

# Hygiene Practices among Workers in Local Eateries of Orolu Community in South Western Nigeria

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## Abstract

**Background:** Activities of local food premises and monitoring of food handlers are usually not regulated. **Aim:** The objective of this study was to determine food hygiene (FH) practices among food handlers in rural communities in South Western Nigeria. **Subjects and Methods:** Descriptive cross-sectional study was carried out among 235 food handlers; data collection was by interviewer administered questionnaires. Using the SPSS software, multivariate analysis in two separate models was done to explore the predictors of correct knowledge and good hygiene practices. The model fit was assessed as good using the Hosmer and Lemeshow test. **Results:** Mean age of respondents was 31.8 (10.8) years. Of the respondents (134) that had training, 17.2% (23/134) had formal training, and 82.8% (111/134) had apprenticeship; about 31.5% (74/235) of respondents maintained a good level of hygiene in their practices. Significant predictors of correct knowledge were found to be being trained (significant 0.01, odds ratio [OR] 2.4, 95% confidence interval [CI] 1.2–4.8) and receiving the training as an apprentice (significant 0.01, OR – referent group); or in a formal setting (significant 0.01, OR 3.3, 95% CI 1.6–7.0) and having no formal education (significant 0.04, OR – reference group). **Conclusion:** Good knowledge and attitude but low level of good practices toward FH characterized food handlers under study.

**Keywords:** Attitude and practice, Food handlers, Food hygiene, Knowledge, Local eateries

## Introduction

The springing up of fast food shops and local eateries in nooks and crannies of South Western Nigeria has been recognized as one of the forces that boosted the economy of the region. Westernization, urbanization and the need to struggle for daily survival has made many Nigerians to abandon the culture of cooking at home. Foods at these eateries are available, accessible and sometimes affordable. These food premises also employ a significant number of staff who handles food items from the stage of processing to marketing.

As a matter of public health importance, food safety and hygienic practices employed in this food marketing sector,

restaurants and hotels would play an important function in ensuring that safe food is available for consumption.<sup>[1]</sup> Safe foods ensure minimal risks and hazards to human health through protecting and preventing edible substances from becoming hazardous in the presence of chemical, physical and biological contaminants that deteriorate or spoil the food.<sup>[1]</sup> Contaminated food represents one of the greatest health risks in a population and a leading cause of disease outbreaks and transmission.

Food handlers in these food premises are responsible for food safety throughout the chain of producing, processing, storage and preparation.<sup>[2,3]</sup> Mishandling and disregard for hygiene measures on the part of these food handlers may result in food contamination and its attendant consequences<sup>[2]</sup> including food poisoning<sup>[4,5]</sup> and spread of diseases with resultant morbidity and occasional mortality.<sup>[2]</sup>

Many factors ranging from ignorance,<sup>[6]</sup> uncaring and poor attitude to personal hygiene,<sup>[3]</sup> lack of basic hygiene infrastructure and sanitary facilities such as water, soap and toilets and lack of food storage and preservation facilities, all

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contributed to poor attitude toward food hygiene (FH) practices among food handlers. In addition, lack of time and staff have been identified as some of the barriers to practice of FH.<sup>[5]</sup> Many food handlers also believed that their products were of relatively low risk to the consumers.<sup>[5]</sup>

In a Nigerian survey, almost half of the respondents studied had poor knowledge of food sanitation.<sup>[2]</sup> Another study carried out among food handlers in a Nigerian University campus showed a predominantly poor level of FH knowledge, very low frequency of hand washing practices and low level of personal hygiene generally.<sup>[3]</sup>

Unfortunately, the agency of government saddled with the responsibility of regulating food sale and marketing National Agency for Food and Drug Administration and Control (NAFDAC) acts centrally, and little or no emphasis is placed on such regulation at state and local council levels. Past epidemics of food borne diseases outbreak in the region usually do not focus food handlers in local eateries despite common knowledge that they may be carriers of infectious diseases. Recently NAFDAC commenced nationwide crackdown on fast food outlets following an outbreak of food poisoning in Nigeria in 2008, and this led to the closure of some popular eateries.<sup>[7]</sup>

Studying food handlers in food premises could determine hygiene knowledge and practice toward prevention of food borne and food related diseases. The study focused mainly on local eateries which are generally more accessible and affordable to the majority of the local populace. Data emanating from such studies could also guide the regulating agencies and other stakeholders into formulating policies that would reduce the occurrences of outbreak of communicable diarrheal diseases as well as making food premises liable to negative effects resulting from their hygiene practices. This study therefore assessed hygiene practices among workers in local eateries in Orolu community in South Western Nigeria.

