Utilisation of Rules for Safe Food Preparation in Niger State, Nigeria

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ABSTRACT

The study examined the utilization of rules for safe food preparations by food sellers in urban and semi-urban centres of Niger State, Nigeria. Two stage sampling procedures were used to select 120 respondents for the study. Validated interview schedule with reliability coefficient of 0.77 was used for data collection and data collected were analyzed using descriptive statistics and t-test. Findings showed that the mean age of the respondents in the respective centres were 41 and 44 years. While majority of the respondents were not members of food sellers associations with 69.2% and 80.0% response rates respectively. Awareness on rules for safe food preparation was higher in urban centres than in the semi-urban centres. However, the utilization of these rules for food preparation across the two centres was low. Challenges to the utilizations of the rules for safe food preparations were un-affordability of storage facility, high cost of disinfectants/detergents and inadequate complementary services. The Result of the t-test showed significant difference (t=3.679) in the level of awareness in the two centres, but there was no significant difference (t=0.310) in the utilization of the rules in the two centres. Therefore, it was recommended that regulatory agencies responsible for enforcing the rules should create more awareness and ensure full compliance to the rules by food sellers through regular visits and monitoring. It was also suggested that Government, Non-Governmental Organisations and stakeholders should assist the food sellers with disinfectants/detergents and storage facilities inform of loans at highly subsidized rates, in order to motivate them to adhere to the critical rules for safe food preparation.

Keywords: Food, Preparation, Rules, Safe, Utilisation

INTRODUCTION

Food is any substance consumed to provide nutritional support for organism, which is usually of plant or animal origin. Food is the third most important thing for living beings to live after air and water; this shows the significance of food for life. According to Banjoko *et al.* (2016), foods generally contain essential nutrients such as proteins, carbohydrates, fats, vitamins and minerals, which are used in the living bodies for growth, repairs, healthy living and as well as source of energy for bodily function and human activities. Thus, human bodies cannot function effectively if one or more food nutrients are missing. While lending credence to this assertion, Omolara *et al.*

(2011) asserted that a healthy and balance diet which provides foods in the appropriate quantity and combinations is the basis for a well-functioning body.

However, the outbreaks of some diseases are associated with foods arising from handling, preparation and storage. According to Food and Agricultural Organisation [FAO] (2003), food poses a significance health and safety risk if not correctly handled, processed, stored and consumed. The source further argued that majority of public food vendors do not meet up with the required hygienic standards and thus result to morbidity and mortality due to food borne diseases. Recently, Osaili *et al.* (2013) stressed that the number of reported cases of outbreaks of food borne diseases and illnesses has been high in the developing nations, Nigeria inclusive which is attributed to poor and unhygienic food preparation practices.

In recognition of the importance of food safety as a vital factor for achieving high level of health, World Health Organization (WHO) introduced 10 golden rules for safe food preparation namely: thorough washing of fruits/foods before eating, cooking of foods thoroughly, eating of cooked foods immediately, storing of cooked foods carefully, reheating of cooked foods thoroughly, avoiding contact between raw and cooked foods, washing of hand repeatedly, cleaning of all kitchen surface meticulously, protecting of foods from insects, rodents/other animals and use of safe water (WHO, 1989). In Nigeria, ministries and agencies responsible for compliance to food safety rules are Federal Ministry of Health, Federal Ministry of Agriculture, National Agency for Food and Drug Administration and Control (NAFDAC), Standard Organisation of Nigeria, all States and Local Governments Ministries and Departments of Health.

It is not certain whether these rules are embraced for the preparation of foods by food vendors who prepare and sell ready foods for public consumption in both urban and semi-urban centres. It is likely that these rules are better applied in urban centres where regulatory agencies are located.

The situation may not be the same in the semi-urban centres as awareness and utilisation or otherwise may be influenced by proximity to regulatory agencies. This study therefore was planned to comparatively evaluate the awareness of the rules for safe food preparation and there utilisation by food sellers in urban and semi-urban centres of Niger State of Nigeria. The specific objectives of the study were to: describe the socio-economic characteristics of respondents in the study area; examine the awareness of the rules for safe food preparation in the study area; assess the utilization of the rules for safe food preparation by food sellers in the study area; and ascertain challenges for utilization of rules for safe food preparation by the respondents in the study area.

The study hypotheses are: there is no significant difference in the awareness of the rules for safe food preparation by food sellers in urban and semi-urban centres of the study area and there is no significant difference in the utilisation of the rules for safe food preparation by food sellers in urban and semi-urban centres of the study area.

