

# KNOWLEDGE OF FOOD SAFETY AMONG FOOD HANDLERS IN BOARDING SECONDARY SCHOOLS IN BAUCHI STATE, NIGERIA

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## **Abstract**

*The study investigated knowledge of food safety among food handlers in Bauchi State. Three research questions were answered and three null hypotheses were tested. The population of the study consisted of 317 food handlers in boarding secondary schools in the state. Census sampling technique was used to select the entire population of the study area in all the thirty five (35) boarding secondary schools in Bauchi State as sample of the study. Researcher's developed questionnaire named Food Safety Knowledge among food handlers Questionnaire (FSKQ) was used as instrument for data collection which was validated by three experts and reliability index of 0.75 was obtained. Out of three hundred and seventeen (317) copies of questionnaire administered, only three hundred and five (305) were dully filled, returned and used for data analysis. Simple frequency counts and percentage were used to organise and describe demographic information of the respondents while Chi- square, independent t-test, Analysis of variance (ANOVA) was used to test the null hypotheses at 0.05 level of significance. The findings of the study revealed that food handlers in boarding secondary schools in Bauchi State had knowledge of food safety ( $\chi^2=192.645, df:1; P<0.05$ ); there was no significant difference between male and female food handlers on knowledge of food safety ( $t=148, df: 302; P>0.05$ ) and there was no significant difference in knowledge of food safety among food handlers in boarding secondary schools in Bauchi State based on their years of experience ( $F=.158, df: 3, 300; P>0.05$ ). It was therefore recommended among others that government should ensure adequate and regular training of food handlers and also institute a modality for regular monitoring of food handlers in boarding secondary schools in Bauchi State to ensure effective food safety practices.*

**Key words:** *Knowledge of food safety, Food handlers, Boarding secondary schools*

## **Introduction**

Food safety is a broad concept that means food is free from all possible contaminants and hazards. Food safety is vital for creating and maintaining hygienic and healthy conditions for the production and consumption of food (Omemu&Aderoju, 2008). Suleiman (2014) stated that food safety is a scientific

discipline describing handling, preparation, and storage of food in ways that prevent food borne illnesses. Food safety deals with the prevention of contamination of food stuffs at all stages of production, collection, transportation, storage, preparation, sale and consumption. According to Vorvick (2014), food safety refers to the conditions and practices that preserve the quality of food to prevent contamination and food-borne illnesses and it is essential in preventing epidemic of food borne illness that occurs when people consume contaminated food.

Udgori and Yadavnavar (2006) stated that knowledge of food safety entails the handlers' awareness of things to be done or things to be put in place, in the course of either acquiring raw food materials, preparing food or serving food to consumers, so that food safety is achieved. This knowledge encompasses knowing that obtaining raw materials (perishable and non-perishable food items) for food preparation from good sources, 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 and observance of personal hygiene, the importance of proper washing of fruits and vegetable, availability of wholesome portable water for drinking among others all have critical roles in ensuring the safety of food/drink for the consumers (Suleiman, 2014).

Osagbemi, Abdullahi and Aderibigbe (2010) reported that food handlers who had good knowledge were 1.69 times more likely to have good food handling practices compared to those who had poor knowledge. Food safety training influenced the reduction of overall microbiological parameters therefore, knowledge fostered better practices and positive attitude (Klingbeil, 2015). Several studies have reported strong emphasis for educational programmes as a way to improve knowledge and control food borne diseases (Angelillo, Viggiani, Rizzo & Bianco, 2000; Bas, Ersun & Kivanç, 2006) and pointed out that food handlers need training and education as a result of their low level of knowledge on microbiological food hazards, temperature control of refrigerators, cross contamination, and personal hygiene.

According to Igusse and Kumie (2012), increase in food borne infection has been linked with the lack of knowledge of food borne infection (FBI) and poor food safety practices (FSP) of food handlers. The knowledge of food handlers about the food borne infections and their safety practices is an important issue in the outbreaks of food borne infection (Fowora, 2012). Bauchi State is located in north eastern part of Nigeria and consists of twenty (20) Local Government Areas (Nigeria, 2017). The state has many food service establishments in various organizations across the state. The boarding secondary

schools of the state have food handlers that are responsible for food preparation and storage for the students. Therefore, many tools have been provided by government to ensure active managerial control of food borne illness risk factors. The State has predominant roles to ensure hygienic food handling and preparation in all the food premises in the state to safeguard the health and wellbeing of the consumers.

