

PATTERN OF FOOD HYGIENE AND ENVIRONMENTAL HEALTH PRACTICES AMONG FOOD VENDORS IN NIGER DELTA UNIVERSITY

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ABSTRACT: *This study examined pattern of food hygiene and environmental health practices among food vendors in Niger Delta University Wilberforce Island Bayelsa State. The descriptive survey design was used in this study. The specific population 156 food vendors who are engaged in all forms of food vending within Niger Delta University communities. The instrument used was questionnaire titled: "Pattern of Food Hygiene and Environmental Health Practices" (r=0.79). Data were analyzed using frequency distribution and percentage. The results of the study showed that majority (96.7%) of the food vendors' ensured good practices in food hygiene, personal hygiene and environmental health practices. Respondents also had good knowledge and awareness on food hygiene. The relationship between food hygiene and environmental hygiene is positive in ensuring safety standard in food as a major issue in environmental health practices. Rules and regulations are enforced by environmental law enforcement agencies on food vending. It was recommended that government should empower food vendor to make training on food hygiene and safety effective and compulsory. Every food vendor should be registered with government environmental health agencies for monitoring and safety compliance*

KEYWORDS: Pattern; Food Hygiene; Environmental Health; Practices; Vendor

BACKGROUND TO THE STUDY

Food hygiene is the proper way and process of maintaining, processing and packaging food. In developing countries like Nigeria, traditional methods of processing and packing food are evident in improper holding, temperature, poor personal hygiene by food handlers. These are commonly observed during food marketing and sales. According to World Health Organization (WHO) (1989), food handling personnel play an important role in ensuring food safety throughout the chain of food production and storage. Mishandling and disregard by vendors may enable pathogenic bacteria to come into contact with and, in some cases, survive and multiply in sufficient numbers to cause illness in the consumers.

Hygiene is more than just being clean; it is defined as the many practices that help people stay healthy. The Longman Advanced learners Dictionary (1996) defined hygiene as the practices of preventing illness and stopping it from spreading by keeping things clean. The Oxford Advance learners Dictionary (2000) further defined hygiene as the science of rules for healthy living. MacMillan Dictionary for students (2002) defines it as a practices or

conditions conducive to good health, and also, as science that deals with maintenance of good health and the prevention of disease.

Meanwhile, the Food and Agriculture Organization, FAO (1989) defined street foods as ready-to-eat foods and beverages prepared or sold by vendors and hawkers especially in street and similar public places and reported that as much as 2.5million people eats street food daily. According to National Policy on Urban Street Vendors (2004), a street vendor is broadly defined as a person who offers goods for sale to the public without having a permanent built up structure but with a temporary static structure or mobile stall (or head load). Street vendors may be stationary by occupying space on the pavements or other public/private areas, or may be mobile in the sense that they move from place to place carrying their wares on push carts, wheel barrows or in cycle or baskets on their heads, or may sell their wares in moving trains, but etc. in the environment.

Mustapha (2006) however stated that, environmental health is defined as a areas of health that focuses on staying informed about environmental issues, helping to keep the water and food safe, proper disposed of waste, conserving energy and natural resources, protecting the natural environment, helping to improve the virtual environment, taking actions to improve the social and emotional environment and being a health advocate for the environment. From the above, it is obvious that the environment is made up of everything around a person. It includes the air people breathe, the water and the food they etc. The environment is an important part of our everyday life. The environment and people depend on one another so one mistake of other can put the life's of many others into danger: As personal hygiene is needed among food vendors, the actions that people take affect the quality of the environment and the environment affect the quality of people's lives (Drapper, 1996).

World Health Organization (WHO, 2005) stated that environmental health addresses all the physical, chemical and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. It is targeted towards preventing diseases and creating health supportive environments. Therefore, as, street foods are appreciated for the taste, flavors and offered at low and affordable price to the general population (Bhowmick, 2005), a study on safety aspect of street food, showed that about 82% of people of all age group prefer to go to restaurants in the evening and that, 61% of the students in age group of 14-21 years consume foods from the street vendors at least once during the lunch break (Mishra, 2007). Vendors prepare food at home and sell or they prepare food at the site of selling. In Niger Delta University communities, varieties of ready to eat foods are available.

