**Practices of Vendors in Provision of Safe and Quality Food for slum Residents in Nairobi, Kenya: A Gendered Exploration**

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**Abstract**

This study investigates the practices of food vendors in providing safe and quality food for informal settlement residents in Nairobi, Kenya, with a specific focus on gender dynamics. Women dominate the food vending sector, comprising 68.40% of vendors, compared to 31.60% male vendors, largely due to the flexibility this occupation offers in balancing household responsibilities and proximity to their homes. However, gender-specific challenges significantly inherent in the informal market setup hinder their ability to ensure food safety and quality. Using the Harvard Analytical Framework and the Netherlands Food Partnership Collective Impact Coalition Framework on Ghanaian Urban Food Environments, the study employed a mixed-methods approach, combining a survey of 554 food vendors and Focused Group Discussions with vendors. The findings reveal significant disparities in food safety practices, with male vendors more likely to maintain hygiene standards such as handwashing (69.01% vs. 56.35%) and proper handling of foods like raw meat (11.64% vs. 3.84%). Women vendors were disproportionately affected by poor sanitation, with 75.88% operating near open drainage compared to 62.36% of male vendors. Key barriers include limited access to sanitation facilities, inadequate storage infrastructure, and socio - cultural related constraints. The study concludes with recommendations for capacity-building programs, improved access to sanitation and storage infrastructure, and gender-sensitive policies to empower women vendors and improve food safety in Nairobi's informal settlements.

**Keywords: Food safety, Gender disparities, Slum residents, Food vendors, Hygiene practices**

1. **Introduction**

Urban informal settlements are a product of urban economic systems characterized by informality, weak governance, speculative land markets, and insufficient planning and investment in infrastructure and housing. They lack adequate housing, basic services, tenure security, and sufficient living space, making them one of the clearest manifestations of poverty ((UN-Habitat, 2020). Over half of Africa’s urban population lives in slums, driven by rapid urbanization and rural-to-urban migration in search of employment opportunities (FAO, 2007). In sub-Saharan Africa, a substantial and growing portion of the population resides in slums. Currently, 61.7% of the urban population in Africa lives in such areas, and by 2050, the number of urban residents is expected to rise from 400 million to 1.2 billion (UN-Habitat, 2013). In Kenya, 51% of the population resides in informal urban settlements, with 60% of Nairobi residents living in slums. (World Bank, 2020; Swerdik, 2017). Informal settlements, which are often excluded from city planning, are marked by poor infrastructure, including inadequate road networks, nonexistent garbage disposal systems, shanty housing, limited access to clean water, and poor sanitation. Additionally, they are overcrowded and lack secure land tenure (UN Habitat, 2016). Low-income urban households in Nairobi spend between 60% and 80% of their income on food. However, due to limited purchasing power, they struggle to afford high-quality food, leaving them with restricted access to formal food markets (Wanyama, 2019). Consequently, inexpensive, often pre-prepared food is the most convenient option for residents in Nairobi’s informal Nairobi settlements.

To cut operational costs, food vendors in the slums often compromise on food quality, offering inexpensive, less fresh, and frequently processed street food (sourcing vegetables and fruits nearing expiration, scraps of meats like intestines from nearby slaughterhouses and undesirable chicken parts and used oils) that is unhygienic and nutritionally poor (Aberman et al., 2021; Downs et al., 2022). Food safety is further jeopardized by the unsanitary physical environment such as open sewers and uncollected garbage, in which the food is sold. In many slum areas, uncovered drainage systems and open garbage disposal create unhygienic conditions, leading to air, soil, and water contamination. Additionally, vendors face limited access to potable water needed for maintaining food hygiene and lack refrigeration and other facilities essential for keeping prepared food safe for consumption (Morris and Haddad, 2022). Thus, an exploration of the knowledge, attitudes and practices of vendors in the provision of safe and quality food is crucial. The knowledge entails understanding foodborne illnesses and their causes (e.g., contamination from unclean hands, dirty surfaces, or spoiled ingredients), hygiene awareness (eg importance of washing hands, using clean utensils, and maintaining a sanitary work environment), and knowledge about proper temperature control for storage and cooking in these informal settings.

Furthermore, vendors may lack understanding of how cross-contamination occurs (e.g., using the same cutting boards for raw meat and vegetables). On the other hand, attitude is the perceived importance of food safety. Indeed, many vendors might view food safety as essential for customer health and business reputation, but some may see it as secondary to profitability and convenience. Also, vendors in informal markets may underestimate the risks of poor food safety, assuming that minor lapses are unlikely to cause significant harm, and some vendors may feel food safety is primarily the customer's responsibility (e.g., washing produce at home), particularly if customers demand cheap and ready-to-eat food. The hygiene practices, include handwashing, regular cleaning of surfaces storage and handling, cooking practices, including inconsistent adherence to recommended cooking temperatures, reusing leftover ingredients without adequate reheating or inspection and improper waste disposal practices (Werkneh et al., 2023). The poor handling of food by the vendors could be because of lack of knowledge on good hygiene practices or lack of facilities (e.g., refrigeration) to ensure the products are kept safe up to the moment of consumption (UN Habitat, 2014), among other factors.

Previous studies have shown that in the urban slums in Nairobi, women make up most of the food vendors because of the flexibility it gives them to handle both their gender roles and that the business activities are operated close to their homes (Swerdik, 2017). However, how women practice food safety in comparison to men and in the context of barriers emanating from the market environments where they operate remain underexplored.

To this end, the main objective of this study was to explore practices of vendors in provision of safe and quality food for informal residents in Nairobi using a gender lens.

1. To determine the gendered food safety and hygiene practices among male and female vendors in Nairobi informal settlements.

1. To analyze gendered challenges of informal food vendors relating to provision of safe and quality food in Nairobi slums.

**2. Materials and Methods**

**2.1 Theoretical Framework**

The study employed the Harvard Analytical Framework (HAF) to analyze food safety practices of men and women food vendors and related drivers and challenges. (March, Smyth and Mukhopadhyay, 1999). The survey and interview questions were applied with an intersectionality approach by looking at the gender and age denominations of food vending activities by both men and women.

