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Hygiene and Safety Measures Practised by Roadside Meat Vendors of Namawojjolo and Lukaya Food Markets, Uganda

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Handling and preparation of roadside roasted meats may often be compromised, considering the general conditions of the makeshift structures and the common minimal education levels of vendors. The study's objectives were to assess hygiene and safety practices applied in handling, preparing, and vending of roadside roasted meats. Conducted in October 2024 at Namawojjolo and Lukaya, two major food markets along central Uganda's busiest highways, the research used an observational checklist and questionnaires to collect data from 90 meat vendors selling roasted beef, chicken, or goat meat on compliance with best known practices. Descriptive results on hygienic and handling practices were generated, and scores above 70% were used as a hallmark for best practice. Only 6.7% instituted complete sanitation and hygienic practices, while 88.9% did not store leftover meat in refrigerators. Among them, 67.8% kept meat in clean containers, 5.6% stored utensils on clean shelves, and 6.7% had clean roasting areas. Most (93.3%) separate raw meat from ready-to-eat meat, and 37.8% had stalls without rodents. Hygienically, 75.6% wore aprons while working, among whom 85.3% were considered clean aprons, 46.7% had hair covered, 91.1% had short and clean fingernails, 93.3% washed hands with soap, 1.1% covered food while presenting to customers, and 11.1% wore jewellery while working. Training on food safety was undertaken by 63.3% and 78.9% served food in paper bags. Personal hygiene practices of most vendors were fairly good, but most lacked sanitation facilities and demonstrated relatively low knowledge of best and acceptable practices in meat handling. There is a need for more sensitisation and provision of sanitation facilities to vendors to improve both the quality and safety of roadside vendor products.

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INTRODUCTION

Roadside vending of food is widespread the world over, more so across Africa and Asia, providing affordable, convenient, and appealing meals for several categories of individuals, among whom are travellers (Oloo & Wakhungu, 2019a). Meat, as a major source of protein, is one of the most common delicacies enjoyed by travellers along roadsides, as evidenced in many African highways, including Uganda. Common meats of choice usually comprise beef, chicken, goat meat, fish, and pork (Tumuhe et al., 2020). Most common preparation methods of meats at roadside markets consist of either roasting or deep frying. These meats are usually prepared either in makeshift huts or semi-permanent structures and presented mostly by semi-illiterate vendors whose main interest is earning quick cash income. This means that compliance with sanitation standards and hygiene guidelines while handling meats, is very subjective and most of the time compromised (Bagumire & Karumuna, 2019; Letuka et al., 2021).

The World Health Organization (WHO) estimates that over 70% of diarrhoea episodes result from physical, biological, or chemical contamination of food (Baidya & Rahman, 2021; Bhalla, 2019). Health challenges are associated with poor methods of food harvesting, storage, preparation, and serving/presentation, which lead to contamination,

adulteration, and spoilage (Momtaz et al., 2023; Uçar et al., 2016).

Relatedly, poor handling practices by food vendors cause contamination and food spoilage, and this ends up being eaten by hungry travellers (Kungu et al., 2021). This kind of bad food is responsible for a significant number of disability-adjusted life years (DALYs), accounting for over 34% of premature deaths in children under the age of five (Hoffmann et al., 2017; Jaffee et al., 2018).

Highway vending of food in Uganda emerged as an option for travellers to access ready-to-eat meals while in transit; however, the regulation of the business is reported not to be very effective (Mugagga, 2021). Due to this, sanitation and hygiene practices by food handlers are so wanting, which expose travellers to unsafe meals such as roasted meats (Bagumire & Karumuna, 2019). Therefore, the objective of this study was to assess hygiene and safety practices applied in handling, preparation, and vending of roadside roasted meats as well as the knowledge of the vendors on food safety of the roadside meat vendors along Namawojjolo and Lukaya Highway Food Markets.

