safety regulations, while experience and training may counteract these impacts. But according to a study by Stratev et al. (2017), food handling practices are not significantly impacted by growing knowledge about food safety.

#### 2.1.1 Causes of Foodborne Diseases

- 1. Foodborne diseases are illnesses caused by consuming contaminated food or drink (WHO 2014). They are very common, affecting millions of people each year.
- Major causes are bacteria (like Salmonella, E. coli, Campylobacter), viruses (like norovirus, hepatitis A), parasites (like Giardia, Cryptosporidium) and toxins (like botulinum toxin). Here are some of the main causes and sources of foodborne diseases:
- Bacteria Common examples include Salmonella, Clostridium perfringens, Campylobacter, Staphylococcus aureus, Listeria monocytogenes, E. coli. They can contaminate foods like meat, poultry, eggs, dairy, seafood, produce, etc.
- 4. Viruses Norovirus is a leading cause of foodborne illness and can infect food handlers and contaminate foods like produce, shellfish, ice. Hepatitis A can spread through contaminated produce, dairy, seafood.
- 5. Parasites Giardia, Cryptosporidium and Toxoplasma gondii are parasites that can contaminate water, produce and meat.
- Toxins Botulinum toxin produced by Clostridium botulinum bacteria causes' botulism. Other toxins can grow on foods like canned goods, meat, grains when improperly preserved.
- Chemical/Pesticides Pesticide residues, heavy metals like mercury, lead, cadmium, and chemicals like acrylamide can contaminate foods.
- 8. Molds/Mycotoxins Molds like aflatoxin can grow on improperly stored grains, peanuts and produce toxins.
- 9. Prions Abnormal prion proteins causing BSE (mad cow disease) can contaminate beef products.
- 10. Allergens Some foods like eggs, dairy, shellfish, nuts can cause allergic reactions, anaphylaxis in sensitive individuals.
- 11. Proper cooking, storage, sanitation and temperature control is key to prevent foodborne illnesses. Tracing

sources and timely reporting of outbreaks also helps control spread.

12. Here are some more details on common foodborne diseases organized by main pathogenic organisms.

## **Bacterial Diseases:**

- Salmonella Causes salmonellosis. Found in foods like raw/undercooked eggs, meat, poultry, dairy. Symptoms are fever, diarrhea, vomiting.
- E. coli O157:H7 Causes hemorrhagic colitis. Found in raw/undercooked beef, leafy greens, and dairy. Symptoms are severe diarrhea, abdominal pain.
- Listeria monocytogenes Causes listeriosis. Found in unpasteurized dairy, deli meats. Symptoms are fever, muscle aches. Can cause pregnancy complications.
- Campylobacter Causes campylobacteriosis. Found in raw/undercooked poultry, dairy. Symptoms are diarrhea, cramping, nausea.
- Clostridium botulinum Causes botulism. Toxin produced and found in canned goods, garlic, and honey. Symptoms are blurred vision, muscle paralysis.

# Viral Diseases:

- 1. Norovirus Causes gastroenteritis. Found in water, shellfish, surfaces. Symptoms are nausea, vomiting, diarrhea.
- 2. Hepatitis A Causes liver infection. Found in shellfish, produce, and infected food handlers. Symptoms are fever, stomach pain, and jaundice.
- 3. Parasitic Diseases:
- Giardia Causes giardiasis. Found in contaminated water, soil. Symptoms are gas, greasy stools, stomach cramps.
- Cryptosporidium Causes cryptosporidiosis. Found in contaminated food, water, surfaces. Symptoms are watery diarrhea, nausea, vomiting.

# 2.1.2 Factors Influencing Food Safety Practice

Because food handlers' improper food safety practices can exacerbate the spread of food-borne illnesses, food safety practices are important public health considerations in the prevention and management of these diseases. Food vending is typically linked to unsafe food handling practices, such as failing to separate easily cross-contaminated food, cooking food by failing to heat it to the proper temperature, improper refrigeration by keeping food at a temperature that encourages the growth of pathogens, poor or inadequate cleaning practices (hand washing, surfaces, vegetables), and eating risky food that may contain harmful pathogens.(Uzoama and others, 2023).Age, gender, and years of vending experience are just a few of the many variables that affect food safety practices. (Teffo and Tabit 2020; Chi et al. 2017; Siddiky et al. 2022).