Specifically, the study applied the Harvard Analytical Framework Tool 2 and 3 on the access and control profile and influencing factors respectively, to understand the gender differences in the food safety outcomes of male and female vendors. The better access to asserts like land, cash as well as resources including education, food safety training and refrigeration services corelate to the better food safety outcomes of men compared to women operating in informal settlements in Nairobi (March, Smyth and Mukhopadhyay, 1999).

To understand aspects of food safety practices, the study was informed by the NFP Collective Impact Coalition Framework on Ghanaian Urban Food Environments (NFP (2021). Conceptualized mainly from the Agriculture, Nutrition and Health Academy - Food Environment Working Group (ANH-FEWG) Food Environments Conceptual Framework and other relevant frameworks that apply the food systems perspective, it provides four domains including the urban consumer, trading and purchasing, healthy food availability and enabling environment, that explain urban food systems in Africa including vending dynamics in informal settlements (ANH-FEWG, 2019). The urban slum consumer’s demand for safe and quality foods is influenced by the trading and purchasing environment in which informal food vendors in slums operate, which in turn are influenced by the enabling environment comprising relevant multi-sector policies, funding and resourcing of informal markets (NFP, 2021, ANH-FEWG, 2019). This framework provided an understanding of the two main study objectives whose focus was food safety practices of vendors operating in informal settlements and challenges that they face that emanate from the poor enabling environment within which they operate.

* 1. **Research Design and Methodology**

**Research Design:** the study employed the descriptive survey method to provide an understanding on the nature and explanations behind the gendered food safety practices of male and female vendors serving informal urban settlements in Nairobi. This deign enabled the study to uncover otherwise missing information on gendered patterns and associated challenges of practices relating to food safety.

**Research Approach:** The study applied a mixed methods approach where both qualitative and quantitative data was collected and used. This approach ensured that reliable and credible data was generated, based on the triangulation of qualitative and quantitative data. It was anticipated that due the mixed methods approach this research work could feed into related policy initiatives. The data collected was done ensuring a participatory approach in which the participants were part of the resolution of challenges faced by women-owned food SMEs participating and serving low -income consumers.

**Study Site:** The study was undertaken in Kibera, an informal settlement in Nairobi County, Kenya. Kibera’s selection was based on the fact that it is the largest slum in Kenya and East Africa at large. It serves a predominantly low-income population who rely on informal food markets to meet their daily food needs (Downs, et al, 2022).

**Target Population and sample size**

The general target population of the survey comprised men and women living in Kibera informal settlements and selling food to the residents. The criteria for selecting vendors included being actively engaged in a food vending business within the selected slum and aged 18 years or older.

The sample size for the survey was determined using the Cochran’s formula, with the following parameters: N= Z2p(1-p)/e2, where: N is the sample size, Z is the critical value of desired confidence level of 95% (corresponding z-score value is 1.96), p=25% (estimated proportion of people in Kenya with access to hand-washing facilities with soap and water), and a desired level of precision of 5% (0.05). The calculated sample size was adjusted for attrition and non-response rate by 5% to obtain the optimal sample size of 554 participants.

**Data Collection Tools**

**Survey/Questionnaire:** The survey collected sex, age, and educational- disaggregated data to explore how gendered biases, challenges, and strategies and strategies in food vending practices.

Socio-demographic data including age, marital status, religious affiliation, level of education, family size, and number of years spent in food vending business, were gathered alongside food safety variables such as training on food safety, handwashing education, access to a water source, the sufficiency of water at the vending premises/ location, the water source at the point of selling food, source of information on handwashing (health workers, city council police, television, teachers, family members, other sources), type of water source (tap water, tank storage, borehole, others), materials always used in handwashing (water only, water and soap), knowledge of hand hygiene and attitude towards hand hygiene and other information that would enable a better understanding of the drivers of good and bad practices among food vendors. Participants were randomly selected to ensure a representative of the study population. These data were analyzed to identify the drivers of good and poor food safety practices.

**Observation checklists:** Two observation checklists were developed: one to record food safety practices (e.g., handwashing, food storage) and another to assess the quality, variety, and safety of food items sold. one to record food safety practices (e.g., handwashing, food storage) and the other to assess the quality, variety, and safety of food items sold by both male and female vendors in the selected study site. These were adapted from nutrition international guidelines and contextualized for the local setting. Trained field researchers administered the checklists under the supervision of the lead researchers. These tools were essential for triangulating observational data with self-reported practices from surveys and interviews.

**Focus Group Discussions**

Focus Group Discussions (FGDs) were used to explore food safety practices by gender for food business owners in Kibera. The FGDs were guided by a semi–structured guide carried out in private venues comprising rented rmeeting rooms from a local CBO inside the informal settlement. Each FGD comprised seven members to maximize chances for every participant to talk. Each FGDs was either only male or only female. Further, the FGDs were segreggated based on age with members being either above or below 35 years of age. In total eight FGDs (2 with young males, 2 with young females, 2 with older males, 2 with older females) were held to ensure free engagement of partcipants. Discussions focused on shared experiences that discussants had on food vendiing in slum settings in Nairobi. Each session lasted 40 to 60 minutes. Infomed consent from individuals and data anonymity were sort and assured to the partcipants prior to data colllection. A voice recorder was used as backup to write notes taken during the sessions to facilitate the accurate recall of verbatim quotations. Recordings were then transcribed after completing the interviews and analyzed.

**Data analysis**

**Statistical analysis**

Data analysis was performed using SPSS software (SPSS Inc., Chicago, Ill., USA). Descriptive statistics was used to summarize data on the practices relating to the sale of quality and safe food among male and female vendors as well as challenges experienced by women and men vendors. Results were reported as mean ± standard deviation. The data obtained was subjected to one-way analysis of variance (ANOVA) and the levels were differentiated using post-hoc Tukey-Duncan’s multiple range tests in Statistical Package for the Social Sciences (SPSS) software version 20. The significance was ascertained at p < 0.05.

Chi-square tests were used to identify significant differences among vendors (disaggregated by gender and age) concerning practices related to food safety and challenges experienced. Multivariate logistic regression was conducted to analyze determinants of good and bad practices among food vendors. The outcome variable was binary, categorized as predominantly good practices (1) or predominantly bad practices (0). Predictor variables included age, marital status, religious affiliation, level of education, family size, years of experience in food vending, training on food safety, handwashing education, water availability at vending locations, type of water source, materials used during handwashing, knowledge of hand hygiene, and attitudes toward hygiene.