MATERIALS AND METHODS

Study Setting/Site

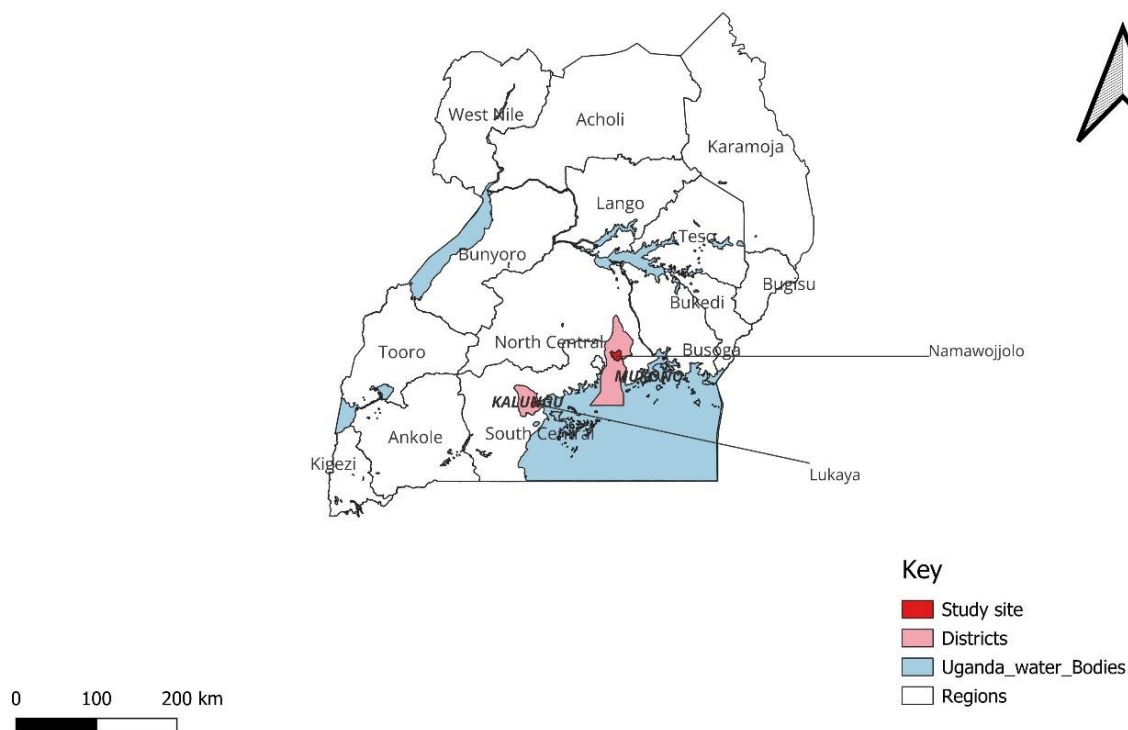
The study was conducted in two purposively selected highway roadside markets of Namawojjolo

along Kampala-Jinja and Lukaya along Kampala-Masaka (Figure 1). The two food markets were selected due to their strategic locations and high amount and variety of ready-to-eat foods and vendors. Namawojjolo is found in Nama, Mukono District of Central Uganda, about 33 km East of Kampala City and 11 km away from Mukono. Kampala-Jinja Highway is the main one linking the Capital City (Kampala) to the Eastern parts of Uganda and even those travelling to the neighbouring Country of Kenya by road. This makes it a very busy road with heavy traffic and many travellers, making stopovers at Namawojjolo Market to get already-prepared food items.

Lukaya is located in Kalungu District, along Kampala – Masaka Highway, approximately 107km from Kampala and 27 km from Masaka Town in Central Uganda. Kampala-Masaka Highway leads to the Southern and Western parts of Uganda and further links to Rwanda and the Democratic Republic of Congo (DRC) borders. Each of these two markets had an individual population of vendors ranging between 300-400 each, who were involved in the sale of different food items daily (Bagumire & Karumuna, 2017).

Figure 1: Map of Uganda Showing the Two Study Sites of Namawojjolo and Lukaya Food Markets

Map showing the two study sites in Uganda (Lukaya and Namawojjolo)



Study Design

The study employed a mixed-method approach. The two study sites and food vendors were purposively

selected based on locational strategy and type of meat product sold.

Study Population

The study population comprised vendors of roasted (ready-to-eat) meats along the highway roadside markets of Namawojjolo and Lukaya. The vendors were of both sexes and adults 18 years and above.

Selection Criteria

All vendors who prepare and sell at least one or all of the three kinds of meat (beef, chicken, or goat meat) to travellers in Namawojjolo and Lukaya Food Markets were targeted. Vendors who sold beef, chicken, or goat meat but did not speak or understand English or the Luganda language were excluded from the study. Also, vendors who had not operated a business in the area for at least one month were excluded.

