

Food Hygiene and Safety Practices amongst Food Vendors in the Western Area, Sierra Leone

Philip John Kanu^{1,2,3}, Hamid Turay^{1,2*}

¹Milton Margai Technical University, Freetown, Sierra Leone

²Centre for Development and Food Safety (SL) Limited, Freetown, Sierra Leone

³Institute of Food Technology, Nutrition and Consumer Studies, Njala University, Njala, Sierra Leone

Email: *hamtu20415@gmail.com

How to cite this paper: Kanu, P.J. and Turay, H. (2024) Food Hygiene and Safety Practices amongst Food Vendors in the Western Area, Sierra Leone. *Food and Nutrition Sciences*, 15, 421-431.

<https://doi.org/10.4236/fns.2024.156028>

Received: May 4, 2024

Accepted: June 23, 2024

Published: June 26, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Food safety and hygiene practices require a multisectoral approach including food, water, sanitation, waste management, transport, education, trade, policies and programs that enable safe food preparation, storage and service. Unsafe food can cause illness keeping people from achieving their full potential and death. This was a descriptive study that uses a mixed method approach to derive insights into the characteristics of food vendors related to demography, knowledge, practices, infrastructure, compliance and recommendation for a policymaking framework. Using the Lemeshows' sample size formula, 473 vendors from formal (restaurants) and informal (cookri-baffa/table top) sites were interviewed and observed. We found from discussions that respondents had a good understanding on how to keep food safe. However, observed practices were poor 93% handled food with their bare hands, 83% did not cover their hair, and 76% did not wear an apron whilst handling, preparing or serving food, 61% did not keep their finger nails clean or short and 57% did not wash their hand before preparing or serving food. Over half (51%) had access to a toilet but 32% reported their use required payment and emphasized their poor condition/inadequate management. Nearly half (47%) of the vending sites did not have a handwashing facility, with soap and water available. Only 7% reported having any authority oversight of food safety. Food safety and hygiene practices in most cookri shops and restaurants was 'poor' with very limited surveillance system in place by competent authorities for compliance of food operators. Hand washing, clean surroundings, and covered food were the most common and emphasized practices to mitigate the risks associated with unsafe food.

Keywords

Food Safety and Hygiene, Formal and Informal Food Vendors, Western Area, Sierra Leone

1. Introduction

To grow and achieve our fullest potential in life, it is essential to be well-nourished, which begins with consuming hygienic and safe food—a fundamental safeguard against disease [1]. Food hygiene is a primary determinant of human health. It encompasses not only the proper handling of many varieties of foodstuff and beverages but also the utensils and equipment used in their preparation, service and consumption. Additionally, it includes the care and treatment of animals to prevent the contamination of food products originating from animal hosts [2].

Food should be nourishing and attractive, visibly clean and free from harmful substances. These include chemicals that can be harmless in small amounts but become dangerous in large amount. They can enter the food accidentally during preparation, or they may accumulate in the food during poor or excessively long storage in for example, metal containers. Micro-organisms may be introduced directly from infected animals, during food preparation, from workers, other foods or the environment. Additionally, toxins may be produced by the growth of bacteria and/or mold.

Cooked food vending in Sierra Leone are categorised by the co-existence of formal and informal establishment. Formal establishment such as restaurant-shave proper infrastructure, are registered as a business entity, and pay a monthly tax to the National Revenue Authority. In contrast, informal food vendors are unlicensed outlets such as ‘cookribaffa’, table-tops selling beans salad, ‘fry-fry’, tea and egg, ‘ebeh/fofoo’, hot-pap or lafidi. Many people find it cheaper to buy food from ‘cookri’ than from restaurants or to make food at home [3].

Informal cooked food vendors (‘cookri’ shops) play an important role in providing affordable cooked food to low-income people [4]. However, they generally do not have clean spaces to sell food, and are notorious for poor sanitation practices. Handwashing, as well as the cleaning of utensils, and dishes is often done in buckets or bowls using the same water [5]. Some vendors sell their food near a dump site or gutter where broken pipes from people’s homes lead to open sewers run alongside water pipes [6]. Food practice is categorized ‘good’ based on adequately protected from flies, personal cleanliness, clean kitchen and designated eating areas, work wear and protective clothing, quality of food, personal behavior and possible contamination [7].

