Original Research Article

HYGIENIC CONDITIONS OF SELECTED EATERIES WITHIN IBADAN METROPOLIS

ABSTRACT

Study design: A questionnaire survey was carried out on 25 eateries from 7 local government areas (LGAs) in Ibadan. Eateries and LGAs were selected by convenience purposive sampling. Four eateries at the most, comprising of standard and substandard types were selected from each of the LGAs. The questionnaire was designed to get information on the hygienic and sanitary condition involved in preparation of the ready to eat chicken meat.

Methodology: Questionnaires were administered to twenty-five eateries in seven LGAs in Ibadan. Data on food handling and preparation practices were obtained from questionnaire filled for each eatery by the representative.

Result: The results showed that most of the chickens were obtained frozen (84%) from cold food shops. Bore hole (88%) was the major source of water. Most (75%) of the prepared chicken were kept in heat regulated show cases. Most of the respondents (91.3%) reported that they were not using the same chopping board for raw and ready to eat food items. Milton was used on utensils and chopping board by most (87.5%) of the respondents. All (100%) the respondents possessed licenses for operation. Majority (88%) of the respondents wore protective clothing while 96% of them always covered their hair. Septic tank latrines were means of disposal by nearly half (54.2%) of the respondents. There was no significant difference $P > .05$, in hygiene practices of the three classes.

Conclusion: Many eateries were supervised by well trained staff on food safety hygiene but in actual practice, hygienic standards were not thoroughly upheld.

Keywords: Hygiene practice, Chicken meat, Food safety, Food preparation, Eateries

INTRODUCTION

Food borne diseases pose a significant burden, making food safety an important public health concern. More people eat outside their homes due to rapid urbanization, eating facilities are becoming a major source of food borne epidemics. Food facilities and preferences for services vary prominently across regions depending on awareness and adherence to food safety standards for restaurants [1]. The U.S. Food and Drug Administration (FDA) Food Code provides the basis for state and local food codes that guide retail food facilities in the United States. This Code consists standard guidance aimed at preventing microbial contamination in restaurants [2].

In Nigeria, the custom of eating outside homes which was once limited to special occasions has now become part of our lifestyle as a result of increasing urbanization. Recent improvements in the economy of the country led to alarming increase in the number and proliferation of eateries [3]. Our modified lifestyles have proliferated food outlets and food vendors in our cities and villages, such that, at least a meal is consumed away from home. Most of those involved in these emerging food facilities do not observe nor aware of food hygiene and other best practices to emphasize food safety and the environmental requirements in which these foods are produced thereby posing a great danger to public health [3]. The modified patterns of food consumption have resulted in the increasing incidence of food borne diseases. Concerns about food safety have increased alarmingly in well-developed societies. However, the real problem of food borne diseases is played out in the developing countries [4]. Diseases due to the consumption of foods such as animal products are increasing due to changes in food production, food processing methods, international food supply, new packaging technologies, and modified eating habits [5, 6].

Consequences of unsafe food include human diseases and economic loss. Although the American food supply is one of the safest in the world, significant annual economic losses was estimated at 33 million cases of food borne diseases and over 9,000 deaths resulting in an estimated loss of 9.4 billion dollars due to consumption of contaminated food [7,8]. The annual economic loss as a result of outbreaks due to Escherichia coli O157:H7 alone is estimated at 216 to 580 million dollars [9]. Nigeria faces a growing array of food safety challenges, more than half of the food borne diseases outbreaks

in the country are associated with poor handling by restaurants and other institutions according to Centre for Disease Control and Prevention's Environmental Health Specialists Network Surveillance for Food borne Disease Outbreak [10]. Another consultant on safety in health and environment, Mrs. Zainab Akanji noted that despite presence of regulatory agencies in the food safety and health sectors, there was a poor enforcement of the processes. She blamed the incidence of food poisoning and safety on handler's error or non-compliance with food hygiene procedures [11]. A report in 2012, indicated that 200,000 people die annually of food poisoning in Nigeria [12].

Food safety education programs to consumers emphasized five important pathogen control factors such as practicing self-hygiene, prevention of cross contamination, avoiding foods from unsafe sources, cooking foods adequately and keeping foods at safe temperatures [13].