METHODOLOGY

The study was conducted in Niger State which is located within Guinea Savannah ecological zone of Nigeria. The State's coordinates is 10.2155^{o} N, 5.3904^{o} E. With annual growth rate of 3.4%, the State has estimated population of 5,337,149 in 2015, of which 85% of the people are farmers, while 15 percent engaged in other businesses or vocational jobs like trading, craft and arts. Annual rainfall ranges from 1,100mm in the Northern part to 1,600mm in the Southern part of the State. The mean average temperature is around 32^{o}C. Some of the crops grown in the State include yam, cotton, maize, sorghum, millet, soybean, cowpea, rice and groundnut. While some of the tree crops cultivated are mango, citrus, cashew, banana, pawpaw. Livestock reared include goat, sheep, cattle, chicken, camel and donkey. The State has three Agricultural Zones (Niger State Geographic Information System, 2007).

Two stage sampling procedure was adopted for this study, at the first stage; two urban and semi-urban centres were purposively and randomly selected respectively from each agricultural zone. The purposively selected urban centres were Bida/Mokwa, Minna/Suleja and Kontagora/New bussa from Agricultural zone I, II and III respectively. While the randomly selected semi-urban centres were Lapai/Agaie, Paiko/Tegina and Mariga/Mekera from Agricultural zone I, II and III respectively. At the second stage, 10 food sellers were randomly selected from each urban and semi-urban centres from the compiled list of food sellers. In all, a total of 120 respondents were selected as the sample size for the study.

Content validity of the instrument for data collection (interview schedule) was ensured through experts' consultation. The interview schedule which was further subjected to Cronbach's Alpha reliability test (0.77) was used by the researchers for data collection in January, 2018. Data were collected on socio-economic characteristics, awareness and utilisation of rules for safe food preparation as well as on challenges for utilization of rules for safe food preparation. Socio-economic characteristics such as age and educational level were measured in years. While house hold sizes and visits by regulatory bodies were measured in numbers and association membership was measured as dummy variable. Marital status was ascertained by asking the respondents to indicate their marital status from the list of options provided. Awareness was determined by asking the respondents to indicate the rules for safe food preparation they are aware of. Utilisation of rules for safe food preparation was measured using 4 points Likert type scale of Always utilised = 4, Sometimes utilised = 3, Hardly utilised = 2 and Never utilise =1. After the measurement, values of the scale were added up and the sum was divided by the number of the values of the scale to get 2.5 (4+3+2+1=10/4=2.5 i.e. cut-off mean/decision point). Thus, any rule with mean of 2.5 and above suggests utilisation of that particular rule for food preparation, while below 2.5 implies no

utilisation of the rule for food preparation. Descriptive statistics were used to achieve objectives one, two, three and four of the study. While the study hypotheses were tested using t-test.

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

The result in Table 1 indicated that the mean age of the respondents were 41 and 44 years in urban and semi urban centres respectively. This implies that most of the respondents were in their middle active ages. At these ages, respondents are expected to have awareness and information on safe food preparation, because of the innovativeness of these age range. Finding also showed that a total of 67.0% of respondents in urban centre and 57.5% in semi-urban centre had one form of formal education or the other. This is expected to expose the respondents to various forms of awareness on rules for safe food preparation. The fact that 71.7% and 74.2% of the respondents were married in their respective urban and semi-urban centres, suggests that the food sellers have experiences in food preparation. However, this result is contrary to the finding of Monney *et al*. (2013) who reported that majority of food vendors in Ghana were single.

The study further revealed that only 30.8% and 20.2% of the respondents respectively were members of food sellers association in urban and semi-urban centres. This is not a good development, because membership of a vocational association serve as a source of awareness and information for improve performance and standard. Findings in Table 1 also indicated that appreciable proportion i.e. 41.7% and 51.7% of the respondents did not received extension visits from the regulatory agencies concern with supervision. This can impact on the awareness and utilisation of the rules for safe food preparation negatively in the two centres. The result of the family size of the respondents revealed that 47.5% of the respondents in urban centres and 38.3% in semi-urban centres had 1-5 family sizes, while 30.8% and 28.3% had family sizes of 6-10 persons.

Possession of large family sizes by the respondents will assist in providing adequate family labour especially by female members for application of rules for safe food preparation.