Chi-square test was used to identify if significant differences among the vendors (disaggregated by gender and age) concerning practices related to food safety and challenges experienced. Multivariate logistic regression was conducted to analyze the determinants of good and bad practices among food vendors. The outcome variable was binary, categorized as predominantly good practices=1 or predominantly bad practices=0. Predictor variables included age, marital status, religious affiliation, level of education, family size, years of experience in food vending, training on food safety, handwashing education, access to a water source, the sufficiency of water at the vending premises/ location, the water source at the point for selling food, source of information on handwashing, type of water source, materials always used in handwashing, knowledge of hand hygiene and attitude towards hand hygiene during preparation and sale of food.

Quantitative data yielded gender-disaggregated information that was triangulated with qualitative findings. The data included trends in food safety practices used to provide affordable food to slum communities in Kenya.

**Qualitative data analysis**

The qualitative data were transcribed verbatim and analyzed using thematic analysis. Recurring themes were identified, and relevant quotes were included to highlight participants’ voices and perspectives. For example, themes such as “barriers to food safety compliance” and “gendered challenges in access to water” emerged. Identifiable information was omitted to ensure participant confidentiality, adhering to ethical standards for qualitative research.

**Data quality assurance measures**

Multiple data sources, including desk review, survey, and interviews, were utilized to ensure triangulation of the data. Triangulation was employed to cross-verify findings and enhance data reliability and validity. Furthermore, validation workshops were conducted to review the quality and confirm the quality and accuracy, and relevance of the data collected. These workshops involved stakeholders such as researchers, community representatives, and food vendor participants. These measures ensured that the data were robust and could reliably inform the study’s objectives and conclusions.

1. **Results and Discussion**

**3.1 Demographic and Socio-economic characteristics**

Table 1 presents the socioeconomics characteristics of the respondents. The results revealed that there was gender variability among the food vendors with 68.40% being female and 31.60 % men. This suggests that the food market is dominated by women possibly due to the given gender roles, whereby, cooking responsibilities are mainly undertaken by females in the society.

**Table 1 Demographic and Socio-economics characteristics of food vendors**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** |  | **N** | **Percentage (%)** |
| Gender | Female | 381 | 68.40 |
|  | Male | 176 | 31.60 |
|  | Total | 557 | 100 |
|  |  |  |  |
| Age | Below 30 years | 177 | 31.89 |
|  | 31-40 years | 195 | 35.14 |
|  | 41-50 years | 136 | 24.5 |
|  | 51-60 years | 41 | 7.39 |
|  | 61-70 years | 6 | 1.08 |
|  | Total | 555 | 100 |
|  |  |  |  |
| Marital status | Single | 164 | 30.09 |
|  | Married | 322 | 59.08 |
|  | Separated | 22 | 4.04 |
|  | Widowed | 37 | 6.79 |
|  | Total  | 545 | 100 |
|  |  |  |  |
| Education level | No education | 13 | 2.46 |
|  | Primary education | 226 | 42.72 |
|  | Secondary education | 217 | 41.02 |
|  | Tertiary | 73 | 13.8 |
|  | Total | 529 | 100 |
|  |  |  |  |

Vendors varied in age with the predominant age category being 31-40 years. This category was closely followed by those below 30 years with 31.89% indicating high involvement of the youth in the food vending business. More than half (59.08%) of the respondents were married, 30.09% single, 6.79% widowed and 4.04% were separated. The findings indicate that 42.72% of food vendors had completed their primary education, 42.72% had completed their secondary education, 13.8% had earned a tertiary degree, and only 2.46% had no formal education.

**3.2 Personal hygiene, water sanitation Practices**

Table 2 shows gender-based differences in hygiene practices observed by food vendors. The findings reveal that male vendors (37.5%) have more access to dustbins compared to female vendors (24.26%), (P=0.01). Similarly, over 29% of male vendors reported availability of handwashing soaps compared to female vendors (18.33%) with a significant value of P=0.02. The result revealed that there was a significant difference (P=0.018) in access and use of clean towel between male and female vendors. More male vendors 11.43% had high level of access and use clean towel compared to female vendors who reported 5.72%. Significant difference was reported between male and female vendors' hygiene practice, especially when it comes to hand washing practices. Compared to female vendors (56.35%), male vendors (69.01%) were more likely to wash their hands after using the washroom and before handling food (47.19% for males and 31.62% for females). More differences were reported in activities such as handling of raw meat and garbage. Males reported high probability of washing hands after handling raw meat and garbage at 11.64% and 52.35% compared to female who reported 3.84 % chance of washing hands after touching raw meat and 41.34% chances of washing hands after handling garbage. Results also show that women vendors were more significantly exposed to open drainage (75.88%) and open garbage (72.36%) than their male counterpart at (62.36%) and 58.43%.