The poultry meat sector tends to provide ready to eat products, which should be safe for the consumer and have a long shelf life [14]. Information about how chickens are prepared in restaurants and about manager's knowledge of safe chickens' preparation is essential to the development of effective interventions. This study was aimed at assessing the hygienic standards put in place by eateries during chicken meat preparation.

METHODOLOGY

Ibadan metropolis has 11 LGAs comprising 5 urban cities and 6 sub-urban cities. A feasibility study carried out at the LGAs showed that there was no even distribution of the eateries into standard, semi standard and substandard. These groupings were based on the general outlook, perceived level of hygiene and the quality of food and services offered by the eateries. A questionnaire survey was carried out on a total of 25 eateries from 7 local government areas within Ibadan metropolis, the eateries and local government areas were selected by simple random and purposeful sampling methods.

Well-structured questionnaires comprising : source and method of chicken preparation ,general hygiene of cooking and serving utensils, acquisition of knowledge, personal hygiene and hygiene condition of eatery facility environment were used to collate relevant information from the eateries on hygienic practices during chicken meat preparation. The questionnaires were filled by the supervisors or representatives of each eatery.

RESULTS

Most (84%) of the chicken was obtained frozen from a cold food shops. Out of the total chickens that were slaughtered, sixty percent (60%) were used throughout the day. The water used for cooking was majorly from bore hole (88%) and the supply of electricity was very constant (76%) for most of the eatery. There were several options of preparing the chicken meat and most (75%) of the prepared chicken meat were kept in heat regulated show cases to minimize food spoilage and induction of bacteria. The unsold chickens were discarded, stored for display on the next day, used with other food preparations or given away (Table 1).

Most of the respondents (91.3%) reported that they were not using the same plate or chopping board for raw and ready to eat food items. Most (94.4%) of the respondents revealed that the plates or chopping boards were washed in between use with soap and water. Sanitizing agents were used on utensils and chopping board by most (87.5%) of the respondents who indicated the most commonly used sanitizer as Milton (22. 2%). Utensils and shopping boards were usually stored in the cupboard (43.5%) (Table 2). Most (95.2%) of the respondent affirmed the presence of a sanitary regulatory system. All (100%) the respondents possessed a license for operation.

The results also showed that most of the respondent (86.5%) gained their skills from formal training. Training about hygiene during handling and cooking of food items is very important. The entire respondent (100%) indicated that they washed their hands before handling of raw chickens. Most of the respondents observed personal hygiene during food preparation. Most of the respondents wore protective clothing (88%); always covered their hair (96%), kept their nails short and unpolished (80%) and never wore jewelry (83.3%). Money was usually dirty and should not be handled by the food handlers, most (96%) of the respondents said that it was the cashier that collected money (Table 3).

This study also showed that some (54.2%) of the respondents had septic tank latrines as means of disposal of sewage while most (82.6%) of the food facilities used the municipal container for the disposal of collected solid waste. All eateries (100%) had toilet facilities situated in a closed apartment with constant water supply and detergent to wash hand. Most of the eateries did not permit live animal in the cooking area (Table 4).

Table 1. Source and Method of Chicken Preparation

Parameter	Respondents	
	N	%
Source of chicken (n=24)		
Eatery has poultry	2	8.3
External farm	3	12.5
Cold food shop	12	50
Market	5	20.8
More than one option	2	8.3
Source of water (n=25)		
Well	2	8
Borehole	22	88
Well and Tap water	1	4
Constancy of electricity (n=25)		
Very constant throughout the day	19	76
Only during working hours	1	4
Not constant	5	20
Style of prepared chicken display (n=24)		
In show glass cases	4	16.6
In heat regulated glass show cases	18	75
In open plates and trays on consumer request	1	4.2
More than one of the options	1	4.2
Time for display of chicken (n=22)		
Whole working period of the day	6	27.2
8-10hrs	2	9.1
6-8hrs	2	9.1
4-6hrs	5	22.7
Less than 4hrs	7	31.8

Table 2. General hygiene of cooking and serving utensils

Parameter	Respondent	
	N	%
Handling of plate/chopping board in between use (n=18)		
Washing with soap and water	17	94.4
Washing with soap & water and have several chopping board	1	5.6
Use of sanitizing agent on utensils and chopping board (n=24)		
Yes	21	87.5
No	3	12.5
Brand of sanitizer used (n=18)		
Hot water & salt	2	11
Jik & morning fresh	1	5.6
Kay-5 sanitizer	1	5.6
Kay-5 sanitizer & chlorinating sanitizer	1	5.6
Milton	4	22.2
Morning fresh	3	16.7