This generally include Nigerian foods like, garri and banga soup, plantain, pepper soup, yam etc apart from lighter snacks like tea, biscuits, ice cream, meat pie etc. This serves as the major source of income for the vendors as consumers get instant taste and cheap food in return. So, food vending in urban areas especially in metropolitan cities has become an integral part of the urban lives and culture. It is however recognized that despite the good taste and ease of availability, street foods are said to be often poorly prepared by individuals who have no good knowledge about hygiene practices. Therefore, street food, are perceived to be a major public health risk (WHO, 2013), as food poisoning and other food borne diseases could occur in institutions such as schools, hostels, hospitals and prisons, where food are served or sold to groups by vendors or other food handlers.

Several factors are known to favour food borne disease or food poisoning during food handling processes. These factors include poor personal and environmental hygiene, poor storage of food, improper preparation and cooking, carrier state such as with unclean hands. Based on these risk factors, the World Health Organization (WHO, 2011) developed preventive steps to enhance food safety. These steps are known as the “golden rules for safe food preparation”. The rules include, thorough cooking of food, re-heating of stored food, avoiding contact between raw foods and cooked food, protection of food from insects, rodents, and other animals.

Despite this “golden rules”, food borne diseases continue to be a serious public health problem in developing countries and the most often affected are school children. The implication here is that, school children who are the few that survived the high infant and childhood mortality and who are known as high risk group for intestinal parasitic infections are further exposed to hazards of purchasing food from vendors who may harbour dangerous pathogens or have the potentials of spreading infection to a large number of other students.

LITERATURE RENEW AND EMPIRICAL EVIDENCES

Food Hygiene:

Food hygiene according to Iragunima (2006) represents those factors which influence the health and wellbeing of an individual. The factors include observance of simple rules about health behaviours including cleanliness, exercise, diet, alcohol, smoking and others, It was stated that, individuals educational or literacy level has an impact on his food health status, because lack of knowledge, skills and awareness about health care delivery system plays a role in the state of health of students and the individual in every family in the society. Shiklomanov (2000) conceives food hygiene as a scientific discipline describing the handling, preparation and storage of food in ways that prevent food borne illness. This includes a number of routines that should be followed to avoid potentially severe health hazards. Also related is food safety consideration which include practices relating to food labeling, food hygiene, food additives and pesticide residues, as well as policies on biotechnology and food, and guidelines for the management of governmental import and export inspection and certification systems for foods.

World Health Organization (2010) noted that food can transmit diseases from person to person as well as serve as a growth medium for bacteria that can cause food poisoning. In developed countries, there are intricate standards for food preparation whereas in less developed countries, the main issue is simply the availability of adequate food and safe water, which are usually critical items. In theory, food poisoning is 100% preventable. The five key principles of food hygiene, according to World Health Organization (WHO, 2011) are:

- i. prevent contaminating food with pathogens spreading from people, pets, and pests;
- ii. separate raw and cooked foods to prevent contaminating the cook foods;
- iii. cook foods for the appropriate length of time and at the appropriate temperature to kill pathogens;
- iv. store food at the proper temperature; and
- v. do use safe water and cooked materials.

World Health Organization (2003) reported that about 30% of reported food cases of poisoning outbreaks in WHO European Region occur in private homes. According to the

WHO, in the USA alone, annually, there are 76 million cases of food borne illness leading to 325,000 hospitalizations and 5,000 deaths well considered.

In (2009) a survey of food hygiene practices at home and childhood diarrhea, in Hani, West Indonesian was carried out. All variables that may contribute to food hygiene practices, i.e., mother's hand washing before preparing food and feeding the child, child's hand washing before eating a meal, and after defecating/urinating, food preparation cleanliness of utensils, water source and safe drinking water, habits of buying cooked food, child's bottle feeding hygiene and housing and environmental conditions.

Therefore, individual is said to be responsible for keeping self healthy and can do this by imbibing certain health habits. The need for food hygiene and environmental hygiene therefore results in a study of good health habits which each person should try to develop in his own life and which he/she should encourage others around to develop too.

There are three important components of food safety (or hygiene) standard (Kathleen, 2010). There may be several food hygiene or safety standards, but their goals are always the same. Each set of rules aims to ensure that food items will not cause harm to consumers. There are no distinct boundaries' to tell these standards apart, although there are different ways to look at it. These regulations can be grouped according to food service import or distribution as each division is governed by different agencies, which may enforce diverse sets of standards. Food hygiene or safety standards that deal with this division are the most widespread among all regulations.