**Table 2. Gendered differences in Water and Sanitation Practices Segregated**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Practice/Condition** | **Male** | **female** | **χ2** | **sig** |
| **Yes**  | **No** | **Yes** | **No** |
| **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| The hygienic conditions of the toilet (clean) | 80 | 46.24 | 93 | 53.76 | 155 | 43.66 | 200 | 56.34 | .32 | .575 |
| The hygienic conditions of the toilet (able to flush) | 25 | 14.88 | 143 | 85.12 | 53 | 15.19 | 296 | 84.81 | .01 | .927 |
| The hygienic conditions of the toilet (water available for flushing) | 90 | 52.02 | 83 | 47.98 | 203 | 57.02 | 153 | 42.98 | 1.18 | .277 |
| The hygienic conditions of the toilet (pit latrine) | 35 | 21.34 | 129 | 78.66 | 65 | 19.17 | 274 | 80.83 | .33 | .568 |
| Are toilet paid for | 113 | 65.70 | 59 | 34.30 | 244 | 67.78 | 116 | 32.22 | .23 | .063 |
| Availability of dustbins to keep waste | 66 | 37.5 | 110 | 62.50 | 90 | 24.26 | 281 | 75.74 | 10.27 | .001 |
| Availability of covered dustbins | 13 | 7.47 | 161 | 92.53 | 16 | 4.37 | 350 | 95.63 | 2.23 | .135 |
| Stall is far from animals | 103 | 58.86 | 72 | 41.14 | 184 | 50.69 | 179 | 49.31 | 3.17 | .075 |
| Availability of hand washing soaps | 53 | 29.78 | 125 | 70.22 | 68 | 18.33 | 303 | 81.67 | 9.17 | .002 |
| Availability of disinfecting solution | 14 | 7.91 | 163 | 92.09 | 17 | 4.59 | 353 | 95.41 | 2.46 | .116 |
| Availability of clean towels | 20 | 11.43 | 155 | 88.57 | 21 | 5.72 | 346 | 94.28 | 5.52 | .018 |
| Washing of hands after visiting toilets | 118 | 69.01 | 53 | 30.99 | 204 | 56.35 | 158 | 43.65 | 7.77 | .005 |
| Washing of hands before handling food | 84 | 47.19 | 94 | 52.18 | 117 | 31.62 | 253 | 68.38 | 12.54 | .000 |
| Washing of hands after touching money | 3 | 1.69 | 174 | 98.31 | 3 | .81 | 368 | 99.19 | .87 | .352 |
| Washing of hands after blowing nose | 8 | 4.97 | 153 | 95.03 | 13 | 3.88 | 322 | 96.12 | .32 | .573 |
| Washing of hands after touching raw meat | 17 | 11.64 | 129 | 88.36 | 11 | 3.48 | 305 | 96.52 | 11.69 | .000 |
| Washing of hands after handling garbage | 89 | 52.35 | 81 | 47.65 | 148 | 41.34 | 210 | 58.66 | 5.65 | .017 |
| Washing of hands after food preparation | 70 | 39.33 | 108 | 60.67 | 98 | 26.78 | 268 | 73.22 | 8.84 | .003 |
| Washing of hands after taking a breaking a break | 19 | 10.73 | 158 | 89.27 | 32 | 8.77 | 333 | 91.23 | .54 | .461 |
| Washing of hands after changing baby napkin/Handling child | 11 | 8.27 | 122 | 91.73 | 21 | 6.93 | 282 | 93.07 | .24 | .621 |
| Washing of hands after touching the phone | 2 | 1.15 | 172 | 98.852 | 2 | .55 | 359 | 99.45 | .56 | .453 |
| Washing of hands after touching other non food items | 3 | 1.69 | 174 | 98.31 | 4 | 1.09 | 363 | 98.91 | .34 | .557 |
| Open drainage/sewer nearby | 111 | 62.36 | 67 | 37.64 | 280 | 75.88 | 89 | 24.12 | 10.77 | .001 |
| Stagnant water on ground | 126 | 71.19 | 51 | 28.81 | 273 | 73.78 | 97 | 26.22 | .87 | .648 |
| Garbage and dirty waste close to the place of selling | 104 | 58.43 | 74 | 41.57 | 267 | 72.36 | 102 | 27.64 | 10.68 | .001 |
| Presence of houseflies in the stalls or shade where food is sold | 134 | 75.71 | 43 | 24.29 | 294 | 80.11 | 73 | 19.89 | 1.38 | .240 |
| Use of cloth/dress/apron as napkins | 57 | 32.95 | 116 | 67.05 | 63 | 18.05 | 286 | 81.95 | 14.5 | .000 |

**3.3 Food safety and hygiene practices**

The results in Table 3 explores differences in adherence and compliance to other safety and hygiene practices including covering the hair, removal of accessories, proper handling of food, cleanliness of the working and eating environment etc.) among male and female vendors. Various practices show statistically significant difference between male and female vendors. For example, female vendors were found to cover their hair while handling food at 34.5%, as compared to male vendors at 19.77%, (p = .00). Similarly, most females (15.68%) were found wearing jewelry when handling food, as opposed to males at 9.50%. Also, more females than males used nail polish; 19.02% and 7.91%, respectively (p = .000). Gender differences was observed with the various methods of surface and dish cleaning. Rate of wiping of the selling surface was found to be more among male vendors, at 41.48%, than females, who had a rate of 23.89%. Notable, more significant difference was witnessed in the use of a clean cloth to remove dust or dirt from the foods, in keeping clean dishes covered, serving ready-to-eat food with their bare hands, ground-level food handling and allowing customers to touch the food before buying.

**Table 3. Gendered differences in Food safety and Hygiene practices**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  **Hygiene Practice** | **Male** | **female** | **χ2** | **sig** |
| **Yes**  | **No** | **Yes** | **No** |
| N | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| Hair covered | 35 | 19.77 | 142 | 80.23 | 128 | 34.50 | 243 | 65.50 | 12.44 | .000 |
| Food vendor wore jewelry while handling food | 17 | 9.50 | 162 | 90.50 | 58 | 15.68 | 312 | 84.32 | 3.90 | .048 |
| Vendor wearing apron/dust coat during food preparation and while selling | 71 | 42.51 | 96 | 57.49 | 147 | 40.83 | 213 | 59.17 | .13 | .715 |
| Vendor has clean and short finger nails | 147 | 82.12 | 32 | 17.88 | 283 | 76.69 | 86 | 23.31 | 4.08 | .130 |
| Vendor hasnail polish | 14 | 7.91 | 163 | 92.09 | 70 | 19.02 | 298 | 80.98 | 11.32 | .000 |
| Use clean water for washing hands and plates | 122 | 69.32 | 54 | 30.68 | 236 | 64.31 | 131 | 35.69 | 1.33 | .248 |
| Are dirty dishes covered | 12 | 7.41 | 150 | 92.59 | 21 | 6.05 | 326 | 93.95 | .33 | .562 |
| Are clean dishes covered? | 24 | 14.72 | 139 | 85.28 | 30 | 8.62 | 318 | 91.38 | 4.38 | .036 |
| Regular wiping of selling surface | 73 | 41.48 | 103 | 58.52 | 86 | 23.89 | 274 | 76.11 | 17.53 | .000 |
| Dirty or dust was removed using (an apron) | 11 | 7.43 | 137 | 92.57 | 27 | 8.28 | 299 | 91.72 | .10 | .752 |
| Dirty or dust was removed using (bare (uncovered)hands)) | 14 | 9.46 | 134 | 90.54 | 32 | 9.97 | 289 | 90.03 | .03 | .863 |
| Dirty or dust was removed using (dirty cloth) | 82 | 50.31 | 81 | 49.69 | 213 | 61.03 | 136 | 38.97 | 5.23 | .022 |
| Dirty or dust was removed using (clean cloth) | 68 | 42.77 | 91 | 57.23 | 99 | 29.91 | 232 | 70.09 | 7.90 | .004 |
| Dirty or dust was removed using (wet wipes/serviettes | 7 | 4.83 | 138 | 95.17 | 9 | 2.86 | 306 | 97.14 | 1.15 | .283 |
| Separate utensils used when preparing raw and cooked foods | 90 | 52.94 | 80 | 47.06 | 209 | 58.54 | 148 | 41.46 | 1.47 | .225 |
| Food prepared on-site | 124 | 70.06 | 53 | 29.94 | 250 | 68.68 | 114 | 31.32 | .11 | .745 |
| Availability of microwave | 7 | 3.98 | 169 | 96.02 | 7 | 1.91 | 360 | 98.09 | 2.03 | .154 |
| Serving ready-to eat food with bare hands | 104 | 59.43 | 71 | 40.57 | 183 | 49.73 | 185 | 50.27 | 4.48 | .034 |
| Serving food that is not reheated | 64 | 36.57 | 111 | 63.43 | 114 | 31.06 | 253 | 68.94 | 1.63 | .201 |
| Use of the same hand to serve food and collect money | 162 | 93.1 | 12 | 6.90 | 344 | 93.73 | 23 | 6.27 | .08 | .781 |
| Handling of food at ground level | 61 | 34.08 | 118 | 65.92 | 201 | 54.32 | 169 | 45.68 | 19.82 | .000 |
| Customers allowed making contact with food sold before making a choice | 57 | 32.02 | 121 | 67.98 | 168 | 45.65 | 200 | 54.35 | 9.20 | .002 |