Morning fresh & scouring powder		1	5.6
Sterilizer		1	5.6
Vinegar		3	16.7
Vinegar or Salted water		1	5.6
Storage of utensils and chopping board (n=23)			
Cupboard		10	43.5
Container with cover		9	39.1
Container without cover		1	4.3
Left on the table		2	8.7
Cupboard and container with cover		1	4.3
Presence of sanitary regulatory system (n=21)			
Yes		20	95.2
No		1	4.8
Possession of license (n=25)			
Yes		25	100

Table 3. Acquisition of knowledge and personal hygiene

Parameter	**Respondents**	
	N	**%**
Acquisition of food preparation skills (n=23)		
Informal training	3	13
Formal training	20	86.9
Wash hands before food preparation and handling of raw chicken (n=25)		
Always	25	100
Method of washing hands (n=25)		
Using soap and water	25	100
Use of protective clothing (n=25)		
Wear always	22	88
Never wear	1	4
Wear sometimes	2	8
Condition of hair (n=25)		
Covered always	24	96
Cover sometimes	1	4
Use of jewelry (n=24)		
Never worn	20	83.3
Worn sometimes	4	16.7
Handling of money (n=25)		
Food handlers collect money with bare hands	1	4
Only cashier collects money	24	96
Keeping of finger nails (n=25)		
Short polished	5	20
Short unpolished	20	80

Table 4. Hygiene condition of food establishment environment

Parameter	**Respondents**	
	N	**%**
Disposal of liquid waste (n=24)		
Open area dumping	1	4.2
Septic tank/latrine	13	54.2

Municipal water drainage	10	41.7
Solid waste storage (n=25)		
Closed container	25	100
Disposal of collected solid waste (n=23)		
Municipal container	19	82.6
On site disposal	3	13
Municipal water drainage	1	4.3
State of toilet facility within the premise (n=25)		
Situated in a closed apartment with constant water supply	25	100
Hand washing facility in the toilet (n=25)		
Enough water and detergent	25	100
Live animals within cooking area (n=25)		
Yes	1	4
No	24	96

