

**STRATEGIES OF ACHIEVING FOOD SAFETY AND HYGIENE PRACTICES AMONG FOOD VENDORS IN TERTIARY INSTITUTIONS IN ABIA STATE, NIGERIA**

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**Abstract**

*This study determine strategies of achieving food safety and hygiene practices among food vendors in tertiary Institutions in Abia state, Nigeria Specifically, the study identified the standard food safety and hygiene practices among food vendors and the influence of environment on food safety and hygiene among food vendors in the study area. Survey research method was adopted to achieve these objectives. The study was guided by two research questions and one hypothesis. Structured questionnaire and observational checklist were used to assess the food safety and hygiene practices among food vendors. The study population comprises of all the registered food vendors of the selected tertiary institutions in Abia State. Convenience sampling techniques was adopted for the study. A sample size of 268 registered food vendors were adopted for the study. Descriptive statistics such as frequencies, percentages and means were used to analyze demographic variables and research questions, while multiple regression analysis was used to test the hypotheses at 0.05 significant level. Findings of the study revealed that washing of hands before and after food preparation, wearing apron and other protective clothing while cooking, not sneezing or coughing over food, not talking much during preparation of food among others are the standard food safety and hygiene practices expected in food vending facilities. The study concludes that management of tertiary institutions to sensitize and educate food vendors on preparing and serving a healthy food to consumers. The findings also revealed that increase in sales, business expansion/size, good reputation, return patronage, income generation among others are the vendor's environment on customer's choice of food vendors. The study concludes that it is the responsibility of the management of tertiary institutions to sensitize and educate food vendors on preparing and serving a healthy food to consumers. Disciplinary*

*actions should be put place by management of various tertiary institutions to non-adherence of standard food safety and hygiene practices.*

**Keywords: Foodsafety, Hygiene, Foodvendor ,Institution, Food ,environment**

## **INTRODUCTION**

Food safety is a vital issue both in developed and developing countries; given that foodborne illnesses causes a lot of distress and thousands of deaths each year (Pilling, 2018). In view of this, the issue of food safety is becoming a key public health priority considering a large number of people who take their meals outside the home (WHO, 2020). As a result of this change in lifestyle (eating outside the home), many people have been exposed to foodborne illnesses that originate from food stands, restaurants and other food outlets. Food handlers have crucial link between food and consumers (Haapala and Probart, 2004 cited in Nyarango, 2018) as there are high contamination tendencies on their part, Considering the numerous people who patronize food from vendors worldwide, that is about 2.5 billion people (as identified by Nyarango, 2018).

World Health Organization (2020) also established five important keys to safer food including ensuring the hands are clean, separating raw food from cooked food, making sure food is cooked completely carefully, keeping food at safe temperatures and using safe water and quality raw materials. These five keys to safer food are of great significance in developing countries, and furnishing food vendors in countries with such knowledge could impact significantly on food safety. Food poisoning occurs from different places, this could be from their homes, workplaces, schools, hospitals or other catering services patronized by consumers. Commercial catering services included restaurants, hotels, finished products from retailers and food vendors. The most crucial food safety problem is a microbial foodborne illness (Fogli, 2016). All those who comes in contact with food, not excluding farmers, food producers, individuals who work in markets and food service establishments, and other food handlers, are obliged to keep food as safe as possible (Fogli, 2016). The Food and Drugs Authority (FDA) is the national regulatory body under the Ministry of Health and are obliged to implement food policies and ensure the safety and wholesomeness of food for consumers. Food and Drug Authority (FDA) roles include food production and processing, site inspections, licensing, product registration and monitoring. They also make sure food handlers go through training on good hygiene practices (Fogli, 2016). In the light of these efforts, the researcher observed that foods served within the canteens of some educational institutions especially in the study area, are not in line with the keys of five safer food established by World Health Organization.