**3.4 Food Storage Practices**

**Table 4. Gendered differences in Food Storage Practices**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Storage practice** | **Male** | **Female** | **χ2** | **sig** |
| **Yes**  | **No** | **Yes** | **No** |
| **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| Cooked food stored on the floor | 22 | 18.49 | 97 | 81.51 | 81 | 34.76 | 152 | 65.24 | 10.08 | .001 |
| Uncooked food items stored on the floor | 35 | 29.41 | 84 | 70.59 | 108 | 46.35 | 125 | 53.65 | 9.37 | .002 |
| Food was stored/displayed in sealed containers/glass displays | 55 | 30.90 | 123 | 69.10 | 70 | 19.07 | 297 | 80.93 | 9.48 | .002 |
| Raw, partially cooked and cooked food products were kept separate | 83 | 47.16 | 93 | 52.84 | 189 | 51.78 | 176 | 48.22 | 1.01 | .313 |
| Previously cooked foods were kept cool e.g in an ice box or fridge | 21 | 12.07 | 153 | 87.93 | 28 | 7.61 | 340 | 92.39 | 2.86 | .090 |
| Availability of fridge | 22 | 12.36 | 156 | 87.64 | 23 | 6.22 | 347 | 93.78 | 6.02 | .014 |
| Availability of freezer | 21 | 11.80 | 157 | 88.20 | 24 | 6.49 | 346 | 93.51 | 4.5 | .033 |
| Availability of an ice box | 6 | 3.39 | 171 | 96.61 | 13 | 3.54 | 354 | 96.46 | .01 | .927 |

Table 4 highlights important gender differences in the food storage practices among vendors. The findings show that storing food on the floor was more prevalent among female vendors, with 34.76% storing cooked food on the floor as compared to 18.49% males, p = .001. 46.35% of females stored uncooked food on the floor as compared to 29.41% males, p = .002. A significant large proportion (30.9%) of male vendors stored or displayed food in sealed containers or glass displays, compared female vendors (19.07%). The fridge and freezer use were low across all vendors, with males reporting a slightly higher access at 12.36% compared to 6.22% for females (p = 0.014). 11.80% of the males reported access to a freezer compared to 6.49% females (p = 0.033). Overall access to the storage infrastructures of ice boxes, fridges, and freezers is limited within the categories. These gendered differences in storage infrastructure suggest that there are certain challenges encountered by female vendors concerning the safety and quality of food. This results in inadequate cold storage, increasing the risks of spoilage and contamination.

**3.5 Determinants of Vendor uptake of safe and quality food handling techniques.**

The study assessed factors influencing the vendor adoption of safe and quality food handling practices using Poisson regression model. First the data was analyzed using standard Poisson regression and then using Zero truncated Poisson regression model. The findings are presented in Tables 5 and Table 6. A goodness of test was used to establish the most effective model. Rule of the thumb provides that lower values of Akaike’s Information Criterion (AIC) or Bayesian Information Criterion (BIC) show a better fit. Thus Zero–Truncated Poisson model was selected due to the smaller AIC and BIC. The discussion is based on the finding from Zero-truncated Poisson model.

