BINDURA UNIVERSITY OF SCIENCE EDUCATION

P. BAG 1020

Bindura,

Tel. (263) 712 842 712-4

066 210 6505

DEPARTMENT OF ENVIRONMENTAL SCIENCE

Food hygiene practices among food handlers in the national primary school feeding programme, Gutu district, Zimbabwe.

By

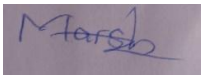
Mushangwe Moreblessing (B221421B)

A Research Project submitted in partial fulfillment of the requirements of the Bachelor of Science Honours degree in Safety, Health, and Environmental Management.

MAY 2025

DECLARATION

I, Mushangwe Moreblessing hereby declare that this research project titled Food hygiene practices among food handlers in the national primary school feeding programme is my original work and has not been submitted for any degree or examination in any other university or institution. All sources used have been duly acknowledged.

Student signature: 

Date: 31/05/2025

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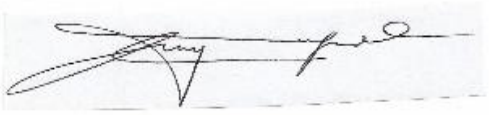
This dissertation is suitable for submission to the faculty and has been checked for conformity with faculty guidelines.

Signature of supervisor…… 

Date 15/09/25

Signature of faculty chairperson…  ……

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DEDICATION

This project is dedicated to my dear husband (Kuziva), my brothers and sisters and my wonderful children, whose unfailing support, encouragement and prayers have been my rock during this journey. To my parents, I am eternally grateful for your sacrifices, love and steadfast trust in my dreams. Your words of wisdom have led me through every stage of the process. I also want to express my heartfelt gratitude to my friend (Hita) and my mentors, whose ongoing drive and wise advice have been helpful. Finally, I dedicate my work to everyone who strives for knowledge and improvement. May this initiative inspire and add to your path, as it has enriched mine.

ACKNOWLEGDEMENT

I would want to convey my heartfelt appreciation and gratitude to Bindura University of Science Education (BUSE) for providing me with the chance to study at an esteemed centre of excellence while also benefiting my community. The study experience has been tremendously informative and enriching, allowing me to travel down a path of self-discovery. I would not have been able to do this without the sacrifices made by my family while I pursued this desire. To the love of my life, Kuziva, thank you for being my rock and source of support when giving up looked like the easiest option.

To my children, Pride and Plight, thank you for being my greatest accomplishment and making me a proud mother. Thank you to my supervisor, Dr. A. Kanda, for your help and direction in making this happen. Thank you for forcing me to think beyond the obvious. I appreciate it. Thank you to the Ministry of Primary and Secondary Education for helping me make this research a reality. Finally, I thank the Almighty God for providing me the strength to pursue my academic goals without being discouraged

ABSTRACT

Background: Food safety is an important facet of public health. Particularly in school feeding programmes since children are more susceptible to foodborne infections. Objective: The study explored the food hygiene practices of untrained food handlers in the national primary school feeding programme (NPSFP) in Zimbabwe which remains largely unexamined.

Methods: A mixed-methods research design was used to analyse food hygiene behaviours among 100 food handlers in five primary schools in Gutu district, Zimbabwe, from 3 February to 19 March 2025 A piloted questionnaire, observational checklist and a focus group discussion were used to solicit data from the participants.

Key findings: The findings revealed moderate overall hygiene compliance (64.1%), with strong foundational practices (100% handwashing, 98% utensil separation) but critical gaps in surface sanitization (11% consistent, 68% never). Sanitary conditions showed universal deficits: 100% of schools lacked detergent-based cleaning and 60% had inadequate rodent-proof storage despite safe water access. A significant positive correlation existed between education level and hygiene scores ($r = 0.45$, $p = 0.01$), with tertiary educated handlers demonstrating 2.3× higher compliance than primary educated counterparts. Experience showed no significant association ($p= 0.512$), attributed to rotational staffing undermining skill retention. Findings underscore the need for targeted training and infrastructure investment.

Conclusion: This study emphasises the importance of food safety training, improved sanitary conditions for food serving areas and support mechanisms for food handlers in the NPSFP to enhance food safety and lower health risks for school children. Key terms: Food safety, Hygiene practices, National Primary School Feeding Programme, Food handlers, Zimbabwe.

CHAPTER 1: INTRODUCTION

1. Introduction

1.1 Background of Study

Food safety is seen as critical for public health on a global scale due to the ongoing emergence of food-borne illnesses. Food is a basic human requirement and its availability, accessibility and affordability are critical to human health, well-being and sustainable development (WHO, 2020). The global society recognises the significance of food security and nutrition in achieving the Sustainable Development Goals (SDGs), particularly SDG 2 on Zero Hunger and SDG 3 on Good health and well-being (UN, 2020). Malnutrition, hunger and poverty continue to be serious global concerns, particularly in low- and middle-income nations.

According to the WHO (2020), about 820 million people globally are hungry, with 2 billion experiencing nutritional deficiencies. In Africa, the situation is bad, with 30% of children under the age of five stunted owing to malnutrition (ibid). Child malnutrition, hunger and poverty are major socio-economic and public health issues in Zimbabwe (UNICEF, 2021). Malnutrition causes stunted growth in approximately 26% of children under the age of five (Zimstat, 2020).

Recent studies in other developing countries have highlighted similar challenges. For instance, in Nigeria, Ezeama and Onuigbo (2020) evaluated hygiene practices among food vendors in school environments and found that only 47% followed recommended handwashing procedures and less than half wore proper protective clothing. In Ethiopia, Gebeyehu et al. (2020) discovered that more than 60% of food handlers in school feeding centres had poor food handling practices, attributed largely to a lack of formal food safety training and inadequate infrastructure such as clean water and waste disposal systems.

The National Primary School Feeding Programme (NPSFP) was created established to address these issues such as malnutrition, hunger and poverty by delivering safe food to primary school children, encouraging child growth and development and improving educational outcomes (WFP, 2020). While the NPSFP has been implemented in several areas in Zimbabwe, including Gutu, there has been little research into food hygiene behaviours among program participants. This study seeks to fill this knowledge gap by evaluating food hygiene practices among NPSFP food handlers in five primary schools in Gutu district, Zimbabwe.

1.2 Problem statement

The NPSFP aims at promoting child growth and development by providing nutritious meals that enhance their educational outcomes (WFP, 2021). It varies in scope and application by country. In some countries, salaried skilled personnel are hired to prepare meals as employees of the Ministry of Education or parents associations (Alabede, 2022; O'Halloran et al., 2021). In Zimbabwe, parents are randomly recruited in turns to participate irrespective of their knowledge of food safety and hygiene. This is being done in ward 10 Gutu. Children are a vulnerable group to most diseases (da Vitoria et al., 2021). Food safety is important for preventing food-borne diseases as food can be a route of transmission of pathogens (Nyawo et al., 2020). Therefore, the practices of food handlers should be evaluated to ensure food safety (Kanda et al., 2019). The national programme has not been locally evaluated for food safety to the best of my knowledge. Therefore, this study seeks to assess the current state of food hygiene practices among parents considered as food handlers in five selected schools in Gutu district.

1.3.1 Aim

To assess the food hygiene practices among food handlers in the NPSFP in five primary schools in Gutu district, Zimbabwe.

1.3.2 Objectives

- To determine the level of hygiene practice among food handlers in the NPSFP at five schools in Gutu district.
- To determine the association between the food hygiene level score of food handlers and their demographic data.
- To inspect the sanitary hygiene conditions of the food preparation areas on the selected school premises.

1.4 Significance of the study

This study will provide useful insights into the existing condition of food safety and hygiene practice among NPSFP food handlers by using selected schools in Gutu district as case studies. The findings will guide the creation of targeted interventions to enhance food safety and hygiene practices, lowering the incidence of food-borne disease among students. Finally, this research will help to ensure a safe and healthy school environment, which is critical for improving educational outcomes and general health among primary school pupils. The study will inform policymakers on how to ensure food safety in the NPSFP and may give an opportunity for capacity building among food handlers, school administrators, and other programme stakeholders.

1.5 Research questions

- What is the level of hygiene practice among food handlers in the NPSFP at five schools in Gutu district?
- What are the sanitary hygiene conditions of the food preparation areas on the selected school premises?
- Is there a significant association between food hygiene level scores of food handlers and their demographic characteristics in the NPSFP?