Another way to look at food hygiene or safety standards is through distribution processing as an example of division. Most causes of contamination begin during production and processing, which is why prevention is crucial at this stage. Standards that focus on this division emphasize the importance of stopping contamination at an early level before it causes widespread harm. A country wide contamination can easily spread to a full blown worldwide disaster if food safety is not practiced from the very beginning. Not only will it require immense effort in recalling contaminated items, but food safety malpractices may also lead to poisoning and illness. Both consequences have an enormous impact on the country's economy and may lead to greater expenses and losses in profit.

Street food vending can be seen as a source of wide range of foods that are nutritionally important for different groups of a population, Von Holy and Makhoane, (2006), Draper (1996) noted, that street foods are processed in many different ways under unregulated conditions. The types of street foods sold differ greatly between countries. However, most meals consist of the staple food served in various forms. In addition, meals such as fried meat, fish and corn meals based ready to eat foods are also prepared and served.

Gordon-Davis (2011) interprets hygiene as the preservation of health and it involves all measures that ensure the safety and quality of food during its handing. These measures are correct storage of both raw and cooked foods, as well as correct preparation and cooking methods. Unhygienic preparation of food provides plenty of opportunity for transfer of bacteria as well as growth or survivals of bacteria and other pathogens.

The hygiene and sanitation aspect is the most significant factor that could possibly have a negative impact on food quality. Menasha, Yaboah-Mame and Ablordey (2002), Gordon-

Davis (2011) have found that in most countries, street food stands simple structures where running water, toilets and washing facilities are seldom available. The washing of hands, utensils and dishes are often done in bowls or pots of water. Menasha et al. (2002) also reported that, disinfection is seldom carried out and pests may be attracted to vending sites if there is inadequate sewage disposal.

The control and regulation of street food vending, catering establishment, and the enforcement of food hygiene and safety are, however carried out at the local government level, where health officers enforce relevant sections of the public health law. In some cases local government council authorities develop byelaws which apply specifically to the regulations and control of food premises. Specific laws enacted to ensure food safety in Nigeria include, the Public Health Law/Ordinance Cap 164 (1917/1958), Standards Organization of Nigeria (SON) Decree (1971), the Food and Drugs Decree number 33 (1974), the Animals Disease Control Decree number 10 (1988) and the making of Breast milk substitute Decree number 41, (1990). Others are Consumer Protection Council Decree number 60 (1992), National Agency for Food and Drugs Administration and Control (NAFDAC) Decree number 15, (1999) and, the counterfeit fake drugs/unwholesome processed Food Decree, number 15, 1999. The need to revise some existing food safety legislations has been emphasized, as some of them are out of date and do not meet current realities and trends in food safety.

Some vending practices are very unhealthy for anyone to see or to consume. The food prepared and how they are prepared and sold from tray/basin without covering, food exposed to flies, food reheated before sale, with vendor wearing hand jewelry, having long nails, using apron and vendors having hair. In the area of health, the focus is on staying informed about environmental issues such as helping to keep water, food, air, noise and other natural resources safe and taking deserved actions to improve the environment itself. John and San (2014) observed that environmental health is the branch of public health that is concerned with all aspects of the natural and built environments that may affect human health. Other terms referring to or concerning environmental health are environmental public health, public health protection, environmental health protection and environmental protection. Environmental health and environmental protection are very much related. Environmental health is focused on the natural and built environments for the benefits of human health; whereas, environmental protection is concerned with protecting the natural environment for the benefit of human health and ecosystems.

Pruss-Utun, Kay Fewtrell & Bartran (2003), recall that environmental health addresses all the physical, chemical and biological factors external to all person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. It is targeted towards preventing all forms of diseases and creating health supportive environmental. This context excludes behaviours not related to environment, as well as behaviours related to the social and cultural environment, as well as genetics (World Health Organization 1990). It refers to the theory and practices of assessing and controlling factors in the environment that can potentially affect health. Environmental health as used by the WHO Regional office for Europe (Novice 1999), includes both the direct pathological effects of chemical radiation and some biological agents and the effects (often indirect) on health and well being of the broad physical, psychological social and cultural environmental, which includes housing, urban development, land use and transport.