**Table 5: Determinants of vendor uptake of safe and quality food handling practices in slums in Kenya: Standard Poisson regression model results.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Coef. |  St.Err. |  t-value |  p-value |  [95% Conf |  Interval] |
| Age | -.009 | .006 | -1.45 | .148 | -.022 | .003 |
| Marital status  |  |  |  |  |  |  |
| Married | .012 | .014 | 0.82 | .41 | -.016 | .04 |
| Separated | .018 | .029 | 0.62 | .537 | -.038 | .074 |
| Widowed | .03 | .021 | 1.44 | .149 | -.011 | .071 |
| Education level |  |  |  |  |  |  |
| Primary education | .001 | .028 | 0.02 | .985 | -.054 | .055 |
| Secondary education | -.018 | .03 | -0.59 | .558 | -.076 | .041 |
| Tertiary | .031 | .033 | 0.94 | .346 | -.033 | .095 |
| Age of business | -.002 | .013 | -0.20 | .844 | -.027 | .022 |
| Pays city rent | .045 | .014 | 3.17\*\*\* | .002 | .017 | .073 |
| Business closed by county officers | .026 | .064 | 0.40 | .686 | -.099 | .151 |
| Type of business |  |  |  |  |  |  |
| Temporary | -.019 | .017 | -1.17 | .242 | -.052 | .013 |
| Mobile | .005 | .024 | 0.23 | .82 | -.041 | .052 |
| Monthly Profit  |  |  |  |  |  |  |
| 4001 – 12000 | .019 | .02 | 0.95 | .341 | -.02 | .059 |
| 12001 – 20000 | .041 | .022 | 1.88 | .061 | -.002 | .083 |
| 20001 – 28000 | .017 | .036 | 0.47 | .641 | -.054 | .088 |
| 28001 – 36000 | .042 | .03 | 1.43 | .154 | -.016 | .1 |
| 36000 or above | .084 | .029 | 2.87\*\*\* | .004 | .027 | .141 |
| Phone use in business | -.02 | .039 | -0.51 | .612 | -.095 | .056 |
| Accessed business loan | .018 | .013 | 1.37 | .171 | -.008 | .043 |
| Training in food handling and storage | -.008 | .029 | -0.28 | .776 | -.066 | .049 |
| Attended safety campaign | .093 | .046 | 2.04\*\* | .041 | .004 | .182 |
| Number of handwashing stations | -.017 | .006 | -2.86\*\*\* | .004 | -.028 | -.005 |
| Source of water |  |  |  |  |  |  |
| Jerrican | -.014 | .022 | -0.65 | .514 | -.056 | .028 |
| Buy from vendor | .024 | .018 | 1.35 | .176 | -.011 | .058 |
| Both | -.049 | .033 | -1.47 | .143 | -.114 | .016 |
| Visit by health inspector | 0 | .02 | 0.02 | .984 | -.039 | .04 |
| Source of food |  |  |  |  |  |  |
| Supermarket | -.031 | .018 | -1.74 | .081 | -.065 | .004 |
| From rural farms | -.062 | .017 | -3.67\*\*\* | 0 | -.096 | -.029 |
| From the urban farm | .007 | .028 | 0.25 | .806 | -.049 | .063 |
| From bigger hotels | .126 | .028 | 4.50\*\*\* | 0 | .071 | .18 |
| Number of taps  | -.043 | .009 | -5.08\*\*\* | 0 | -.06 | -.027 |
| Constant | 3.883 | .173 | 22.38\*\*\* | 0 | 3.543 | 4.223 |
| Mean dependent variables | 64.308 | SD dependent variable | 6.780 |
| Pseudo r-squared  | 0.040 | Number of observation  | 299 |
| Chi-square  | 81.062 | Prob > chi2  | 0.000 |
| Akaike crit. (AIC) | 1993.529 | Bayesian crit. (BIC) | 2111.943 |
| \*, \*\*, \*\*\*, Significant levels at 10%, 5%, 1% respectively |

**Table 6: Determinants of vendor uptake of safe and quality food handling practices in slums in Kenya: Truncated Poisson regression**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   |  Coef. |  St.Err. |  t-value |  p-value |  [95% Conf |  Interval] |
| Age | -.009 | .006 | -1.45 | .148 | -.022 | .003 |
| Marital status  | 0 | . | . | . | . | . |
| Married | .012 | .014 | 0.82 | .41 | -.016 | .04 |
| Separated | .018 | .029 | 0.62 | .537 | -.038 | .074 |
| Widowed | .03 | .021 | 1.44 | .149 | -.011 | .071 |
| Education level | 0 | . | . | . | . | . |
| Primary education | .001 | .028 | 0.02 | .985 | -.054 | .055 |
| Secondary education | -.018 | .03 | -0.59 | .558 | -.076 | .041 |
| Tertiary | .031 | .033 | 0.94 | .346 | -.033 | .095 |
| Age of business | -.002 | .013 | -0.20 | .844 | -.027 | .022 |
| Pays city rent | .045 | .014 | 3.17\*\*\* | .002 | .017 | .073 |
| Business closed by county officers | .026 | .064 | 0.40 | .686 | -.099 | .151 |
| Type of business | 0 | . | . | . | . | . |
| Temporary | -.019 | .017 | -1.17 | .242 | -.052 | .013 |
| Mobile | .005 | .024 | 0.23 | .82 | -.041 | .052 |
| Monthly Profit  | 0 | . | . | . | . | . |
| 4001 – 12000 | .019 | .02 | 0.95 | .341 | -.02 | .059 |
| 12001 – 20000 | .041 | .022 | 1.88 | .061 | -.002 | .083 |
| 20001 – 28000 | .017 | .036 | 0.47 | .641 | -.054 | .088 |
| 28001 – 36000 | .042 | .03 | 1.43 | .154 | -.016 | .1 |
| 36000 or above | .084 | .029 | 2.87\*\*\* | .004 | .027 | .141 |
| Phone use in business | -.02 | .039 | -0.51 | .612 | -.095 | .056 |
| Accessed business loan | .018 | .013 | 1.37 | .171 | -.008 | .043 |
| Training in food handling and storage | -.008 | .029 | -0.28 | .776 | -.066 | .049 |
| Attended safety campaign | .093 | .046 | 2.04\*\* | .041 | .004 | .182 |
| Number of handwashing stations | -.017 | .006 | -2.86\*\*\* | .004 | -.028 | -.005 |
| Source of water | 0 | . | . | . | . | . |
| Jerrican | -.014 | .022 | -0.65 | .514 | -.056 | .028 |
| Buy from vendor | .024 | .018 | 1.35 | .176 | -.011 | .058 |
| Both | -.049 | .033 | -1.47 | .143 | -.114 | .016 |
| Visit by health inspector | 0 | .02 | 0.02 | .984 | -.039 | .04 |
| Source of food | 0 | . | . | . | . | . |
| Supermarket | -.031 | .018 | -1.74 | .081 | -.065 | .004 |
| From rural farms | -.062 | .017 | -3.67\*\*\* | 0 | -.096 | -.029 |
| From the urban farm | .007 | .028 | 0.25 | .806 | -.049 | .063 |
| From bigger hotels | .126 | .028 | 4.50\*\*\* | 0 | .071 | .18 |
| Number of taps  | -.043 | .009 | -5.08\*\*\* | 0 | -.06 | -.027 |
| Constant | 3.883 | .173 | 22.38\*\*\* | 0 | 3.543 | 4.223 |
| Mean dependent var | 64.308 | SD dependent var  | 6.780 |
| Pseudo r-squared  | 0.040 | Number of obs  | 299 |
| Chi-square  | 81.062 | Prob > chi2  | 0.000 |
| Akaike crit. (AIC) | 1989.529 | Bayesian crit. (BIC) | 2100.542 |
| \*, \*\*, \*\*\*, Significant levels at 10%, 5%, 1% respectively |

The results revealed that paying city rent, participating in food safety campaign, monthly profit, vendors sourcing food materials from bigger hotel and small rural farms, number of taps and number of handwashing stations influenced vendor uptake of the safe and quality food handling practices. It was observed that paying city rent for business positively influenced adoption of safe and quality practices and was significant at 1 %. (P<0.01). Suggesting that vendors who paid rent had high likelihood of observing safe food practices. This could be attributed to the fact that having a permanent place of work exhibit some form of stability which promotes better business practices.