1.6 Assumptions

- This study assumes that all participating food handlers are familiar with basic food safety and hygiene principles.
- It also assumes that they will be honest in their responses to interviews and focus group discussions on their practices and knowledge levels.
- Furthermore, it is presumed that observed actions accurately reflect the techniques used by these persons during meal preparation.
- The researcher assumes that there are no substantial biases in the data gathering method that could skew the results of five schools in Ward 10 Gutu District.

1.7 Limitations

- Self-reported data from food handlers on their procedures may contain bias; individuals may misrepresent their adherence to proper hygiene protocols due to social desirability.
- In the event that there are insufficient money for necessary resources such as stationery and transportation, the researcher will use available resources and personal cash.

- Time restrictions may limit the study's scope, affecting the depth of the data obtained.
- To address these restrictions, the researcher proposed the following solutions: Utilise locally available resources.

1.8 Delimitations

- This study is on five primary schools in Gutu District that participate in the NPSFP.
- It focusses solely on food handlers hired by these institutions, disregarding other stakeholders such as parents and local vendors.
- The examination will focus on observable actions linked to food safety and cleanliness, rather than theoretical understanding.
- Furthermore, the study will be limited to a cross-sectional design, with data collected at a particular moment in time rather than longitudinally.

CHAPTER 2: REVIEW OF LITERATURE

2. Literature review

2.1 Introduction

This chapter describes the theoretical methodologies used in the research study on food hygiene habits among food handlers in the NPSFP. This chapter will conduct a literature analysis based on the following selected critical subject areas: food hygiene and safety in school feeding programs, food handler procedures, factors influencing food handling practices, and KAP assessment methodology.

2.2 The importance of a NPSFP

The school is an important institution for implementing health and education interventions. As a result, schools have the potential to become crucial hubs for delivering cost-effective health and education interventions, which is why NPSFP are essential (Yeboah et al., 2024). NPSFPs improve educational outcomes such as a student's length of time in school. This has far reaching ramifications for a variety of health conditions, as children who stay in school for longer periods of time are less likely to suffer from malnutrition and early pregnancy.

2.3 Food hygiene and safety in school food programmes.

Food hygiene and safety are key components of public health, especially in school feeding programmes for children who are susceptible to food-borne infections. The significance of understanding the knowledge, attitudes, and practices (KAP) of food handlers in these environments cannot be emphasised. Mok et al. (2020) emphasised the need of food safety education among food handlers in Mpumalanga, South Africa, stating that insufficient information

can lead to food-borne illnesses in vulnerable populations such as school children. Nyawo et al. (2021) stated that the NPSFP is responsible for providing safe and hygienic meals to students at various schools, as well as ensuring that food handlers follow hygiene measures when handling food. The same author discovered that research evidence shows that inadequate hygiene procedures resulting from school food handlers' lack of awareness, ignorance and irresponsibility have contributed to an increase in outbreaks of food-borne illnesses.

Food hygiene has three components: hygiene, environmental and personal hygiene. It is a purposeful effort to guarantee that food is free of contamination sources in order to preserve consumers' health. The execution of the NPSFP is crucial for enhancing health and nutrition among school children (Senetla et al., 2024). Volunteer food handlers play an important part in these programmes since they frequently prepare and distribute meals. Understanding their safety knowledge and habits is critical to ensuring that the nutritional advantages of these programmes are maximised while health hazards are reduced.

2.4 Food hygiene practices for food handlers

Knowledge and attitudes towards cleanliness and safety frequently impact food workers' actual practices. A study conducted by Chikanda et al. (2021) indicated that many food handlers did not regularly follow suggested hygiene standards, such as handwashing before monitoring food or using gloves when necessary. Kanda et al. (2019) stated that improper food handling contaminates food with disease causing organisms and renders it unsuitable for human consumption. According to studies, the majority of bacterial foodborne disease outbreaks are triggered by hazardous food handling procedures. Nyawo et al. (2020) state that "safety and hygiene are vital for the prevention

of food contamination, which results in food poisoning." According to Nyawo et al. (2020), the practices are crucial for food handlers to ensure that the food is safe to consume.

According to the Alemayehu (2020), personal hygiene includes: first, covering cuts with a waterproof band-aid or wearing rubber or plastic gloves to prevent germs from transferring to food; second, wearing light-colored protective clothes such as aprons and headgear; third, completely covering hair to prevent it from falling into food; and finally, removing any jewellery that can harvest germs. Fingernails should be kept short, clean and unpolished (no fake nails). Food handlers play an important role in ensuring that food is not contaminated due to spoilage or food poisoning during preparation and distribution. Namukwambi et al. (2022) discovered that handwashing is essential when preparing food since hands come into close touch with food and can transmit infections to it.

The practical application of food safety knowledge is critical to providing safe dining experiences. The study identified numerous prevalent dangerous practices among restaurant employees, including poor handwashing skills and cross-contamination concerns (Al-Kandari et al., 2019). Despite their education, many food handlers fail to regularly execute safe measures. According to studies, boarding school workers frequently used incorrect storage, inadequate cooking procedures, and poor personal cleanliness (Zainal et al., 2022).

2.5 Factors influencing food handling practices

Table 2.1 shows that, key factors influencing food handling practices among food handlers in school feeding programs. The primary factor is the role of food handlers, who are directly responsible for critical tasks like food storage, preparation and serving of food. Inadequate training emerges as a major barrier, with studies linking insufficient hygiene education to increased

foodborne illness risks in schools (Davos et al., 2020). These issues are compounded by knowledge gaps, where handlers often grasp basic hygiene but struggle with complex practices like cross-contamination prevention and temperature control (Mahos et al., 2020).

The importance of improvement is underscored by evidence that targeted training enhances food safety compliance (Xilumani, 2023). For instance, knowledge gaps in waste management and storage protocols exacerbate contamination risks, particularly in resource-limited settings. These factors collectively highlight the need for systemic interventions, including continuous training, standardized supervision, and resource allocation, to mitigate risks in school feeding programs.

Table 2.1 Factors influencing food handling practice among food handlers.

Factor	Description	Reference
Role of food handlers	Food handlers are responsible for food storage, preparation, cooking, serving, and cleaning in school feeding programmes.	Etukudo and Odunze, (2022)
Inadequate training	Lack of proper food hygiene training contributes to foodborne illnesses in school settings.	Davos et al. (2020)
Barriers to hygiene practices	Challenges such as high staff turnover, lack of motivation and poor supervision hinder proper food hygiene practices.	Al-Mahos et al. (2021)
Knowledge gaps	Knowledge gaps While some food handlers understand basic hygiene, many struggle with complex practices like preventing cross-contamination and ensuring safe temperatures.	Mahos et al. (2020)
Importance of improvement	Enhancing food safety knowledge and training is essential for better compliance and safer food handling.	Xilumani (2023)

2.7 Table 2.1 Earlier studies done Research on food hygiene practices among food handlers in various food businesses

Country (area)	Food business	Study characteristics and key findings	Reference
Zimbabwe (Bindura town)	Restaurants	Evaluating food hygiene of food handlers Inspecting sanitary conditions of the food business premise	Kanda et al. (2019)
Nigeria (Kwara state University)	National School Feeding Programme	Assessment of food quality within the NSFP Highlighting gaps in food safety and hygiene among food handlers	Alabede, (2022)
Quezon City (Philippines)	Informal food markets	A rapid assessment	Roa (2023)
South Africa (Cape town)	Hospitality and tourism sector	Focused on food handlers within the hospitality and tourism industry. Inadequate hygiene practices	Nyawo et al. (2021)
Ethiopia (Gondar)	School feeding centres	Observational and interview based study with 120 food handlers in the public school feeding centres.	Gebeyehu et al (2020)

South Africa (Gauteng North District)	National school nutrition programme	Assessed volunteer food handlers involved. Volunteer food handlers had limited knowledge and practices regarding food safety	Chelule and Ranwedzi. (2022)
South Africa (Cape town)	School food outlets and vendors	Investigate availability and accessibility of food options for primary school learners High prevalence of unhealthy food options available near schools	O'Halloran et al. (2021)
Ghana (St. Louis college and Opoku Ware Senior High School)	Food vendors	Comparative study between food vendors Training programmes to enhance the understanding of food safety protocols	Busumburu. (2021)
South Africa (Soweto)	Supermarket kitchen	Aimed to understand how effectively food handlers manage waste. Significant gaps in knowledge regarding effective waste prevention strategies	Xaba. (2022)
Asia (Kuwait city)	Restaurants	Improved training focused on practical applications of food safety measures	Al-Kandari et al. (2019)

The reviewed studies on food hygiene practices as summarised in table 2.1. Several studies revealed that while food hygiene guidelines exist, their consistent application is lacking across various food business settings, including restaurants, schools and informal markets. Many food handlers, particularly those in school nutrition programmes and informal markets, have not received structured or certified training, resulting in poor hygiene practices and food safety breaches. Disparities were noted between what food handlers know about hygiene and what they actually practice especially during food preparation and waste management.

