

## **FOOD HANDLING PRACTICES AND SAFE FOOD PROVISION BY UNCLASSIFIED RESTAURANTS IN NAIROBI CITY COUNTY**

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### **ABSTRACT**

**Purpose of the Study:** To investigate the impact of food handling practices on safe food provision in unclassified restaurants in Nairobi city county.

**Statement of Problem:** Food safety is a major public health concern globally. In Nairobi, Kenya, informal eateries are often linked to food poisoning and diarrhea due to poor safety practices, highlighting the need for a thorough examination of food handling in these establishments.

**Methodology:** The study employed a mixed method approach, targeting 124 unclassified restaurants in Nairobi. Data was collected from 189 participants across 40 selected restaurants using questionnaires, interviews, and observation checklists. Ethical procedures, including research clearance and participant consent, were strictly adhered to.

**Results:** The study found that while most respondents generally followed personal hygiene practices (handwashing, glove use, cleanliness), issues like improper dress code and mixing of food items during preparation were observed. Most restaurants had essential hygiene items but lacked adequate water points for handwashing. Chi-square tests showed a significant relationship between food handling practices and safe food provision, rejecting the null hypothesis of no significant relationship.

**Conclusion:** The study concluded that food handling practices significantly affect the provision of safe food in unclassified restaurants in Nairobi, with proper handling being critical from preparation to serving.

**Recommendations:** The study recommends that the government should enforce licensing, audits, and hygiene inspections for all restaurants, including unclassified ones, to ensure adherence to food safety standards.

**Keywords:** *Food Safety, Food Handling Practices, Nairobi Restaurants, Unclassified Eateries, Public Health, Hygiene Practices.*

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## INTRODUCTION

Restaurants frequently trigger disease outbreaks due to supplier risks, temperature abuse enabling pathogen growth, cross-contamination from unclean surfaces or utensils, and unhygienic food handler practices (Smigic et al., 2020). While classified licensed establishments undergo mandated audits and oversight, informal food vendors, escaping regulation, may lack structured safety training and guidelines (Kibret & Abera, 2012). Indeed, research by Musakala (2022) reveals that handling practices greatly impact safe provision, as do compliance, training, and management. Moreover, studies underscore that food safety knowledge and hygienic adherence are critical among handlers, with Al-ghazali (2020) finding direct positive links to actual practices. In Kenya's capital, 70% of largely unregulated eateries reveal unsafe ingredients, water access, pests, and waste proximity (Njue et al., 2023; Kagwanja et al., 2020). Compared even to street foods, these unclassified outlets see higher customer food poisoning and diarrhea rates (King et al., 2000). Yet, specific unhygienic practices propagating such public health risks in Nairobi's informal restaurant sector are unclear. Assessing safety gaps would inform regulatory and training interventions targeting operators, infrastructure upgrading, and consumer education to spur improvements.

Given that unregulated restaurants account for up to 70% of dining establishments in urban Kenya (FAO, 2012), there is a critical need for analysis around food handling and safety procedures in this segment. Assessment to establish areas requiring intervention can inform future education and capacity building efforts or policy discussions as applied to Nairobi City's sizeable informal restaurant sector. Such initiatives may help safeguard consumer wellbeing and reduce incidence of food contamination originating from unstandardized restaurants. The significance of food handling practices in unclassified restaurants is paramount to ensuring the

provision of safe food to customers. Despite their widespread presence and vital role in serving millions of people, these restaurants often lack strict adherence to food safety management practices. The safe handling, production, and storage of food are crucial in preventing contamination and diseases, while also retaining enough nutrients for a healthy diet (Food and Agriculture Organization (FAO, 2018; WHO, 2015). However, the safety of food in Nairobi's unclassified restaurants is frequently questioned due to a lack of clear guidelines and consistent practices.

