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Food Safety And Hygiene Practices Among Street Food Vendors: Implication For Health In Nasarawa State, Nigeria

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Abstract

The study assessed food safety and hygiene practices among street vendors; and implications for health in Nasarawa State, Nigeria. Three research objectives guided the study. The population for the study was 1,251 street food vendors. Proportionate random and purposive sampling techniques were used to select 303 food vendors' respondents, thirty (30) medical personnel, and thirty (30) environmental health officers. Descriptive statistics of mean were used for answering the research questions. Findings on sources of food contamination showed vented accessories (3.71) as the major source, followed by dirty environment (3.66) and the lowest means is the poor quality of vended food (3.02). Findings on the food handling process showed washing of food thoroughly before cooking (2.99) is the most practiced among street food vendors. An item that was never accepted was excessive makeup when preparing and handling food (1.09). Findings on the roles of environmental health officers revealed prosecution of offenders (2.33) and effecting food safety rules (2.33) were the major roles practiced about food safety and hygiene except monitoring vendor activities which scored (1.33). Finally, the study concludes street food vendor training should be prioritized to improve the safety of street food, other policies and measures should also be propagated to improve the food safety knowledge and proper handling practices. It was recommended among others that environmental health officers in charge of the management of food vendors both mobile and stationary should involve the development of coordinated, effective, integrated and preventive strategies that emphasis vendor registration, formal training on hygiene practices, initial medical and periodic medical certification and regular personal and environmental hygiene checks.

Keywords: **Street food vendors, Food safety, Food hygiene, Food consumption patterns**

Introduction

Food is a basic human need that plays a vital role in the sustenance of life and the growth of an individual. The term "street food" refers to a wide variety of ready-to-eat foods and beverages sold and sometimes prepared in public places. Street food according to Bouafou, Beugre and Amani (2021) are foods consumed where it was purchased or can be taken away and eaten elsewhere. Street food is homemade food and junk food consumed outside the home or sold on the street (Albuquerque et al., 2019; Sousa et al., 2019). According to Mazi, Onyeaka, Akegbe, Njoawuani, Ochular, Oladunjoye, Omotosho, Nwaiwi, Tamasiga, Odeyemi (2023), street-vended foods (SVF) are foods and beverages prepared and/or sold by vendors in street and other public places for immediate consumption or consumption at a later time without further processing or

preparation. Globally, street food vending is a ubiquitous activity in large cities. Street foods can be found in clusters around places of work, schools, hospitals, universities, railway stations, bus terminals, and taxi ranks in urban areas. This raises concern for the safety of the foods sold. Food safety and hygiene is the proper way and process of maintaining, processing, and packaging food. In developing countries like Nigeria, traditional methods of processing and packaging food are evident in improper handling, inappropriate temperature, and poor personal hygiene of food handlers. These are commonly observed during food marketing and sales (Sadiku, Ashaolu & Musa, 2019). The principles of food safety and hygiene, according to the World Health Organization (2022) are to prevent contaminating food with pathogens spreading from people, pets and pests, separate raw and cooked foods to prevent contaminating the cooked foods, cook foods for the appropriate length of time and at the appropriate temperature to kill pathogens, store at the proper temperature, and use safe water and safe raw materials while cooking food.

Food infections follow the ingestion of bacteria, toxins, or viruses, which may result from the eating of contaminated food or drinking water from already contaminated food or derived during processing from other foods by cross-contamination (from surfaces, equipment and handling processes). Poisonous chemicals or other harmful substances can also cause food-borne diseases.

Most of the food-borne diseases are preventable. Prevention involves limiting contamination all the way from the farm to the table. Therefore, careful steps should be taken from production of food, transportation, temporary storage, preparation, serving and consumption to avoid contamination of the food. Effective food hygiene control is vital to avoid the adverse effect on the health of consumers. Good hygiene practices have been documented by previous researchers such as Ziblim and Alhassan (2021) and Manko, (2018) to prevent several foodborne diseases, it is broadly acclaimed that deliberate or accidental contamination of food due to inappropriate handling might endanger the lives of consumers. Food safety and hygiene practices observed among food vendors include poor personal and environmental hygiene, inadequate storage, of food and drinks, and improper preparation and cooking (Faremi *et al.,* 2018).