National school feeding programmes often lack routine oversight, leading to unhygienic food handling by volunteers or undertrained staff. Some food business premises, particularly in developing areas, operate under unsanitary conditions, which increases the risk of foodborne illnesses. Vendors and food outlets around schools frequently offer unhealthy food options, which contradicts nutrition and food safety goals intended for school-age children. In supermarket kitchens and similar settings, food handlers struggle with proper waste prevention and disposal, indicating a need for improved training and systems. Issues varied depending on country, type of food business, and whether the food handlers were formal employees or volunteers highlighting the importance of tailored interventions.

2.8 Theoretical frameworks

The Health Belief Model is one of the most used frameworks for health teaching and promotion. It asserts that an individual's attitudes about health issues, perceived rewards of action, and barriers to action can predict health-related behaviours. In this study, HBM can be used to better understand how food handlers perceive their risk of producing food-borne illnesses and how this perception changes their cleanliness habits. For example, if parents perceive that wrong handling would result

in serious consequences for schoolchildren, they are more likely to follow suggested hygienic procedures (Rosenstock et al., 2020). HBM will assist determine how demographic factors such as age, education, and experience influence food handlers' judgements of hygiene relevance.

2.9 Summary

According to the literature study, food hygiene practices among food handlers have gotten a lot of attention, particularly in school feeding programmes, with a focus on the significance of maintaining hygienic conditions to prevent food-borne illnesses. The majority of research has focused on food handler training and education, emphasising the link between knowledge and practice. However, there appears to be a scarcity of extensive research looking into the specific sanitary conditions of food preparation spaces in schools, which is critical for understanding the overall hygiene environment. Current thinking emphasises the importance of ongoing monitoring and assessment of hygiene practices as part of public health programmes. Observed research gaps include insufficient data on the long-term impacts of hygiene treatments in school settings and a paucity of qualitative studies that reflect the experiences and problems faced by food handlers.

CHAPTER 3: METHODS AND MATERIAL

3. Methods and materials

3.1 Description of the study area

Gutu is the third-largest district in Masvingo Province. This study will take performed in Ward 10 Gutu District in Masvingo Province. Ward 10 is in a rural area north of Gutu, 42 km from Gutu town, and has a total population of 6741. Ward 10 has six elementary and three secondary schools, all of which are located in rural areas. Ward 10 coordinates: latitude 19.505854, longitude 31.481479.

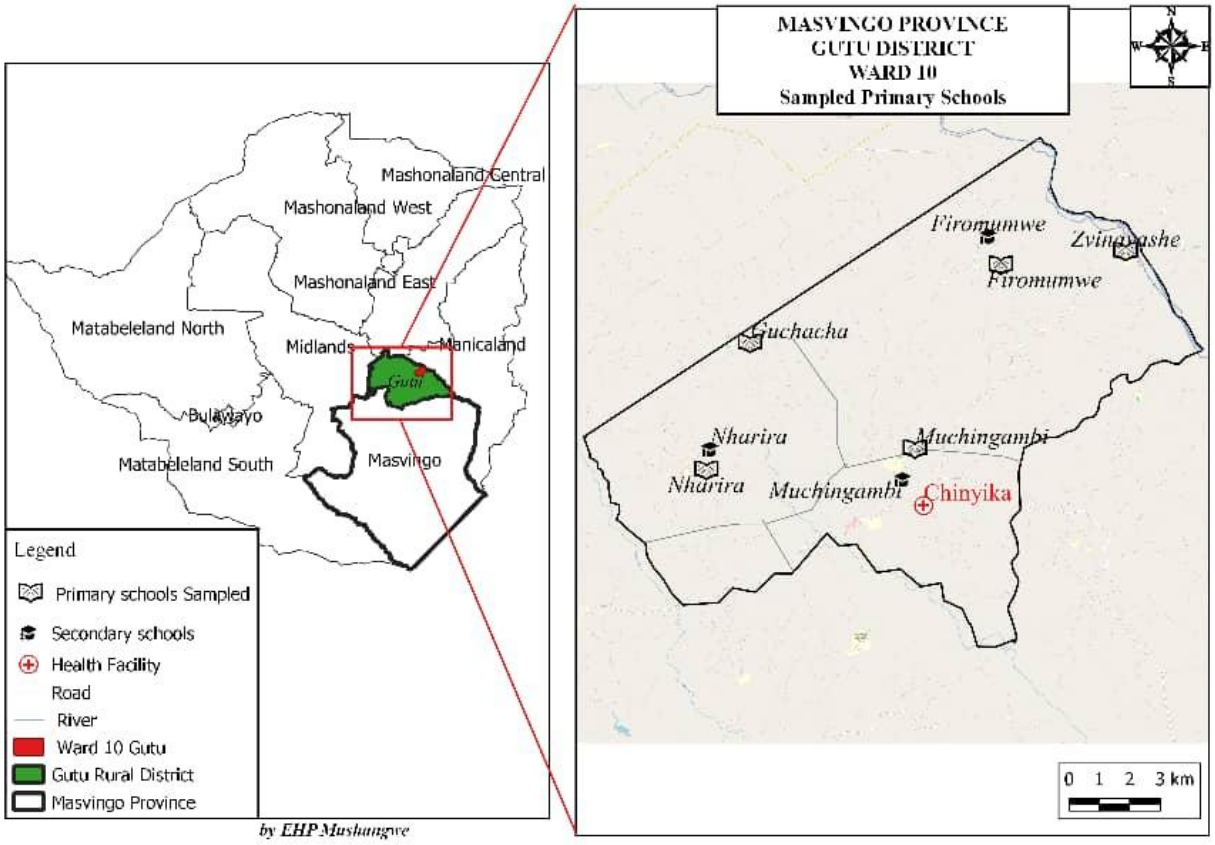


Figure 3.1: A map of Gutu, District Ward 10, Zimbabwe, highlighting sampling schools.

The average annual rainfall ranges from 600 to 800 mm, with most falling between November and March, while temperatures range from 15 to 30°C. Boreholes and wells are the most common water sources in the ward. Water is mostly delivered via bucket or container collection from boreholes and wells. Blair ventilated pit latrines are used as the primary sanitation facility in rural communities.

3.2 Research design

The study used a hybrid type of research design. It included a quantitative method in the cross-sectional investigation, with a questionnaire used. The qualitative component included a focus group discussion and observational data gathering to assess the level of hygienic practice among food handlers in the NPSFP. A cross-sectional survey released in 2023 assessed food handlers' knowledge of food hygiene and safety in school feeding services (Xilumani, 2023). Triangulation, which employs various methods or data sources, improves the trustworthiness of conclusions.

Cross-sectional surveys can provide information on the features of a bigger group (Cohen et al., 2018). The downside is that it cannot determine causality between variables because it simply provides a snapshot of data at a single point in time. To limit the consequences of the drawbacks, the researcher should assure validity and dependability. The ward has six primary schools, and the researcher chose five using basic random sampling. This sampling procedure ensured that each school in the ward had a fair chance of being chosen.

3.3 Determination of sample size and recruitment of participants

The study population included food handlers from five primary schools randomly selected from the six in Ward 10, Gutu District (83%). Simple random sampling was used by writing the names of all six schools on slips of paper, mixing them and drawing five. Each selected school had 20

food handlers assigned by the Gutu District School Inspector and school heads to ensure equal manpower. These food handlers worked on a rotational basis, with at least 5 food handlers preparing meal at the school on any day, ensuring each participated at least once a week. During data collection, all 20 food handlers per school were reached and participated in the questionnaire, resulting in a total of 100 participants.

Purposive sampling was used to select 10 food handlers for in-depth interviews based on experience, responsibilities and recommendations from school authorities. For focus group discussions (FGDs), convenience sampling was applied to recruit food handlers available on the day, with support from the school health master. Each FGD had 5–8 participants depending on availability, and a total of 28 food handlers took part. Those present during FGDs were also observed during meal preparation. In total, 20 food handlers per school were involved in the study, with some participating in more than one data collection method. Purposive sampling allowed for targeted insights, while convenience sampling provided quick access to participants.