Sample Size

This was calculated using the Kish-Leslie formula for sample size determination for an infinite population (Kish- Leslie, 1965) and adjusted using the modified Kish-Leslie formula for a finite population. The total number of vendors sampled was 90, which was taken to be representative of the vendors working in the roadside markets.

Data Collection

Convenience sampling was used for selecting meat vendors to interview for assessing hygiene practices followed while handling, preparing, and vending roasted meats. An observational checklist combined with a semi-structured questionnaire was used to capture the information. For each selected stall,

data was collected by observing different hygiene practices such as handwashing, touching money, cleaning utensils and surfaces, and personal hygiene such as the cleanliness of clothes (aprons), plus interviewing the vendor on demographic information and knowledge of food safety. Before data collection, the survey checklist and questionnaire were pretested in Zigoti, a market with a similar setup to those under study, and ten (10) vendors were used to test the tools. The data was collected by four research assistants who were trained for two days by the principal investigator before data collection.

Data Analysis

Scored hygiene checklists from direct vendor observations were compiled, and parameters were scored as binary or categorical variables (Yes/No, Good/Satisfactory/Poor). Descriptive statistical analysis was performed by calculating percentages, frequencies, and means of vendors following each specified hygiene practice. Total hygiene scores were computed for each vendor, and scores above 70% were used to determine best hygiene practices.

RESULTS

Characteristics of the Study Participants

The study involved 90 participants, of whom most 46 (51.1%) were vendors from Lukaya. The majority were males, 89 (98.9%), and most, 83 (92.2%) of the participants stayed in the area where they worked, as shown in **Table 1**.

Table 1: Demographic Attributes of Meat Vendors from Namawojjolo and Lukaya Food Markets, Uganda

Variable	Frequency	Percentage
Site:		
Namawojjolo	44	48.9
Lukaya	46	51.1
Gender:		
Male	89	98.9
Female	1	1.1
Religion:		
Catholic	29	32.2

Variable	Frequency	Percentage
Protestant	21	23.3
Pentecostal	8	8.9
Muslim	31	34.4
Others	1	1.1
Marital status:		
Single	22	24.4
Married	68	75.6
Residency in the area of work:		
No	7	7.8
Yes	83	92.2
Level of Education:		
No education	4	4.4
Primary	40	44.4
Secondary	46	51.1

Characteristics of Business/Stalls of Roadside Roasted Meat Vendors Along Namawojjolo and Lukaya Food Markets, Uganda

Out of the 90 participants, more than half, 48 (53.3%) of the participants owned their business of vending meat, where the majority, 87 (96.7%), were sharing a fireplace for meat roasting, and 65 (72.2%) carried out both roasting and selling

activities simultaneously. The majority, 50 (55.5%), sold roasted chicken; however, a few, 33 (36.7%), of the participants reported having received complaints about their meat products. Additionally, more than half 56, 62.2%) of the participants reported having licensed their business operations, as shown in **Table 2**.

Table 2: Description of Work-related Factors of Meat Handling, Preparation, and Vending Along Namawojjolo and Lukaya Food Markets, Uganda

Variable	Frequency	Percentage
Owner Operator:		
No	42	46.7
Yes	48	53.3
Shared resources:		
No	3	3.3
Yes	87	96.7
Labour division:		
Seller only	4	4.4
Roaster only	21	23.3
Both roast and seller	65	72.2
Meat category:		
Chicken	50	55.5
Beef	33	36.7
Goats' meat	7	7.8
Source of meat:		
Farmers	45	50
Butcher	32	35.6
Middlemen	13	14.4
Business license:		
No	34	37.8

Variable	Frequency	Percentage
Yes	56	62.2
Complaints from customers:		
No	57	63.3
Yes	33	36.7
Types of stalls:		
Semi-Permanent	40	44.4
Permanent	44	48.9
Improvised	6	6.7

Personal Hygiene Practices among Meat Vendors of Namawojjolo and Lukaya Food Markets, Uganda

Among the 90 participants, 68 (75.6%) wore aprons while working, but only 58 (85.3%) wore clean aprons. Results indicated that only 42 (46.7%) of the vendors had their hair covered, but the majority, 82 (91.1%), had short and clean fingernails (**Table 3**).