Deliberate or accidental contamination of food during large scale production might endanger the health of consumers and have very costly repercussions on a country (Abdolshahi & Yancheshmeh, 2020). Contaminated food can have severe consequences on the health of consumers (Dubik *et al.,* 2018). Mishandling and disregard of proper hygiene by food vendors may enable the pathogenic bacteria to come into contact with food and, in some cases, survive and multiply to cause illness in consumers (Sadiku, Ashaolu & Musa, 2019). Food safety and hygiene practices have become a major concern to the consumers and the society at large. This is because the consumption of contaminated food and water contributes to a myriad of health problems among consumers, such as diarrhea, dysentery and worm infestation. Food vending form part of the integral diet of Nigerians. Food quality can affect the health, and physical activities of the consumers. Food vendors do not strictly apply food hygiene practices, and this affects the health of people who patronize these food vendors. This gives a strong reason for this research.

Statement of the Problem

There is a rising concern over the quality and safety of street vended food, these concerns have arisen regarding food safety and hygiene practices among street food vendors. Many of the food vendors do not consider consumer's food needs and therefore do not strictly apply food hygiene practices to ensure that food served are wholesome (Dubik *et al.,* 2018).

Inadequate food safety practices can lead to the spread of food-borne illnesses such as

food poisoning. According to an estimate based on the 2015 data by world health organization (WHO) food borne disease is responsible for over 600 million illnesses and 420,000 premature deaths globally. In Nigeria, unsafe food result in an estimated 173 million cases of diarrhea due to foodborne illness. Other illnesses of food borne disease include stomach cramp, nausea, vomiting and dysentery. Deliberate or accidental contamination of food due to improper food handling by the food vendors endangers the life of consumers and also have serious consequences on health (Abdolshahi & Yancheshmeh, 2020).

It is an undeniable fact that there are microorganisms such as bacteria, archaea, fungi (yeasts and molds), algae, protozoa, and viruses that are found in the environment at any given time which may be transferred into food if carelessly handled. Harmful micro-organisms can lead to various adverse effects. Bacteria, viruses, and parasites can cause food-borne illnesses, resulting in symptoms such as nausea, vomiting, diarrhea, abdominal pain, and fever. Common pathogens like Salmonella, E. coli, and Listeria can contaminate food during production, processing or handling. Food spoilage bacteria may make food unpalatable or unsafe to eat due to changes in taste, odor, or appearance. Despite the crucial role in the local food industry, there is a noticeable gap in understanding the extent to which vendors adhere to proper food safety standards. Regardless of the efforts of the government through its National Agency for Food and Drug Administration and Control (NAFDAC) to improve the safety of food and drugs, food safety remains a major issue that has been exacerbated by the people's low knowledge of food safety and hygiene (WHO, 2023).

Objectives of the study

The main objective is to assess food safety and hygiene practices among street vendors; and the implications for environmental health in Nasarawa State, Nigeria.

The specific objectives are to:

1. determine the sources of food contamination in Nasarawa State.
2. assess the food handling process among street food vendors in Nasarawa State.
3. examine the role of environmental health workers food safety and hygiene practices among street food vendors in Nasarawa State.

Methodology

Research Design: The study employed a descriptive survey research design. The study adopted a survey research design which is appropriate as the opinions of group of people were_sought by collecting and analyzing data considered to be representative of the entire group. (Nworgu, 2015)

The Study Area The study was conducted in Nasarawa State, North-Central Nigeria. Nasarawa State is termed agrarian state and is enriched with a lot of cultures and some business organizations such as marketing firms, financial institutions, food storage facilities tertiary institutions among others, this provides great opportunities for food vending businesses in the state.

Population of the Study: Three sets of populations were involved in the study located across six (6) LGAs of Nasarawa State. The LGAs include: Lafia, Doma, Akwanga, Nasarawa Eggon, Keffi and Karu. The list of the registered street food vendors constitutes the population of the study from the selected Local Government Areas which were 1,251 registered street food vendors (Nasarawa State Social Investment Agency, 2024). Five (5) environmental health personnel were drawn from each local government of the study area totaling thirty (30). Five (5) medical personnel in designated hospitals from each of the local government areas were used for the study totaling thirty (30).

Sample and Sampling Techniques: A sample size of three hundred and sixty-three (363) food vendors was selected using Proportionate random sampling techniques to draw sample respondents, thirty (30) medical health personnel and thirty (30)

environmental health officers were selected using a purposive sampling technique.

The instrument for Data Collection: The research instrument for the collection of data was three self-structured questionnaires titled 'Food Safety and Hygiene Practices Among Street Food Vendors: implication for Health (FSHPIH). The three self-structured questionnaires comprise of: FSQ1 for street food vendors, FSQ2 for environmental health officers, and FSQ3 for medical health personnel. The instrument was validated for the purpose of clarity and relevance. The expert's comments were used to strengthen the instrument before the pilot study was embarked upon for the final draft of the instrument. The reliability of the research instrument was determined through a pilot study using twenty (20) food vendors in Makurdi Metropolis, Benue State. Cronbach Alpha was used to determine the reliability score of 0.81. These makes the instrument reliable.