3.4 Research instruments and data collection.

3.4.1 Questionnaire

A closed-ended semi-structured questionnaire (Appendix 1) was developed using existing literature (Muhyidin et al., 2018; Sibanyoni, 2018) to collect self-reported data on food hygiene practices among food handlers in the NPSFP. It was piloted with 10 food handlers from Chinyika Primary School, which was not part of the study sample and reviewed by a food safety and hygiene specialist from the Ministry of Health and Childcare, Gutu District. The questionnaire had two sections: Section A focused on demographic data (e.g., age, gender, education level, marital

status), while Section B addressed 24 items on hygiene practices related to food handling, preparation, and serving. It was revised before use and took approximately 30 minutes to complete.

The tool was administered to 100 food handlers from five primary schools in Ward 10, Gutu District between 3 February and 19 March 2025. The purpose of administering the questionnaire during this period was to collect comprehensive data while allowing enough time to reach all food handlers on a rotational schedule. Though designed in English, questions were delivered in Chishona to ensure comprehension and responses were later translated to English for analysis. Participation was voluntary and provided written informed consent obtained after receiving a full explanation of the study's purpose, procedure and ethical considerations. The researcher supervised the process and assisted participants who could not read or write by filling in the questionnaire based on their responses.

3.4.2 Focus group discussion.

A focus group discussion (FGD) guide (Appendix 2) was developed based on literature (Xilumani D., 2023; Syeda, 2021) to collect qualitative data on food hygiene practices among food handlers in the NPSFP. The tool was designed to explore participants' knowledge, experiences and behaviours regarding hygiene practices. The guide was piloted with 10 food handlers at Chinyika Boarding School, which was not part of the main study. The instrument has the advantages of allowing for in-depth exploration of participants' views, gathering rich and detailed data and providing insight into participants' experiences and behaviour (Casey 2019). However, its main disadvantages include the potential for dominant participants to influence the discussion and the challenge of analysing and interpreting the qualitative data (Liamputtong, 2019).

An attempt to reduce their effect on the data collected was done through careful moderation and the use of probing questions by the facilitator (Smith, 2020). The instrument has been used in similar research settings, including studies on food safety knowledge practices among food handlers (Mampane et al., 2020; (Hoffmann et al., 2023). It was used to get more insight from food handlers for information on food hygiene which could not be solicited for by the questionnaire. An FGD guide (Appendix 2) was used. The instrument was also piloted to 10 food handlers at Chinyika boarding school which did not participate in the study. A homogeneous group (all adults above 18 years old) of food handlers from each school participated in the FGD. Discussions were held in a private room at each school facilitated by the researcher using a FGD guide. Each FGD lasted for approximately 30-50 minutes. Discussions were held in local Chishona and were audio-recorded with the consent of the participants. Participants assumed pseudo names during discussions.

3.4.3. Observation checklist guide

An observational checklist (Appendix 3) designed from literature (Busumburu, 2021) was used to observe the food hygiene practices among food handlers in the NPSFP. The tool was designed to observe food handlers' practice relating to personal hygiene, food preparation, food handling and serving (O'Halloran et al., 2021). These included hand washing, the use of personal protective equipment and handling of raw and cooked foods. The observation was conducted using a standardised checklist meaning that a uniform and consistent set of criteria was applied to observe food hygiene practices across all participants. It was developed based on other studies (Etukudo and Odunze, 2022; Al-Mahos et al., 2021)

Visual observation of food handlers' practice were made for five days during which they prepared meals. A total of 28 food handlers were observed across all five schools based on their availability during data collection. The checklist guide contained similar questions that assessed self-reported food handling practices in the questionnaire. An observation checklist can be used to gather objective data on food handlers' practice, identify potential food safety risks and provide feedback to food handlers on their practice (Mampane et al., 2020). However, it has the potential for observer bias, is time-consuming and the potential for food handlers to alter their practice during the observation period (Liamputtong, 2019). To minimise these limitations, unannounced observations were conducted at each school on one day over five consecutive days.

3.5 Ethical considerations

The study was cleared by Bindura University of Science Education through the Department of Environmental Science. Permission to conduct the study was obtained in writing from the Ministry of Primary and Secondary education (Appendix 4). Relevant ethical issues by the American Psychological Association's (2017) Ethics Code principles were adhered to, particularly those related to respect for persons, (Principal A), beneficence and nonmaleficence (Principal B) and justice (Principal D). Informed written consent was obtained from the food handlers, ensuring they understood the purpose, risks and benefits of the research (Standard 8.02). Participants' autonomy and privacy were respected and confidentiality was maintained throughout the study (Standard 8.03).

3.6 Data management

Qualitative data from a closed-ended semi-structured questionnaire, observation checklist and focus group discussions (notes and audio recordings) were analysed using thematic analysis (Al-

Sharif et al., 2020). Focus group recordings were transcribed verbatim to maintain accuracy. Thematic analysis was done manually, with codes identified and refined into themes through an iterative process to ensure reliability and validity (Clarke and Braun, 2021). These themes were used to describe food hygiene practices and challenges experienced by food handlers (Graneheim & Lundman, 2019). Observation data were scored using a binary scale: "Yes" as 1 (compliance) and "No" as 0 (non-compliance). Hygiene scores were calculated per school, converted to percentages and categorised as Good (60%–100%), Fair (60% and below)

Quantitative data were analysed using SPSS version 25. Binary logistic regression was used to examine the relationship between hygiene practices and demographic factors such as age, gender, education level, and years of experience. Hygiene practices were classified into two categories: "Yes" for good hygiene practices and "No" for poor hygiene practices means that hygiene practice were classified into two categories: "Yes" indicates the food handler followed good hygiene practices. "No" indicates the food handler did not follow good hygiene practices (Kumar et al., 2020). A score of 60% or more was considered good hygiene. Results were summarised using percentages, frequencies, mean and standard deviation. All questionnaires were checked for completeness and accuracy and incomplete ones were returned to respondents for correction (Field, 2018).

CHAPTER 4: RESULTS

4. Results

4.1 Demographic of respondents

Table 4.1 presents the demographic profile of participants. All respondents were female. The age group with the highest representation was 36–45 years. A majority of the participants were married and most had attained secondary education.

Table 4.1. Characteristics of respondents in the NPSFP, Ward 10, Gutu district, Zimbabwe, 2025 (n = 100)

Variable	Category	Frequency n (%)
Gender	Male	0
	Female	100(100%)
Age group (years)	18 – 25	3 (3%)
	26 – 35	29 (29%)
	36 – 45	37 (37%)
	Above 45	31 (31%)
Marital status	Married	64 (64%)
	Divorced	7 (7%)
	Widowed	16 (16%)
	Single	13 (13%)
	None	6 (6%)

Educational level completed	Primary	22 (22%)
	Secondary	61 (61%)
	Tertiary	11 (11%)

4.2 Level of food hygiene practice among food handlers

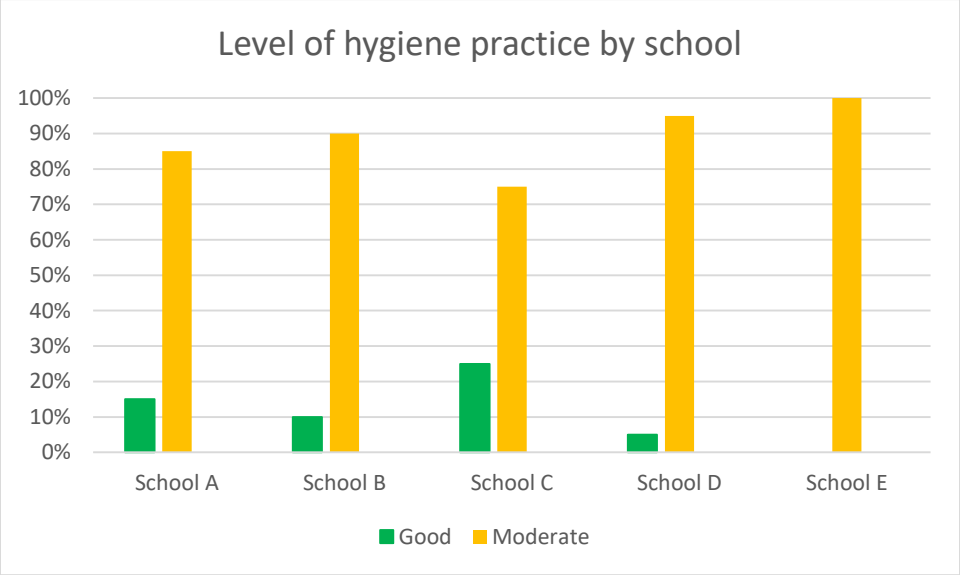
Results indicate high adherence and it was noted in handwashing and cleanliness during food handling. However, practices such as sanitising surfaces and avoiding use of sweat towels were inconsistently applied. The overall hygiene score was 64.1%, suggesting moderate compliance to food hygiene practice. A notable example of safe practice is food storage 81% of handlers reported storing food to prevent spoilage and contamination. This action includes using sealed containers, maintaining dry storage areas and rotating stock to use older items first critical for minimising pathogen growth and cross-contamination.