Table 1: Socio-economic characteristics of respondents

Variables	Urban centres F (%) (n=120)	Semi-urban centres F (%) (n=120)
Age (Years)		
18-35 (young)	51 (42.5)	46 (38.3)
36-55 (middle age)	57 (47.5)	56 (46.7)
>55 (old age)	12 (10.0)	18 (15.0)
Mean	41 years	44 years
Educational level		
No formal education (0 year)	42 (35.0)	51 (42.5)
Primary education (1-6 years)	38 (31.7)	39 (32.5)
Secondary education (7-12 years)	28 (23.3)	22 (18.3)
Tertiary education (13-17 years)	12 (10.0)	8 (6.7)
Marital status		
Married	86 (71.7)	89 (74.2)
Single	27 (22.5)	19 (15.8)
Divorced	7 (5.8)	12(10.0)
Membership of Association		
No	83 (69.2)	96 (80.0)
Yes	37 (30.8)	24 (20.0)
Extension Visits		
No visit	50 (41.7)	62 (51.7)
One visit	25 (20.8)	28 (23.3)
Two visits	24 (20.0)	19 (15.8)
Three visits	21 (17.5)	11 (9.2)
Family Size		
1-5	57 (47.5)	46 (38.3)
6-10	37 (30.8)	34 (28.3)
11-15	23 (19.2)	26 (21.7)
16-20	3 (2.5)	14 (11.7)

Source: Field survey, 2018

Awareness of Rules for Safe Food Preparation

Table 2 shows the awareness of rules for safe food preparation by the food sellers across the two centres. In urban centres, the six rules for safe food preparation which majority of the respondents were aware of include: thorough washing of fruits/food before eating (100.0%), cooking of foods

thoroughly to reach temperature of at least 70^0 C (95.0%), reheating of cooked foods thoroughly to eliminate microbes that develop during storage (80.0%), avoiding contact between raw and cooked foods to reduce contamination of cooked foods by raw foods (77.5%), storing of cooked foods carefully under either hot (near or above 60^0 C) or cool (near or below 10^0 C) conditions (75.0%) and cleaning of all kitchen surface meticulously (70.8%). In semi-urban centres, the study revealed that the respondents were also aware of the first four listed rules above with 100.0%, 91.7%, 71.7% and 70.0% response rate, respectively.

The rules for safe foods preparation which the respondents have least awareness on across the two centres were use of safe water or boiled water for preparing food and protecting of foods from insects, rodents and other animals. The low awareness observed for some rules is an indication of a weak or poor enlightenment drive on the rules for safe food preparation especially in the semi-urban centres. This has implication for the utilisation and public health. This is because adherence to certain safety rules can only be guaranteed when people concerned are well informed, otherwise the food market will be characterised by unsafe foods of undesirable health consequences on the food customers.

Table 2: Awareness of rules for safe food preparation

Rules	Urban centres F (%) (n=120)	Semi-urban centres F (%) (n=120)
Thorough washing of fruits/foods before eating	120 (100.0)	120 (100.0)
Cooking of foods thoroughly to reach temperature of at least $70^{O}C$	144 (95.0)	110 (91.7)
Eating of cooked food immediately to reduce risk of microbes proliferation	68 (56.7)	32(26.7)
Storing of cooked foods carefully under either hot (near or above $60^{O}C$) or cool (near or below 10^{0} C) conditions	90 (75.0)	(51 (42.5)
Reheating of cooked foods thoroughly against microbes that may have developed during storage.	96 (80.0)	80 (71.7)
Avoiding contact between raw and cooked foods to reduce contamination of cooked foods by raw foods	93 (77.5)	84 (70.0)
Washing of hands repeatedly before and after food preparation and after every interruption.	50 (41.7)	45 (37.5)
Cleaning of all kitchen surface meticulously	85 (70.8)	36 (30.0)
Protecting of foods from insects, rodents and other animals	43 (35.8)	27(22.5)
Use of safe water or boiled water for preparing food	48 (40.0)	28 (24.2)

Source: Field survey, 2018

Utilisation of Rules for Safe Food Preparation

Finding in Table 3 indicated that thorough washing of fruits/foods before eating ($\bar{x}$=3.34), cooking of foods thoroughly to reach temperature of at least $70^{O}C$ ($\bar{x}$ =2.60), avoiding contact between raw and cooked foods to reduce contamination of cooked food by raw foods ($\bar{x}$=2.59) and reheating of cooked thoroughly to destroy microbes that develop during storage ($\bar{x}$=2.58) were the rules for safe food preparation utilised by the food sellers in urban centres. In the semi-urban centres, the result revealed that only three rules were well utilised namely thoroughly washing of fruits/food ($\bar{x}$=3.21),

cooking of foods thoroughly ($\bar{x}$=2.65) and avoiding contact between cooked and raw foods ($\bar{x}$=2.57).

On the other hand, the study showed use of safe water or boiled water for preparing foods and protecting of foods from insects, rodents and other animals as the least utilised rules across the two centres. This result is in consonant with WHO (2004) which stressed that animal food products are processed with untreated stream and river waters in Nigeria. This has implication for outbreak of water borne diseases and Lassa fever which is caused by rodents' contact with human foods. The study shows that awareness of the six rules for safe food preparation by majority of the respondents in urban centres did not fully translate to the utilisation of such rules. This point to the need for enforcement by regulatory agencies to ensure compliance to the rules for safe food preparation by reluctant food sellers in the two centres of the study area.