## 2.2 Empirical Review

# 2.2.1 Knowledge of Food Vendors on Food Hygiene

Food safety is significantly impacted by food sellers. In other words, it is essential for the prevention and management of foodborne illnesses, therefore any food vendor who does not grasp it faces a significant risk to food safety. Knowledge is acquired

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through the learning process, which can include both official and informal education as well as firsthand experience. It has long been believed that behavior and practices are inevitably derived from knowledge. Guidelines for food safety can be improved by being aware of the negative effects of poor food hygiene practices. A global investigation on food hygiene practices has been conducted. (Prochaska & colleagues, 2021). Having sufficient understanding of food safety is essential for implementing food safety measures in food vending sites (Cortese et al., 2016). For instance, Osaili et al. (2018) found that sellers lacked adequate knowledge about food safety in their study conducted in Jordan. Similar findings were made by Kunadu et al. (2016) and Nkosi and Tabit (2021), who found that food vendors in Ghana and South Africa lacked adequate knowledge about food safety, which had an impact on their food safety procedures such as hand washing with soap and warm running water when handling and serving food.

# 2.2.2 Practices of Food Hygiene by Food Vendors

Food hygiene practice is a subject of extensive scope, and it is a comprehensive phrase used to describe the preservation and preparation of food in a manner that guarantees the food is safe for human consumption. The prevention of food contamination at every stage of production, collection, transit, storage, preparation, sale, and consumption is the focus of food hygiene. According to WHO (2015), a food-borne sickness is a disease that is typically contracted by food consumption.

Poor hygiene habits, incorrect food temperatures, and a failure to follow correct food preparation methods are all associated with food contamination (Monney et al., 2013). For instance, according to a study done in Bulgaria by Stratev et al. (2017), only 48.9% of food vendors said they regularly read the usage and storage guidelines for packaged food, while 44.4% of them often taste and serve food with their bare hands. Additionally, research on food from street food sellers in Brazil revealed that food vendors were not adequately practicing proper hygiene habits such cleaning their hands, covering their hair, and keeping their food cold (Cortese et al., 2016).

#### 2.2.3 Food Hygiene According to WHO

The state and practice of food hygiene aids in preserving health and halting the spread of illness. The preservation and preparation of food in a way that guarantees its safety for human consumption and avoids infection is referred to as food hygiene. Food hygiene is becoming a more significant health concern. Globally, governments are stepping up their efforts to make food safer. These initiatives are a reaction to growing consumer concerns and a growing number of food safety issues. Food safety is the process of keeping an eye on food to make sure it won't result in foodborne illness (WHO, 2021).

#### 2.2.4 Standard of Food Hygiene Practices

The Safer Food Manual's Essentials Over a million individuals contract food poisoning illnesses each year, and consuming contaminated food results in over a thousand fatalities. The majority of food-borne illnesses can be avoided by following safe food handling procedures. The WHO introduced the five keys and categorized the messages under straightforward sections (WHO, 2014).

a) Keep clean

Before handling food and frequently while preparing it, wash your hands.

- 1. Once you've used the restroom, wash your hands.
- 2. All surfaces and tools used in food preparation should be cleaned and sanitized. Keep food and kitchen areas safe from animals and bug infestations.

b) Separate raw and cooked food

- 1. Keep fish, poultry, and raw meat apart from other foods.
- 2. Handle raw food with different tools and utensils, like cutting boards and knives.

c) Cook thoroughly.

- 1. Cook food thoroughly, especially meat, poultry, eggs and sea food.
- 2. Bring food like soup and stew at boiling to make ensure that they have reach seventy degrees Celsius for meat and poultry.

D) Keep food in safe temperature.

- 1. Do not store food for too long even in the refrigerator
- 2. Do not leave cook food at room temperature for more than two hours Refrigerate promptly all cooked and perishable foods below five degrees Celsius

E) Use safe water and raw materials

Use safe water or treat it to make it safe-Select fresh and whole some foods

- 1. Choose food process for safety.
- 2. Wash fruits and vegetables, especially if eaten raw.
- 3. Do not use food beyond its expiring date.