Attending food safety campaigns was found to have a positive and significant effect (P<0.05) on the safe and quality handling of food. A one unit increase in number safety campaigns attended increased uptake of the safe practices by 4.5%. Safety campaigns have been used as a key avenue of promoting safe food handling practice especially in the informal settlement.

Income category for vendors with over Kshs36000 per month was positive and significant at (p<0.01). A one shilling increase in monthly profit increase the adoption of safe and quality practices by 8.6%. Meaning that some income from the profit is ploughed back in to the business to promote safe handling of food.

Source of food for the vendor’s business revealed mixed results. Sourcing food from bigger hotels was positive and significant (P<0.01). This shows that bigger hotels adhere to safe food handling practice. On the other hand, source of food from rural farms indicates a negative and significant relationship (p<0.01) with uptake of safe and quality food practices. This could be attributed to the fact that food from rural farm is not subject to strict quality check.

Number of Taps (p < 0.01) and number of Handwashing Stations (p = 0.01): The negative association with additional taps and handwashing stations may seem contrary, but having more taps and handwashing stations does not always equate to improved safe and quality food. This may be the result of poor maintenance, crowding, or erratic water supply, all of which can reduce the usefulness of extra facilities. This implies that expanding the number of facilities without guaranteeing their quality and functionality might not enhance food safety and quality.

**3.6 Overall Challenges Faced by Food vendors**

The study investigated the disparities in challenges faced by food vendors in the slums based on gender. The results are presented in Table 7. The finding shows significant gender differences in several issues, suggesting that men and women may experience such problems at varying levels.

 **Lack of access to productive resources like land** (p = .047): Female vendors (91.3%) faced greater obstacles in accessing productive resources compared to male vendors (85.8%). This can be attributed to the fact that men have high chances of property ownership, access to credit which are key resources in starting food business. Similarly, men have more options dictated by social norms, giving them more advantage over female in accessing information and other productive resources.

 **Lack of lighting at the market** (p = .014): Lack of lighting was mentioned as a problem by more female vendors (98.2%) than male vendors (94.3%), which is crucial for security. High rates of insecurity, particularly at night, have been linked to slums, with women and children being the primary victims. The absence of lights causes fear and shortens working hours.

**Lack of childcare services at the market** (p = .010): A higher percentage of female vendors (96.6%) than male vendors (91.5%) cited the lack of childcare services at the market as a challenge. Informal employment mostly offers little flexibility for addressing household chores, which affects women's capacity to manage work and family obligations.

**Cultural beliefs affecting gender-specific business involvement** (p = .007): More female vendors (95.3%) reported that cultural beliefs limit their business activities compared to male vendors (89.1%). Various cultural stereotypes and norms limit women’s access to certain practices and technologies key for promoting their food businesses.

**Table 7. Challenges faced by vendors.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Challenges faced by vendors** | **Gender** | **X2** | **sig** |
| **Male** | **Female** |
| **Significant** | **insignificant** | **significant** | **insignificant** |
| **N** |  **%** | **N** |  **%** | **N** | **%** | **N** | **%** |
| Risk of theft and mugging of food business items | 163 | 92.6 | 13 | 7.4 | 354 | 93.2 | 26 | 6.8 | .05 | .815 |
| Risk of experiencing sexual and physical harassment while at work | 140 | 79.5 | 36 | 20.5 | 326 | 85.8 | 54 | 14.2 | 3.46 | .063 |
| Lack of access to productive resources like land and other asserts to support the business | 151 | 85.8 | 25 | 14.2 | 347 | 91.3 | 33 | 8.7 | 3.92 | .047 |
| Poor access to sources of safe, quality and affordable foods for sale | 166 | 94.3 | 10 | 5.7 | 365 | 96.1 | 15 | 3.9 | .84 | .358 |
| Poor access to business and financial networks / SACCOS | 150 | 85.2 | 26 | 14.8 | 335 | 87.9 | 46 | 12.1 | .78 | .377 |
| Poor access to clean transportation for food and raw materials | 172 | 97.7 | 4 | 2.3 | 361 | 95.0 | 19 | 5.0 | 2.26 | .133 |
| Lack of information on food hygiene and safety | 170 | 96.6 | 6 | 3.4 | 371 | 97.9 | 8 | 2.1 | .82 | .364 |
| Poor access to financial resources /formal loans to expand the business | 162 | 92.0 | 14 | 8.0 | 362 | 95.3 | 18 | 4.7 | 2.30 | .129 |
| Lack of access to food storage facilities and equipment for the business | 166 | 94.3 | 10 | 5.7 | 367 | 96.6 | 13 | 3.4 | 1.55 | .231 |
| Lack of time for business due to household chores and family members care | 158 | 89.8 | 18 | 10.2 | 357 | 93.9 | 23 | 6.1 | 3.07 | .0798 |
| Harassment by city council officials | 158 | 90.3 | 17 | 9.7 | 351 | 92.1 | 30 | 7.9 | .52 | .468 |
| Lack of information on financial literacy | 167 | 94.9 | 9 | 5.1 | 369 | 96.9 | 12 | 3.1 | 1.28 | .257 |
| Lack of food safety inspection and certification services | 169 | 96.6 | 6 | 3.4 | 366 | 96.1 | 15 | 3.9 | .09 | .770 |
| Lack of access to sanitation and waste disposal facilities at the market | 170 | 96.6 | 6 | 3.4 | 374 | 98.2 | 7 | 1.8 | 1.30 | .253 |
| Lack of access to technology for the business – phones etc, internet/ bundles/ smart phone | 166 | 94.3 | 10 | 5.7 | 368 | 97.4 | 10 | 2.6 | 3.18 | .074 |
| Lack of lighting at the market | 166 | 94.3 | 10 | 5.7 | 374 | 98.2 | 7 | 1.8 | 6.01 | .014 |
| Lack of access to clean water services at the market for cooking and drinking | 170 | 96.6 | 6 | 3.4 | 377 | 99.0 | 4 | 1.0 | 3.80 | .051 |
| Lack of access to clean private toilets facilities at the market/ vendor site | 172 | 97.7 | 4 | 2.3 | 376 | 99.2 | 3 | 0.8 | 2.12 | .145 |
| Lack of child care services at the market | 161 | 91.5 | 15 | 8.5 | 368 | 96.6 | 13 | 3.4 | 6.59 | .010 |
| Cultural belief that people of my gender cannot be involved in some kinds of businesses | 156 | 89.1 | 19 | 10.9 | 361 | 95.3 | 18 | 4.7 | 7.17 | .007 |
| High cost of living | 166 | 94.3 | 10 | 5.7 | 357 | 93.7 | 24 | 6.3 | .08 | .777 |