## Subjects and Methods

### Study area

Orolu community is located in the heart of Orolu Local Government Area in Osun State in South Western Nigeria. The 2006 population census puts the population of the area at around 200,000 people.<sup>[8]</sup> Majority are traders, artisans, farmers or civil servants. There are thirty (30) local eateries in the community. There are social amenities such as PHCs, hotels, banks, private clinics, primary and secondary schools, etc.

### Study design and duration

It was a descriptive cross-sectional study carried out among food handlers at local eateries (bukaterias) in Orolu community of Osun State, South Western Nigeria from January to March, 2012.

### Study population

The target populations in the community under study were food handlers in local eateries popularly referred to as “bukaterias.” Food handlers in hotels and fast food shops or joints were excluded from the study. Eligible respondents should have been directly involved with handling of food items for a minimum of 6 months.

### Sample size estimation

Using the formula for calculating sample size for population <10,000, a sample size of 208 was calculated based on hygiene knowledge prevalence of 50%.<sup>[9]</sup> Total sample size was taken as 240 after adding 10% for possible non response.

### Sampling method

There were thirty local eateries in the community; twenty-four of which were selected through simple random sampling by balloting. In each bukateria, a list of staff involved with handling of raw and processed food was made, and each was found to have an average of 15–18 food handlers. Ten food handlers were selected using simple random sampling by balloting from each bukateria.

### Data collection

All eligible respondents were interviewed using precoded, pretested questionnaires. The interview was conducted by trained research assistants who could also speak the local language. A vernacular version of the questionnaire was prepared for the uneducated respondents to reduce inter-observer variation in interpretation during the interview.

### Study variables

Information collected were based on socioeconomic characteristics of the respondents, the operations of their eateries as regards food sanitation, their knowledge and attitude toward FH practices and its relation to public health.

### Ethical consideration

Ethical approval to conduct this study was obtained from the Research Ethics Committee of Lautech Teaching Hospital Osogbo. Permission was also obtained from the Local Government Department of Health and Community Development, and operators of the eateries selected to take part in the study. Informed consent was obtained from each respondent verbally before being interviewed.

### Data management

The SPSS version 17.0 statistical package (Chicago, IL, USA) was used for data entry and analysis. Validity of data collected was ensured by double entry and random checks for errors. Knowledge, attitude, and practices were scored based on responses of respondents to questions that were asked. Correct or favorable response was scored +1 while

negative or wrong responses were scored 0. Pertaining to knowledge and perception, the scale was from 0 to 12, and a score of 0–6 was taken as poor knowledge and poor perception, while a score of 7–12 was taken as good. Scoring for attitude was on a scale of 0–6, with 0–3 taken as negative attitude, and 4–6 taken as positive attitude. The scale for practice was based on 0–7; poor or low-level practice was for respondents with 0–3 while good or high-level practice was taken for scores of 4–7.

We conducted a multivariate analysis in two separate models to explore the predictors of correct knowledge and good hygiene practices. In a first model, we fit a forward stepwise logistic regression model to the data to explore factors that influenced knowledge of FH. The model fit was assessed as good using the Hosmer and Lemeshow test. In the second model, the outcome variable (practice) was coded 1 for respondents who had good FH practices and 0 for those who did not. The independent variables included in the model were age, sex, education, religion, tribe, marital status, role in the eatery, years of experience, type of training, certification, aware that FH is an important issue for caterers, has had training on FH, can correctly describe FH and believes FH is necessary in food preparation. The model fit was assessed as good using the Hosmer and Lemeshow test.

Relevant frequency distributions and summary measures were done. We used the Chi-square test to examine bivariate relationship and multivariate logistic regression to examine the predictors of correct knowledge and good hygiene practice. All tests were performed at the 5% significance level, and two independent sample *t*-test analyses was used to compare mean differences between quantitative variables.

## Results

A total of 235 respondents questionnaire were completely analyzed giving a response rate of 97.9% (235/240). Mean age of respondents was 31.8 (10.8) years. They had spent a medium of 4 years in the local eatery business (interquartile range: 2–10 years). Of the respondents, 57.0% (134/235) have had training on FH of which 17.2% (23/134) had formal training, and 82.8% (111/134) had apprenticeship. They all had varying roles in the eatery. These and other baseline characteristics are presented in Table 1.

In Table 2, about 94% (220/235) of respondents were aware that FH was an important issue for caterers but only 55.7% (131/235) could correctly describe FH. Respondents differed in their disposition to issues related to FH. Almost all felt that FH is necessary in food preparation (93.2% [219/235]) and should be practiced at all steps of food preparation and serving (97.9% [230/235]). Questions relating to their practices elicited that 31.5% (74/235) of respondents maintained a good level of hygiene in their practices. Other details of disposition and practices are as shown in Table 2.