The major challenge with informal food vendors is the lack of infrastructure and resources for proper food storage and handling. Limited access to electricity, inadequate kitchen space, insufficient water and sanitation facilities make it dif-

difficult for vendors to maintain the freshness and safety of their products [8]. Without proper infrastructure, the risk of contamination and spoilage increases, posing a direct threat to the health of the consumers [9].

The Food and Agriculture Organization highlights that financial constraints as a major barrier for small businesses in adhering to effective food safety and hygiene measures [10]. As a result, food vendors may resort to cost-cutting measures that compromise safety standards, putting consumers at risk of food-borne illnesses. Additionally, there is a lack of a regulatory framework and surveillance systems for food safety in Sierra Leone. The United Nations Development Programme emphasizes the importance of effective regulatory systems in ensuring food safety [11]. In the absence of such systems, vendors may not adhere to necessary hygiene practices, leading to the sale of unsafe foods [12].

There is a growing awareness worldwide of the need to strengthen national food safety systems to improve protection of consumers' health and to gain trust and confidence thereby facilitate food trade [13]. Stakeholders are demanding that governments provide stronger leadership, adequate resources at appropriate levels to ensure food safety across the entire food and feed chain [2].

Sufficient, safe and nutritious foods are clearly identified as relevant to all Sustainable Development Goals (SDGs), highlighting the interdependence between health, well-being, nutrition, food safety, and food security. It imperative to integrate food safety into realisation of key SDGs, notably SDG 2 (Zero hunger), SDG 3 (Good health and well-being), and SDG 8 (Decent work and economic growth). Moreover, food safety must also be integrated in pursuit of SDG 1 (No poverty), SDG 12 (Responsible consumption and production patterns), and SDG 17 (Partnerships for the goals). The integral role of food safety is a critical factor in achieving these SDG, particularly for poor consumers in low-and middle-income countries [14]. This underscores the necessity multi-sectoral approach to food safety.

The study aims to assess food hygiene practices among formal and informal food vendors in Western Area with the goal of informing policymaking frameworks.

2. Research Questions

- 1) What do food vendors know about food safety and hygiene?
- 2) What preventive measures are taken to reduce cross-contamination from food?
- 3) How many food vendors comply with the food and feed safety standards?
- 4) What are the food quality control and monitoring procedures by authorities?

3. Methods

This was a descriptive study that used mixed method approach. The researchers performed in-depth interviews with both formal and informal food vendors al-

lowing flexibility for respondents to explain what they understand about food safety, hygiene, and their practices and non-participant observation of the vendor site and their practices

Participants were recruited using the snowball sampling approach, including cookri shops (informal vendor), restaurants (formal vendors), “table top shops” and door-to-door sales that are within and around main junctions and strategic areas in the capital Freetown and surrounding Western Areas.

3.1. Sampling

Using the Lemeshows’ sample size formula ($n = (Z^2 * p * q)/E^2$), and the finite population correction: $n' = (n * N)/(n + N)$ [15], where n represents the required sample size, Z -Z-Score (1.96); p -Standard deviation = 0.5; $q = 1 - p = 0.5$; E -the margin of error = 0.5; and N is the targeted population reflective of the sample size. In the 2015 Population and Housing Census an estimated 32,253—‘Food and Accommodation Services’ were present in the Western Area Urban (WAU) and Western Area Rural (WAR) Districts [16], the adjusted sample size of respondents to be recruited was 379. To ensure robustness, an 80% adjustment was applied, resulting in a final sample size of 473 food vendors.

3.2. Sampling Areas and Data Quality Assurance

The areas sampled were based on the enumeration areas (EAs) in Western Area both Urban (WAU) and Rural (WAR), provided by Statistics Sierra Leone. A total of 40 clustered EAs were sampled to ensure representation of all food vendors within these areas.