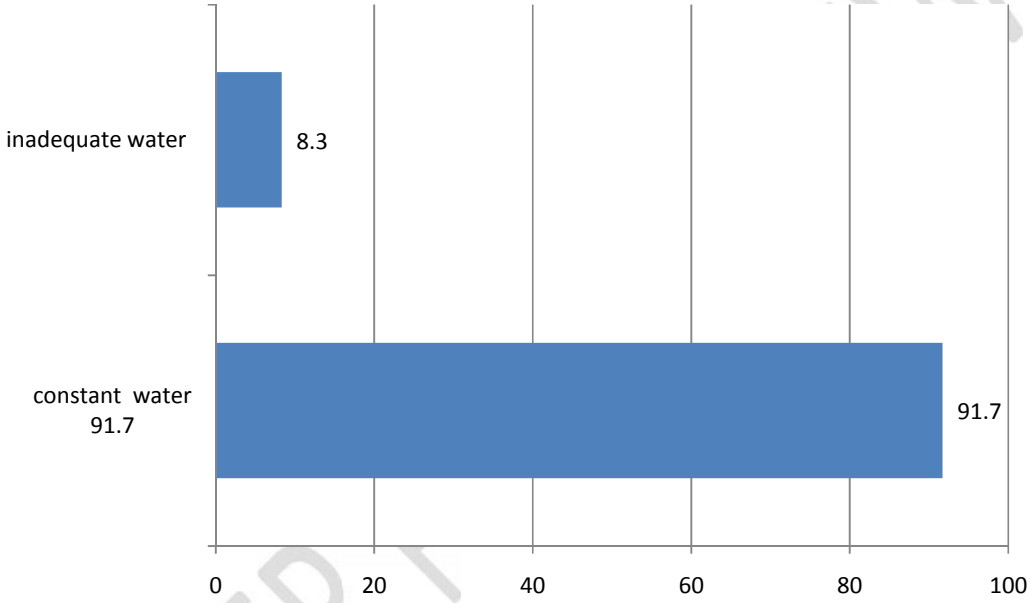

Fig 1. Water supply

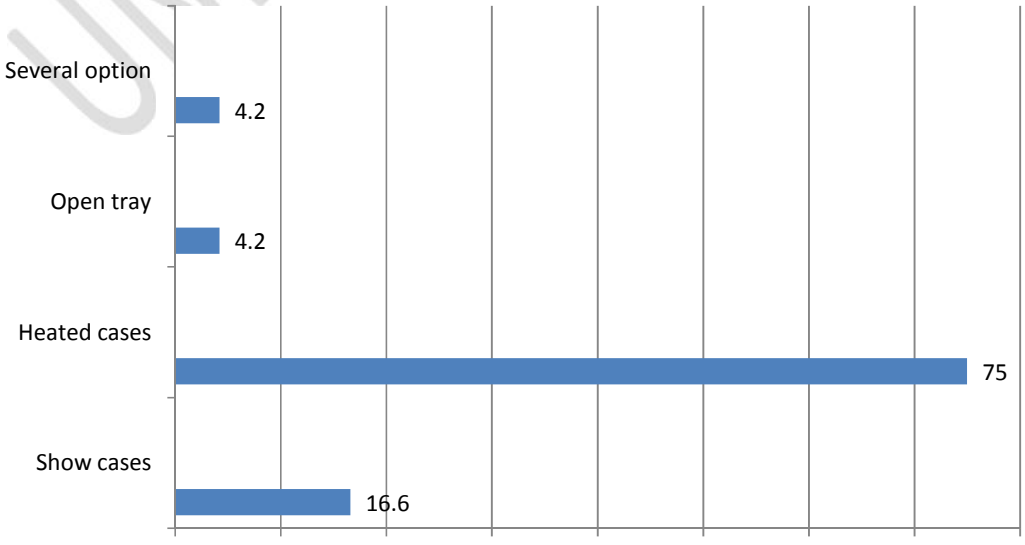

Fig 2. Style of display of prepared chicken

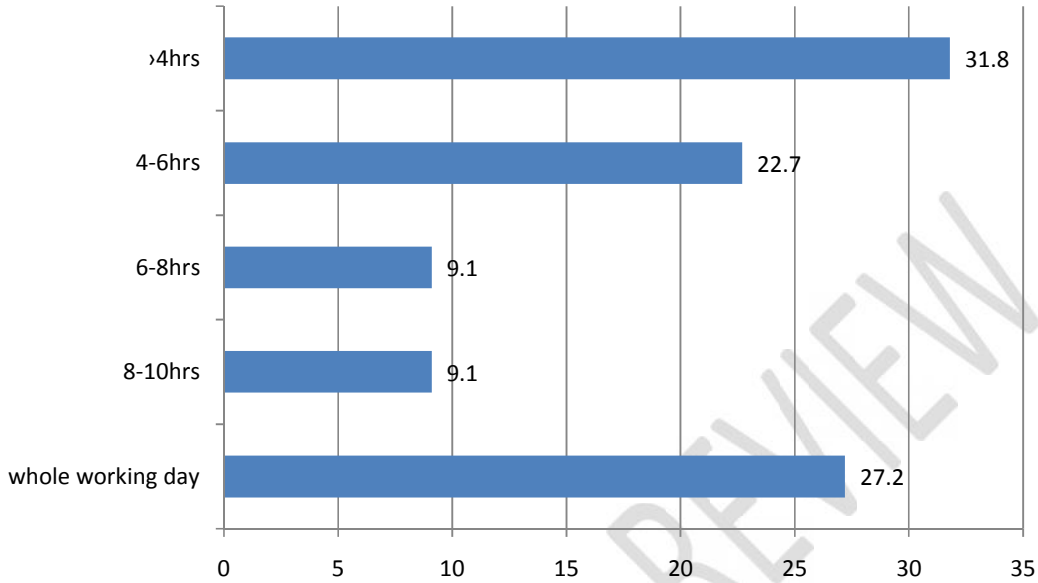

Fig 3. Time period for display of chicken

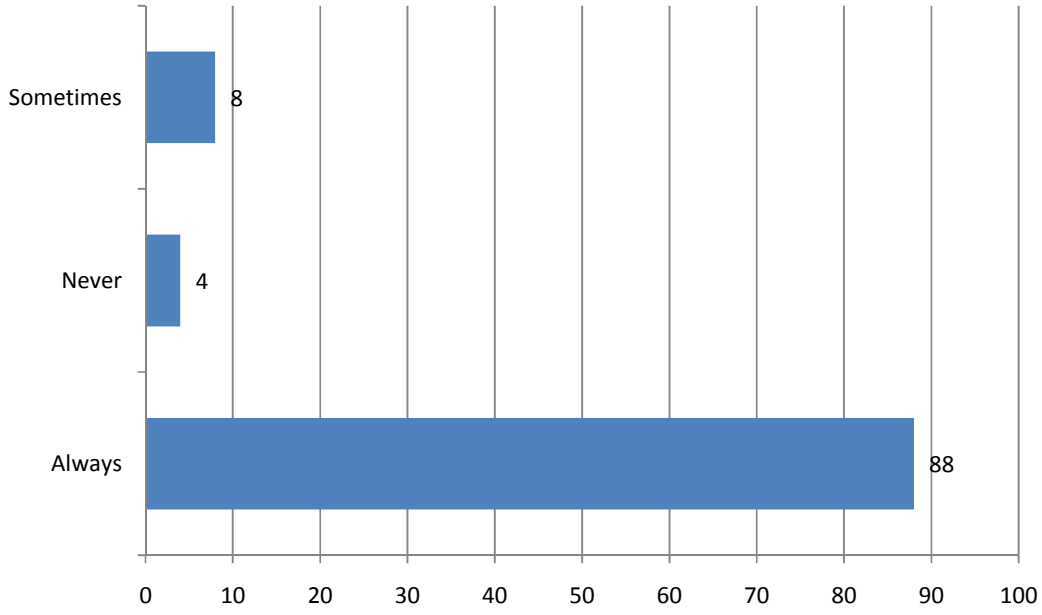

Fig 4. Use of protective clothing

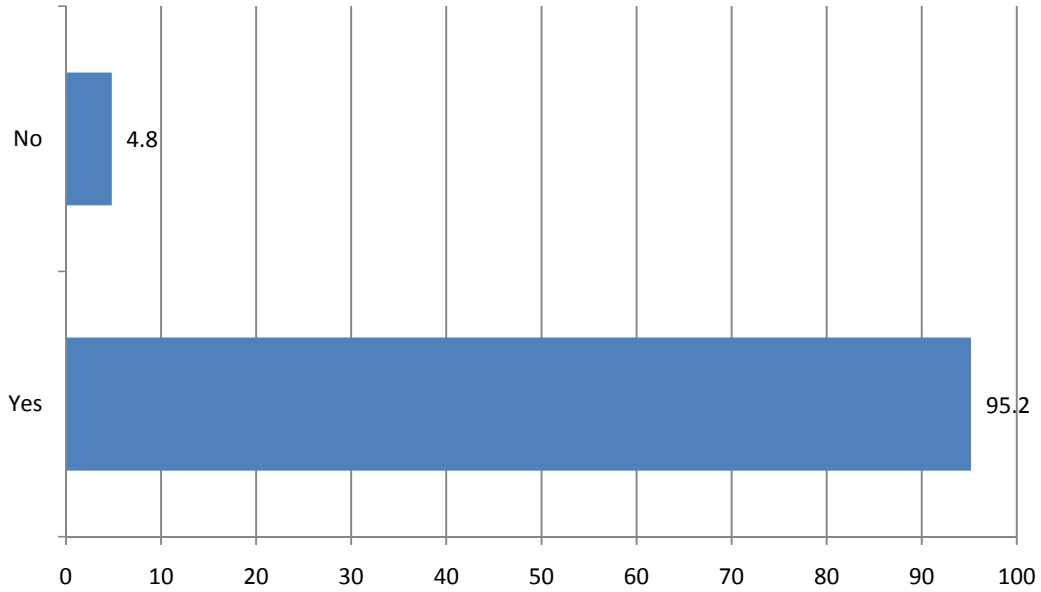

Fig 5. Presence of sanitizing agent

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The total hygiene score was derived from the items of the questionnaire and was then used to analyze the data collected. There was no significant difference *P*=.07, in the total hygiene score among the three classes of eatery studied. The standard, semi standard and substandard eateries were similar in their hygiene practice as at the time of the study. This might probably due to substandard routine check and lack of strict adherence to laid down hygienic practices. It can be assumed that standard eateries are standard because of a neat environment mainly rather than presence of more upgraded hygienic practices.