Food handlers are essential in maintaining food safety throughout the production and storage chain. Their effectiveness in practices such as hand washing, proper utensil cleaning, thorough sanitization of food preparation areas, waste management, and maintaining an adequate supply of clean water is crucial in determining the hygiene level of food served to customers (Odundo et al., 2018). These practices are key in preventing foodborne illnesses but are often inadequately implemented in unclassified restaurants, posing health risks to consumers. The WHO (2019) emphasizes basic food handling procedures for safety, including cooking to the correct internal temperatures, keeping food clean, separating raw and cooked foods, maintaining safe food temperatures, and using potable raw materials. However, the application of these guidelines in unclassified restaurants in Nairobi is inconsistent, leading to precarious food safety. Moreover, the HACCP (Hazard Analysis and Critical Control Points) framework outlines comprehensive procedures for storage, handling, cooking, and cleaning, addressing biological, physical, and chemical hazards from production to consumption (Tian, 2017). Despite these guidelines, actual practice in Nairobi's unclassified restaurants often falls short. This situation in Nairobi City County reflects a broader challenge in many developing regions, where the lack of structured training in food handling, inadequate knowledge about food safety practices, and poor enforcement of regulations contribute to the substandard food safety observed in these establishments.

## **STATEMENT OF THE PROBLEM**

Food safety is a critical public health issue globally, causing significant illness and death annually. Restaurants and eateries, particularly in high-risk settings, are often linked to foodborne disease outbreaks due to poor safety practices and non-compliance with guidelines (Smigic et al., 2020). This situation is especially pressing in Nairobi, Kenya, where studies have identified various safety infractions in restaurants, such as contamination, pest issues, and

waste proximity (Kagwanja et al., 2020). These informal eateries see higher rates of food poisoning and diarrhea among patrons compared to other dining options (King et al., 2000).

Despite unclassified restaurants comprising 70% of Nairobi's food establishments, there are significant gaps in adhering to safety protocols for storage, preparation, handling, and service (FAO, 2012; Odundo, Okemo & Chege, 2018). The World Health Organization (WHO, 2019) and Tian (2017) recommend best practices in thermal processing, preventing cross-contamination, maintaining personal hygiene, and following HACCP principles, which are crucial for implementation. However, there's a lack of basic food handling principles in these restaurants, increasing the risk and spread of foodborne illnesses among their extensive customer base.

Although Sub-Saharan studies have examined food safety knowledge and practices (Al-Ghazali et al., 2020; Musakala et al., 2022; Souza et al., 2018), specific research focusing on the unclassified restaurant sector in Nairobi is scarce. Most existing research in Nairobi has targeted general foodservice establishments rather than specifically informal eateries. This gap underscores the necessity for a focused assessment of unsafe food handling practices and the resulting public health risks in these critical, unregistered, and unrated dining establishments that dominate the urban hospitality landscape in Kenya. Such findings could inform policy and educational interventions to protect consumers.

## **OBJECTIVE OF THE STUDY**

The objective of the study was to determine the influence of food handling practices and safe food provision by unclassified restaurants in Nairobi city county

## **THEORETICAL REVIEW**

The Theory of Planned Behavior (TPB) provides a robust framework for analyzing workplace behaviors and intentions such as safe food handling (Clayton & Griffith, 2008). According to TPB, behaviors are influenced by attitudes towards the behavior, subjective norms, and perceived control over that behavior. In a restaurant context, employers shaping positive attitudes about hygiene, propagating norms about safe practices, and empowering staff with control through training, can enhance compliance (Mullan & Wong, 2009). Building on this premise, the Health Action Process Approach (HAPA) further elaborates the intention-behavior gap by differentiating motivation processes that influence intention formation versus volition processes that support intention realization into action (Schwarzer, 2008). Here, self-

efficacy to carry out safe food behaviors, positive outcome expectations, and task-related planning are critical. Several workplace safety theories also offer useful perspectives, applied to a foodservice context. The Domino Theory propagates an accident causation model whereby lack of management commitment to safety creates problems that spread through the organizational hierarchy ultimately impacting staff behaviors and safety outcomes (Hollnagel, 2004).