## **OBJECTIVES OF THE STUDY**

The main objective of the study is to determine the strategies of achieving standard food safety and hygiene practices among food vendors in tertiary institutions in Abia state: Specifically the study will

- (i) Identify the standard food safety and hygiene practices (HACCP) expected of food vendors in tertiary institutions in the study area.
- (ii) Ascertain the Influence of environment on achieving food safety and hygiene practices in the study area.

## **RESEARCH QUESTIONS**

- (i) What are the standard food safety and hygiene practices expected of food vendors in tertiary institutions in the study area?
- (ii) What are the Influence of environment on achieving standard food safety and hygiene practices in the study area

## **RESEARCH HYPOTHESES**

**H0<sub>1</sub>:** Food vendor's environment have no significant influence on food vendors in the study area

### **LITERATURE REVIEW**

Food contamination occurs most commonly from excreta on people's fingers, flies etc (i.e. faeco-oral transmission). Food contamination may also occur by skin infection especially the hands of food-handlers (staphylococcal food poisoning), consumption of diseased animals (tape worm, brucellosis etc) or chemicals used as pesticides on crops (Osisanya,2015). The presence of litter and domestic animals in and around vending areas in tertiary institutions has been observed in some of these areas where food tested showed parasitic contaminations(Lah, 2016).. Majority of the food vendors did not have adequate means of disposing refuse rather it is been disposed in nearby gutters; the end result is the presence of flies at the vending site with inadequate food protection (Lah, 2016). Poor environmental conditions in Nigeria such as the dusty roads along which food vendors operate offer good settings for bacterial growth. Several factors have been found to impact the risk of food contamination. These include but are not limited to food type, pH, a process of preparation, water availability, the degree of handling, exposure temperature, and holding time (Osisanya, 2015). Therefore food vendors in tertiary institutions in Abia state should desist from the use of fabrics, cloths, dish towel or apron for hand drying because it can quickly accumulate a large population of microorganism, especially when left moist and their use can actually increase food contamination rather than reduce it. On issues relating to the use of raw vegetables, it is known that some food vendors treat them with vinegar or salt solution; but most of the time these vegetables are washed with only water. Under such conditions, most of the disease-causing organisms still remain on the fresh vegetables and cause foodborne diseases once they are ingested. In most cases, these food vendors usually do not have training in food handling and on hygienic ways of handling food. This trend of affairs might be attributed to the fact that the majority of the food vendors were only trained at home from parents or guardians (Esen and Owusu, 2013). Food safety standards play a crucial role in ensuring the safety and standard of our food ultimately saving life (WHO, 2023). See the picture below:



**7th June**





**World Food Safety Day**

**1 in 10**  
people are affected by foodborne diseases yearly

**420,000**  
people die every year from eating contaminated food

**600 Million**  
More than 600million people fall ill from eating contaminated food yearly.

**200**  
diseases caused by unsafe food, ranging from diarrhoea to cancers

**Food safety standards play a crucial role in ensuring the safety and quality of our food, ultimately saving lives.**

### Key food safety standards

|   |  |  |
|---|--|--|
| <p><b>Good Hygiene Practices</b></p>  <p>such as handwashing and preventing cross-contamination, significantly reduce the risk of foodborne illnesses.</p> | <p><b>Food Storage and Temperature Control</b></p>  <p>Maintaining proper storage and temperature control prevents the growth of harmful bacteria and preserves food quality.</p> | <p><b>Hazard Analysis Critical Control Points (HACCP)/ Good Manufacturing Practices (GMP)</b></p>  <p>HACCP identifies and controls hazards in food production while GMP provides guidelines for maintaining hygiene and safety in food processing facilities.</p> |
| <p><b>Food Labeling</b></p>  <p>Accurate labeling helps individuals avoid allergens and make informed choices.</p>   | <p><b>Traceability and Recall Systems</b></p>  <p>swiftly identify and remove contaminated food from circulation, safeguarding lives by preventing widespread outbreaks.</p>      | <p><b>Food Inspections and Audits</b></p>  <p>Regular inspections and audits of food establishments by regulatory bodies help ensure compliance with food safety standards.</p>  |