Food Hygiene and Environmental Health Practice

The following practices are to be followed by all operators to prevent food poisoning. Remember the customer will be impressed that you care about the way you handle food. A food handler must take all reasonable measures not to handle food or surfaces likely to come into contact with food in ways that are likely to compromise the safety and suitability of food. Practices must include:

- (1) Clean aprons and hair covering to be worn at all times.
- (2) Adequate hand washing facilities are to be provided and must include a basin, bowl or other suitable container and adequate supply of clean water, soap, nail brush and clean towels, disposable paper towels and soap are to be provided for hand washing and drying purposes wash hands regularly, before, during and after food handling.
- (3) Food handlers who have symptoms that indicate the handler may be suffering from a food borne disease should not be handling food.
- (4) Food handlers must have clean habits and have an elementary knowledge of hygiene. No smoking, picking of pimples, no sickness, cold or sores. There must be no over handling of foods.
- (5) Disposable rubber gloves are to be worn by all food handlers. Food handlers should not handle money from sales. One person allocated to handle money only.
- (6) Ready to eat potentially hazardous food must be stored at either below 5⁰C or above 60⁰c temperatures and must be used within four (4) hours. After (4) four hours the food must be discarded.
- (7) Food must at all times be protected from flies, dust, from unnecessary handling in preparation or from public handling and being coughed, sneezed and breathed over.
- (8) All cloths, tea towels, etc are to be maintained in a clean condition and used solely for the purpose for which they are intended.
- (9) All disposable eating utensils shall be pre-wrapped in paper napkins, cellophane bags or similar material prior to distribution to the public.
- (10) Drinking straws, paper cups, spoons, etc. shall be enclosed in suitable dispensers or otherwise protected from contamination.
- (11) Beverages, e.g. coffee and tea are to fully enclosed in suitable dispensers.
- (12) All equipment, appliances, utensil, fittings and fixtures are to be durable, smooth, impervious, non-toxic easily cleanable and free from cracks and crevices
- (13) Sauces and condiments are to be enclosed on dispensers and not open dishes.
- (14) All food is to be protected in sealed packages or containers while in transit from the place of preparation to the staff premises.

Environmental health has been defined by World Health Organization (WHO) as cited by Corvalan, (2000), as the control of all those factors in the physical environment that exercise or may exercise deleterious (harmful) effects on the physical development, health and survival of man. In like manner, Ademuwagun and Oduntan (1986) defined environmental health as the provision and control of all those factors in people's physical surrounding which can affect their health.

Following the establishment of the Environmental Health officers' Registration Council of Nigeria in 2007 efforts have been made to raise the level of environmental health practices in the country. This is because, environmental health has continued to play a major role in disease prevention, control and the sustenance of environmental health integrity worldwide. The reality as agreed by experts is that, over 70% of diseases causing the highest morbidity

and mortality in the country are environmental related, thus, make the control of environmental health practices crucial in the efforts of government to alleviate poverty and achievement of the Millennium Development Goals (MDGs).

Statement of the Problem

Given the above background, it is very worrisome to observe that the pattern of food as hygiene practiced falls short of basic requirements of environmental health practices. Besides, the poor handling (processing) by vendors has in recent times constituted a menace to environmental health practices as in most cases negated the best practices as advanced by the World Health Organizations. Unfortunately, no past studies seem to have focused on this issue in our immediate community. Therefore, this study investigated the pattern of food hygiene and environmental health practices among food vendors in Niger Delta University communities as a way of filling existing gap in knowledge.

Objectives of the Study

The general objective of this study is to determine the pattern of food hygiene and environment health practices among food vendors in Niger Delta University communities.

However, the specific objectives include among other thing to:

- i) find out the elements of food hygiene among food vendors;
- ii) establish the level of knowledge and awareness of vendors on food hygiene and environmental health practices;
- iii) determine the relationship between food hygiene and environmental health practices among food vendors;
- iv) find out basic environmental health practices that are common among food vendors; and
- v) make appropriate recommendations arising from the above objectives towards sustaining appropriate food hygiene and environmental health practices among food vendors.

Research Questions

Arising from the specific objectives above, the study was guided by the following research questions

- i) What are the elements of food hygiene among food vendors?
- ii) What is the level of knowledge, awareness and application of food hygiene among food vendors?
- iii) Are there any relationships between food hygiene and environmental health practices?
- iv) What are the basic environmental health practices prevalent among food vendors in Niger Delta University communities?
- v) How can food hygiene be better improved to enhance healthy living and environmental health practices among food vendors in Niger Delta University communities?

METHODOLOGY

A descriptive survey research design was used for this study. The population of this study comprised all food vendors in Niger Delta University Communities with a population of about Three Hundred and twelve (312) vendors who were engaged in all forms of food vending within Niger Delta University Communities.

Using the random proportional sampling techniques, the researcher selected 90% percent of the total population of the food vendors in the area under investigation which amounted to 156 samples used for the study.