In addition, High Reliability Theory states that organizations can achieve consistent safety performance through leadership promoting collective mindfulness, redundancy in safeguards, extensive training to manage complex systems, and continuous progress via small scale experiments (Weick & Sutcliffe, 2015). Both underscore senior management's oversized role in enabling food safety culture through systems, policies, and practices. Theories centered on risk and crisis communication also offer insights into food safety strategies. The Crisis and Emergency Risk Communication (CERC) framework recognizes that during health emergencies like food recalls or disease outbreaks, public understanding of risk is shaped by transparent communication, accountability, messaging tailored to audience knowledge, and community engagement (Reynolds & Seeger, 2005). Adherence to CERC principles in communicating with consumers, the media, and food control authorities can determine response effectiveness and organizational reputational outcomes amidst crises arising from safety violations.

## **EMPIRICAL REVIEW**

Mwangi (2018) studied food handlers' hygiene practices as determinants of consumers' choice of selected African indigenous restaurants' in Nairobi City County, Kenya by adopting a cross-sectional descriptive survey. The study revealed an insignificant linkage between customers' choice of restaurants and food handlers' practices. However, the research did not link handlers' hygiene practices and provision of safe food hence the need to conduct the study. Tessema, Gelaye, and Chercos (2014) established the significance of knowledge regarding proper food handling practises based on a cross-sectional quantitative study design study on food handling practises among food handlers in Dangila town, Northwestern Ethiopia. The goal of the current study is to connect safe food handling procedures to the provision of wholesome food in unclassified eateries. Kamboj, et al. (2020) studied food safety and cleanliness using an empirical review. The incidence of foodborne illness is significantly influenced by improper food handling practises. Approximately 97% of foodborne illnesses linked to catering

establishments may be caused by improper food handling practises. Maintaining the intended food handling practises in the workplace requires constant reinforcement of the hygiene messages.

Husain, et al. (2016) determined the effect of food safety training on food handlers' knowledge and practices. On-site observations were done to assess hygienic practices during the handling of raw food and cooking equipment. Knowledge about personal hygiene and related to rules for preparing safe food was significantly improved after the food safety intervention. A significant within-group and between-group improvement was demonstrated for the observed behaviour of raw food handling and equipment sanitation. Wafukho, Rotich and Cheloti (2021) conducted a study on personal and environmental hygiene measures on food safety compliance in selected public universities in Kenya. Descriptive and explanatory research designs were used to guide the study. Self-administered questionnaires and interview schedule were used to collect primary data from food handlers and senior managers respectively. Multiple linear regression results show that there exists a significant positive relationship between personal hygiene measures, environmental hygiene measures and food safety compliance in selected public universities in Kenya. Lema, Abuhay, Kindie, Dagne and Guadu (2020) studied food hygiene practice and its determinants among food handlers at University of Gondar, Northwest Ethiopia, 2019. Univariate and multivariable binary logistic regression analyses were used to test the association of covariates with the food safety practice. The study indicated that there should be continuous supportive supervision to raise the skills of food handlers to comply with better food hygiene practice. Food hygiene training should be given especially to female food handlers.

As they aid in preventing the contamination of food items with dangerous pathogens and other contaminants, proper food handling procedures are essential to guaranteeing the safety of food supply (Aung & Chang, 2020). The food supply chain is covered by these measures in a number of ways, including preparation, storage, transportation, and production. The risk of foodborne infections can be considerably decreased and public health outcomes can be improved by implementing food safety measures including good hygiene practises, temperature control, and cross-contamination prevention (World Health Organisation, 2020). Da Cunha et al. (2019) conducted a thorough empirical evaluation to examine how food safety training programmes affected the knowledge, attitudes, and practises of food handlers. According to the study, food handlers' understanding of safe food handling practises and their attitudes towards food safety

were both improved by training programmes. Additionally, the findings showed that using gloves and washing hands were two effective ways to dramatically lower the risk of food contamination (de Cunha et al., 2019).

Another study by Todd et al. (2020) showed that food handlers' long-term behaviour change might be effectively promoted by food safety training programmes when paired with continuous reinforcement and support. In addition to training programs, regulatory frameworks and monitoring systems are essential for enforcing proper food handling measures and ensuring safe food provision (Codex Alimentarius Commission, 2020). Governments and food safety authorities should collaborate with food producers and handlers to develop and implement comprehensive food safety regulations, as well as invest in the development of robust inspection and monitoring systems. These efforts can contribute to minimizing foodborne illness outbreaks and ensuring that the food supply chain remains safe and secure (World Health Organization, 2019).