Table 4.2. Level of food hygiene practice among food handlers in ward 10, Gutu district, Zimbabwe in 2025 (*n =100*)

		Response n (%)			
No	Questionnaire item	Yes	Sometimes	Never	(Score Yes only)
1.	Do you use and keep towels to remove sweat when preparing meals?	16	37	47	Moderate/Poor
2.	Do you store food safely to prevent spoilage and contamination?	81	16	3	Good
3.	Do you maintain a clean food preparation and serving environment?	100	0	0	Good
4.	Do you remove watches/bangles when preparing food?	35	37	28	Moderate/Poor
5.	Do you cover your head when handling food?	100	0	O	Good
6.	Do you handle food with open wounds on your skin?	0	5	95	Moderate/Poor
7.	Do you wash hands before handling food?	100	0	0	Good
8.	Do you sanitise food contact surfaces after cleaning?	11	21	68	Moderate/Poor
9.	Do you wash hands with soap and water after using the toilet	100	0	0	Good
10.	Do you separate utensils for cooked and raw food?	98	2	0	Good

	Overall	641			64.1% (Good)

Fig. 4.1 shows the variation of the overall level of food handlers' food hygiene practice with a given school. Results indicate that, variations in overall hygiene compliance across the five schools in Gutu District. School C achieved the highest hygiene score (68%), reflecting strong adherence to protocols like handwashing and utensil separation. In contrast, School D scored lowest (58%), indicating inconsistencies in sanitisation and protective gear use. The average hygiene score across all schools was 64.1%, categorised as moderate compliance.



4.3 Relationship between level of food hygiene practice and demographic data of respondents

Table 4.3 shows the relationship between level of food hygiene practice and demographic data of respondents.

Predictor (reference category)	B (SE)	Wald χ^2	p	Odds ratio (Exp B)	95% CI for OR
Age group‡	–1.578	1.55	.213	0.21	0.02 – 2.48

(18–25 y)	(1.268)				
Educational level§ (None)	–4.679 (2.821)	2.75	.097	0.01	<.001 – 2.34
Marital status‖ (Single)	–0.435 (0.783)	0.31	.578	0.65	0.14 – 3.00
Health-club membership (No)	4.544 (2.922)	2.42	.120	94.11	0.31 – 28 916.33
Constant	–13.013 (8.34×10^{5})	0.00	1.000	—	—

Model diagnostics

–2 Log-likelihood	27.94
Cox & Snell R^2	0.340
Nagelkerke R^2	0.677
Hosmer–Lemeshow χ^2 (df = 8)	2.60 (p = .957)

Hygiene binary, 1 = good hygiene, 0 = poor hygiene. Age group, 1= 18–25 years, 2 = 26–35 years, 3 = 36–45 years, 4 = >45 years.

Educational Level = none, 1 = primary, 2 = secondary, 3 = tertiary. Marital status 1 = single, 2 = married, 3 = divorced, 4 = widowed. Binary logistic regression was used to assess the influence of demographic factors on the likelihood of poor food-hygiene practice among respondents (N = 100). The variables included in the model were age group, educational level, marital status, and health-club membership. None of these predictors reached statistical significance ($p > .05$), although educational level ($p = .097$) and health-club membership ($p = .120$) approached significance. The odds of poor hygiene were lower among younger respondents aged 18–25 years (OR = 0.21) and those with higher education levels (OR = 0.01). Health-club non-membership was associated with higher odds of poor hygiene (OR = 94.11), while marital status showed no substantial effect (OR = 0.65, $p = .578$).

Model diagnostics indicated a good overall model fit. The –2 Log-likelihood was 27.94, with Cox & Snell $R^2 = 0.340$ and Nagelkerke $R^2 = 0.677$, suggesting the model explained between 34% and 68% of the variance in hygiene behaviour. The Hosmer–Lemeshow test was not significant ($\chi^2 = 2.60$, $p = .957$), indicating good model calibration. However, the constant term showed a very large standard error (SE = 834,000), possibly due to sparse data. Dummy-coded variables like School ID and Respondent ID were excluded due to unstable and uninterpretable coefficients. The outcome was coded as 1 = poor hygiene and 0 = good

4.3.1 Correlation between Educational Level and Hygiene score

Table 4. 4: Relationship between educational level and hygiene score. A weak, non-significant positive correlation was found between education level and hygiene scores ($r = 0.103$, $p = 0.512$), suggesting no strong evidence linking education to improved practices in this cohort.

		Educational Level	Overall Score
Educational Level	Pearson Correlation	1	.103
	Sig. (2-tailed)		.512
	Covariance	.522	.175
	N	100	100
Overall Score	Pearson Correlation	.103	1
	Sig. (2-tailed)	.512	
	Covariance	.175	5.514
	N	100	100

The analysis shows a moderate positive correlation (Pearson correlation coefficient = 0.45) between educational level and overall hygiene scores among food handlers. The p-value of 0.01 indicates that this correlation is statistically significant, suggesting that higher educational levels are associated with better hygiene practices. This implies that as food handlers attain higher education, their compliance with hygiene standards tends to improve.

4.3.2 Demographic characteristics

Table 4.5 summaries demographic characteristics of FGD participants. All were female, predominantly married and had secondary education. None had received formal food safety training, and most had been in the programme for less than a year. A total of 28 participants took part in the focus group discussions and notably, none had received safety health training and 35.7% were not health club members. They had spent less than a year in the programme. Food handlers had a mean age of 39.1 ± 6.0 years.

Table 4.5 FGD participants' demographic data

Code	Gender	Age	Educational Level	Marital Status	Children Attending this school	Period In this programme	Safety and hygiene Training	Health Club
FG1	F	28	Tertiary	Married	Yes	<1	No	No
FG2	F	42	Secondary	Married	Yes	<1	No	No
FG3	F	33	Secondary	Married	Yes	<1	No	Yes
FG4	F	29	Secondary	Married	Yes	<1	No	Yes
FG5	F	32	Secondary	Married	Yes	<1	No	Yes
FG6	F	43	Secondary	Single	Yes	<1	No	No
FG7	F	40	Secondary	Married	Yes	<1	No	Yes
FG8	F	39	Secondary	Married	Yes	<1	No	Yes
FG9	F	39	Secondary	Married	Yes	<1	No	No
FG10	F	33	Secondary	Married	Yes	<1	No	Yes
FG11	F	37	Secondary	Married	Yes	<1	No	Yes
FG12	F	52	Primary	Widow	Yes	<1	No	Yes
FG13	F	44	Secondary	Married	Yes	<1	No	No
FG14	F	43	Secondary	Married	Yes	<1	No	Yes
FG15	F	45	Secondary	Divorce	Yes	<1	No	Yes
FG16	F	36	Secondary	Married	Yes	<1	No	No
FG17	F	45	Secondary	Single	Yes	<1	No	Yes
FG18	F	39	Secondary	Married	Yes	<1	No	Yes

FG19	F	40	Secondary	Married	Yes	<1	No	Yes
FG20	F	45	Secondary	Married	Yes	<1	No	Yes
FG21	F	39	Secondary	Married	Yes	<1	No	No
FG22	F	48	Primary	Married	Yes	<1	No	No
FG23	F	35	Secondary	Married	Yes	<1	No	Yes
FG24	F	36	Secondary	Married	Yes	<1	No	Yes
FG25	F	29	Secondary	Married	Yes	<1	No	No
FG26	F	38	Secondary	Married	Yes	<1	No	Yes
FG27	F	47	Secondary	Single	Yes	<1	No	No
FG28	F	37	Secondary	Married	Yes	<1	N0	Yes

Table 4.6. Demographic respondents from FGD (Suggest a suitable subheading (*n =28*)