The instrument used for data collection was a self structured questionnaire titled “Pattern of Food Hygiene and Environmental Health Practices (PFHEHP)”. This questionnaire consisted of two sections. “A and B”. Section ‘A’ consisted the personal data of the respondents, while section B focused on the main question items designed to respond to the research questions. Four point rating scale of Strongly Agree (SA) Disagreed (D) and Strongly Disagree (SA) Agree (A) were used as spread of scores.

The questionnaire was validated to ascertain the content, face, predictive construct and concurrent validities. This was to ensure that the test items measure accurately what they were intended to measure in respond to the research questions so raised. The test re-test method of reliability was adopted. The questionnaire was first administered to a small sample of respondents from Yenagoa campus (Community) of Niger Delta University (faculty of law). Two weeks later it was re-administered to the same group. After scoring the two test the reliability was determined using, Pearson Product Moment Correlation Co-efficient. The correlation yielded a reliability value of 0.79 which was considered very reliable for data collection for the study. The data collected were analyzed using frequency distribution count and percentage analysis.

RESULTS AND DISCUSSION

Table 4.1.1 Sex Distribution of Respondents

Sex	Frequency	Percentage
Male	75	48
Female	81	52
Total	156	100%

Source: Field Survey, 2014

The results in Table 4.1.1 above show that 48% of respondents were male, while 52% were female. The implication is that, there were more female that are engaged in food vending than male. This is a validation of the female natural tendency to be engaged in food processing.

Table 4.1.2 Age Distribution of Respondents

Age (yrs)	Frequency	Percentage
20 yrs	22	14
21-25 yrs	34	22
26-30 yrs	31	20
31 yrs above	69	44
Total	156	100%

Source: Field Survey, 2014

The results in table 4.1.2 show that majority of the participants were of the age above 26 to 31 years. The implication is that, most of the vendors were youth who perhaps engage in food vending as a self-reliant employment opportunity.

Table 4.1.3 Distribution on the Highest Educational Qualification

HEQ	Frequency	Percentage
Primary school certificate	13	8
Secondary school certificate	34	22
TCII/NCE/Diploma certificate	56	36
First Degree certificate	47	30
Other	6	4
Total	156	100%

Source: Field Survey, 2014

The results in the above table 4.1.3 show that, majority of the respondents (40%) were holders of TCII/NCE/Diploma certificate, and the first Degree certificate holders. This shows that most of the people that were into food vending (70%) had knowledge of what they were doing as evident in their level of educational attainment.

Table 4.1.4 Distribution on Types of Food Vending

Food	Frequency	Percentage
Snacks	62	40
Cooked food	88	56
Others	6	4
Total	156	100%

Source: Field Survey, 2014

The results in the table 4.1.4 show the distribution on the types of foods that vendors serve. Snacks and Cooked Food constituted the bulk of food items that the vendors display. The implication is that food vendors in this area must adhere strictly to best health practices.

Table 4.1.5 Distribution on Certification By Relevant Agencies

Certification Status	Frequency	Percentage
Certificated for Operation	53	34
Non-Certificated caterer for Operation	103	66
Total	156	100%

Source: Field Survey, 2014

The results in the above Table 4.1.5 show that only 34% of the respondents were certificated caterer, with operational license, while 66% of the respondents were non-certificated caterers. The implication is that, non certificated caterers are into food vending which poses and constitutes serious health hazard to the end users In the University communities.

Table 4.1.6 Distribution on Years of Active Engagement in Food Vending

YEAR	Frequency	Percentage
1yrs	30	19
2-5	64	41
5 above	62	40
Total	156	100%

Source: Field Survey, 2014

The results in the above table 4.1.6 show that 19% of the respondents were into the business for 1 year, while 41% of the respondents were into the business for 2-5 years. Respondents who had been into the business for 5 years and above were 40%. This shows that most of the food vendors were longtime operators in the business while few just started.

Research Question 1: What are elements of food hygiene among food vendors?

Table 4.2.1: Summary of Mean and Standard Deviation Scores of On the Elements of Food Hygiene among Food Vendors.