**Table 1: Baseline characteristics of respondents**

Variables	Frequency (n)	Percentage
Age	Mean=31.8 years	SD=10.8 years
Sex (n=235)		
Male	35	14.9
Female	200	85.1
Education level (n=235)		
None	30	12.8
Primary/Arabic school	94	40.0
Secondary school	97	41.3
Tertiary	14	6.0
Religion (n=235)		
Christian	109	46.4
Islam	119	50.6
Traditionalist	7	3.0
Tribe (n=235)		
Yoruba	210	89.4
Igbo	22	9.4
Hausa/others	3	1.3
Marital status (n=235)		
Single	89	37.9
Married	126	53.6
Divorced/widowed	20	8.5
Role in the eatery (n=235)		
Administrator	41	17.4
Cook	59	25.1
Vendor	14	6.0
Waiter/waitress	73	31.1
Cleaning duties	32	13.6
Multiple roles as assigned	16	6.8
Years of experience	Median=4 years	IQR=2-10 years
Ever undergone training on FH (n=235)		
Yes	134	57.0
No	101	43.0
Type of training (n=134)		
Formal	23	17.2
Apprenticeship	111	82.8

SD: Standard deviation, IQR: Interquartile range, FH: Food hygiene

Table 3 showed bivariate analysis to examine the relationship between ability to describe FH and training, educational status and role in the eatery showed that all these factors had statistically significant associations with ability to describe FH. About 7 of every 10 persons who reported having received training on FH could correctly describe FH ( $P < 0.001$ ).

In a first multivariate analysis model, the descriptive information for these variables has been presented in Tables 1 and 2. The model fit was assessed as good using the Hosmer and Lemeshow test (significant of 0.5 at a df of 8). Significant predictors of correct knowledge were found to be being trained (significant 0.01, odds ratio [OR] 2.4, 95% confidence interval [CI] 1.2–4.8) and receiving the training as an apprentice (significant 0.01, OR – referent group); or in a formal setting (significant 0.01, OR 3.3, 95% CI 1.6–7.0).

**Table 2: Awareness, attitude and practice of FH**

Variables	Frequency (n)	Percentage
Awareness of FH (n=235 with multiple responses)		
Aware that FH is an important issue for caterers	220	93.6
Can correctly describe FH	131	55.7
Attitude and disposition to FH practice (n=235 with multiple responses)		
FH is necessary in food preparation	219	93.2
FH should be practiced every time during all steps from food preparation to serving	230	97.9
Illness such as food poisoning could result from poor FH	187	79.6
FH should be enforced by public health authorities	229	97.4
Food handlers should be compelled to procure materials and infrastructure necessary for FH	169	71.9
All food handlers should be subjected to mandatory quarterly medical screening	167	71.1
FH practices (n=235 with multiple responses)		
Store cooked food overnight	126	53.6
Use preservative in storing cereal	110	46.8
Always wash hands before handling food	93	39.6
Always wash hands after toilet	208	88.5
Does regular medical check-up	72	30.6
Continues to work even when ill	96	40.9
Wears at least one protective device	135	57.4
Prepares food in a hygienic space	89	37.9
Has access to at least 5 items for maintaining FH	193	82.1
Receives regular monitoring/supervisory checks	78	33.2
Hygiene practice categories (n=235)		
Good/high level	74	31.5
Poor/low level	161	68.5

FH: Food hygiene

**Table 3: Relationship between training, education and role in eatery and ability to describe FH (Hosmer and Lemeshow test)**

Variable	Definition of FH			P
	Cannot correctly describe FH (n=104) (%)	Can correctly describe FH (n=134) (%)	Total (n=235) (%)	
Have you ever obtained training on FH				
Yes	40 (38.5)	94 (71.8)	134 (57.0)	<0.001
No	64 (61.5)	37 (28.2)	101 (43.0)	
Educational status				
None	23 (22.1)	7 (5.3)	30 (12.8)	0.001
Primary/Arabic school	42 (40.4)	52 (39.7)	94 (40.0)	
Secondary school	33 (31.7)	64 (48.9)	97 (41.3)	
Tertiary	6 (5.8)	8 (6.1)	14 (6.0)	
Role in the industry				
Administrator	11 (10.6)	30 (22.9)	41 (17.4)	0.01
Cook	30 (28.8)	29 (22.1)	59 (25.1)	
Vendor	5 (4.8)	9 (6.9)	14 (6.0)	
Waiter/waitress	28 (26.9)	45 (34.4)	73 (31.1)	
Cleaning duties	21 (20.2)	11 (8.4)	32 (13.6)	
Multiple roles as assigned	9 (8.7)	7 (5.3)	16 (6.8)	

FH: Food hygiene

In the second model, the descriptive information for these variables has been presented in Tables 1 and 2. The model fit was assessed as good using the Hosmer and Lemeshow test (significant of 0.44 at a df of 8). Significant predictors of good FH practice were found to be being a cook (OR 10.6, 95% CI 2.0–55.2); having no formal education (significant 0.04, OR –referent group); and having received training in an informal setting (significant 0.05, OR –referent group), as

an apprentice (significant 0.03, OR 3.9, 95% CI 1.1–13.4), and in a formal setting (significant 0.04, OR 2.3, 95% CI 1.1–5.1).