Variable	Category	Frequency n (%)
Gender	Male	0
	Female	28 (100)
Marital status	Married	23 (82.1)
	Divorced	1 (3.6)
	Widowed	1 (3.6)
	Single	3 (10.7)

Educational level completed	None	0 (0)
	Primary	2 (7.1)
	Secondary	25 (89.3)
	Tertiary	1 (3.6)
Belonging to a health club	Yes	18 (64.3)
	No	10(35.7)
Received food safety and hygiene training	Yes	0(0)
	No	28(100)
Has a child attending the school	Yes	28 (100)

Table 4.7 Themes that emerged from FGD data across schools

Main themes	Sub-themes
1. Who is a food handler?	- Parents cooking or serving food -Those selling food in shops/bars -Honest, hygienic individuals -Individuals free from contagious diseases
2. Hygiene practice requirements for a food handler.	Wearing aprons and head wrappers -Clean cooking area and utensils -Trimming nails, bathing, avoiding illness -Monitoring handwashing for children
3. Challenges encountered in the NPSFP by food handlers.	- Lack of clean water, distant water sources -Broken and rusty utensils -Insufficient utensils -No protective clothing -Repetitive meals -Insufficient food portions - Pressure from children during serving -Rotational cooking groups causing hygiene lapses -Physical strain (e.g., carrying water) -weevils in mealie meal

Defining a food handler proved to be difficult in some schools. Examples of the definition include:

> "Wash my body before coming to cook for the kids. Utensils and cooking area I will check if they are clean. Cook sadza properly and the plates checked if they are clean and check if the kids wash their hands" (FGD 3; School A).

> "Anyone who is honest, does not steal, and handles food properly" (FGD 19; School E).

However, sensible definitions were given by food handlers from other schools (BC and D):

> "Food handlers are everyone who cooks food and everyone who sells food" (FGD 12; School B).

Sub-themes that emerged from the main theme 'Hygiene practice requirements for a food handler' indicated that food handlers understood and followed hygiene practice when in handling and preparing food. School C food handlers emphasised the importance of adhering to practices to prevent illness, cross-contamination, and spreading bacteria. A food handler from School D said:

> "Food handlers should wash their hands with soap and clean water. Practice good personal hygiene, tie their heads with wrappers to prevent hair from entering the food and maintain a clean kitchen and utensils" (FGD19).

Challenges that were being encountered in the NPSFP by food handlers included fetching water from a distant location. A food handler from School E said:

> "The water source is far from the cooking area, causing parents to struggle with carrying buckets, leading to backaches" (FGD 27).

Further, limited vegetables for school children and the same food daily e.g., cabbages or chunks were reported. Food handlers across all five schools identified insufficient utensils as a key challenge in serving food (FGD 2, FGD 3, FGD 6, FGD 7, FGD 11, FGD 18, FGD 20, FGD 23 and FGD 26).

Other concerns included:

> "The school should choose responsible parents to cook without rotating" (FGD 19).

"In response to the existence of weevils in mealie meal, a food handler suggested that:

4.5 Sanitary hygiene conditions of the school food preparation and serving premise

Table 4.8 shows the results of the sanitary inspection of the food preparation and serving environment. Results show all schools lacked detergent-based cleaning and sanitization of preparation areas (rated "Poor"). While water sources and utensil cleaning were "Good" (100%), rodent-proof storage was inadequate in Schools A, B and D ("Poor").

Table 4.8. Sanitary hygiene Inspection results

Observation	Score for school				
	A	B	C	D	E
Food preparation areas are cleaned with detergents	Poor hygiene	Poor hygiene	Poor hygiene	Poor hygiene	Poor hygiene
Food preparation areas are cleaned with detergents prior to food preparation	Poor hygiene	Poor hygiene	Poor hygiene	Poor hygiene	Poor hygiene
Food handlers wash hands with soap and water before starting food preparation?	Fair hygiene	Good hygiene	Good hygiene	Fair hygiene	Fair hygiene

Food handlers separate utensils when preparing raw and cooked foods?	Fair hygiene	Fair hygiene	Fair hygiene	Fair hygiene	Fair hygiene
Food preparation areas sanitized prior to food preparation and serving.	Poor hygiene	Poor hygiene	Poor hygiene	Poor hygiene	Poor hygiene
Food is stored in a secure place that is rodent proof.	Poor hygiene	Poor hygiene	Fair hygiene	Poor hygiene	Fair hygiene
There is a safely managed water source.	Good hygiene	Good hygiene	Good hygiene	Good hygiene	Good hygiene
Utensils and equipment are cleaned with safe water before use.	Good hygiene	Good hygiene	Good hygiene	Good hygiene	Good hygiene

CHAPTER 5: DISCUSSION

5. Discussion

5.1 Introduction

This chapter interprets key findings from the study on food hygiene practices among handlers in Gutu district's NPSFP, contextualising them within global literature. We discuss implications for program sustainability, child health and policy interventions.

5.2 Demographic characteristics of respondents

The homogeneity of respondents 100% female, predominantly married (64%) with secondary education (61%) reflects gendered norms in Zimbabwean school feeding programs (Chelule & Ranwedzi, 2022). This aligns with Senetla et al. (2024), who note that women dominate unpaid food-handling roles in African NPSFPs due to cultural caregiving expectations. However, the absence of formal food safety training (Table 4.5) contrasts with Ethiopia's NSFP, where 72% of handlers received hygiene training (Gebeyehu et al., 2020). This gap underscores the need for structured training to leverage handlers' educational capital.

The majority of food handlers were middle-aged and married, with secondary-level education. This demographic may contribute positively to consistent participation and understanding of basic hygiene requirements. However, the absence of male participation may indicate untapped community potential.

5.3 Level of food hygiene practice among food handlers

Handlers demonstrated strong adherence to basic hygiene (for example. 100% handwashing before cooking), mirroring South African studies (Nyawo et al., 2021). However, systemic practices

lagged only 11% consistently sanitised surfaces (Table 4.2) and 68% never sanitised, comparable to Nigeria's NSFP where inadequate sanitisation correlated with 40% higher contamination risk (Alabede, 2022). These inconsistencies echo Al-Kandari et al. (2019) knowledge rarely translates to complex practices without ongoing supervision. The variation in hygiene scores across schools (Fig. 4.1) reveals contextual challenges influencing compliance. School C's higher score (68%) aligns with better resource access, such as functional water sources and consistent supervision. Conversely, School D's lower score (58%) correlates with infrastructural gaps, including distant water points and insufficient cleaning supplies, echoing findings from Nigeria and South Africa (Alabede, 2022; O'Halloran et al., 2021).

The moderate overall scores (54.6 - 61.8%) signal the "hygiene paradox" noted by Mok et al. (2020) respondents over report foundational practices while neglecting procedural rigor. Nonetheless, poor compliance in critical control areas such as sanitizing surfaces and avoiding food handling with open wounds signals a knowledge or resource gap. These inconsistencies raise concerns about cross-contamination risks and reflect findings by Simango and Rukure (2021), who noted similar hygiene lapses in institutional food handling in Zimbabwe.

5.4 Relationship between level of food hygiene practice and demographic data of respondents

The logistic regression model revealed no statistically significant associations between demographic factors and poor food-hygiene practice, although model fit was strong (Hosmer–Lemeshow p = .957). Educational level and age appeared to offer some protection against poor hygiene, as shown by odds ratios below 1. However, the wide confidence intervals suggest that the study may have lacked statistical power. Similar trends have been observed in studies from Ethiopia and Somaliland, where higher education was significantly associated with better hygiene

outcomes. The non-significant effect in this study may result from the small sample size (N = 100) and broad category groupings, particularly in age.

The high odds ratio for health-club membership (OR = 94.11) implies a strong potential influence on hygiene practice, but the estimate was imprecise and affected by sparse-data bias. It is possible that nearly all club members reported good hygiene, creating quasi-separation in the data. Marital status did not significantly influence hygiene behaviour, a finding consistent with previous studies in university settings but contrasting with some community-based reports. Overall, the results highlight that demographic characteristics alone may not be sufficient to predict hygiene behaviour. Future studies should incorporate structural and contextual variables such as training, supervision and environmental support while also ensuring adequate sample size and model stability.