# 2.2.5 Food Hygiene Strategies

Keeping food at the proper temperature, including chilled food, and keeping hot and cold food cooked as rapidly as possible before chilling it are the ways to maintain good food hygiene. Every item, especially the meat, is cooked to perfection. Areas used for food preparation, handling, and storage are kept hygienic, and food handlers consistently uphold high levels of personal cleanliness. Cross-contamination between raw and prepared meals is avoided (WHO 2015).

Increasing food safety initiatives, reaffirming that food safety is still a crucial component of public health, a top governmental priority, and a way to carry out the 2030 Agenda for Sustainable Development. The resolution also acknowledged the necessity of coordinated efforts at the local, national, regional, and international levels at every stage of the supply chain. Additionally, it urges all member states to create food safety policies that take into account the supply chain at every stage, the best available scientific data, recommendations, and innovations, as well as consumer interests. It also calls for sufficient funding to enhance national food safety and regional policies related to agriculture, trade, health, the environment, and development (Di Wu et al., 2021).

#### 2.2.6 Food Vendor's Hygiene

Hands should be thoroughly cleaned frequently when handling food, especially before handling raw food, especially raw meat, after blowing your nose, sneezing, or coughing. You should also wear clean clothes, aprons, and protective gloves, cover any cuts or sores with clean, water-resistant dressing, avoid coughing or sneezing over food, and avoid smoking (WHO 2014).

# 2.2.7 Environmental Hygiene

Training and oversight: It is the duty of food business owners and license holders to guarantee that all food handlers receive sufficient supervision, guidance, and food hygiene training. Food handlers who exhibit signs of food illness, such as vomiting, diarrhea, or stomachaches, should not touch food and should leave areas where food is prepared as once. The manager or license holder must be informed of any further illnesses and skin disorders. They must then decide if the person can still handle food and whether these symptoms provide a risk of bacterial or disease transmission.

Food preparation: Care must be taken when handling food to avoid infection, and handlers must maintain proper personal hygiene. For raw and prepared food, use distinct cutting boards or work surfaces, tools, and utensils. Steer clear of needless food handling. Prior to and following usage, clean surfaces and equipment. All poultry should be cooked through, with the center of the pork meat kept at a temperature that is consistent throughout.

- ▶ 60 degrees centigrade for at least 45 minutes.
- > 70 degrees centigrade for at least 10minutes
- > 75 degrees centigrade for at least 30minutes.

All food kinds should be transported in packaging or containers to prevent food contamination during transit. When cooked food is not kept hot until it is served, it should be chilled as soon as possible. The proper temperature is maintained for hot foods. Food that is ready to consume is kept apart from raw food. Foodtransporting vehicles are kept clean and in good repair, and food and non-food items are stored separately. areas used for handling food. When applicable, food outlets' internal structure and design should support proper food hygiene procedures, such as safeguarding against cross-contamination between and while food is being prepared (Ministry of Health, 2009).

# 2.3 Challenges Faced by Food Vendors in Implementing Food Hygiene

Food vendors have different techniques and deal with a variety of issues. These difficulties include poor hygiene habits and a lack of awareness about food safety. Poor food handling techniques and an unhygienic vending environment result from food vendors' frequent lack of formal education. Additionally, among the difficulties food vendors encounter in implementing food hygiene are budgetary limitations and consumer demand (Amami et al., 2016).

# **Materials and Methods**

The purpose of the study is to ascertain the level of knowledge and practical strategies used by food vendors at the Mvog-betsi market to implement food hygiene. The study area description, study design, study population, sample size, sampling technique, data collection tool, data analysis tools, data collection procedure, © Copyright IRASS Publisher. All Rights Reserved

ethical consideration, study duration, and results dissemination are the headings under which this work will be categorized.

# 3.1 Study Design

The study design was a community based descriptive crosssectional study.

# 3.2 Study Area and Setting

The study was carried out in the Mvog-betsi market. This market is situated in Yaoundé VI of the Mfoundi department, Central Region of Cameroon. It is in the middle of 4 quarters namely Etoug-ebe, Melen, Cite verte and Mokolo. It is bounded to the south by the Mvog-betsi Botanical Zoo (for the conservation and protection of biodiversity). The Mvog-betsi market also known as the new Melen market was instituted in 2007. This market is a food market as most of the things sold there are food stuffs. Food vendors are found all over the markets and along the streets of the market. The food stuffs being sold at the Mvog-betsi market are green leafy vegetables, chicken, plantains, cocoyam, fish, meat, corn, beans, rice, tomatoes, green spices, and fruits like pineapple, mangoes, pear, water million, and apple.