Food safety is an increasingly important public health issue to prevent or control food borne illnesses which is a major public health problem in the developed and developing world. Lack of food safety leads to various food borne illness such as food poisoning, typhoid and paratyphoid fevers, cholera, shigellosis (bacillary dysentery), hepatitis A, giardiasis, trichinellosis, cancer, and lassa fever which are responsible for substantial morbidity and mortality worldwide. In response to the increasing number of food borne illness, governments all over the world are intensifying their efforts to improve food safety. Therefore, food safety continues to be a public health issue worldwide because foods borne illness are widespread. Consequently, consumers are increasingly concerned about food safety and quality; and demand more transparency in production and distribution.

The incidence of food borne diseases is quite alarming. Nigeria has over the years grappled with the problem of food borne diseases which lead to social and economic loss. The major food or water borne diseases among boarding secondary schools include hepatitis, diarrhea, abdominal pain and typhoid which can be spread through contaminated food or water leading to high fever and death. The researcher observed through Bauchi State Ministry of Health (2015) annual health report, which estimated the burden of foodborne diseases that each year as many as 600 or almost 1 in 6 students in boarding secondary school fall ill after consuming contaminated food. It was also reported that there are series of cases of food borne illnesses among students such as diarrhea, dysentery, abdominal pain and typhoid fever which associated with poor knowledge and skills to prevent diseases associated with poor food handling. These diseases are associated with inadequate food preparation, handling and storage (cooking food at an appropriate time and length, poor food storage facilities) and poor food safety attitude such as food preparation without proper washing of the food items, hands and utensils, leaving food uncovered before and after cooking and lack of personal hygiene. It is against this background that the researcher intends to investigate the knowledge and practice of food safety among food handlers in boarding secondary schools in Bauchi State. The researcher answered the following questions:

1. Do food handlers in boarding secondary schools in Bauchi State have knowledge of food safety?

2. Do male food handlers in boarding secondary schools in Bauchi State differ from their female's counterparts in their knowledge of food safety?
3. Is there any difference in the knowledge of food safety among food handlers in boarding secondary schools in Bauchi based on their years of experience?

### **Hypotheses**

The following null hypotheses were tested.

1. Food handlers in boarding secondary schools in Bauchi State do not have knowledge on food safety.
2. Male food handlers in boarding secondary schools in Bauchi State do not significantly differ from their female counterpart in knowledge of food safety.
3. There is no significant difference in knowledge of food safety by food handlers in boarding secondary schools in Bauchi State based on their years of experience.

### **Methodology**

Descriptive survey research design method was used for this study. Population of the study comprised of all the 317 food handlers in 35 boarding secondary schools in Bauchi State. Since the population of the study is minimal, the census sampling technique was used to select the entire population of the study area as a sample of the study. The sample respondents consisted of one hundred and ninety three (193) male and one hundred and twenty four (124) female.

A self developed questionnaire named "Food Safety Knowledge of Food Handlers Questionnaire" (FSKQ) was used as instrument for data collection. The questionnaire was made up of two sections; section "A" is made up of two (2) Items which sought information on demographic information of the respondents while section "B" is made up of fifteen (15) items which sought information on knowledge of food safety. Five copies of the instrument were validated by three experts. A reliability of 0.75 was obtained using split-half method from 30 food handlers in Government Secondary School Birnin-Kudu in Jigawa State and data collected was subjected to a statistical test using Spearman Brown's Prophecy Formula.

Three hundred and seventeen (317) copies of the questionnaire were administered to food handlers in boarding secondary schools in Bauchi State in their respective places of work with the help of four (4) research assistants which were fully briefed on how to administer and collect the questionnaire from the respondents.

## Result

Simple frequency counts and percentage were used to organize and described the demographic information of respondents. An inferential statistic of Chi-square, t-test and (ANOVA) were used to test the null hypotheses one, two and three at alpha level of 0.05.

**Hypotheses 1:** Food handlers in boarding secondary schools in Bauchi State do not have significant knowledge of food safety.

**Table 1: Chi-square summary on knowledge of food safety by food handlers in boarding secondary schools in Bauchi State**

| Variable      | FO         | FE        | $\chi^2$ df | P |      |
|---------------|------------|-----------|-------------|---|------|
| Knowledge     | 273(89.8%) | 152       | 192.645     | 1 | .001 |
| Not knowledge | 31(10.2%)  |           | 152         |   |      |
| Total         |            | 304(100%) |             |   |      |

$\chi^2_{\text{tab}}=3.84$ , df:1; P <0.05

The result in the table 1 showed that 273(89.8%) of the respondents had knowledge of food safety while 31(10.2%) were not. This means that food handlers in Bauchi State had food safety knowledge. ( $\chi^2=192.645$ , df:1; P<0.05). therefore, the null hypothesis is rejected. This means that food handlers in boarding secondary schools in Bauchi State had food safety knowledge.