Comparing the hygiene practices for the two markets of Namawojjolo and Lukaya showed that vendors from Namawojjolo generally demonstrated better hygiene practices than those in Lukaya. For instance, 39 (88.6%) of Namawojjolo vendors wore aprons while working, compared to 29 (63.0%) in Lukaya. Similarly, 38 (86.4%) of those who wore

aprons in Namawojjolo kept them clean, whereas only 20 (43.5%) of those in Lukaya did the same. There was also a contrast observed in hair covering, with 31 (70.5%) of vendors in Namawojjolo covering their hair, compared to just 11 (23.9%) in Lukaya. On the other hand, in both markets, the fingernail hygiene, not wearing jewellery while working, and washing of hands were relatively high for both locations, as shown in **Table 3**.

Despite relatively good individual hygiene indicators, overall sanitation and hygiene practices were poor in both markets, though more severe in Lukaya. Only 6 (13.6%) of Namawojjolo vendors were classified under "good" hygiene and sanitation practices, compared to a mere 1 (2.2%) in Lukaya.

Table 3: Personal Hygiene Practices among Meat Vendors of Namawojjolo and Lukaya Food Markets, Uganda

Hygiene indicator	Namawojjolo Freq (%age)	Lukaya Freq (%age)	Total Freq (%age)
Wearing an apron at work:			
No	5 (11.4%)	17 (37.0%)	22 (24.4%)
Yes	39 (88.6%)	29 (63.0%)	68 (75.6%)
Clean/Unclean aprons:			
No	6 (13.6%)	26 (56.5%)	32 (35.6%)
Yes	38 (86.4%)	20 (43.5%)	58 (64.4%)
Hair covered at work:			
No	13 (29.5%)	35 (76.1%)	48 (53.3%)
Yes	31 (70.5%)	11 (23.9%)	42 (46.7%)
With short/clean fingernails:			
No	5 (11.4%)	3 (6.5%)	8 (8.9%)
Yes	39 (88.6%)	43 (93.5%)	82 (91.1%)
Wearing jewellery:			
No	38 (86.4%)	42 (91.3%)	80 (88.9%)
Yes	6 (13.6%)	4 (8.7%)	10 (11.1%)
Wash hands with soap:			

Hygiene indicator	Namawojjolo	Lukaya	Total
No	1 (2.3%)	5 (10.9%)	6 (6.7%)
Yes	43 (97.7%)	41 (89.1%)	84 (93.3%)
Wash your hands with soap after visiting the toilet:			
No	0 (0.0%)	1 (2.2%)	1 (1.1%)
Yes	44 (100.0%)	45 (97.8%)	89 (98.9%)
Hygiene and sanitation status:			
Poor-Practices	38 (86.4%)	45 (97.8%)	83 (92.2%)
Good-Practices	6 (13.6%)	1 (2.2%)	7 (7.8%)

Sanitation Practices among Meat Vendors of Namawojjolo and Lukaya Food Markets, Uganda

Very few 29 (32.2%) of the participants kept meat in clean containers, far fewer 5 (5.6%) stored

utensils on clean shelves, and a meagre 4 (6.7%) had meat roasting areas that were clean and free from dust and spider webs. Most 84 (93.3%) of the vendors stored raw meat separate from ready-to-eat meat, while fewer than 34 (37.8%) had stalls without rodents (**Table 4**).

Table 4: Sanitation Measures Practices by Meat Vendors of Namawojjolo and Lukaya Food Markets, Uganda

Variable	Frequency	Percentage
Keeping ready-to-eat meat in a clean container:		
No	61	67.8
Yes	29	32.2
Utensils stored in a clean shelf/cupboard:		
No	85	94.4
Yes	5	5.6
Raw meat is stored separately from ready-to-eat one:		
No	6	6.7
Yes	84	93.3
Leftover ready-to-eat meat stored in the refrigerator:		
No	80	88.9
Yes	10	11.1
Hand-washing facility in the toilet:		
No	2	2.2
Yes	81	97.8
Availability of waste disposal containers:		
No	33	36.7
Yes	57	63.3
Categories of waste disposal containers:		
Dust-bin	48	53.3
Sacks	14	15.6
Others (pits, rubbish heap, and open field)	35	38.9
Presence of insects and rodents:		
No	34	37.8
Yes	56	62.2
Clean (free from dust, spider webs) meat roasting area:		
No	86	93.3
Yes	4	6.7