Source: Adapted from WHO, (2023)

Hazard Analysis and Critical Control Points (HACCP) has been endorsed by the National Academy of Sciences, the Codex Alimentarius Commission which is an international food standard-setting organization, and the National Advisory Committee on microbiological criteria for foods (ICMSF, 1980 cited in Ezirigwe, 2015). It is the best system available for designing programmes to assist food firms in producing foods that

are safe to consume. The biggest advantage of HACCP over the other systems is that it pre-empts all the activities in the food process thus reducing risks of food-borne diseases. The system is endorsed as an effective and rational means of assuring food safety from harvest to consumption (Ezirigwe, 2018). HACCP system is also based on a preventive methodology, with the aim of avoiding potential risks that can cause harm to consumers by eliminating or reducing hazards, in order to ensure that unsafe foods are not placed at the disposal of the consumer, examples of Health Hazards in Food (Ezirigwe, 2018):

- Biological hazards such as bacteria, viruses, and parasites that can contaminate food and lead to serious infection after ingestion.
- Chemical hazards as a result of harmful substances such as dioxins, heavy metals, antifungals and pesticides.

Physical hazards including sharp particles made of metal, wood, bone, or glass or other splinters that can threaten people's health.

The HACCP system uses a critical control approach during product processing to prevent food safety problems, from raw materials to the final product (Iro, Amadi, Enebi & Amadi, 2017). Based on scientific evidence, this method allows the identification of specific hazards that have an impact on consumer's health and measures for its control. In this way, its application assumes a guarantee of food safety, focusing mainly on prevention and reducing dependence on inspections and tests on finished products, which translates into a decrease in operating costs. This can be applied in all sectors of the food industry, from the primary producer to the consumer (Iro, *et al*, 2017).

The application of such a system allows food vendors and material resources to be directed to the key points of the process and, when properly implemented, allows for a greater involvement and commitment of all employees in understanding and guaranteeing food safety. It then provides the means to prevent mistakes in food safety management that may undermine the survival of the establishment. In addition, implementation of the HACCP system assists official surveillance and control services in fulfilling their tasks and promotes international trade through improved confidence in the safety of food by consumers (Ezirigwe, 2018).

These benefits are in contrast to some difficulties, which can shape the application of this system, such as the cost that food vendors will have to bear for their implementation, given the need for technical and material resources, which are not always available, especially in small food outlets, resistance to change, changing practices and habits may also be an obstacle for certain food vendors in tertiary institutions.

The HACCP system is based on seven fundamental principles (Ezirigwe, 2018):

1. Conduct a hazard analysis;
2. Determine critical control points (CCP);
3. Establish critical limits for each critical control point (CCP)
4. Establish monitoring procedures to control each critical point.
5. Establish corrective actions to be taken when a given critical control point (CCP) is outside acceptable levels.
6. Establish verification procedures that demonstrate that the HACCP system works effectively.
7. Establish data recording and archiving systems that document the entire HACCP plan It is therefore, important that food vendors in tertiary institutions in Abia state should ensure that they applied the food safety control measures in food handling and establish the viability of implementing a HACCP system as a strategy for quality control in the catering establishment in order to achieve customer satisfaction.

World Health Organization (2020), defined hygiene as conditions and practices that help to maintain health and prevent the spread of diseases. While the present study defined hygiene as all the necessary practices and conditions that are exhibited by individuals in their daily activities to ensure the prevention of diseases and to maintain good health. Hygiene practices should be of utmost priority to food vendors in tertiary Institution. In order to prevent food poisoning, cross contamination, food borne disease and other illnesses that may arise through poor hygiene practices, which may affect consumers. It is always important that food vendors wear garments that are suitable for their job, which in this case is the food processing industry. Christy,2015 state that Wearing proper clothing and footwear for food processing is the best way to maintain