#### 3.3 Study Population

The study population was food vendors selling food stuff in Mvog-Betsi market within the study period.

# Inclusion Criteria

✓ Food vendors (18 years and above) selling ready to eat items in the Mvog-besti market (both males and females) who will consent to answer the questions in the questionnaire.

# **Exclusion Criteria**

- ✓ Food vendors that won't consent to answer the questionnaire.
- ✓ Food vendors that won't be present the time of data collection.

# 3.4 Study Duration

The study duration was 6months from February to July 2024.

# 3.5 Sampling Method

#### 3.5.1 Sample Size Calculation

The Cochrane's Formular was used to determine the sample size of the population

$$n = [(Z)2(p)(q)]/e2$$

where n = Sample size,

Z = Considering the confidence level of 95%, Z value is read from the normal distribution table Z = 1.96.

P = prevalence (0.073 Or 7.3%)

q = Proportion of failure (1-p)

e = Error of margin (0.05 or 5%) at 95% confidence level.

n = (1.96)2 (0.073) (0.927) / (0.05)2

n = (3.8416)(0.073)(0.927) / 0.0025

n = 109.684

n = 110 Participants.

# 3.5.2 Sampling Method

Primary data was gathered from respondents using open-ended and closed-ended questionnaires utilizing a systematic random sampling technique. After greeting the food vendors, introducing herself, explaining the goal of the study, and getting their assent, the researcher walked to the market and gave questionnaires to each vendor with an odd number—1, 3, and 5—until a sample of 110 people was reached. In systematic random sampling, individuals were chosen chronologically, with each participant having an equal chance of being chosen.

# 3.6 Data Collection Procedures and Sampling Analysis

Data was collected using semi structured questionnaire with both open ended and closed ended questions as per study objectives.

Variables

Dependent variables: Knowledge, Practice

Independent variables: Age, Gender, education.

# 3.7 Data Management and Analysis

Following data collection, SPSS (Statistical Package for Social Science) version 23 and Microsoft Excel were used to evaluate and manage the results in accordance with predetermined goals. The results were then shown using frequency tables, pie charts, bar charts, and histograms. Flash drives were used to store the analyzed data for backup purposes.

# 3.8 Ethical Considerations

To carry out this research,

- > An authorization was obtained from school.
- A verbal consent was obtained from those who were willing to participate in the study.
- A hand written letter was given to the quarter head of Mvog-betsi in order to obtain permission to carryout research in the Mvog-betsi market.

#### **Presentation and Analysis of Results**

The sample size used for this work was 110 participants. 110 questionnaires were administered and the criterion for the validation of data collected was for each questionnaire to be filled to at least 80%. All the 110 questionnaires were answered and handed to the investigator. The data was analyzed following specific objectives as follow;

Section One: Socio-demographic data

Section Two: Knowledge employ by food vendors on food hygiene

Section Three: Practical measures employ in the implementation of food hygiene.

**Section Four:** Challenges faced in the implementation of food hygiene.

#### Section A. Socio-Demographic Data

# Table 2 Socio-Demographic Characteristics of FoodVendors

From the table below, majority 90(81.8%) of respondents are female while minority 20(18.2%) are males. Majority of respondents 56(50.9%) fall within the age range of 18-27 years, almost all the food vendors are Christians 90(81.8%). Majority 57(51.8%) were single and had primary level as their highest level of education (47.3\%). Majority 51(46.4%) have a vending experience of 1-5 years while a minority 13(11.8%) have a vending experience of >= 11 years.

Variables	Items	Frequency	Percentages	Cumulative
				frequency
Age (in	18-	56	50.9	50.9
years)	27 years	26	23.6	74.5
	28-	20	18.2	92.7
	37 years	6	5.5	98.2
	38-	2	1.8	100.0
	47years	110	100.0	
	48-			
	57years			
	>=58years			
	Total			
Gender	Female	90	81.8	81.8
	Male	20	18.2	100.0
	Total	110	100.0	
Religion	Christian	90	81.8	81.8
0	Muslim	6	5.5	87.3
	Others	14	12.7	100.0
	Total	110	100.0	
Level of	Primary	52	47.3	47.3
education	school	24	21.8	69.1
	Secondary	34	30.9	100.0
	school	110	100.0	
	Tertiary			
	Total			
Marital	Single	57	51.8	51.8
status	Married	50	45.5	97.3
	Divorced	3	2.7	100.0
	Total	110	100.0	
Years of	<1 year	16	14.5	14.5
experience	1-5years	51	46.4	60.9
r · · ·	6-10vears	30	27.3	88.2
	>=11 years	13	11.8	100.0
	<u>,</u>	110	100.0	
		-		