## **METHODOLOGY**

The mixed methods study assessed food handling practices and safe food provision in 124 unclassified restaurants in Nairobi City County, Kenya. A sample of 189 participants was drawn including managers, supervisors, cooks and waiters from 40 purposively selected restaurants in the CBD area. Data collection involved semi-structured questionnaires, interviews with managers, and observation checklists to evaluate practices. Quantitative data was analyzed using descriptive and inferential statistics while qualitative data underwent thematic content analysis. Key ethical procedures included obtaining research clearance and approvals, seeking participant consent, and assuring confidentiality.

## **FINDINGS AND DISCUSSION**

The study evaluated the food handling practices and safe food provision in unclassified restaurants located in Nairobi City County, Kenya. A survey was administered to a total of 189 individuals, consisting of 168 restaurant employees and 21 managers. The poll received a response rate of 78.9%. The demographic findings revealed that the predominant proportion of participants were women (62%), belonging to the age group of 26-30 years (35%), possessing a diploma (45.2%), and having accumulated 4-5 years of professional experience (33.8%). The substantial response rate and inclusive sample facilitate additional examination of the impact of food handling practices on the provision of safe food in these establishments.

## Food Handling Practices

The first objective was to assess the influence of food handling practices on safe food provision by unclassified restaurants in Nairobi City County. The objective was analysed by employing descriptive statistics and inferential analysis. Hypothesis testing was also conducted in this section.

## Descriptive Statistics

The study determined the influence of food handling practices on safe food provision by unclassified restaurants. The participants of the study responded on statements related to food handling practices. Result findings are presented in Table 1.

**Table 1: Food Handling Practices**

| Food handling practices                                                     | SD  | D   | NAD | A   | SA  | Mean | Std Dev |
|-----------------------------------------------------------------------------|-----|-----|-----|-----|-----|------|---------|
| Hand washing every time after visiting the washrooms                        | 12% | 22% | 3%  | 39% | 26% | 3.6  | 1.4     |
| Hand washing before and after handling foods                                | 12% | 18% | 1%  | 47% | 22% | 3.7  | 1.3     |
| Using gloves while handling salads                                          | 15% | 20% | 2%  | 38% | 26% | 3.5  | 1.4     |
| Cleaning the working areas after and before food preparation                | 18% | 20% | 1%  | 36% | 24% | 3.5  | 1.5     |
| Adhering to policy of clean as you go after handling every item             | 19% | 19% | 2%  | 36% | 24% | 3.5  | 1.5     |
| Storage of Red and white meats in separate fridge/freezers/cold rooms       | 13% | 17% | 1%  | 40% | 30% | 3.6  | 1.4     |
| Thawing freezers are used to thaw frozen meats                              | 16% | 20% | 3%  | 34% | 28% | 3.5  | 1.5     |
| Raw and cooked foods are stored in fridge/freezers for not more than 5 days | 18% | 20% | 1%  | 35% | 26% | 3.5  | 1.5     |
| Cooked foods are reheated at 76.7o C to prevent food contamination          | 15% | 22% | 2%  | 37% | 24% | 3.6  | 1.4     |
| Frozen foods for cooking are thawed using running water or microwave        | 17% | 19% | 3%  | 36% | 26% | 3.5  | 1.5     |

Focusing at personal hygiene practices, majority of respondents agreed that they washed hands every time after visiting the washrooms as indicated by mean response of 3.5 and standard deviation of 1.4. Most respondents also indicated that they washed hands before and after handling foods (mean response of 3.7 and Std Dev of 1.3). Also, most of the respondents were

agreed that they use gloves while handling salads (mean response of 3.5, Std Dev of 1.4), clean the working areas after and before food preparation (mean of 3.5 and standard deviation of 1.5) and adhere to policy of clean as they go after handling every item as shown by mean response of 3.5 and standard deviation of 1.5. The results imply that personal hygiene practices remain one of primary aspect of food safety. Plate 5.1 (appendix 5.5) shows dress code for some workers in the unclassified restaurants. The photos were taken by researcher upon management approval. The first photo on the left indicates a restaurant where staff are provided with dress code while preparing food. In the second picture on the right, the hotel staff was not provided with dress code. In addition, the chefs are not wearing head gear and is handling food without gloves. Proper dress code is from head to toe.