## Discussion

Mean age in this study is close to that of a study carried out among food handlers in fast food restaurants in Benin.<sup>[10]</sup> This constitutes the young adult age group that is expected to be

actively working and contributing their quota to economic growth by working in eateries. In this study, about one-tenth of total respondents (and one-third of those trained) had formal training on FH. This is higher when compared to a similar study in which none of the respondents under study acquired food handling skills through formal training.<sup>[11]</sup> However, the figure is low when compared to another study in Benin that reveals that more than half of the food handlers had no training in FH and safety.<sup>[12]</sup> In Nigeria, regulatory authorities such as NAFDAC and Standard Organization of Nigeria are regularly on top of regulating FH practices and registration of food premises including eateries.

Training of food handlers is a fundamental requirement for ideal FH practices, and this might have forced many eateries toward training of newly employed food handlers. This could explain the figures reported in this study. Training will assist workers to have adequate information about hand washing before and after touching food items, and adequate cooking of raw food and basic practices related to FH. According to Food and Agricultural Organization (FAO), food handlers should have the necessary knowledge and skills to enable them to handle food hygienically,<sup>[13]</sup> they are expected to receive training at least to a level suitable for their roles and responsibilities.<sup>[14]</sup> FAO recommends that every vendor/helper of food should undergo a basic training in FH before licensing.<sup>[15]</sup> All this could reduce new infections and burden from diarrheal diseases and food borne infections.

Training in FH and safety, longer years of work and in some cases, the level of education as reflected by Hosmer and Lemeshow tests are predictive factors that have been shown to influence knowledge and practices of FH in this study. This agreed with other studies among food handler.<sup>[5,7,10,16]</sup> However, lack of formal education was reported to be a predictor for good food hygienic practice in this study. This agreed with another study which revealed that the level of education of food handlers did not significantly influenced their practice of FH and safety.<sup>[10]</sup>

In this study, most (above 90%) have good knowledge about FH, a finding similar to previous studies in Benin where good knowledge about FH was found among the respondents,<sup>[14]</sup> and Mauritius where food vendors were found to be quite aware of hygienic conditions, and which have to be respected while handling and preparing foods.<sup>[17]</sup> This study thus further reveals that respondents with good knowledge about FH may have more positive attitude and good practice than those without knowledge.

In this study, in spite most respondents having good knowledge and majority having good attitude or disposition about FH, only about one-third had a high level or good practice of FH. This finding has also been seen in previous studies where it was found that majority of food handlers were not implementing their knowledge into practice, that level of knowledge of food

handlers does not impact on the hygiene standard of their food premises, and that more than two-thirds of respondents admitted to sometimes not carrying out food safety behaviors despite their knowledge about FH in Wales.<sup>[5,17,18]</sup> In a study carried out about food-borne diseases outbreaks in schools, contamination of food by food handlers as one of the most common practices that contributed to these diarrheal disease outbreaks.<sup>[19]</sup>

Another study carried out in Ilorin on food vendors observed that respondents who used soap and water for cleaning, vended food at locations that were relatively closer to water source, had good level of FH practices compared to other vendors who used unsanitary methods to clean their utensils,<sup>[20]</sup> as supported by findings from this study. This stresses the importance of good access to water and sanitary facilities as a possible panacea for the practice of good FH. This supports reported attitude of majority of food handlers in this study, that eateries should be compelled to procure materials and infrastructure necessary for FH and the claims of respondents that they usually wash their hands regularly before and after touching food and food items.

### Limitations of this study

There could be a possible response bias on the part of some respondents that may try to portray their eateries as compliant with safety regulations out of fear of being sacked. This was appropriately handled by persuasive training and sensitivity of the research assistants and several reassurances of the respondents.

## Conclusion

Good knowledge and attitude but low level of good practices toward FH characterized food handlers under study. Authors advocate formal pre-employment training on FH to prospective food handlers by their employers. Other recommendations include periodic medical examinations and on the job health education and promotion exercises for food handlers. Stakeholders involved in regulating the operations of food premises should also remove barriers to good FH practices toward ensuring food sanitation and prevention of food borne diseases in local eateries in Nigeria.

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