S/N	Variables	SA F (%)	A F (%)	D F (%)	SD F (%)	Total	Mean	SD
1	Proper washing of food items before cooking	119 (76%)	37(24%)	(0%)	(0%)	156(100%)	3.76	0.427
2	Proper washing of hands before handling of food items	94(60%)	56(36%)	(0%)	6(4%)	156(100%)	3.53	0.695
3	Proper washing of plates before and after serving of food to customers	119(76%)	37(24%)	(0%)	(0%)	156(100%)	3.76	0.427
4	Washing of hands and wearing of apron while preparing and serving food	94(60%)	59 (38%)	3(2%)	(0%)	156(100%)	3.58	0.532
5	Covering of food in warm up stainless plate before serving to customers	72(46%)	69(44%)	9(6%)	6(4%)	156(100%)	3.33	0.755
6	Preservation of food in fridge before use	59(38%)	75(48%)	13(8%)	9(6%)	156(100%)	3.18	0.815
7	Proper bath or shower daily before attending to customers	84 (54%)	66 (42%)	3(2%)	(0%)	156(100%)	3.50	0.574
8	Cleaning of the environments and store	84(54%)	69(44%)	3(2%)	(0%)	156(100%)	3.50	0.606
9	Reheating of the food before serving to customers	72(46%)	66(42%)	16(10%)	3(2%)	156(100%)	3.33	0.729
10	Trained on food hygiene and safety	75 (48%)	75(48%)	6(4%)	(0%)	156(100%)	3.44	0.571
Grand Mean							3.49	0.613

Decision Rule: Cut off mean = 2.50 from table 4.2.1 above, it is empirically obvious that all the mean scores for all the variables are greater than the cut-off mean score of 2.50. Given about the grand mean score of 3.49 is also greater than the cut-off mean score of 2.50. It is empirically proven that these variables represent the key elements of food hygiene among food vendors in the Niger Delta University communities. It thus implies that the practices of food hygiene is real and evident among food vendors in these communities as investigated.

Research Question 2: What is the level of knowledge, awareness and application of food hygiene among vendors?

Table 4.2.2: Summary of Mean and Standard Deviation Scores on the Level of Knowledge, Awareness and Application of Food Hygiene Among Vendors

S/N	Variables	SA F (%)	A F (%)	D F (%)	SD F (%)	Total	Mean	SD
11	I am well trained on food preparation and service to customers	84(54%)	62(40%)	6(4%)	(2%)	156(100%)	3.45	0.694
12	The Environment where the food is prepared and served must be clean and properly ventilated without pests	87(56%)	62(40%)	3(2%)	3(2%)	156(100%)	3.49	0.667
13	Plates are properly washed and dried up for service immediately after usage	84(54%)	62(40%)	6(4%)	3(2%)	156(100%)	3.45	0.694
14	Sanitation officers\inspectors provide adequate checks on us to ensure safety and health standard in food vending	91(58%)	53(34%)	9(6%)	3(2%)	156(100%)	3.49	0.695
15	Used item are disposed properly after usage	94(60%)	53(34%)	3(2%)	6(4%)	156(100%)	3.51	0.723
16	Already prepared food and raw food are kept together	19(12%)	16(10%)	50(32%)	72(46%)	156(100%)	1.89	1.020
17	Education or sensitization is regularly carried out on food hygiene and safety by school authorities	56(36%)	72(46%)	9(12%)	6(4%)	156(100%)	3.12	0.837
Grand Mean							3.20	0.761

From table 4.2.2 above, all the variables' mean scores are greater than the cut-off mean score of 2.50 except for them 16 which is an isolated case. However, the grand mean score of 3.20 is higher and also greater than the cut-off mean score of 2.50. Thus, it can be deduced that then was a very high level of knowledge, awareness and application of food hygiene practices among food vendors in the Niger Delta University communities. Besides, it can be empirically sustained that, the food vendors are knowledgeable, and constantly in food hygiene in the vending process.

Research Question 3: Are there any relationship between food hygiene and environmental health practices?

Table 4.2.3: Frequency Distribution on the Relationship Between Food Hygiene and Environmental Health Practices.

S/N	Variables	SA F (%)	A F (%)	D F (%)	SD F (%)	Total	Mea n	SD
18	One of the duties of health officers is to check the operational standards of food vendors	59(38%)	61(44%)	3(2%)	(0%)	156(100%)	3.53	0.573
19	Environmental health officers ensure that food vendors maintain the highest standard of hygiene in their catering services	87(56%)	66(42%)	3(2%)	(0%)	156(100%)	3.45	0.537
20	Ensuring safety standards in food hygiene is a major issue in environmental health practices	75(48%)	75(48%)	3(2%)	3(2%)	156(100%)	3.42	0.633
21	Maintenance of food hygiene reduces the outbreak of food born disease and epidemics which environmental health practices safe guard.	84(54%)	69(44%)	3(2%)	(0%)	156(100%)	3.52	0.538
22	Environmental health practice entails regular check on food vendors to promote and sustain basic hygiene in water and food consumption.	66(42%)	84(54%)	3(2%)	3(2%)	156(100%)	3.37	0.623
23	Environmental health officers are to enlighten food vendor on safety	69(44%)	78(50%)	6(4%)	3(2%)	156(100%)	3.37	0.653
24	Rules and regulation are enforced in the vending practices in the nation by law enforcement agencies	53(34%)	98(63%)	3(2%)	3(2%)	156(100%)	3.28	0.599
Grand Mean							3.43	0.599