Data was collected from participants using a pre-tested, interviewer-administered structured checklist. Researchers used Google Form and Kobo Collect toolbox on android or iPhone devices for data gathering. Forty data collectors received two days of training on administering the checklist questions and conducting interviews. Researchers supervised the data collection daily to ensure completeness and reliability.

3.3. Data Analysis

The data was cleaned and analysed in Microsoft Excel. To map and derive insights into various characteristics related to food vendors, investigations across demography, knowledge, practices, compliance and recommendations. For statistical significance between respondents and different parameters collected were tested by chi-test at $p < 0.05$ to validate statistical significance.

4. Results

A total of 473 food vendors participated in the study: 366 from WAU and 107 from WAR. The majority of participants were female (371, 78.4%), with 314 (66.4%) aged between 25-45 years and over half had secondary level education or higher (51.3%). Most had been food vendors for 3-5 years 302 (63.8%). The

majority operated informally, without infrastructure, registration, taxes/market fees based on their location (65.8% and 64.9% respectively) (Table 1). Most vendors (93%) were not monitored for food safety compliance although, 33 large restaurants (7%) reported visit from the Consumer Protection Agency to check the expiry dates of tin foods. Some of the unregistered vendors pay a daily tax of NL2 (two new Leones) which when accrued for the month is equivalent to the monthly tax paid by the registered food vendors.

Table 1. Vendors characteristics.

		n= 473	
Characteristics	Type	n	%
WAU		366	77
	WAR	107	23
Sex	Female	371	78.4
	Male	101	21.4
Age	15 - 25	76	16.1
	26 - 45	314	66.4
	>45	84	17.8
Education	None	23	4.9
	Islamic	143	30.2
	Primary	58	12.3
	Secondary	154	32.6
	Tertiary	93	19.7
Experience in years	1 - 2	85	17.9
	3 - 5	302	63.8
	Above 5	86	18.2
Infrastructure	Formal	162	34.2
Registration/monitoring status			
	Monitored by Consumer Protection Agency	33	7.0
	Paying licence fee/daily fee	166	35.1

5. Key Themes Identified (Amongst Food Vendors)

5.1. Knowledge of Correction Measures Taken to Maintain Food Safety

It is evident that the respondents are aware of the importance of hygiene in preventing foodborne illnesses to protect the health of their customers. Food vendors most commonly emphasized such as hand washing, clean surroundings, covering food, cleaning utensils, and personal hygiene. Other practices like using clean water, proper cooking, maintaining toilet hygiene and personal protective measures were less commonly cited (Table 2).

Table 2. Personal measures and environmental factors to conserve food safety (N=473).

Common responses	n	%
Handwashing (with soap and water)	185	39.1
Cleaning surroundings (includes regular sweeping)	175	37.0
Washing Utensils	160	33.8
Personal hygiene (includes cutting nails, covering head, sneezing and coughing etiquettes)	75	15.9
Avoiding contamination (surfaces, open food, use of dirty water)	28	5.9
Proper cooking	46	9.7
Washing food items	26	5.5
Covering food	174	36.8
Access to water	359	76%
Payment for water	61	13%
Access to a toilet	241	51%
Payment for toilet access	151	32%
Handwashing facility with soap and water	251	53%
Adequate waste management	71	15%
Paid waste collectors	402	85%
Smelly surroundings	359	76%
Paved, tidy floors	307	65%

5.2. Food Hygiene Practices amongst Food Vendors

The study revealed significant gaps in food hygiene practices among food vendors. It was found that 93% of food vendors handled food with bare hands, 83% had their hair uncovered, and 76% did not wear an apron while handling, preparing or serving food. Additionally, 61% were unmindful of their finger nails being clean or short. Observations revealed that 23% of food vendors had unclean attire with sweat running down their body, and 57% did not wash their hands each time before touching, handling, or serving ready to eat foods. Furthermore, 96% of vendors do not follow the three-compartment dishwashing system (wash, rinse, dry), and 87% left their utensils uncovered. Overall, 76% of food vendors operated in unclean smelly environment with multiple flies. The more formal establishment demonstrated better food hygiene (**Table 3**: food hygiene practices).