Data Analysis Techniques: Descriptive statistics of mean were used to answer all objectives. For objective one any mean above 3.0 was considered agreed, while any mean below 3.0 was considered disagreed, for objective two, any mean above 2.00 was considered always while any below 2.00 was considered never, objective three any item with a mean score of 2.50 above was considered as always with the index of (1.50 – 2.50) sometimes (0 – 1.5).

Results

The analysis of the sources of food contamination shows that the major sources of food contamination is the use of vended accessories such as plastic bottles, straws, hand cloves (3.71), poor personal hygiene (3.65), dirty environment (3.66), improper food storage (3.35), use of dirty equipment/ plate (3.69), inadequate cooking temperature and time (3.18), contaminated raw food (3.48), pest infestation (3.32), poor quality of vended food (3.02) and dirty water (3.50) and the least mean is poor quality of vended food (3.02) which was also accepted by respondents as sources of food contamination.

Table 1: Sources of Food Contamination in Nasarawa State, Nigeria

Sources of food contamination	Mean	Remarks
Poor personal hygiene	3.65	Accepted
Dirty environment	3.66	Accepted
Improper food storage	3.35	Accepted
Use of dirty equipment/plate	3.69	Accepted
Inadequate cooking temperature/time	3.18	Accepted
Contaminated raw food	3.48	Accepted
Pest infestation	3.32	Accepted
Poor quality of vended food	3.02	Accepted
Dirty water	3.50	Accepted
Vended accessories (plastic bottles, straws, hand cloves)	3.71	Accepted

Table 2 shows the food handling process with 19 items, sixteen items all indicate the food handling process they use always with only three items indicating that they never use heavy makeup, do not allow pets to move around the food preparation area and avoid the use of kitchen utensils like knife when one has a cut in the hand or exposure of open sore.

Table 2: Food Handling Process Among Street Food Vendors

Food handling process	Mean Score	Remar
Reheating left-over foods	2.77	Alway
Hand washing before and after food preparations	2.58	Alway
Wear clean aprons during food preparation and serving	2.12	Alway
Clean the storage area before storing new foods and products	2.54	Alway
Avoid cooking when suffering from any health challenges (diarrhea, vomiting, sores and cuts)	2.50	Alway
Buy clean and fresh food for cooking	2.22	Alway
Washing food thoroughly before cooking	2.99	Alway
Cover retail food	2.56	Alway
Store food hot in transparent show glass cases	2.11	Alway
Use clean water for cooking	2.97	Alway
Washing of cutting boards in between usage	2.33	Alway
Store raw and cooked food separately	2.55	Alway
Excessive makeup when preparing and handling food	1.09	Never
Pets move around when food is being prepared and served	1.43	Never
Heat cold food before serving it to the customers	2.21	Alway
Handling food when you have a knife cut on your hand	1.46	Never
Protect food from dust and flies	2.90	Alway
Check brand when buying foodstuffs for quality and expiring date	2.44	Alway
Compliance with the food handling process has a possible impact on the environmental health of consumers	2.74	Alway

Table 3 shows the role of environmental health workers on food safety and hygiene. 14 items are presented and 13 of these items shows the roles sometimes played by health workers, monitoring vendors activities by these health workers shows that it is never done.

Table 3: Role of Environmental Health Workers concerning Food Safety and Hygiene

Role of environmental health workers	Mean	Remarks
Monitoring vendors activities	1.33	Never
Make vendors undergo medical examinations	2.00	Sometimes
Training on food hygiene practices	2.00	Sometimes
Enforcing food hygiene and safety regulations that are paramount in ensuring safe food and safety standards	2.00	Sometimes
Examining food handlers medically so that illnesses are not transmitted through food	2.00	Sometimes
Monitoring strict compliance to the wearing of apron during food preparation and selling.	2.00	Sometimes
Making sure vendors don't prepare and sell fo od close to open drainages.	2.00	Sometimes
Inspect street food vendors' facilities on a weekly or monthly basis	2.00	Sometimes
Make sure street food vendors always keep their business sites clean	2.00	Sometimes
The Enlightenment campaign properly established	2.00	Sometimes
Prosecution of offenders	2.33	Sometimes
Licensing of food vendors	2.00	Sometimes
Supervision enhances good environmental health of consumers	2.15	Sometimes
Effecting food safety rules	2.33	Sometimes