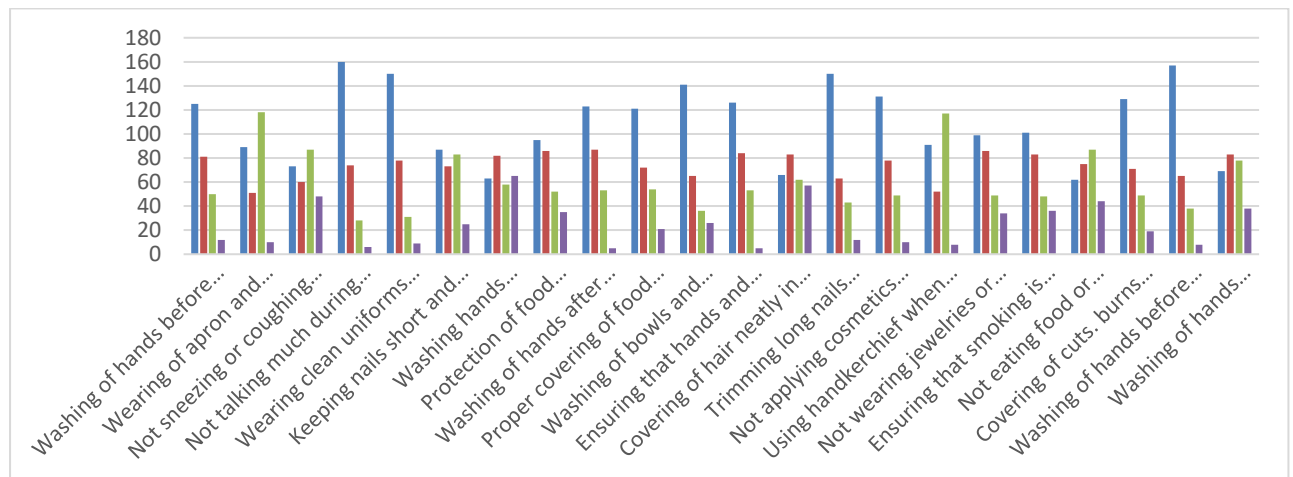
the cleanliness of food. Any food vendor in tertiary institution who deals with processing food should wear impermeable gloves as they are a necessity that should be kept clean and sanitised at all times to prevent the spread of bacteria. As well as that, all jewellery must be removed when dealing with food, because jewellery could be the main source of negative microorganisms. Wearing the correct footwear which is sturdy, clean and comfortable is a must. Any footwear worn in the food processing environment within the food preparation area must not cross-contaminate, therefore it is best to dedicate one pair of shoes to be worn solely in the kitchen and not worn anywhere else. Wearing the proper clothes is also a standard followed by all food manufacturing companies. The proper clothing includes wearing an apron, coat, hairnet and gloves while working to ensure no food gets contaminated or it could make customers ill. If a uniform is required to be worn in the kitchen, then more than one uniform should be purchased for each person so that the uniform is cleaned regularly. Hair and facial hair protection should be put on at all times when cooking and preparing food as this is another basic hygiene practice that must be followed at all times. Keeping your hands clean is an absolute must in any industry as it is a daily process for us all. Predominantly, keeping your hands clean in food processing is required as it can prevent the spread of diseases and food vendors in tertiary institution should ensure clean environments. Cleaning your hands is a way for you to combat possible bacteria and contaminating agents inside the workplace (Christy ,2015)

**METHODOLOGY**

A survey research design was used through administration of questionnaire, oral interview and observation. This study was carried out in Abia State, Nigeria. The population for the study was made up of registered food vendors in tertiary institutions in Abia State which include: Abia State University, MOUAU, Abia Poly, College of Education Technical Arochukwu, Gregory University Uтуру, Rhema University, Clifford University Owerrinta. A sample size of 268 was adopted. Convenience sampling technique were also adopted. Researchers made questionnaire, personal interview and observation was used in obtaining the needed informations. The study were analyzed using descriptive statistics such as frequencies, percentage, and mean deviation for both respondents’ personal data and research questions.