Section B: Knowledge on Food Hygiene

#### 4.2 Source of information



Figure 1: Distribution of respondents according to their source of information on food hygiene

From the figure above, it can be seen that majority of respondents 49(54.50%) got their information from school, while a minority 9(10.10%) got it from the market.

#### Table 3 Respondents Knowledge on Food Hygiene

From the table below, 90(81.8%) have heard of food hygiene, 74(81.8%) could define food hygiene well. 72(79.1%) identified diarrhea as a disease related to poor food hygiene, 39(43.6%) picked typhoid while 51(56.4%) identified cholera as a food borne disease.

	Variables	Frequency	Percentages
	Yes	90	81.8%
	No	20	18.2%
		110	
	Yes	74	81.8%
	No	16	18.2%
	Total	90	
Diarrhea	Yes	72	79.1%
	No	18	20.9%
		90	
_			
Dysentery	Yes	25	27.3%
	No	65	72.7%
		90	10
Typhoid	Yes	39	43.6%
	No	51	56.4%
	Total	90	
Cholera	Yes	51	56.4%
	No	39	43.6%
	Total	90	
	Diarrhea Dysentery Typhoid Cholera	VariablesYes NoYes No TotalDiarrheaYes NoDysenteryYes NoTyphoidYes No TotalCholeraYes No Total	VariablesFrequencyYes90No2011010Yes74No16Total90DiarrheaYesYes72No189090DysenteryYesYes39No51Total90CholeraYesYes51No39Total90

# 4.2 Overall Knowledge on Food Hygiene



Figure 2: Distribution of respondents according to overall knowledge

From the figure above, it can be seen that majority 60.7% of respondents have good knowledge on food hygiene whil39.3% have poor knowledge on food hygiene.



Figure 3: distribution of respondents according to their source of water use in vending

From the figure above, we can see that majority 38(42.2%) of vendors use tap water in vending, 33(36.7%) uses well water while 19(21.1%) uses spring water.

# Section C: Practical Measures Employ by Food Vendors in the Implementation of Food Hygiene

#### 4.5 Method of Hand Washing



Figure 4: Distribution of respondents according to methods of hand washing

From the figure above, majority 45(50%) wash their hands with just water with no detergent while a minority 17(19.1%) wash their hands with running water and soap.



Figure 5: Distribution of respondents according to some personal hygiene practices

Majority of respondents 52(57.3%) wash their hands frequently, minority (2.7%) wear clean clothes.

# 4.6 Over all Hygiene Practice



Figure 6: Distribution of respondents according to their overall hygiene practices

Figure 4 above shows that a majority 67(74.4%) of vendors have poor hygiene practice while only 23(25.6%) practice good hygiene.

Section D Challenges faced by vendors in the implementation of food hygiene

# Table 4 Distribution of Respondents to the ChallengesFaced in Implementing Food Hygiene

The table below shows that majority 51(56.4%) face challenges in lack of water while minority 20(22.7%) face deficient knowledge as a challenge in implementing food hygiene.

Characteristics	variables	Frequency	Percentage %
Challenges faced in imple	ementing food	hygiene	
Lack of water	Yes	51	56.4
	No	39	43.6
	Total	90	100.0
Financial constraints	Yes	33	36.4
	No	57	63.6
	Total	90	100.0
Deficient knowledge	Yes	20	22.7
	No	70	77.3
	Total	90	100.0
Lack of access to adequate sanitation	Yes	33	36.4
	No	57	63.6
	Total	90	100.0

# Table5. BinaryLogisticRegressionAnalysisofDeterminantsAssociatedwithOverAllKnowledgeandOverAllPractice ofFoodHandlers (N=110).