Decision Rule: Cut-off mean = 2.50; N =156. The result in table 4.23 shows that all the items mean scores are greater than the cut-off mean score of 2.50. On the general, the grand mean of 3.43 is also greater than the cut-off which depicts that there exists a positive relationship between food hygiene and environmental health practices in monitoring and enforcement of hygiene standards among food vendors in the area.

Research Question 4: What are the basic environment health practices prevalent among food vendors in Niger Delta University?

Table: 4.2.4: Summary of Mean and Standard Deviation Scores on the Basic Environmental Health Practices Prevalent among Food Vendors

S/N	Variables	SA F (%)	A F (%)	D F (%)	SD F (%)	Total	Mea n	SD
25	Regular fumigation and application of disinfectants in area where food is prepared	31(40%)	61(39%)	10(6%)	7(5%)	156(100%)	3.27	0.739
26	Regular washing of gutters and disposition of waste bins and stagnant waters	81(52%)	69(44%)	6(4%)	(0%)	156(100%)	3.48	0.573
27	Regular mopping of floors and surrounding where food is served to customers.	91(58%)	59(38%)	3(2%)	3(2%)	156(100%)	3.53	0.637
28	Wearing of white apron to maintain the highest level of cleanness while attending to customers.	53(34%)	84(54%)	16(10%)	3(2%)	156(100%)	3.20	0.695
29	Ensuring that food items are properly covered and protected against contamination	109(70%)	47(30%)	(0%)	(0%)	156(100%)	3.70	0.460
30	Ensuring that already prepared meal.	81(52%)	75(48%)	(0%)	(0%)	156(100%)	3.52	0.501
31	All cooking and eating utensils must or should be washed daily	94(60%)	62(40%)	(0%)	(0%)	156(100%)	3.60	0.491
32	Refill or branded drinking water is very hygienic and important	34(22%)	78(50%)	25(16%)	6(12%)	156(100%)	3.81	0.914
33	Proper cover of drinking water is very hygienic and important	91(58%)	66(42%)	(0%)	(0%)	156(100%)	2.58	0.495
Grand Mean							3.41	0.612

Decision Rule: Cut-off Mean = 2.50. The data presented in table 4.2.4 indicates that all the mean scores for the variables measured are greater when the cut-off score of 2.50. The implication as evidently shown from the grand means score of 3.41 that, there are prevailing basic environmental health practices in the area as investigated. These environmental health practices are related to food hygiene and food vending activities in the communities around the Niger Delta University.

Research Question 5: How can food hygiene be better improved and promoted to enhance environmental health practices among food vendors in Niger Delta University Communities.

Table 4.2.5: Summary of Mean and Standard Deviation Scores on Improved Measures for Food Hygiene and Environmental Health Practices Among Food Vendors

S/N	Variables	SA F (%)	A F (%)	D F (%)	SD F (%)	Total	Mean	SD
34	Food hygiene can be better improved when all vendor comply with environmental health practices.	75(48%)	72(46%)	6(4%)	3(2%)	156(100%)	3.40	0.660
35	Only trained food canteens should be legally engaged in food vending so as to apply basic environmental health practices	75(48%)	44(28%)	19(12%)	3(2%)	156(100%)	3.31	0.760
36	Regular inspection of food vendors by environmental health officers must be sustained	81(52%)	69(44%)	6(4%)	(0%)	156(100%)	3.48	0.573
37	All food vendors in and around the university community must be registered to ensure regulation of environmental health practices	81(52%)	62(40%)	9(6%)	3(2%)	156(100%)	3.42	0.700
38	There must be regular observance of best practices in food preparation and vending in the university community	69(44%)	78(50%)	6(4%)	3(2%)	156(100%)	3.37	0.635
39	There must be regular environmental sanitation in every last day of the week in every canteen.	62(40%)	75(48%)	13(8%)	6(4%)	156(100%)	3.23	0.761
40	Only boys should attend to customers, because they are more hardworking and smart and more careful	13(8%)	13(8%)	50(32%)	81(52%)	156(100%)	1.74	0.931
Grand Mean							3.14	0.612

Decision-Rule: Cut-off mean score = 2.50. Given that the mean scores for six items are greater than 2.50 except an item with a mean score of 1.74, the grand mean score of 3.14 is indicative of the fact that there are improved measures/strategies on enhanced food hygiene and environmental health practices among food vendors in the Niger Delta University communities. Beside the last strategy which does not measure as valid, the study has established that improved strategies are in place to ensure food hygiene and environmental health practices among food vendors in the communities.