**ANALYSIS OF RESEARCH QUESTIONS**

**Question 1:** What are the standard food safety and hygiene practices expected of food vendors in tertiary institutions in the study area?



**Figure 1:** Standard food safety and hygiene practices expected of food vendors in tertiary institutions in Abia State

Table 1 above shows the standard food safety and hygiene practices expected in food vending facilities This includes, washing of hands before and after food preparation, wearing of apron and other protective clothing while cooking, not sneezing or coughing over food, not talking much during preparation of food to avoid spit entering the food, wearing clean uniforms at all times, keeping nails short and cut neatly at all

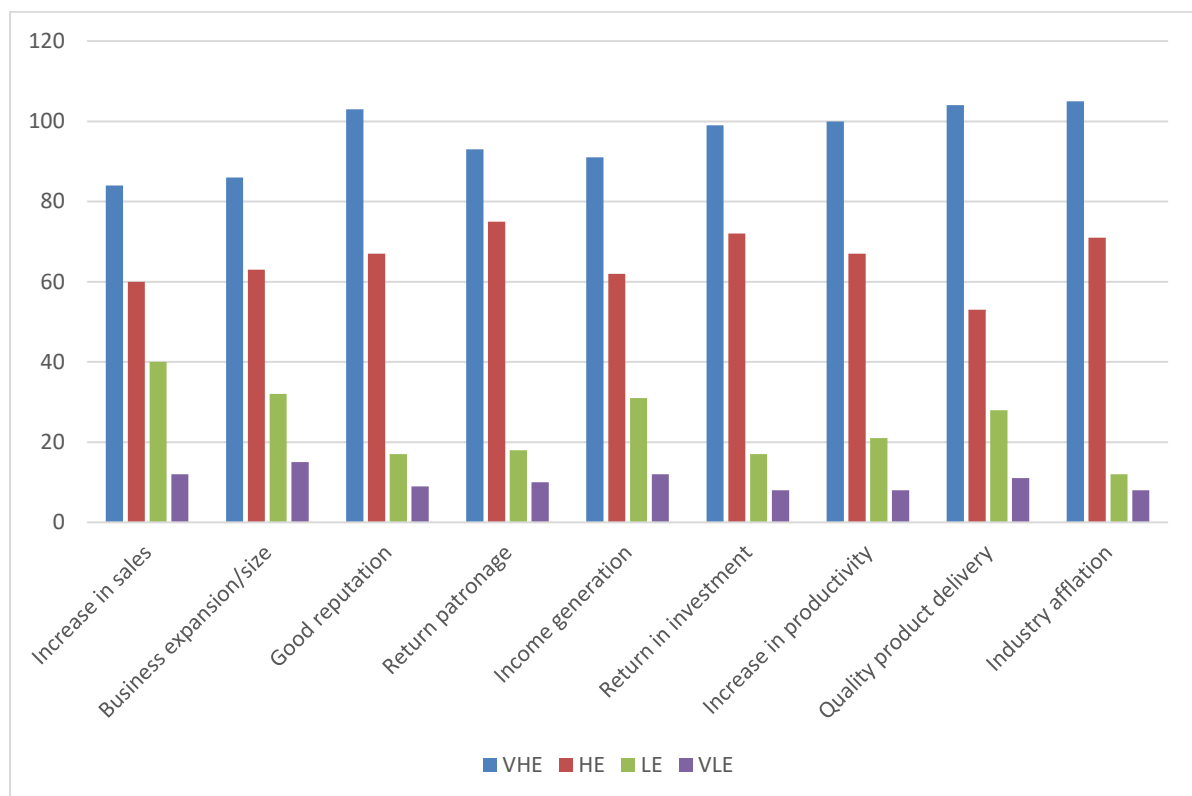


times, washing hands thoroughly after visiting the toilet, protection of food materials from insects and rodents among others. This implies that the above listed variables are the standard food safety and hygiene practices expected in food vending facilities and is extracted from (WHO,2020). This result is in conformity to the findings of Nyarango, (2018), Ezirigwe, (2018); Iro, Amadi, Enebi & Amadi, (2017); WHO, (2015) which revealed the standard food safety and hygiene practices expected by food vendors, the variables they revealed are synonymous to the items used in this study, though majority of the food vendors in tertiary institutions in Abia state does not meet up with the standards identified by (WHO,2020).