Table 5. Hygiene practice score

EATERY	TOTAL HYGIENE SCORE
Standard	1.54±0.52[a]
Semi standard	1.63±0.58 [a]
Substandard	1.52±0.67 [a]

Values are in means ± standard deviation; at 95% confidence level, means with different / similar superscripts along the same column are significantly different / not significantly different (similar) from one another.

The same superscript above indicates and yet confirms that there is no significant difference in hygiene score among the three classes of Eatery.

Table 6. Rating of the hygiene of all the eatery studied

Rating	Percent
High	33.3
Average	50.0

Low	16.7
Total	100.0

Half of the eateries had average hygiene score, while only 33.3% of them met the high hygiene score for chicken meat preparation practices in spite of responses given on general hygiene maintenance during chicken meat preparation.

DISCUSSION

Half of the eateries painstakingly earned average score for chicken meat preparation which means that some of the eateries required a serious upgrade in hygiene practices. Sanitizers are chemicals that are capable of destroying microorganisms including food poisoning and other disease-causing bacteria. The most commonly used sanitizers in food facilities contained chlorine or quaternary ammonium compounds (QUATs) as active ingredients. These should be used in accordance with the manufacturer's instructions, other alternatives such as vinegar, lemon juice and methylated spirits should not be used as sanitizers. Vinegar was used by some eateries but will not be effective due to its weak acidic nature[15]. In the study conducted, majority of the eateries used Milton as a sanitizer which is safe and good. Milton solution is totally food safe and can be used to disinfect fridges, chopping boards and plastic containers with no need to rinse [16].

The oldest and most traditional way of sterilizing all forms of cooking equipment is to boil them in boiling water and add some salt in the water to help in the disinfecting process. The boiling temperature of the water is increased slightly so as to destroy more bacteria though there are some bacteria that won't be killed at boiling point temperature [17]. A recent study showed that the chopping board was 200 times dirtier than a toilet seat thereby posing in dangerous source of cross-contamination. It's important to use different boards for raw and ready to eat chicken meat during preparation also the boards should be well cleaned and stored [18].

It appears there are emerging non-compliance to hygienic standard. Quality of food and safety should be commensurate with the cost of service. Most workers reported safe food preparation practice, as evident in the responses to questionnaires on hygienic practices but in reality it is most likely that reported engagement in food safety practices was more frequent than actually engaging in those practices. This finding is in agreement with previous studies [19-22]. This attitude might be displayed in order to preserve their respects and acceptability. In spite of high hygienic practices reported in the questionnaires, the fact was that half of the eatery had a hygiene score of average.

Regulations to enforce compliance with time and temperatures are necessary to ensure food safety**.** WHO (2006) proffered five (5) indicators for food safety such as keeping clean, separating raw and cooked products, cooking thoroughly, keeping food at safe temperature and using both safe water and raw materials.

Good hygiene goes hand in hand with food safety. Employees who are directly in contact with food items should practice proper hygiene in food preparation and handling. Government should enact policy for implementing food safety guidelines in the food facility industry [24]. In a study carried out food risk was reportedly influenced by food type, method of preparation, water availability, handling, exposure, temperature and holding time [25].These factors were also considered important in rating of the eateries hygienic standard in this work.

Many laws have been enacted to ensure food safety in Nigeria such as 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 or unwholesome processed Food Decree, number 15, 1999 [24]. It is necessary to revise the existing food safety legislations because they have not fully been able to address current realities and trends in food safety.

CONCLUSION

This study showed that most of the eateries were supervised and managed by staffs with considerable knowledge on the requirements for food safety hygiene during chicken preparation,

though the affirmation of knowledge on safety hygiene during food preparation did not really translate to an actual practice in preparation of the ready to eat chicken meat.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

CONSENT

The consent of participating eateries was obtained through the Manager or Representative at each eatery's premise before filing the questionnaire.

ETHICAL APPROVAL

The approval to commence the study was obtained from the UI/UCH Research and Ethics Committee at Institute of Medical Research and Advanced Training, Ibadan, Nigeria.

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