Knowledge on Hygiene and Sanitation Measures of Meat Vendors from Namawojjolo and Lukaya Food Markets, Uganda

Of the 90 roadside roasted meat vendors who participated, more than half 57 (63.3%) reported having received training on food safety, hygiene and sanitation measures; where majority 73 (81.1%) knew food borne diseases, including

contamination 55/90 (75.3%), and unhygienic handling of food items 44/90 (60.3%). Additionally, results indicated that contamination of food occurs due to unhygienic hands 77/90 (85.6%), working environment 60/90 (66.7%), unclean utensils 44/90 (48.9%), using contaminated water 15/90 (16.7%), and exposure to insects and rodents 30/90 (33.3%),

Table 5.

Table 5: Knowledge on Hygiene and Sanitation Measures in Meat Handling, Preparation, and Presentation by Meat Vendors of Namawojjolo and Lukaya Food Markets, Uganda

Variables	Frequency	Percentage
Training on food safety measures:		
No	33	36.7
Yes	57	63.3
Knowledge of foodborne diseases:		
No	17	18.9
Yes	73	81.1
Identified causes of foodborne disease:		
Contamination with germs	55	75.3
Contamination with chemicals	14	19.2
Unhygienic food	44	60.3
Food from inappropriate sources	12	16.4
Pathways leading to transmission of foodborne illnesses:		
Contaminated water	8	8.9
Vectors	37	41.1
Others (cold food, half-roasted meat, sick animals)	11	12.2
Knowledge of sources of food contamination:		
Unhygienic hands	77	85.6
Unhygienic working environment	60	66.7
Unclean utensils	44	48.9
Using contaminated water	15	16.7
Exposure to insects and rodents	30	33.3
Storage of ready-to-eat meat in separate containers		
No	2	2.2
Yes	88	97.8
Knowledge of the right temperature for storing fresh meat:		
Unknown	32	35.6
Below 2°C	5	5.6
between 2-60°C	47	52.2
above 60°C	6	6.7
Knowledge on how personal hygiene prevents foodborne disease:		
No	6	6.7
Yes	84	93.3
Knowledge of safe/ hygienic food presentation practices to customers:		
No	89	98.9
Yes	1	1.1
Use of packaging materials in food handling/storage:		
Paper bag	71	78.9
Transparent polythene	5	5.6
Both paper bag and polythene	14	15.5

DISCUSSION

Summary of Findings

The study involved 90 meat vendors of beef, chicken, and goat, where the majority were males and more than half were operating from Lukaya. The majority sold chicken and beef, with a significant portion reporting that they were operating licensed businesses. Some of the best hygiene practices included vendors wearing aprons while working, keeping their fingernails short and clean, and washing their hands with soap. However, sanitation practices were poor; they only kept ready-to-eat meat in a clean container, and many vendors did not store utensils or roasting areas properly. Vendors reported that they had received food safety training, with most recognising the importance of hygiene in preventing foodborne diseases. However, few understood proper meat storage temperatures or practices, like covering food when presenting it to customers. Most vendors believed that good hygiene could prevent foodborne illnesses.

Personal Hygiene

Most roadside meat vendors, that is, those who sold and roasted meat, wore aprons while working, with the majority having clean aprons. This reflected good personal hygiene practices in this area. These were clean because keeping the aprons clean is one way of attracting customers; however, if the apron is dirty, customers can avoid buying from you or your stall. These findings are similar to a study conducted on Highway markets in Uganda, which showed a relatively high score of 2.5/3 for the hygiene of aprons (Bagumire & Rollanda, 2017).

The study revealed that only very few of the vendors covered their hair. Vendors need to cover their hair because hair can carry bacteria, dust, and sweat, which may contaminate the food. It also provides a professional appearance, reassuring customers about food safety. The findings in this study showed fewer vendors covering their hair compared to findings of a study conducted in Nigeria that

reported 53.9% covering their hair (Chukuezi, 2010).