**Question 2:** How does environment influences consumer’s choice of food vendors in tertiary institutions in Abia state?

**Table 2: Mean responses of respondents on the influence of environment on achieving food safety and hygiene practices in tertiary institutions in Abia state**

| S/N               |                          | VHE         | HE         | LE         | VLE       | Total no | Total score | Mean        | Remark |
|-------------------|--------------------------|-------------|------------|------------|-----------|----------|-------------|-------------|--------|
| 1                 | Increase in sales        | 84 (42.9%)  | 60 (30.6%) | 40 (20.4%) | 12 (6.1%) | 196      | 336         | 3.10        | Accept |
| 2                 | Business expansion/size  | 86 (43.9%)  | 63 (32.1%) | 32 (16.3%) | 15 (7.7%) | 196      | 344         | 3.12        | Accept |
| 3                 | Good reputation          | 103 (52.6%) | 67 (32.2%) | 17 (8.7%)  | 9 (4.6%)  | 196      | 412         | 3.35        | Accept |
| 4                 | Return patronage         | 93 (47.5%)  | 75 (38.3%) | 18 (9.2%)  | 10 (5.1%) | 196      | 372         | 3.28        | Accept |
| 5                 | Income generation        | 91 (46.4%)  | 62 (31.6%) | 31 (15.8%) | 12 (6.1%) | 196      | 364         | 3.18        | Accept |
| 6                 | Return in investment     | 99 (50.5%)  | 72 (36.7%) | 17 (8.7%)  | 8 (4.1%)  | 196      | 396         | 3.34        | Accept |
| 7                 | Increase in productivity | 100 (51.0%) | 67 (34.2%) | 21 (10.7%) | 8 (4.1%)  | 196      | 400         | 3.32        | Accept |
| 8                 | Quality product delivery | 104 (53.1%) | 53 (27.0%) | 28 (14.3%) | 11 (5.6%) | 196      | 416         | 3.28        | Accept |
| 9                 | Industry affiliation     | 105 (53.6%) | 71 (36.2%) | 12 (6.1%)  | 8 (4.1%)  | 196      | 420         | 3.39        | Accept |
| <b>Grand Mean</b> |                          |             |            |            |           |          |             | <b>3.26</b> |        |



**Figure 2: Mean responses of respondents on the influence of environment on achieving food safety and hygiene practices in tertiary institutions in Abia state**

Table 2 shows that 42.9% are to a very high extent aware of increase in sales, 30.6% are aware to a high extent, 20.4% are aware to a low extent while 6.1% are aware to a very low extent. This was accepted with a mean score value of 3.10 which was more than the acceptable level of 2.5. 43.9% are to a very high extent aware of business expansion/size, 32.1% are aware to a high extent, 16.3% are aware to a low extent while 7.7% are aware to a very low extent. This was accepted with a mean score value of 3.12 which was more than the acceptable level of 2.5. The result also shows that 52.6% are to a very high extent aware of good reputation, 32.2% are aware to a high extent, 8.7% are aware to a low extent while 4.6% are aware to a very low extent. This was accepted with a mean score value of 3.35 which was more than the acceptable level of 2.5. 47.5% are to a very high extent aware of return patronage, 38.3% are aware to a high extent, 9.2% are aware to a low extent while 5.1% are aware to a very low extent. This was accepted with a mean score value of 3.28 which was more than the acceptable level of 2.5.