Table 3. Food hygiene practices of food vendors in Western Area Urban and Rural N = 473

Variables	n	%
Vendor handling food with bare hands	440	93
Hair uncovered	393	83
Unclean, smelly surroundings with flies (poor hygiene)	359	76

Continued

Washed hands before handling, or serving food	203	43
Vendors' nails clean and short	186	39
Vendors' clothes clean and presentable	151	32
Wore an apron when handling, preparing or serving food	114	24
Touching body (poking nose, sneezing, yawning, scratching)/sweat running off the body while preparing or serving food	108	23
Vendors' hair covered when handling, preparing or serving food	80	13
Utensils covered to protect them from flies	62	13
Utensils were adequately cleaned following the three-compartment dishwashing system (wash, rinse and dry)	18	4

5.3. Environmental Condition of Food Vending

Observation showed that informal vending (cookribaffa, and other table top sellers) site are located close to the street, besides a gutter or a near a rubbish dump. However, 76% indicated that they have access to water supply mentioning sources such as tap (22%), well water (36%), sachet (32%) and others (rivers/streams) (10%). Vendors often access water from distance sources, standing in long queues spending hours before they get their containers filled, 13% of respondents mentioned paying for water either per rubber container (5 gallons), from tanks, or wells.

Overall, 51% of respondents reported having access to toilet facilities. Around 32% mentioned that the availability of toilet facilities came with the requirement to pay for their use, or suffering from poor management. Furthermore, nearly half (47%) of the vendors do not have handwashing facility, with soap and water readily available.

Only 15% vendors had adequate waste management practices, resulting in fewer flies, 24% 'smelt comfortably' indicating better waste management and 35% had unpaved untidy floors. The majority paid waste collectors (86%) to collect waste whilst others burnt (5%) or dumped their waste (5%).

5.4. Factors Associated with Hygienic Practices of Food Vendors

Educational level, registration status, and experience (being a food vendor for more than three years) and sex were the key factors associated with good food safety practices.

Clean surroundings were significantly higher amongst those secondary and tertiary education compared to the other categories ($p < 0.05$). Additionally, practices such as covering of food and utensils, waste management, fewer flies and try serving food without touching body part (scratching, sneezing, or poking nose) ($p < 0.001$). There are good hygienic practices in female owned establishment when compared to male, however, amongst the male, 86% practice better food hygiene practices, while amongst the females alone, 60% practice good food hygiene with $p < 0.005$. There was no statistically significant difference by the

age of the vendor and their practices.

6. Discussion

This study revealed that a significant proportion 76% of food vendors have poor food safety and hygiene practices. This result is consistent with findings from Nigeria (76%) [17] and in Bole sub-city of Addis Ababa (72%) [18]. Food vendors were very causal and/or lethargic about proper hygiene practices such as covering food, using clean utensils, maintaining clean food handling environment and proper disposal of waste. They see flies and uncomfortable smell as normal in their business. We observed that, there are many cookri corners closer to the street mostly beside a gutter with heaped-up of rubbish selling cheap unhygienic, uncooked, and substandard food. The findings underscore the urgent need for comprehensive food safety education for vendors, awareness campaigns, and food safety regulations with surveillance.

Personal hygiene, both of the food handlers and the consumers, was identified as a factor contributing to unsafe food. It was clear among vendors failing to wash hands, touching food with unclean hands, scratching their head, sneezing closer to the food and sweat running off their body whilst preparing or serving or handling food. Some formal establishment have insufficient staffing where the same staff will be in the kitchen and at the same time serving customers with running nose due to the heat from the kitchen, not wearing apron and serving with their bare hands. The appearance and hygiene practices of the seller were highlighted by participants as crucial factors. Sellers who appeared clean, neat, and well-groomed were more likely to attract clients. Hygiene practices, both personal and in the preparation of food, were seen as indicators of the seller's commitment to food safety.