This is a breach in the quest for safe food provision in unclassified restaurants. Regarding separation of different type of food items during preparation, the picture in 4.1 indicates disregard of this noble practice. There is mix of meat and vegetables during preparation which is not acceptable. This may result to possible cross contamination possibly because there's chicken and VEGES together. Regarding food hygiene practices, most of respondents agreed that the restaurants store red and white meats in in separate fridge/freezers/cold rooms as shown by mean response of 3.6 and standard deviation of 1.4. Most of the respondents also indicated that thawing freezers are used to thaw frozen meats as shown by mean of 3.5 and standard deviation of 1.5. Further, majority of respondents agreed that raw and cooked foods are stores in fridge/freezers for the correct number of days (mean of 3.5 and standard deviation of 1.4), cooked foods are reheated at 76.7o C to prevent food contamination (mean of 3.6 and std dev of 1.4) and that frozen foods for cooking are thawed using running water or microwave (mean of 3.5 and standard deviation of 1.5). Table 2 shows more descriptive results regarding food handling practices focusing on equipment hygiene practices and environmental hygiene practices.

**Table 2: Food Handling Practices**

| Item                                                   | Not available (%) | Available (%) |
|--------------------------------------------------------|-------------------|---------------|
| Soap/detergents for washing hands before handling food | 25.8%             | 74.2%         |
| Soap/detergents for cleaning utensils                  | 27.4%             | 72.6%         |
| Clean dishes for serving food                          | 32.3%             | 67.7%         |
| Clean dressing code for all staff                      | 25.8%             | 74.2%         |
| Sufficient waste bins to dispose waste                 | 28.2%             | 71.8%         |
| Neat food storage facilities                           | 24.2%             | 75.8%         |
| Neat kitchen (s) separated from washrooms              | 38.7%             | 61.3%         |
| Hand wash basins                                       | 29.8%             | 70.2%         |
| Plenty water for washing hands                         | 29.8%             | 70.2%         |
| Clean eating tables                                    | 29.0%             | 71.0%         |
| Clean dish cloth to wipe dishes                        | 25.8%             | 74.2%         |

From the observation checklist, it was observed that soap/detergents for washing hands before handling food, soap/detergents for cleaning utensils, clean dishes for serving food, clean dressing code for all staff, sufficient waste bins to dispose waste, neat kitchen (s) separated from washrooms, neat food, storage facilities, hand wash basins, plenty water for washing hands, clean eating tables and clean dish cloth to wipe dishes were available in majority of restaurants. However, the items were not available in some restaurants. The photos indicate that the kitchens for some of the restaurants were properly arranged. The proper arrangements of the kitchen are essential in ensuring that there is no food contamination during preparation. Proper set up of kitchens alongside proper food handling procedures are key in ensuring safe food provision. KII 3 indicated:

*“...in some cases, waiters and waitresses fail to follow the acceptable food handling procedures like washing hands before handling food or wearing gloves”. [KII 3, 2021]*

The water points seem to lack washing soap or detergents. In addition, the water points seem insufficient for the restaurant workers as implied by few taps and water tanks. This may

interfere with the food safety provision as hotel restaurants lack sufficient water points for washing hands before handling food.

However, KII 6 indicated:

*“...Every waiter and waitress in this hotel is required to wear on clean dress code before serving customers. There are detergents for washing hands and cleaning hotel dishes. In addition, the eating tables are often wiped with clean towels. In terms of waste disposal of food remains, there are outsourced waste management agencies that come to collect waste items on daily”. [KII 6, 2021]*

### **Relationship between Food Handling Practices and Safe Food Provision by Unclassified Restaurants**

Chi square test was employed to determine the relationship between food handling practices and safe food provision by unclassified restaurants. The hypothesis was tested using p value calculated. The acceptance/rejection criterion is that, if the  $p\text{ value} > 0.05$ , we fail to reject the  $H_{01} < 0.05$ , the  $H_0$  is rejected. The null hypothesis ( $H_{01}$ ) was that there is no significant relationship between food handling practices and safe food provision by unclassified restaurants in Nairobi City County. Table 3 shows the Chi square test for food handling practices and safe food provision by unclassified restaurants.