**Hypotheses 2:** Male food handlers in boarding secondary schools in Bauchi State will not significantly differ from their female counterpart in knowledge of food safety.

**Table 2: Independent t-test summary on difference between male and female food handlers in their food safety knowledge**

| Gender | N   | Mean  | SD    | SE    | df  | t     | P    |
|--------|-----|-------|-------|-------|-----|-------|------|
| Male   | 185 | 59.63 | 8.306 | .611  | 302 | 148   | .882 |
| Female |     | 119   |       | 59.50 |     | 6.170 | .566 |
| Total  |     |       |       |       |     |       | 304  |

$t_{\text{tab}}=1.97$ , df: 302; P>0.05

The result in table 2 showed that the mean scores (59.63) of the male respondents on food safety knowledge was greater than the mean scores (59.50) of female respondents which means that male were relatively knowledgeable than the female food handlers. Also there was no significant difference between male and female food handlers on knowledge of food safety ( $t=148$ , df: 302; P>0.05). Therefore, the hypothesis tested was accepted. This means that male food handlers

in boarding secondary schools in Bauchi State did not significantly differ from their female colleagues in their knowledge of food safety.

**Hypotheses 3:** There is no significant difference in knowledge of food safety by food handlers in boarding Secondary Schools in Bauchi State based on their years of experience.

**Table 3: Analysis of variance on knowledge of food safety by food handlers based on their years of experience**

|               | Sum of Squares | df  | Mean Square | F      | P    |
|---------------|----------------|-----|-------------|--------|------|
| Between Group | 27.148         | 3   | 9.049       | .158   | .924 |
| Within Group  | 17161.112      | 300 |             | 57.204 |      |
| Total         | 17188.260      |     |             |        | 303  |

The result in table 3 indicated no significant knowledge of food safety ( $F=.158$ ,  $df: 3, 300$ ;  $P>0.05$ ). The hypothesis tested was retained. This indicated that there was no significant difference in knowledge of food safety by food handlers in boarding secondary schools in Bauchi State based on their years of experience.

### Discussion

The result was aimed at finding out knowledge of food safety among food handlers in boarding secondary school in Bauchi State. The outcome of this study revealed that food handlers in boarding secondary school in Bauchi State had food safety knowledge. This finding is in line with the study of Afolaranmi, Hassan, Bello and Misari (2015) who conducted studies on knowledge and practice of food safety and hygiene among food vendors in primary schools in Jos, Plateau State, Nigeria, which opined that one hundred and six (60.9%) of the respondents had good knowledge with a mean knowledge score of  $18.59 \pm 5.90$ . The findings of this study was also consistent with the finding of Norazmir *et al*, (2012) that revealed that knowledge on food safety was good as well as practice for both school and their also practiced food safety included in good practice range. The finding is not consistent with the study of Adebukola, Opeyemi and Ayodeji (2015) who reported that about 41.6% food handlers had poor knowledge food borne infection (FBI).

The outcome of the study revealed that significant difference did not exist between male and female food handlers in boarding secondary school in Bauchi State in their knowledge of food safety. This finding is inconsistent with the report of Norazmir *et al*, (2012) who showed that a high level of food safety knowledge and practices among male and female students. The findings of this study is also in line with another study conducted by Chukwuoch *et al*, (2009) that revealed that there was no significant difference in both knowledge and

practice of food sanitation between male and female food handlers. Another study carried out by Turnbull-Fortune and Badrie (2014) also found no difference in the scores for food safety practice between gender but the difference was significant for knowledge. Food safety knowledge skills of male food handlers at the secondary level were significantly lower than that of the females.

The findings of the study revealed that there was no significant difference in knowledge of food safety by food handlers in boarding secondary school in Bauchi State based on their years of experience. The result is contrary with the findings of Nee and Sani (2011) was found that neither age nor level of working experience have significant impact on both food safety knowledge and practice. The result is in line with another study conducted by Afolaranmi, *et al*, (2014) who reported that years of working experience had positive statistical significant influence on the knowledge, attitude and practice of food safety and hygiene.

### **Conclusion**

Food handlers in boarding secondary schools in Bauchi State have food safety knowledge, male food handlers in boarding secondary schools in Bauchi State do not significantly differ from their female counterpart in knowledge of food safety and there is no significant difference in knowledge of food safety by food handlers in boarding secondary schools in Bauchi State based on their years of experience.