5.5 Focus group discussion data

5.5.1 Demographic characteristics

FGD respondents' demographics mirrored survey trends 100% female, 89% secondary educated, but 0% had hygiene training a critical deficit also observed in Gauteng's NPSFP (Chelule & Ranwedzi, 2022). This uniformity suggests systemic undervaluation of handlers' training needs. Notably, none had received formal food safety training, highlighting a critical gap in capacity building within the programme. Despite their relatively high education level, many participants lacked access to health clubs or structured health education, which could have improved their food handling practices.

5.5.2 Emerging themes for thematic analysis of focus group discussion data

Participants defined a food handler in terms of honesty, hygiene and active involvement in cooking or serving food. However, the definitions varied, indicating inconsistent understanding of roles and expectations. Handlers' conceptual ambiguity about their role reflects fragmented program governance, similar to Philippines' informal markets (Roa, 2023).

Challenges like distant water sources and insufficient utensils (Table 4.7) directly undermine hygiene, corroborating Davos et al. (2020): resource scarcity precipitates 68% of hygiene lapses in low-income school programs. Rotational food handling further strained hygiene consistency, as different individuals brought varying levels of commitment and knowledge The demand for "non-rotational" cooking groups (FGD 19) highlights how operational instability impedes consistency a finding echoed in Nepal's NSFP (Yeboah et al., 2024).

5.6 Sanitary hygiene conditions of the school food preparation and serving premise

Persistent "poor hygiene" ratings for surface cleaning or sanitisation (Table 4.8) align with sanitary failures in Bindura's restaurants (Kanda et al., 2019). However, "good hygiene" in water safety or utensil washing indicates handlers prioritise visible tasks over invisible pathogens a behavior noted by Al-Mahos et al. (2021) in Kuwaiti kitchens. Rodent vulnerability in storage areas (60% "poor hygiene") mirrors risks in Cape Town school outlets (O'Halloran et al., 2021), emphasizing infrastructural neglect.

Poor sanitization practices and inadequate cleaning agents were observed in all schools, compromising food safety. These findings support earlier evaluations by FAO (2019) that rural schools often lack the resources for proper food area sanitation.

However, the consistent availability of safe water sources and utensil hygiene presents an opportunity for improvement. Addressing gaps in sanitization and food storage could significantly enhance food safety in the programme.

5.7 Summary

Food handlers in Gutu's NPSFP display adequate foundational hygiene but struggle with systemic practices, exacerbated by training gaps and resource constraints. Education correlates with better outcomes, yet operational models (e.g., rotation) dilute this advantage. Prioritizing infrastructure, continuous training and stable teams could bridge compliance gaps, aligning with WHO's NPSFP safety frameworks (WHO, 2023).

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6. Conclusion and Recommendations

6.1 Conclusion

The study revealed that while some food handlers in the National Primary School Feeding Programme demonstrate good hygiene practices, a significant number still lack proper training, resources, and adherence to standard food safety procedures. Demographic factors such as education level and work experience were associated with hygiene practices.

Recommendations

- Continuous tailor made all-inclusive training programmes should be implemented, including occasional courses focusing on practical skills such as surface cleaning and basic handwashing practices.
- Infrastructural enhancements that meet legislative requirements should be put in place to support hygiene practices. Adequate resources for food preparation and serving should be availed at schools to ensure food safety
- A national survey should be made on the programme.

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APPENDIX 1: QUESTIONNAIRE

Questionnaire ID:

BINDURA UNIVERSITY OF SCIENCE EDUCATION

P. BAG 1020 Tel. (263) 712 842 712-4

Bindura,

Researcher: Mushangwe M: Chinyika Rural Hospital, Ministry of Health and Child Care, Gutu

Email:mushangwemoreblessing9@gmail.com Cell: 0771207661

Supervisor: Dr. A. Kanda: Department of Environmental Science, Bindura

E-mail: akanda@buse.ac.zw Cell: 0772 773 560

FOOD HYGIENE PRACTICES: NATIONAL PRIMARY SCHOOL FOOD PROGRAMME

Introduction

My name is *Mushangwe Moreblessing*. I am a final year student at Bindura University of Science Education (Registration No: B221421B), studying towards obtaining a BSc (Hons) degree in Safety, Health and Environmental Management (SHEM). I am also an Environmental Health Technician (EHT) stationed at Chinyika Rural Hospital. As part of my curriculum requirements I am undertaking research entitled "*Food hygiene practice among food handlers in the national primary school feeding programme: a cross-sectional study of five schools in Ward 10, Gutu district, Zimbabwe"*. Findings from the study will inform policy and practice in the programme to all stakeholders including government, the school and parents. I invite you to assist me with some information on this matter, provided you are willing to take part in the study.

Ethical statement

The study has been cleared by Bindura University of Science Education through the department of Environmental Science, the Ministry of Primary and Secondary Education, Ministry of Health and Child Care district offices. Confidentiality and anonymity of shared information are guaranteed. By voluntarily participating in the study it implies that you understood its purpose and how you will be involved. This also means that you have provided your informed consent. If you feel that you wish to discontinue in the survey, please feel free to indicate it. It will take about 20 minutes of your time.

Signature: ……..... Date: …..…….. /2025

Name of primary school:……..…… Village: …….

Instruction

Please put a cross (X) against a number indicating your response for each item.

Section A: Socio-demographic information

1. Gender: **1**. Male **2**. Female

2. Age group: (years): **1**. 18 - 25 **2**. 26 - 35 **3**. 36 - 45 **4**. > 45

3. Educational level: **1**. None **2**. Primary **3**. Secondary **4**. Tertiary

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

5. DO you have children attending this school? **1**. Yes **2**. No

6. Period you have been in this programme (years): **1**. < 1 **2**. 1 - 3 **3**. > 3

7. Did you receive any food safety and hygiene training (± month)? **1**. Yes **2**. No

8. Do you belong to any health club? **1**. Yes **2**. No

Section B: Food hygiene practices

Item	*Hygiene practice question*	*Responses*		
		***1**..Always*	***2.** Sometimes*	***3.** Never*
9.	Do you wash your hands before handling food?			
10.	Do you use to wash utensils and equipment with safe water and soap / detergent?			
11.	Do you sanitise food contact surfaces after cleaning?			
12.	Do you wash vegetable using running safe water?			
13.	Do you wash your hands with soap and water after using the latrine?			
14.	Do you have a medical examination certificate			
15.	Do you report for work when ill, have a fever, upset stomach or diarrhoea?			
16	Do you handle food with open wounds on your skin?			

17.	Do you wear a clean apron when preparing and serving food			
18.	Do you cover your head when preparing and serving food?			
19.	Do you wear perfume or make-up when preparing and serving food?			
20.	Do you remove watches or bangles when preparing and serving food?			
21.	Do you serve food while it is still hot?			
22.	Do you maintain a clean work environment?			
23.	Do you check expiry / best before dates for food products?			
24.	Do you store food safely to prevent spoilage and contamination?			
25.	You prepare and serve food far away from latrines and waste heaps?			
26.	Food waste is properly disposed of in appropriate bins			
27.	Do you use separate utensils for cooked and raw food?			
28.	You use food items that were received earlier first			
29.	Do you report to the EHT if you observe that one is ill but working?			
30.	Do you carry prepared food in containers to eat or give you children at home later?			
31.	Do you use and keep towels and place them on shoulders to remove sweat while cooking?			
32.	Do you prepare or serve food with washed wet hands?			

END OF QUESTIONNNAIRE

THANK YOU FOR YOUR PARTICIPATION

APPENDIX 2: FOCUS GROUP DISCUSSION GUIDE

BINDURA UNIVERSITY OF SCIENCE EDUCATION

P. BAG 1020 Tel. (263) 712 842 712-4

Bindura,

Researcher: Mushangwe M: Chinyika, Hospital, Ministry of Health and Child Care, Gutu

E-mail:mushangwemoreblessing9@gmail.com Cell: 0771207661

Supervisor: Dr. A. Kanda: Department of Environmental Science, Bindura

E-mail: akanda@buse.ac.zw Cell: 0772 773 560

FOOD HYGIENE PRACTICES: NATIONAL PRIMARY SCHOOL FOOD PROGRAMME

Introduction

My name is *Mushangwe Moreblessing*. I am a final year student at Bindura University of Science Education (Registration No: B221421B), studying towards obtaining a BSc (Hons) degree in Safety, Health and Environmental Management (SHEM). I am also an Environmental Health Technician (EHT) stationed at Chinyika Rural Hospital. As part of my curriculum requirements I am undertaking research entitled "*Food hygiene practice among food handlers in the national primary school feeding programme: a cross-sectional study of five schools in Ward 10, Gutu district, Zimbabwe"*. Findings from the study will inform policy and practice in the programme to all stakeholders including government, the school and parents. I invite you to assist me with some information on this matter, provided you are willing to take part in the study.