Discussions

Response on major sources of food contamination revealed ended accessories such as plastic bottles, straws, hand cloves, poor personal hygiene, dirty environment, improper food storage, use of dirty equipment/plate, inadequate cooking temperature/time, contaminated raw food, pest infestation, poor quality of vented food and dirty water. Food joints are major sources of food-borne diseases and individuals in the food value chain sometimes contribute in diverse ways to the outbreak of food-borne illnesses according to (WHO, 2022). Food can be contaminated when major foodborne microbes are present in healthy animals raised for food, meat and poultry during slaughter by small amounts of intestinal contents. Fresh fruits and vegetables can be contaminated if they are washed with water that is contaminated by animal manure or human sewage. Microbes can spread to food at any time while the food is grown, harvested or slaughtered, processed, stored, shipped or prepared. Chemical contaminants may also occur in our food from various sources. Contaminants can be present in foods mainly as a result of the use of agrochemicals such as residues of pesticides and veterinary drugs, contamination from environmental sources such as water, air and soil pollution, cross – contamination or formation during food processing, migration from food packaging materials, presence or contamination by natural toxins or use of unapproved food additives and adulterants which typically pose a health concern (Berg, Kleter, Battaglia & Bouwman, 2020).

The result in Table 2 shows the analysis of the food handling process among the street food vendors that the most important food handling process was washing food thoroughly before cooking. This is the most basic hygienic food process that people learn at the early stage of learning cooking rudiments. Poor or improper handling of food such as not reheating leftover foods, not putting on aprons, not cleaning utensils, or

knives, not covering raw foodstuffs, flies sporadically landing on the foods, vendors serving bare hands, wiping off perspiration with bare hands shows neglect for food safety practices. Chen, Wen, Song, Chen, Ding and Wang (2022) opines that improper handling and poor hygiene measures by food vendors may enable pathogenic bacteria to meet food and, in some instances, multiply in sufficient quantities to cause harm or illness to the consumer. Excessive makeup should be discouraged while handling food, nail polish/fake fingernails may drop into the food during preparation. Such practices also trap food debris that can contaminate food. Preparation or handling of food, when one is having influenza, diarrhea, fever, or other illnesses, can cause food-borne diseases. Cooking utensils should be washed and sanitized to remove or kill any bacteria. Drinking straws or food wrappers can be dangerous to health. Chopping boards, knives spoons, tongs, and other utensils for cooked and uncooked food should be separated to avoid food contamination. Reheating food thoroughly is an important step in reducing the risk of food poisoning since most bacteria and parasites are destroyed by heat which is also why cooking and reheating foods thoroughly help to prevent foodborne illnesses. Food that are not served immediately should be properly stored, hot food should be kept in a warmer or heating equipment above 60 degrees centigrade. The floor should be kept clean and dry, sweeping, mopping, and washing floors daily ensures proper hygiene of the environment. Rodents, cockroaches, and flies carry many germs and other harmful organisms, consumption of food and water contaminated by rodents, flies and cockroaches can cause food poisoning and other infectious diseases (Kumar, 2020).

Findings on the role of environmental health workers in food hygiene and health. Prosecution of offenders and effecting food safety rules were the most often roles played by environmental health workers in ensuring food hygiene. Alhassan (2021) revealed that maintenance of laws and regulations is paramount in ensuring that food vendors are in the street food vending industry since by nature, most of us need to be inspired, monitored, or even supervised before we do the needful.

Environmental health officers are responsible for the enforcement of food hygiene and safety regulations that are paramount in the maintenance of food hygiene and safety standards. They are given the mandate to examine food handlers medically. This medical screening lay emphasis on illnesses which can easily be transmitted through food (Rotherham,2024).

Conclusion and Recommendation

Food safety and hygiene practices are crucial in the food business to avoid food contamination.

To improve the food handling processes of food vendors the role of environmental health workers in the state is important adequate intervention as it was observed that some of food vendors' activities were never monitored by environmental health officers to ensure safety and hygiene. Improving the standard of food consumed by individuals will promote good health as many depend on food vendors for their daily meals because of their easy access and affordability.

The following recommendations were made:

1. Food Vendors should adhere to the best practices in the food vending business
2. Home Scientists and professional food operators should carry out sensitization programs and campaigns to educate consumers on food safety and the risks associated with poor food handling.
3. The environmental health officers should monitor food handling processes among street food vendors effectively and impose punishment for compliance, also Environmental health officers in charge of the management of food vendors both mobile and stationary outlets should involve the development of coordinated, effective, integrated, and preventive strategies that

emphasis vendor registration, formal training on hygiene practices, initial medical and periodic medical certification and regular personal and environmental hygiene checks.

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