DISCUSSION OF FINDING

Food safety or hygiene regulations that are included in this division are more focused on food presentation and handling. This includes maintaining the appropriate temperature in salad bars and storage freezers. Meat and poultry should be prepared in accordance with the recommended heat level. Otherwise, consumers should at least be informed that the meat was under cooked as customers may have different preferences with how their steak is prepared. Good hygiene goes hand in hand with food safety. Employees who are directly in contact with food items practice proper hygiene in food preparation and handling. The local health department is in charge of implementing these guidelines in the food service industry. Depending on the government, these policies may require overall hygiene in the workplace and service area. Some employees are even encouraged to wear hairnets while preparing food.

Food safety are not to be taken lightly especially by those who are engaged in the food service industry. Businesses, who are non-compliant to these standards are at risk of losing their license to operate and may even be required to pay fines. The local government reprimands uncooperative businesses by revoking their licenses until proper action is taken. The hot climate and environmental conditions in Amassoma, such as the dusty places, in which street food vendors are working, provide favourable conditions for bacterial growth. Food risk is influenced by food type, PH, and method of preparation, water availability, handing, exposure, temperature, and holding time” (Campbell, 2011). Arambulo, (1994) has identified various characteristic of street foods which influence the health risks involved. The characteristics identified include the type of food product; the non-use, use or overuse of food additives; and the nature and extent of microbial or chemical contamination. Nicolas, (2007) has also found out that, street food studies carried out in Africa have shown that their unrestricted and unregulated growth have placed a strain on resources in cities, and towns. These resources include, water, sewage system and interferences with the city plan through congestion and littering adversely affecting daily life. This sale of street food is highly argumentative from a health point of view. Bad hygiene practices represent a major threat to consumer health and is a matter of great significance for public health mainly due to improper hygiene practices (Lucca, 2006).

Given the findings of this study, it was observed that proper washing of food items before cooking is very important, proper washing of the hands before handling the food items is very good. Meanwhile proper washing of the plates before and after serving food to customers is a good safety standard in food hygiene as a major issue in environmental health practices, it is also very important that environmental health officers provide enlightenment to food vendor on safety.

The findings of this research corroborates the submission of previous studies by Lucas and Ferraz (2006), who reported that street food vending is a common income –generating venture particularly for women in developing countries. This finding tend to support the submission that women are more into the business of food vending than men and environmental hygiene are carried out effectively, for the promotion and development of their business.

CONCLUSION

Based on the findings to this study, the researcher hereby draws the following conclusion. The study found that food vendors in Niger Delta University communities generally adhered to good food hygiene practices with regards to regular practices, protection of food from flies and dust, serving of good foods, hand hygiene and use of an apron. Training of food vendors on food hygiene and safety has had a significant association with safety of food from flies and dust. The importance of training among food vendors is to ensure perpetuation of best practices in the street food vending business thereby protecting public health.

RECOMMENDATIONS

The following recommendations are made:

1. Government should help to make training on food hygiene and safety effective and compulsory for every food vendor.
2. Every food vendor should be registered with government and environmental health officers.
3. The law enforcement agencies should be very active after giving the rules and regulation so as ensure that these regulations are being put into effect.
4. Regular check by environmental health officers should be sustained.
5. There should be only trained and certificated food vendor that should be legally engaged in food vending practices.
6. If your canteen or store is not properly ventilated it should be closed.

Owing to the importance of personal food hygiene and environmental health practices, the findings of this research work should be used as a document for decision making on practices of food hygiene and environmental health practices. Food hygiene is and environmental health practices very important because when an environment is dirty are become, ill and when proper food hygiene or when you don't have proper personal hygiene your level of food hygiene becomes very low, sickness, diseases comes into the system and cause harm to the body that may lead to death. Proper food and environmental health practices can help one to live a healthy and long life so it is very important, to live a healthy and safe life.

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