Ethical statement

The study has been cleared by Bindura University of Science Education through the department of Environmental Science, the Ministry of Primary and Secondary Education, Ministry of Health and Child Care district offices. Confidentiality and anonymity of shared information are guaranteed. By voluntarily participating in the study it implies that you understood its purpose and how you will be involved. This also means that you have provided your informed consent. If you feel that you wish to discontinue in the survey, please feel free to indicate it. It will take about 20 minutes of your time.

Signature: ……..... Date: …..…….. /2025

Instruction

Please put a cross (X) against a number indicating your response for each item.

Section A: Socio-demographic information

1. Gender: **1**. Male **2**. Female

2. Age group: (years): **1**. 18 - 25 **2**. 26 - 35 **3**. 36 - 45 **4**. > 45

3. Educational level: **1**. None **2**. Primary **3**. Secondary **4**. Tertiary

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

5. Do you have children attending this school? **1**. Yes **2**. No

6. Period you have been in this programme (years): **1**. < 1 **2**. 1 - 3 **3**. > 3

7. Did you receive any food safety and hygiene training (± month)? **1**. Yes **2**. No

8. Do you belong to any health club? **1**. Yes **2**. No

Section B: Focus group discussion with food handlers in the National Primary Schools Feeding Programme (NPSFP)

Objective: To eexplore food handlers' hygiene practices regarding food safety in the National primary school feeding programme

Venue: ……..

Village: …….

Introduction (10 min) START TIME: …….

- Welcome and introductions (Facilitator, All) [*Introduce any other guests present*]
- Study's purpose and ethical issues (Facilitator)
- Establishing ground rules and pseudo names on cards (placed in front of each participant)
- Entertain a few questions for clarification

Discussion

1. Introduction of the NPSFG: Facilitator (*5 min*)

2. Familiarisation: Importance of food to school children: Mini discussion (*5 min*)

3. Main discussion question [*Audio-recording starts here*]

(a) Who is a food handler? (Facilitator and All) (*5 min*)

(b) Hygiene practice requirements for a food handler: All, Facilitator (30 mins)

(c) Challenges encountered in the NPSFP by food handlers: All, facilitator (*20 min*)

(d) Summary: Facilitator, All (*10 min*)

(e) Vote of thanks: Facilitator (*2 min*)

END TIME: ……..

APPENDIX 3: OBSERVATION CHECKLIST

BINDURA UNIVERSITY OF SCIENCE EDUCATION

P. BAG 1020 Tel. (263) 712 842 712-4

Bindura,

Researcher: Mushangwe M: Chinyika, Hospital, Ministry of Health and Child Care, Gutu

E-mail: mushangwemoreblessing9@gmail.com Cell: 0771207661

Supervisor: Dr. A. Kanda: Department of Environmental Science, Bindura

E-mail: akanda@buse.ac.zw Cell: 0772 773 560

FOOD HYGIENE PRACTICES: NATIONAL PRIMARY SCHOOL FOOD PROGRAMME

This is normally used when the questionnaire of any other tool is used. There is no need for introductions. However, permission is sought to make observations.

Observer, tick under the appropriate column to record observations

Sanitary requirements for food handling premise and food handlers; personal hygiene	Observed	
	Yes	No
1. Food handlers wash hands with soap and water before starting food preparation?		
2. Food preparation areas are cleaned with detergents prior to food preparation		
3. Food preparation areas are sanitised prior to food preparation and serving		
4. Utensils and equipment are cleaned with safe water before use		
5. Food handlers separate utensils when preparing raw and cooked foods?		
6. Food handlers have trimmed fingernails		
7. Food handlers have covered heads		
8. Food handlers wear no jewellery and make-up		
9. Food handlers wear clean aprons / protective clothing without pockets		
10. Vegetables are washed with running safe water		
11. There is a bin /garbage pit for food left overs		

12. The food preparation area is far away from latrines or garbage pits (at least 30 m)		
13. There is a safely managed water source		
14. Food is stored in a secure place that is rodent-proof		
15. School children wash hands with running-to-waste water		
16. School children can wash hands properly (20s procedure)		

END OF OBSERVATION CHECKLIST

Copy

ALL communications should be addressed to
"The Provincial Education Director for Primary and Secondary Education"
Telephone: 263585/264331
Fax: 039-263261

ZIMBABWE

Ministry of Primary and Secondary Education
P. O Box 89
Masvingo

24/2/2025

MUSHANGKIE MOREBLESSING
CHINTIKA RURAL HOSPITAL
P. BAG 976
GUTU

RE: PERMISSION TO CARRY OUT RESEARCH AT Machingambi, Nharira, Guchacha, Firamumke and Zvirayeshe Primary Schools.

Reference is made to your application to carry out research at the above mentioned schools in Gutu District, Masvingo Province on the research topic titled:

Food Hygiene Practices among Foodhandlers in the National Primary School Feeding Programmes in Gutu District: A cross-sectional Study of five schools in Gutu District.

Please be advised that permission has been granted to carry out your research.

You are therefore advised to liaise with the District Schools Inspector who is responsible for the schools which are part of the sample for your research.

MIN. OF PRY & SEC. EDUCATION
PROVINCIAL EDUCATION DIRECTOR
MASVINGO PROVINCIAL OFFICE
24 FEB 2025
P.O. BOX 89, MASVINGO
ZIM. TEL: 0392-264331
FAX: 039-263261

S. Mhike
Provincial Education Director
MASVINGO PROVINCE

APPENDIX 5: Ethical Clearance

Telephone: +263 8644073772
E-mail: mrcz@mrcz.org.zw
Website: http://www.mrcz.org.zw

Medical Research Council of Zimbabwe
20 Cambridge Road
Avondale
Harare
Zimbabwe

APPROVAL

Ref: MRCZ/B/2946 **24 June 2025**

Moreblessing Mushangwe
Bindura University of Science Education
P. Bag 1020
Bindura

RE: - Food Hygiene Practices Among Food Handlers in The National Primary School Feeding Programme. A Cross-Sectional Study of the Five Schools in Gutu District

Thank you for submitting the application for review of research activity to the Medical Research Council of Zimbabwe (MRCZ). Please be advised that the MRCZ has **reviewed** and **approved** your application for the above-titled study.

This approval is based on the review and approval of the following documents that were submitted to MRCZ for review: -

1. Study Protocol
2. Informed consent forms
3. Data collection instruments

- **APPROVAL NUMBER** : **MRCZ/B/2946**

This number should be used on all correspondence, consent forms and documents as appropriate.

- **TYPE OF MEETING** : **Expedited**
- **APPROVAL DATE** : **23 June 2025**
- **EXPIRATION DATE** : **22 June 2026**

After this date, this project may only continue upon renewal. For renewal purposes, a progress report on a standard form obtainable from the MRCZ Offices should be submitted **three months before the expiration date** for continuing review.

1. **SERIOUS ADVERSE EVENT REPORTING**: All serious problems related to subject safety must be reported to the Institutional Ethical Review Committee (IERC) and the MRCZ within 3 working days using standard forms obtainable from the MRCZ Offices or website.
2. **MODIFICATIONS**: Any changes in the Protocol (including changes in the consent documents) require prior MRCZ and IERC approval using standard forms obtainable from the MRCZ offices.
3. **TERMINATION OF STUDY**: When a study terminates, a report must be submitted to the MRCZ using standard forms obtainable from the MRCZ Offices or website.
4. **QUESTIONS**: Please get in touch with the MRCZ by Telephone No. +263 8644073772 or by e-mail at mrcz@mrcz.org.zw

Other

1. Please remember to send in copies of your research results for our records and the Health Research Database.
2. You're also encouraged to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study.
3. **In addition to this approval, all clinical trials involving drugs, devices, and biologics (including other studies focusing on registered drugs) require approval of the Medicines Control Authority of Zimbabwe (MCAZ) before commencement**

Yours Faithfully

.....

MRCZ SECRETARIAT
FOR CHAIRPERSON
MEDICAL RESEARCH COUNCIL OF ZIMBABWE

MEDICAL RESEARCH COUNCIL OF ZIMBABWE
APPROVED
23 JUN 2025
20 CAMBRIDGE ROAD
AVONDALE, HARARE

PROMOTING THE ETHICAL CONDUCT OF HEALTH RESEARCH