It was observed that most of the vendors maintained short and clean fingernails. Short and clean nails reduce the risk of cross-contamination, which prevents the spread of harmful bacteria like *Salmonella* and *E. coli* from hands to food. Furthermore, it also improves handwashing effectiveness where it's easier to clean hands properly, as bacteria and debris are not trapped under them. These findings are consistent with a study done in South Africa that revealed the importance of keeping fingernails short and clean (Rohith, 2021).

Sanitation Practices:

We noted that generally the sanitation practices were poor, especially in Lukaaya, where very few of the vendors maintained clean roasting areas, and also very few stored utensils on clean shelves, indicating poor adherence to sanitation standards. A similar study reported low conformity to recommended sanitation conditions among roadside meat vendors due to inadequate facilities (Bagumire & Rollanda, 2017; Soon, 2019).

Food Safety:

Whilst some vendors reported having received training on food safety and having licensed businesses, there were no certificates observed. However, they noted that NGOs were the ones who trained them, and therefore, they acquired knowledge on food safety, where some of the participants knew about diseases that are associated with poor hygiene practices. This gap between knowledge and practice is consistent with findings from other studies that attribute such discrepancies to economic pressures and a lack of regulatory enforcement (Oloo & Wakhungu, 2019b).

Only 5.6% of vendors correctly identified below 2°C as the safe temperature for storing fresh meat or as the temperature critical for slowing bacterial growth. Similarly, only 11.1% used refrigeration

while storing meat. The findings are similar to a study in Nigeria, where only 18% of street vendors knew the correct meat storage temperature (Chukuezi, 2010)

Despite the low education levels, 63.3% reported receiving food safety training, and 81.1% demonstrated knowledge of foodborne diseases. However, practices like sharing the fireplace can be sources of cross-contamination, indicating a gap between awareness and implementation. This gap between knowledge and practice is consistent with findings from other studies that attribute such discrepancies to economic pressures and lack of regulatory enforcement (Oloo & Wakhungu, 2019a).

CONCLUSIONS

In conclusion, while roadside meat vending provides affordable meals for travellers, personal hygiene practices such as wearing aprons, maintaining short and clean fingernails, and regular handwashing were well observed; however, significant gaps were noted in sanitation and food safety. Poor meat handling practices, inadequate storage, and lack of proper cleaning for roasting areas and utensils pose potential risks for food contamination.

Although most vendors acknowledged the importance of hygiene and had received some training on food safety, there was a clear gap between knowledge and practice, particularly regarding meat storage temperatures and food presentation standards. The absence of regulatory enforcement and economic constraints may contribute to these lapses.

Recommendations

To improve hygiene and food safety among roadside meat vendors, vendors should be encouraged to cover their hair, maintain proper handwashing, and uphold personal hygiene practices. Authorities should enforce sanitation standards by ensuring clean roasting areas, proper

waste disposal, and safe storage for utensils and meat. Regular training on food handling, storage temperatures, and cross-contamination prevention should be provided, alongside stricter regulatory enforcement requiring food safety certification.

Given the particularly poor sanitation conditions observed in Lukaya (as compared to Namawojjolo), we recommend prioritising infrastructure improvements in the Lukaya food market and stricter law enforcement.

Additionally, local governments and NGOs should support vendors by providing clean water, proper storage facilities, and designated waste disposal points. Implementing these measures will enhance food safety, reduce contamination risks, and improve consumer confidence.

To ensure the effectiveness of the proposed interventions, we recommend establishing a monitoring system that includes: (1) quarterly hygiene assessments, (2) annual surveys to track changes in vendor knowledge and practices, (3) establishment of baseline indicators for measuring improvement, and (4) community health surveillance to monitor foodborne illness incidents. Local health authorities should collaborate with market associations to implement these monitoring mechanisms and ensure sustainable improvements in food safety practices.

Declarations

Acknowledgment

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Availability of Data and Materials

Datasets and materials for information in this manuscript are available upon request.

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Authors' Contributions

AN developed and designed the study. She supervised the data collection, the data analysis and drafted the manuscript.

EAM and RHA played major roles in the conceptualisation and design of the study, interpretation of the data, and writing of the manuscript. All the authors read and approved the final version of the manuscript.

Consent for Publication

Not applicable.