The findings reflect a range of experiences and access levels to water supply within the community. Water availability, access, and safety are some of the key challenges encountered by food vendors and within the communities. While a significant portion of participants had access to water supply, the responses also highlighted challenges such as payment for water and variability in availability. The reliance on diverse water sources and facilities demonstrates the complex nature of water access in the context of food preparation and other daily activities. Some vendors use fetch water from unprotected sources like shallow wells, streams or river for cooking and washing of dishes, and some costumers even drink this water if they cannot afford to buy sachets water. Contaminated water used in cooking and the overall cleaning of utensils were noted as contributing factors to food contamination. These findings emphasize the need for local construction of water-wells and erection of water tanks for availability of clean water that contribute significantly to food safety.

The findings suggest a diverse range of experiences and perspectives regarding access to toilet facilities in the food establishment centres. While a significant proportion of respondents do have access to toilet facilities, there are concerns about payment, condition, and management. Furthermore, a notable portion of

establishment do not have access to these facilities, potentially indicating a gap in sanitation infrastructure. Adequate and well-maintained toilet facilities are essential components of maintaining a clean and safe food space for both traders and consumers.

The study findings unveiled diverse practices and perspectives regarding the provision of handwashing facilities for consumers within the 'food environment'. It was evident that a portion of establishments have handwashing facilities (with soap and water) (47%) available for their customers, which reflects an essential effort to promote hygiene and food safety. On the other hand, a considerable proportion of establishments reported the absence of handwashing facilities for consumers, citing reasons such as cost constraints or the perception that customers used spoon to eat. This suggests a potential gap in promoting proper hygiene practices, raising concerns about the potential spread of contaminants. These findings underscore the need for increased awareness and implementation of handwashing facilities in the food environment to uphold food safety and public health standards. The existence of varying practices and attitudes highlights the complexity of addressing this issue, but it also presents an opportunity for interventions and education that prioritize hygiene and sanitation.

7. Conclusion and Recommendations

It is apparent that many food vendors do know some of the essentials regarding food safety and hygiene. However, their practices were 'poor' and surveillance is very weak. It is vital that food vendors are routinely monitored not only to maintain but to improve food safety management. Competent authorities should develop monitoring tools that align with the food safety handbook to monitor food operator's compliance to food regulations.

Acknowledgements

The authors would like to thank all the business operators and their staff interviewed for their collaboration during the field survey. Our appreciation to the students of Milton Margai Technical University who participated as field workers for their cooperation and patience during the fieldwork.

Availability of Data and Materials

Throughout the research process, stringent data security measures are upheld, including the secure storage of photos, audio recording and any associated notes. The Centre for Development and Food Safety (SL) Limited, archives all responses on site, which will not be shared to maintain confidentiality.

Funding

Funding for this study was made possible by the generous support from the Centre for Development and Food Safety (SL) Limited, Board of Directors and the Council of Technical Advisors. The funder had no role in the design, data

collection, and analysis, decision to publish, or preparation of the manuscript.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the Sierra Leone Ethics and Scientific Review Committee at the Ministry of Health and Sanitation. The optional nature of the study (that participants could refuse to answer questions if they were uncomfortable, that from the study at any time in which case none of their data would be used) was explained verbally. All the respondents granted informed written consent to participate and all data was anonymized. Confidentiality was assured.