The result also shows that 46.4% are to a very high extent aware of income generation, 31.6% are aware to a high extent, 15.8% are aware to a low extent while 6.1% are aware to a very low extent. This was accepted with a mean score value of 3.18 which was more than the acceptable level of 2.5.

50.5% are to a very high extent aware of return in investment, 36.7% are aware to a high extent, 8.7% are aware to a low extent while 4.1% are aware to a very low extent. This was accepted with a mean score value of 3.34 which was more than the acceptable level of 2.5. The result also shows that 51.0% are to a very high extent aware of increase in productivity, 34.2% are aware to a high extent, 10.7% are aware to a low extent while 4.1% are aware to a very low extent. This was accepted with a mean score value of 3.32 which was more than the acceptable level of 2.5

The result also shows that 53.1% are to a very high extent aware of quality product delivery, 27.0% are aware to a high extent, 14.3% are aware to a low extent while 5.6% are aware to a very low extent. This was accepted with a mean score value of 3.28 which was more than the acceptable level of 2.5. The result also shows that 53.6% are to a very high extent aware of Industry afflation, 36.2% are aware to a high extent, 6.1% are aware to a low extent while 4.1% are aware to a very low extent. This was accepted with a mean score value of 3.39 which was more than the acceptable level of 2.5. The results showed that all the listed items have grand mean value of 3.26 which is greater than 2.5 (which is the criterion mean).

**Test of Hypothesis 1**

**H0<sub>1</sub>:** Food vendor’s environment have no significant influence on consumer’s choice of food vendors.

**Table 1: Multiple regression analysis on the influence of Food vendor’s environment on customer’s choice of food vendors in tertiary institutions.**

| Variables         | Coefficients | Standard error | t-statistics | P-value |
|-------------------|--------------|----------------|--------------|---------|
| C                 | 0.265867     | 0.066667       | 3.987995     | 0.0001  |
| Avoid insects     | 0.683164     | 0.073007       | 9.357465     | 0.0000  |
| Clean cloths      | 0.520579     | 0.035458       | 14.68173     | 0.0000  |
| Covered food      | 0.075895     | 0.031423       | 2.415241     | 0.0161  |
| Covered hair      | 0.018186     | 0.041169       | 0.441737     | 0.6589  |
| Hand washing      | 0.129808     | 0.036194       | 3.586489     | 0.0004  |
| No sneezing       | 0.292697     | 0.028371       | 10.31686     | 0.0000  |
| Protective cloths | 0.842299     | 0.037276       | 22.59608     | 0.0000  |
| Short nails       | 0.099406     | 0.059745       | 1.663834     | 0.0969  |
| F-statistics      | 1322.270     |                |              |         |
| P-value           | 0.00000      |                |              |         |
| R-square          | 0.960        |                |              |         |
| Adjusted R-square | 0.959        |                |              |         |

The table above shows the result of the multiple regression analysis of the influence of Food vendor’s environment on customer’s choice of food vendors in tertiary institutions. Food vendor’s environment were used as independent variables while customer’s choice was used as dependent variable.

Based on the table above the R square has the value of 0.960 which means that 96.0% variation in customer patronage of food vending is explained or caused by explanatory variables (food safety and hygiene



practices) of food vendors in tertiary institutions. The remaining 4.0% is a result of error in variable or other variables not captured in the model. The high value of these explanatory variables indicates that application of food safety and hygiene practices can influence customer patronage in food vending. The adjusted R-square is 0.959 which means that there is 95.9% influence of food safety and hygiene practices on customer patronage in food vending.

This result simply means that protection of food materials from insects and rodents, washing of hands before and after food preparation, wearing of apron and other protective clothing while cooking, not sneezing or coughing over food, wearing clean uniforms at all times, keeping nails short and cut neatly at all times, proper covering of food while selling to prevent flies and other insects not entering the food are major factors that determines customer patronage in food vending.