Food sellers with university education had greater understanding of food hygiene than those with only a primary education, according to a binary logistic regression study [AOR=0.87; 95%CI (0.3-2.1)]. Compared to those who lacked information, food vendors with secondary education had an average level of food hygiene expertise [AOR=1.35; 95%CI (0.5-3.6)]. With a p-value of p-0.716, the association between general knowledge and educational attainment is statistically negligible. This indicates that knowledge and educational attainment are strongly correlated negatively.

There is a strong positive relationship between overall practice of food hygiene and years of vending with p-value of p=0.02. This stipulates that the more one stays in the vending business and gain experience, the more likely they practice food hygiene.

Variables/categ ory	Number of examine d (%)	Knowledge frequency (%) Knowledge level (n,		AOR with 95% CI	P- Valu e
		%) Good Poor			
Level of education Primary Secondary Tertiary	52(17.3 %) 24(21.8 %) 34(30.9 %)	32(61.5 %) 13(54.2 %) 22(64.7 %)	20(38.5 %) 11(45.8 %) 12(35.3 %)	Ref 1.35(0.5- 3.6) 0.87(0.3- 2.1)	0.71 6
		Practice level (n, %)			
		Good	Poor		
Years of vending <1year 1-5years	16(14.5 %) 51(46.4	5(31.3%) 16(31.3 %)	11(68.7 %) 35(68.6	Ref 0.41(0.4 8-3.69)	0.02

6-10years	%)	4(13.3%)	%)	0.08(0.1	
>=11years	30(27.3	3(23.1%)	26(86.7	0-0.74)	
-	%)		%)	0.05(0.0	
	13(11.8		10(76.9	6-0.57)	
	%)		%)		

Ref.-Reference analysis for binary logistic regression

AOR. Adjusted odds ratio; CI-Confidence interval

# **5.1 Discussion of Findings**

# 5.1.1 Socio-Demographic Characteristics

During data analysis, it was observed that out of the 110 respondents recruited for the study, 90(81.8%) were females and 20(18.2%) were males, making a total of 100%. The majority being women because food preparation is culturally regarded in African society as exclusive for females thereby reflecting their socio –cultural role (Adebayo et al., 2023). This might also be due to the fact that food vending is a popular industry for women in undeveloped nations, including Cameroon, where they are the only employers and businesses in operation. According to the majority of comparable research, there are more women in Nigeria (281, or 72.6%), Ghana (96.6%), and Ethiopia (395, or 83.3%). Additionally, Assob et al. (2013) found that there were more women than men selling street food in Cameroon.

Concerning age, majority of respondents were between the age range18-27years with a percentage of 45.5% (50). This contradicts a study carried out by Tabitha Yusuf and Dr. Peter Chege, 2019 where 42.1% Of vendors in Nigeria were aged 26-35 years.

For marital status, majority 57(51.8%) were single, 50(45.5%) were married and 3(2.7%) were divorced. This is similar to a study carried out by Uzoama et al., (2023) where majority (54.9%) were single and (45.1%) were married. In the present study, all the food handlers had gone to school. This is similar to a study carried out by Barnabas et al., (2023) where almost all the vendors had gone to school.

Majority of respondents 52(46.4%) were found to have been in business for 1-5 years. This is similar to a study conducted by Azanaw et al., 2021 where majority 265/395(67%) of respondents had been in the vending business for 1-5 years.

# 5.1.2 Knowledge on Food Hygiene and Importance of Food Hygiene.

In the present study, 60.7% of food handlers had good knowledge on food hygiene which is similar to studies conducted in Malaysia (54.7%) and in Nigeria (56.3%). It is tempting to say that the level of knowledge among the majority of food vendors in the present study could be related to the fact that a majority of respondents had either secondary or tertiary level of education which could have formed the basis for increased comprehension of food hygiene and therefore improved knowledge. However, this is in contrast with a study conducted in Thailand which found out that only 15.2% of food vendors had good knowledge on food hygiene. This may be due the difference in the level of education as majority of respondent in the study conducted in Thailand had no formal education. Similar to responses from a study done in Ethiopia (Zeru et al., 2007), where slightly more than half of the vendors could accurately name foodborne disease, the majority of food sellers in this survey were aware of at least one sort of foodborne disease.