Table 3: Utilisation of rules for safe food preparation

Rules	Urban centres Mean	Semi-urban centres Mean
Thorough washing of fruits/foods before eating	3.34	3.21
Cooking of foods thoroughly to reach temperature of at least $70^{O}C$	2.60	2.65
Eating of cooked food immediately to reduce risk of microbes proliferation	1.26	1.19
Storing of cooked foods carefully under either hot (near or above $60^{O}C$) or cool (near or below 10^{0} C) conditions	2.28	2.23
Reheating of cooked foods thoroughly against microbes that may have developed during storage.	2.58	2.41
Avoiding contact between raw and cooked foods to reduce contamination of cooked foods by raw foods	2.59	2.57
Washing of hands repeatedly before and	1.12	2.02

after food preparation and after every interruption.		
Cleaning at all kitchen surface meticulously	2.42	1.20
Protecting of foods from insects, rodents and other animals	2.07	1.06
Use of safe water or boiled water for preparing food	2.10	1.07

Source: Field survey, 2018

Challenges for Utilisation of Rules for Safe Food Preparation

From Table 4, challenges to the utilisation of rules for safe food preparation in the urban centres were un-affordability of storage facility such as refrigerator for storing foods (57.5%), high cost of disinfectants/detergents for cleaning kitchens and regular hand washing (51.7%) and inadequate complementary visits by regulatory agencies for guidance (45.0%). Similarly, 62.5%, 60.0% and 53.3% of the respondents were confronted with problems of un-affordability of storage facility, insufficient complementary services and high cost of disinfectants/detergents respectively in semi-urban centres. This result affirms the finding of Umar *et al.* (2017) which stressed that high cost of disinfectants limited the adoption of water and sanitation practices. These finding suggests that high cost of supporting inputs and insufficient complementary services limit the utilisation of rules for safe food preparation by the food sellers in the study area.

Table 4: **Challenges for utilisation of rule for safe food preparation**

Challenges	Urban centres F (%) (n=120)	Semi-urban centres F (%) (n=120)
Un-affordability of storage facility	69(57.5)	75 (62.5)
High cost of disinfectants/detergents	62(51.7)	64 (53.3)
Inadequate complementary visits	54(45.0)	72 (60.0)

Source: Field survey, 2018

Difference in Awareness and Utilisation of Rules for Safe Food Preparation

The t-value of 3.679 in Table 5 showed significant difference in the level of awareness on the rules for safe food preparation. The result perhaps statistically validates the earlier assertion that the level of awareness was higher in urban centres than in the semi-urban centres. This may be attributed to closeness to regulatory agencies in urban centres. However, the t-value of 0.310 indicated that there was no significant difference in the utilisation of the rules in two centres.

Table 5: Difference in the level of awareness and utilisation of rules for safe food preparation in urban and semi-urban centres

Centres	No	Mean	Difference	t-value
Awareness				
Urban centres	60	61.76	24.9	3.679*
Semi-urban centres	60	36.84		
Utilisation				
Urban centres	60	50.35	0.29	0.310 ^{ns}
Semi-urban centres	60	50.06		

Source: Computed from field survey data, 2018
*=Significant at 5%
ns= Not significant

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, it was concluded that majority of the respondents were in their middle ages, most of whom were not members of occupational associations. There was significant difference in the level of awareness on the rules for safe food preparation in the urban and semi-urban centres. However, the awareness on the rules did not translate to their full usage in the two centres. Challenges for the utilisation of the rules were high cost of storage facility, disinfectants/detergents and inadequate complementary services by regulatory agencies. Therefore,

it was recommended that the respondents should be encouraged by regulatory bodies such as National Agency for Food and Drug Administration and Control (NAFDAC) to join food sellers associations for easy contact and information dissemination on food safety. Also, more awareness should be created by NAFDAC and other related bodies such as agricultural extension agencies especially in the semi-urban centres on all aspect of the rules for comprehensive and effective information dissemination.

The Federal, State and Local Governments as well as Ministries and Departments of Health concerned should carryout regular monitoring and provide complementary services to ensure compliance to the rules for safe food preparation. Moreso, Government, Non-Governmental Organisations and stakeholders should assist the food sellers with disinfectants/detergents and storage facilities (Refrigerator) inform of loans at highly subsidized rates, in order to motivate them to adhere to the critical rules of storing cooked foods under right condition and regular hand washing. Such loans can be made available through the occupational associations.

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