**Table 3: Cross tabulation between food handling practices and safe food provision by unclassified restaurants**

|                         |              | Safe food provision by unclassified restaurants |       |       |
|-------------------------|--------------|-------------------------------------------------|-------|-------|
| Variable                |              | No                                              | Yes   | Total |
| Food handling practices | Unacceptable | 23                                              | 26    | 49    |
|                         | Acceptable   | 25                                              | 83    | 108   |
| Total                   |              | 48                                              | 109   | 157   |
|                         |              | ( $\chi$ )                                      | 8.988 |       |
| Chi-square              | P-value      | .003                                            |       |       |

Cross tabulation results in Table 3 shows that food handling practices resulted to safe food provision by unclassified restaurants. The influence of food handling practices on safe food provision by unclassified restaurants was statistically significant as supported by a chi square

of 8.988 and a reported p value of  $.003 < 0.05$ . This implies that food handling practices significantly influences safe food provision by unclassified restaurants.

### **Hypothesis Testing for Food Handling Practices**

The hypothesis was tested using the chi square results as shown in Table 3. The study sought to test the given null hypothesis:

*H<sub>01</sub>: There is no significant relationship between food handling practices and safe food provision by unclassified restaurants in Nairobi City County.*

The p value calculated was  $.003 < 0.05$ . The results thus imply that food handling practices significantly influences safe food provision by unclassified restaurants. The null hypothesis was rejected and alternative hypothesis accepted that there is significant relationship between food handling practices and safe food provision by unclassified restaurants.

### **CONCLUSION**

The study revealed that food handling practices have a significant impact on the ability of unclassified restaurants to provide safe food. The study findings indicate that food handling practices have a significant impact on the safe provision of food by unclassified eateries. Food handling refers to the systematic procedures involved in the preparation of food to ensure its safety for ingestion by the general public. Food handling, which is crucial for ensuring food safety, should always be given first priority. The process of managing food begins in the kitchen during its preparation and continues until it is served to clients. Proper food handling necessitates adherence to established protocols such as handwashing, adhering to dress code, covering hair, and utilizing thoroughly cleaned utensils for food service. Food handling entails the practice of thoroughly cleansing hands and surfaces before to handling food, ensuring the separation of different food items, cooking food to the appropriate temperatures, and storing food in clean and suitable conditions. WHO emphasizes the fundamental protocols for managing food to ensure that the food supplied is not detrimental? The measures outlined ensure the safety of food by encompassing cooking techniques, maintaining cleanliness, properly segregating raw and cooked foods, assuring correct internal temperatures, and using portable raw materials.

## RECOMMENDATIONS

The study recommends a comprehensive approach to enhance food safety in Nairobi's critical unclassified restaurant sector, calling for collaborative efforts from multiple stakeholders. This includes the government enforcing mandatory licensing, regular audits, and hygiene inspections for all restaurants, with a particular focus on informal eateries. Additionally, it emphasizes the need for capacity building among food handlers, suggesting enhanced training and education to ensure adherence to safety standards. The study also highlights the importance of upgrading facilities in these informal establishments, with the government and industry associations providing necessary incentives and infrastructure support. Raising public awareness through sustained mass media messaging and community engagement initiatives is also seen as crucial. These initiatives, led by public health authorities, aim to empower consumers to demand higher safety standards. Industry associations are urged to champion food safety campaigns, offer affordable training, and establish award schemes for unclassified restaurant owners and staff. The study underscores that through collaborative actions, including funding from development partners for hands-on instruction in proper food handling, storage, cleaning, and waste disposal, significant improvements can be made in addressing the public health risks posed by Nairobi's unclassified restaurants.

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