1. **Discussion**

In this study, a significant proportion of food vendors were women (68.4%), consistent with findings from other regions, including Mekelle City, Northern Ethiopia (Werken et al., 2023), Dhaka City, Bangladesh (Md Jisan Ahmed et al., 2024), Gedeo Zone, Southern Ethiopia (Negassa et al., 2023), and Takoradi Submetro, Ghana (Nortey et al., 2024). This gender disparity can be attributed to cultural norms that associate food preparation and kitchen-related chores with women, facilitating their transition from domestic roles to vending. Additionally, women often face limited access to education and formal employment opportunities, making informal food vending an attractive economic alternative (Salamandane et al., 2023). The low initial capital required for street food vending further reinforces its accessibility for women. These findings underscore the importance of designing gender-sensitive interventions that address systemic barriers while leveraging women’s critical role in the sector.

Moreover, the study revealed that most vendors are below 40 years old, representing the millennial and Gen Z demographics. This insight calls for innovative training strategies tailored to younger vendors, such as mobile-based learning platforms, gamified modules, and social media campaigns. Such tools can effectively engage tech-savvy younger generations, ensuring they adopt safe food handling practices and improve the quality of their products. Targeted programs that integrate both gender and generational needs will enhance the effectiveness of future interventions in the food vending sector.

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This study reveals that male vendors are more likely to practice better hygiene than female vendors, despite women forming most food vendors. Similar findings were reported by Negassa et al. (2023), who observed that female vendors in Ethiopia were 85% less likely to exhibit good hygiene practices compared to their male counterparts. Studies in Northwest Ethiopia (Lema et al., 2019) and Shiraz, Iran (Askarian et al., 2015) also reported similar trends, with male vendors consistently adhering to higher hygiene standards.

The gender disparity in hygiene practices observed in this study may stem from several underlying factors, including access to sanitation infrastructure, differences in education levels, and disparities in training opportunities. Previous research has shown that the presence of adequate water infrastructure, such as taps and washing facilities, is significantly associated with improved food hygiene practices (Negassa et al., 2023; Khairuzzaman et al., 2014). However, this study found a negative association between hygiene practices and the number of taps (p < 0.01) and handwashing stations (p = 0.01). This suggests that the mere presence of infrastructure does not guarantee its functionality or accessibility. For example, taps and handwashing facilities might lack a consistent water supply, be poorly maintained, or remain inaccessible due to overcrowding.

To address these challenges, future research should focus on assessing the operational effectiveness of hygiene infrastructure rather than solely quantifying its availability. Additionally, interventions should prioritize providing targeted training for women vendors to bridge knowledge gaps and improve compliance with hygiene standards. Collaborative efforts between government and community organizations could enhance infrastructure functionality while promoting inclusive training programs tailored to the needs of female vendors. This multi-pronged approach can help reduce gender disparities and improve overall food hygiene practices in informal vending environments.

Improved food hygiene practices are consistently linked to regular inspections and compliance with government regulations. In this study, 96% of both male and female vendors identified the lack of certification as a major challenge to achieving food safety. This highlights the need for future interventions to integrate hygiene and safety training with certification and compliance mechanisms. Studies in Ethiopia (Legesse et al., 2017; Azanaw et al., 2019) and Kenya (Mwove et al., 2020) have demonstrated that vendors inspected by health professionals are significantly more likely to adopt appropriate food hygiene practices compared to those who are not.

To address these challenges, government agencies should establish regular inspection programs for informal food vendors, ensuring they are held to the same standards as formal food handlers in hotels and restaurants. These inspections should go beyond enforcement to include professional guidance aimed at improving vendor practices. Furthermore, vendors should be linked to training programs like the World Health Organization’s (WHO) Five Keys to Safer Food framework. This globally recognized framework offers clear and actionable steps for maintaining safe and hygienic food practices, making it an ideal tool for improving vendor compliance.

By combining regular inspections with accessible training and certification programs, these interventions can empower vendors to meet hygiene standards while improving consumer trust. However, efforts should also address potential barriers to compliance, such as limited resources, lack of awareness, and logistical challenges, ensuring that all vendors, especially those in resource-poor settings, can participate fully.

1. **Conclusion**

This research underscores the pivotal role of women food vendors in Nairobi's informal settlements and the unique challenges they face in ensuring the provision of safe and quality food. Despite their dominance in the sector, women vendors encounter systemic barriers, including limited access to resources, insufficient training on food safety, and socio-cultural constraints that hinder their ability to thrive. These challenges not only affect their livelihoods but also compromise food safety for slum residents, posing significant public health risks.

To address these issues, it is essential to implement targeted and practical interventions. Training programs tailored to women vendors should focus on equipping them with the skills and knowledge needed to adopt safe food handling practices. Improving access to financial resources, such as microcredit programs and subsidies for sanitation infrastructure, can help vendors invest in better equipment and facilities. Additionally, promoting gender-sensitive policies—such as childcare support at markets, enhanced market lighting, and equitable access to sanitation infrastructure—will empower women vendors to overcome socio-cultural and logistical constraints.

By fostering an enabling environment for women vendors, policymakers and stakeholders can significantly improve food safety and quality in informal settlements. This, in turn, will enhance public health outcomes, strengthen livelihoods, and contribute to the resilience of urban food systems. The findings of this study highlight the urgent need for multi-sectoral collaboration to address these challenges and ensure sustainable improvements in the informal food vending sector.

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