Avoiding insects has the coefficient of 0.683164. This implies that 1% increase in avoiding insects by food vendors will lead to 0.683164% increase in customer patronage food vending.

Wearing clean cloths has coefficient value of 0.520579. This implies that if food vendors increase in wearing clean cloths by 1% it will increase customer patronage by 0.520579%.

Covering of food has coefficient value of 0.075895. This implies that if food vendors increase in covering their foods by 1% , it will increase customer patronage by 0.075895%.

Covering of hair has coefficient value of 0.018186. This implies that if food vendors increase in covering their hairs by 1% , it will increase customer patronage by 0.018186%.

Hand washing of food has coefficient value of 0.129808. This implies that if food vendors increase in washing their hands by 1% , it will increase customer patronage by 0.129808%.

No sneezing and coughing has coefficient value of 0.292697. This implies that if food vendors reduce the rate of sneezing and coughing by 1%, it will increase customer patronage by 0.292697%.

Wearing protective cloths has coefficient value of 0.842299. This implies that if food vendors increase in wearing protective cloths by 1% , it will increase customer patronage by 0.842299%.

Keeping short nails has coefficient value of 0.099406. This implies that if food vendors increase in keeping short nails by 1% , it will increase customer patronage by 0.099406%.

**Decision rule:** If the probability of the F-statistic obtained from the result is less than 0.05 (5%) level of significance, the null hypothesis will be rejected, ( $H_0$ ) and the alternative hypothesis, ( $H_1$ ) will be accepted. The F-statistic with 1322.270 has probability of 0.0000% level of significance. Since the probability of the F statistics is above 5% level of significance, we would reject the null hypothesis,  $H_0$  and therefore conclude that food safety and hygiene practices have significant influence on customer patronage in food vending in tertiary institutions in Abia state.

### **DISCUSSION OF FINDINGS**

The findings from question 1 revealed the standard food safety and hygiene practices by food vendors such as the correct storage methods for different food items, proper separation of raw food items from ready-to-eat food, the need to wash hands correctly after being exposed to certain contaminants, proper waste management, the importance of cooking food at the right temperature and for the correct duration, the importance of proper dressing & observance of personal hygiene, the importance of proper washing of fruits and vegetable, availability of wholesome portable water for drinking etc all have critical roles in ensuring the safety of food/drink for the unsuspecting consumers. The finding is consistent to the findings of Nigugusse & Kumie (2012) which revealed the standard food safety and hygiene practices.

The findings from research question 2 showed increase in sales, business expansion/size, good reputation, return patronage, income generation, return in investment, increase in productivity, quality product delivery and industry afflation are the vendor's environment on customer's choice of food vendors. The result is in conformity to the findings of Edwin, Peace, Okwuchukwu & John (2021) which revealed that food safety and hygiene practices have positive and significant influence on customer patronage which is paramount to customer satisfaction and a bedrock of revenue generation to food vendors.

### **CONCLUSION**

Food is an essential part of life, but if it is contaminated it can cause illness even death, and food can be contaminated with toxic substances from outside or in the food itself. There are possibilities of contamination with microbiological, chemical and physical hazards with or without the growth of microorganisms in each step of food preparations. The responsibility for food safety lies within those that process the food, to ensure that the food produce and sell is well-received, stored, well prepared and satisfies the relevant requirement of food law. Appropriate strategies should be applied by food vendors in the study area, in order to achieve guidelines for food safety and hygiene practices. It is also the responsibility of the management of tertiary institutions to sensitize and educate food vendors on preparing and serving a healthy food to consumers.

## RECOMMENDATIONS

1. The health authorities should have a system of monitoring food-borne outbreaks associated with specific premises in tertiary institutions
2. Proper training will ensure correct passage of information to food vendors and increase participation in HACCP implementation
3. Food vendors in tertiary institutions should adhere to the standard food safety and hygiene practices (HACCP) expected in food vending facilities.
4. Disciplinary actions should be put place by management of various tertiary institution to non-adherence of food safety and hygiene practices

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