Competing Interests

The authors declare that they have no competing interests.

REFERENCES

- Bagumire, A., & Karumuna, R. (2017). Bacterial contamination of ready-to-eat meats vended in highway markets in Uganda. *African Journal of Food Science*, 11(6), 160-170.
- Bagumire, A., & Karumuna, R. (2019). Sanitation facilities and practices for street-vended meats at two major highway markets in Uganda. *African Journal of Food, Agriculture, Nutrition and Development*, 19(2), 14337-14353.
- Bagumire, A., & Rollanda, K. (2017). Hygiene facilities and practices for vended meats at selected highway markets in Uganda. *Journal of Food and Nutrition Sciences*, 5(1), 1-10.
- Baidya, S., & Rahman, T. (2021). *A Review on the prevalence and Detection of Bacterial contamination in Common Food and Associated Health Risk* Brac University].
- Bhalla, T. C. (2019). International laws and food-borne illness. In *Food Safety and Human Health* (pp. 319-371). Elsevier.
- Chukuezi, C. O. (2010). Food safety and hygienic practices of street food vendors in Owerri, Nigeria. *Studies in sociology of science*, 1(1), 50.
- Hoffmann, S., Devleeschauwer, B., Aspinall, W., Cooke, R., Corrigan, T., Havelaar, A., Angulo, F., Gibb, H., Kirk, M., & Lake, R. (2017). Attribution of global foodborne disease to specific foods: Findings from a World Health Organization structured expert elicitation. *PloS one*, 12(9), e0183641.
- Jaffee, S., Henson, S., Unnevehr, L., Grace, D., & Cassou, E. (2018). *The safe food imperative: Accelerating progress in low-and middle-income countries*. World Bank Publications.
- Kish- Leslie. (1965). Sampling organizations and groups of unequal sizes. *American Sociological Review*, 564-572.
- Kungu, J. M., Ejobi, F., Atuheire, C., Baluka, S., Kiganira, D. B., Namyalo, E., Meeme, R., & Okuyo, B. A. (2021). Assessment of Compliance to Animal Source Foods Quality and Safety Standards in Uganda. A Case of Kampala and Mbarara Districts.
- Letuka, P. O., Nkhebenyane, J., & Thekisoe, O. (2021). Street food handlers' food safety knowledge, attitudes and self-reported practices and consumers' perceptions about street food vending in Maseru, Lesotho. *British Food Journal*, 123(13), 302-316.
- Momtaaz, M., Bubli, S. Y., & Khan, M. S. (2023). Mechanisms and health aspects of food adulteration: A comprehensive review. *Foods*, 12(1), 199.
- Mugagga, H. (2021, January 05, 2021). How safe is the meat we eat? *Daily Monitor Uganda*. <https://www.monitor.co.ug/uganda/lifestyle/re>

views-profiles/how-safe-is-the-meat-we-eat--
1672864

- Oloo, N. S., & Wakhungu, J. W. (2019a). Level of knowledge of street and highway food vendors and consumers on basic food handling principles in Kampala and Kisumu cities, East Africa. *Multidisciplinary Research Academic Journal (MDRAJ)*, Vol 4. (Issue 2).
- Oloo, N. S., & Wakhungu, J. W. (2019b). Level of knowledge of street and highway food vendors and consumers on basic food handling principles in Kampala and Kisumu cities, East Africa. *Multidisciplinary Research Academic Journal (MDRAJ)*, 4(2), 1-13.
- Rohith, S. (2021). *An investigation into the hygiene practices and food safety of street vendors outside pension pay-out points in urban poor communities in the City of Cape Town Stellenbosch*: Stellenbosch University].
- Soon, J. M. (2019). Rapid Food Hygiene Inspection Tool (RFHiT) to assess hygiene conformance index (CI) of street food vendors. *LWT*, 113, 108304.
- Tumuhe, C. L., Kusiima, J., Sekamate, W., & Mulumba, M. (2020). Food Staffs Available on Market Stalls and Restaurants in Rural Urban Centers; a Case of Kagadi Town, Uganda. *Journal of Food Security*, 8(1), 29-37.
- Uçar, A., Yilmaz, M. V., & Çakiroglu, F. P. (2016). Food safety—problems and solutions. *Significance, prevention and control of food related diseases*, 3.