#### 5.1.3 Practical Measures Employed by Food Vendor in

#### the Implementation of Food Hygiene

According to Aiken et al., 2013 practice refer to the ways in which people demonstrate their knowledge and attitude through their actions. The results from the present study shows that 74.4% of respondents have poor hygiene practices and 25.6% practice good food hygiene. The findings are slightly below compared to a study conducted by Monney et al., (2013) where 271(90.3%) of respondents had poor food hygiene practice and 29(9.7%) had good food hygiene practice. The small discrepancy can result from different study times and environments. The results also support those of Muyanja et al. (2011) and Legesse et al. (2017), among others, who found that the majority of their respondents practiced inadequate food hygiene.

Additionally, cleaning your hands properly with soap will help you avoid stomach infections and get rid of temporary microflora. Just 19.1% of respondents in the current study wash their hands with soap and running water, compared to 57.35 percent who practice hand washing. This is comparable to a research conducted in Nigeria that found that just 21% of sellers regularly washed their hands with soap and water. According to Galgamuwa et al. (2016), hand washing with simply plain water can lessen the load of common flora, but it cannot eradicate all harmful microorganisms. Thus, poor hand hygiene may be a significant contributing factor to the high prevalence of food-borne illnesses in the marketplace.

# 5.1.4 Challenges Face by Food Vendors in the Implementation of Food Hygiene.

Respondents were asked about the various challenges they faced in the implementation of food hygiene and majority 56.4% identifies lack of water as a challenge they faced in implementing food hygiene, 36.4% identify financial constraint as a challenge they faced. The finding opposed the findings of Amaami et al., (2016) where 65.7% of respondents identified financial constraints as an obstacle to adhering to good hygiene practices. Looking at the number of food vendors who actually had the knowledge and also applied proper food hygiene, it could be said that if these challenges were resolved, most food vendors will adhere to proper hygiene practices.

# **5.3 Conclusion**

For knowledge, food vendors had a good knowledge on proper food hygiene but some did not know the importance of proper hygiene. It can be concluded that a good number of food vendors had adequate knowledge but majority were not practicing food hygiene.

For practice, food vendors had poor food hygiene practices likely due to the challenges food vendors faced like lack of water, financial constraints, lack of adequate knowledge.

# **5.3 RECOMMENDATIONS**

From the above conclusion, it can be recommended that

#### To the Yaoundé VI city council

To employ people that will always pass round and check the food vendors in the environment in which they prepare food and where food is being sold.

# The government

- Regulate vending activities and develop training programs to enrich vendors on food safety and hygiene.
- The government should provide portable water to the community at large.
- The government should provide forums where vendors could be sensitized on food hygiene.
- There should be more sensitization of food vendors so that they practice what they know.

# To the food vendors

Food vendors should put into practice the various hygiene methods like frequent hand washing, covering of hair, cleaning of surfaces and environment in order to prevent food related disease.

# References

- Adebayo YO, Lasabi OT, Akinsanya OB, Ogunleye AE (2023). Food hygiene practices among food vendors in Odeda local Government Area, Ogun State, Nigeria. Doi: https://dx.doi.org/10.4314/njns. v44i2.23.
- Asmawi UM, Norehan AA, Salikin K, Rosdi NA, Munir NA, Basri NB (2018) An assessment of knowledge, attitudes and practices in food safety among food handler engaged in food courts. Curr Res Nutr.Food Sci J6(2): 346-353.//doi.org/10.12944/CRNFSJ.6.9.09.
- 3. CDC. (2010). OPRP-Handwashing guidelines. Atlanta:Georgia, USA:CDC.
- Chi FF, Yan H, Nan J, Dong XN et al (2017). A survey on the awareness and satisfaction of the national food safety standards in Shaanxi province among relevant personnel. Foreign med Sci seet Medgeogr 38:122-125
- Di Wu, Christopher Elliott, and Yongning Wu (2021). Food Safety Strategies: The one health approach to global challenges and China's Actions. June 11; 3(24): 507-513. doi: 10.46234/ccdcw2021.131
- Cortese RDM, Veiros MB, Feldman C, Cavalli SB (2016) F00d safety and hygiene practices of vendors during the chain of street food production in Florianopolis, Brazil: a cross-sectional study. Food control. 62:178-186. http://doi.org/10.1016/j.foodcont.2015.10.027.
- Feldman CH, Hartwell H, Brusca J, Su H, and Zhao H. (2015). Nutrition information and its influence on menu choice within higher education establishments. British Food Journal.