Authors' Contributions

HT designed and conducted the study. HT, and 40 students from MMTU participated in the fieldwork and compiled the data. HT and PJK analysed and interpreted the data. PJK and HT drafted, reviewed and revised the manuscript. Both authors have read and approved the final manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] IFAD (2023) Investing in Rural People: Sustainable Food Value Chain for Nutrition. <https://www.ifad.org/en/web/knowledge/-/publication/sustainable-food-value-chains-for-nutrition>
- [2] Department of Nutrition and Food Safety, WHO Secretariat (2022) WHO, Draft Who Global Strategy for Food Safety 2022-2030: Towards Stronger Food Safety Systems and Global Cooperation. Geneva.
- [3] Kanu, P.J., Turay, H., Kandeh, A. and Hodges, M. (2023) Environment and Awareness Influencing Food Safety in the Western Area, Sierra Leone. *Food and Nutrition Sciences*, **14**, 1013-1030. <https://doi.org/10.4236/fns.2023.1411064>
- [4] Ma, L., Chen, H., Yan, H., Wu, L. and Zhang, W. (2019) Food Safety Knowledge, Attitudes, and Behavior of Street Food Vendors and Consumers in Handan, a Third Tier City in China. *BMC Public Health*, **19**, Article No. 1128. <https://doi.org/10.1186/s12889-019-7475-9>
- [5] Lamin-Boima, P.T. (2017) Knowledge, Attitude and Practice of Street Food Vendors in Selected Schools within Bo City Southern Sierra Leone. *International Journal of Scientific & Technology Research*, **6**, 254-272.
- [6] Okojie, P.W. and Isah, E.C. (2014) Sanitary Conditions of Food Vending Sites and Food Handling Practices of Street Food Vendors in Benin City, Nigeria: Implication for Food Hygiene and Safety. *Journal of Environmental and Public Health*, **2014**, Article ID: 701316. <https://doi.org/10.1155/2014/701316>
- [7] International Finance Corporation (2020) Food Safety Handbook: A Practical Guide for Building a Robust Food Safety Management System. The World Bank.

- [8] Gov.UK (2024) Guidance on Food Safety and Kitchen Hygiene. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/683730/HS_10.2_Food_Safety_and_Kitchen_Hygiene.pdf
- [9] Snyder, A.B., Martin, N. and Wiedmann, M. (2024) Microbial Food Spoilage: Impact, Causative Agents and Control Strategies. *Nature Reviews Microbiology*. <https://doi.org/10.1038/s41579-024-01037-x>
- [10] FAO (2024) FAO Strategic Framework 2022-31. <https://openknowledge.fao.org/server/api/core/bitstreams/29404c26-c71d-4982-a899-77bdb2937eef/content>
- [11] UNEP, FAO and UNDP (2023) Rethinking Our Food Systems: A Guide for Multi-Stakeholder Collaboration. Nairobi, Rome and New York.
- [12] Azanaw, J., Gebrehiwot, M. and Dagne, H. (2019) Factors Associated with Food Safety Practices among Food Handlers: Facility-Based Cross-Sectional Study. *BMC Research Notes*, **12**, Article No. 683. <https://doi.org/10.1186/s13104-019-4702-5>
- [13] Jaffee, S., Henson, S., Unnevehr, L., Grace, D. and Cassou, E. (2019) The Safe Food Imperative: Accelerating Progress in Low- and Middle-Income Countries (Agriculture and Food Series). The World Bank. <https://doi.org/10.1596/978-1-4648-1345-0>
- [14] FAO, WHO and WTO (2024) International Forum on Food Safety and Trade (23-24 April 2019, Geneva, Switzerland). https://www.who.int/docs/default-source/resources/joint-statement.pdf?Status=Temp&sfvrsn=61b890c4_12
- [15] Lwanga, S.K. and Lemeshow, S. (1991) Sample Size Determination in Health Studies: A Practical Manual. World Health Organization. https://iris.who.int/bitstream/handle/10665/40062/9241544058_%28p1-p22%29.pdf?sequence=1&isAllowed=y
- [16] Gboku, M.L.S., Davowa, S.K. and Gassama, A. (2017) Statistics Sierra Leone 2015 Population and Housing Census: Summary of Final Results Planning a Better Future. https://www.statistics.sl/images/StatisticsSL/Documents/Census/2015/sl_2015_phc_thematic_report_on_agriculture.pdf
- [17] Emmanuel, A., Mangai, J.M., Kayong, E.A., *et al.* (2015) Assessment of Practice of Food Safety and Hygiene among Food Vendors within Jos North Local Government Area of Plateau State, Nigeria. *International Journal of Medical and Health Research*, **1**, 83-86.
- [18] Abdi, A.M., Amano, A., Abraham, A., Getahun, M., Ababor, S. and Kumie, A. (2020) Food Hygiene Practices and Associated Factors among Food Handlers Working in Food Establishments in the Bole Sub City, Addis Ababa, Ethiopia. *Risk Management and Healthcare Policy*, **13**, 1861-1868. <https://doi.org/10.2147/rmhp.s266342>