Based on the findings of this study, the following recommendations were made:

1. The State Ministry of Education should organise seminar and workshop periodically to maintain the level of food safety knowledge among food handlers in boarding secondary schools in Bauchi State.
2. Government should provide equal opportunity and concern to food handlers in boarding secondary schools in Bauchi State in respective of years of experience to maintain and promote food safety knowledge and change their improper food safety practice.
3. Health education in the form of training on basic principles of food safety should be organized in respective of gender to maintain and promote food safety knowledge and change the poor practice of food handlers in boarding secondary schools in Bauchi State.

### **References**

- Adebukola, O. C., Opeyemi, A.O. & Ayodeji, A. I. Knowledge of food borne infection and food safety practices among local food handlers in Ijebu-Ode Local Government Area of Ogun State. *Journal of Public Health Education*; 7(9):268-273.
- Afolaranmi, T. O., Hassan I. Z., Bello A.D., Tagurum Y.O., Miner C.A., Zoakah, A. I. & Ogbonna, C. (2014). A vital tool for improving the knowledge and practice of

- food safety and hygiene among food handlers in boarding secondary schools in Plateau State. *Journal of Medicine in the Tropic*, 3(1): 22-36.
- Afolaranmi, T. O., Hassan, I. Z., Bello, A. D. & Misari, Z. (2015). Knowledge and practice of food safety and hygiene among food vendors in primary schools in Jos, Plateau State, North Central Nigeria. *Journal of Medical Research*, 4(2): 16-22.
- Angelillo, I. F., Viggiani, N.M., Rizzo, L. & Bianco, A. (2000). Food handlers and food borne diseases: knowledge, attitudes, and reported behavior in Italy. *Journal of Food Protein*; 63(3): 381-385.
- Bas, M., Ersun, A.S., & Kivanç, G. (2006). The evaluation of food hygiene knowledge, attitudes, and practices of food handlers in food businesses in Turkey. *Journal of Food Control* 17(3): 317-322
- Bauchi State Ministry of Health (2015). Annual health statistic report. Health information and statistic record office, Bauchi State.
- Chukwuocha, U. M., Dozie, I. N., Amadi, A. N., Nwankwo, B. O., Ukaga, C. N. & Aguwa, O. C., (2009). The knowledge, attitude and practices of food handlers in food sanitation in a metropolis in south eastern Nigeria. *Eastern African Journal of Public Health* 1(6): 240-243.
- Fowora, M. (2012). Food borne infection from food local restaurants in Lagos, Nigeria Causes and need for intervention. *Journal of Public Health and Epidemiology*; 7(9):268-273.
- Igusse D., Kumie A. (2012). Food hygiene practices and prevalence of intestinal parasites among food handlers working in Mekelle university student's cafeteria. *Global Advance Research Journal of Social Science* 1(4): 065-071.9.
- Klingbeil, D. F. (2015). The important of food safety, knowledge, and practice among food handlers: Plymouth university training and food safety. *Journal of Food Science Research*; 3(1): 45-50.
- Nee, S. & Sani, N. A. (2011). Knowledge and attitudes about food safety and to evaluate the quality of food (physical & Operational Standards) in the student canteen at Duhok University. *Journal of Food Hygiene*; 2(4): 234-252.
- Norazmir, M. N., NoorHasyimah, M. A., Shafurah, A. S., Sabariah, B. S., Ajau, D. & Norazlanshah, H. (2012). Knowledge and practices on food safety among secondary school students in Johor Bahru, Johor, Malaysia, *Journal of Nutrition* 11(2): 110-115.
- Omemu, A. M. & Aderoju, S. T. (2008). Food safety knowledge and practices of street vendors in the city of Abeokuta, Nigeria. *Food control*; 19(4):396-402.
- Suleiman, O. S. (2014). Food hygiene practices among food handlers in Ahmadu Bello University (A.B.U.), Zaria. *Msc thesis, Kaduna state, Nigeria*, 59-60.
- Turnbull-Fortune, S. & Badrie, N. (2014) Practice, behavior, knowledge and awareness of food safety among secondary and tertiary level students in Trinidad, West Indies. *Food and Nutrition Sciences*; 2(5): 1463-1481

- Udgiri, R. & Yadavnavar, M. C. (2006). Knowledge and food hygiene practices among food handlers employed in food establishments of Bijapur city. *Indian Journal of Public Health* 50(3): 240-241.
- Vorvick, L. J. (2014). Food safety; Northwest Division of Physician Assistant Studies, Department of Family Medicine, University of Washington, U.S. Seattle Press.