- 8. Galgamuwa LS, Iddawela D, Dharmaratne SD. Knowledge and practices of food hygiene among food handlers in plantation sector, Sri Lanka. Int J Sci Rep 2016; 2(12):304-11.
- 9. Gangi F, Mustilli M, and Varrone N. (2018). The inpact of corperate social responsibility (CSR) Knowledge on corporate financial performance: evidence from the European banking industry. Journal of knowledge management,23 (1), 110-134.
- Iwu AC, Uwake KA, Duru CB, Diwe KC, Chineke HN, Merenu IA, Ohale I (2017). Knowledge, attitude and practices of food hygiene among food vendors in Owerri Imo State, N igeria. Occup Dis Environ Med 5(01):11-25. http://doi.org/10.4236/odem.2017.51002
- Isoni Auad L, Cortez Ginani V, Stedefeldt E, Yoshio Nakano E, Costa Santos Nunes A, and Puppin Zandonadi R. (2019). Food safety knowledge, attitudes and practices of Brazilian food truck food handlers' nutrients, 11(8),1784.
- Kaptso KG, Tchabo W, Chebelem Mbafor B, Asoba NG, Amungwa AF, Mbofung CMF. (2021). Assessment of food hygiene and vending practices among street food vendors in Buea and Kumba City Council (South-West Region Cameroon). Food Sci & Nutri Tech 2021, 6(2):000263.
- Kunadu APH, Ofosu DB, Aboagye E, Tano-Deborah K. (2016) Food safety knowledge, attitudes and safereported practices of food handlers in institutional foodservice in Accra Ghana. Food control 69:324-330.http://doi.org/10.1016/j.foodcont.2016.05.011.
- Leina K, Abuhay N, Kindie W, Dagne H, and Guadu F. (2020). Food hygiene practice and its determinants among food handlers at university of Gondar, Northwest Ethiopia, 2019. International journal of general medicine, 1129-1137.
- Monney I, Agyei D, Owusu W (2013). Hygiene practices among food vendors in educational institutions in Ghana: the case of Konongo.foods. 2(3):282-294.https://doi.org/10.3390/foods 2030282.
- Nguendo Blaise. (2014). Assessment of hygiene practices and health status of street-food vendors in Yaounde; Cameroon.
- Nkosi NV, Tabit FT (2021). The food safety knowledge of street food vendors and sanitary conditions of their street food vending environment in the Zululand District. South Africa. Heliyon 7(7): e07649.http://doi.org/10.1016/j.heliyon.2021.e07640.
- Osaili TM, AL-Nabalsi AA, Allah Krasneh HD (2018). Food safety knowledge among food service staff at the Universities in Jordan. Food control. 89:167-176.http://doi.org/10.1016/j.foodcont.2018.02.011
- OI Emmanuel, Ibe Sally NO, Nwanya Emmanuel, Ogamienlen Christopher Sule. (2013). Knowledge and practice of food hygiene among food vendors in Ihiagwa. Owerri West Local Government. Area, Imo State
- 20. Siddiky NA, Khan MSR, Sarker MS, Bhuiyan MKJ, Mahmud A, Rahman MT, Samad MA (2022) knowledge, attitude and practice of chicken vendors on food safety and foodborne pathogens at wet markets in Dhaka,

Bangladesh.	Food	control.	131:108456,	
http://doi.org/1	0.1016/j.foo	dcont.2021.10	8456.	

- 21. Stratev D, Odeyemi OA, Pavlov A, Kyuchukova R, Fatechi F, Bamidele FA (2017) Food safety kmowledge and hygiene practices among vertinary medicine students at Trakia University, Bulgaria. J infect Public Health 10.778-783. http://doi.org/10.1016/j/jiph.2016.12.001
- 22. Teffo LA, and Tabit FT. (2020). Assessment of the food safety knowledge and atiitudes of food handlers in

hospitals. BMC Public Health, 20: 311.http://doi.org/10.1186/s 12889-020-8430-5

- 23. WHO (2021a) food safety. World Health Organization of the United Nations. www.who.int/health-topics/food-safety/, accesses date; 01 July 2022.
- 24. World Health Organization. WHO estimates of the global burden of foodborne diseases. Foodborne diseases burden epidemiology reference group 2007-2015. World Health Organization 2015.http://apps.who.int/iris/handle/10665/199350 (accessed 31 oct 2022). [Google Scholar].