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ASSESSMENT OF FOOD SAFETY KNOWLEDGE AMONG HOUSEHOLDS IN AKWA IBOM STATE, NIGERIA

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Abstract
This study examined the food safety knowledge of households in Akwa Ibom State. Using a structured questionnaire, primary data was collected from 457 respondents, through a multi-stage sampling procedure. Specifically, study described the prevalence, margin and intensity, given three critical indices, of food safety knowledge. It additionally, identified the factors influencing the probability of households having food safety knowledge. Results show that average age of respondents is 41years, with household size of 5persons, monthly income of N94973, and number of children below five years and adults above 65 years as 1 each. The results, with mean of 0.70 as critical index showed that 55.36% of households are informed about food safety. At critical index of 0.7, there is a gap of four (4) knowledge items between the informed and uniformed. Education, household income and confidence in safety labels are significant factors influencing the probability of household's having food safety knowledge. The study established and provided a more incisive look into the gap between the informed and uninformed, with respect to food safety knowledge. It, therefore recommends that this margin be bridged by awareness programmes which could be propagated by government or non-government organisations.

Keywords: Food safety knowledge, prevalence, margin, and intensity

Introduction

Food Safety is a term describing handling, preparation and storage of food in ways that prevent food borne illnesses (Eze and Anyaegbunam, 2014). Globally, one out of every ten persons contract food-borne illnesses (FBIs). Over 91 million people including Africa acquire food-borne illnesses annually with resultant deaths of about 137,000. Additionally, in developing countries there is higher risk of the occurrence of FBIs, which directly bears on the public health and consequent economic development (WHO, 2015).

FBI is a growing public health concern in developing and developed countries, causing morbidity and mortality in the general population, especially among vulnerable groups, such as infants, young children, elderly and the immune compromised (Nyenje and Ndip, 2013). The signs and symptoms of FBI which run the gamut from gastro intestinal symptoms, such as; stomach upset, diarrhoea, fever, vomiting, abdominal cramps, and dehydration, to more severe systemic illnesses, such as; paralysis and meningitis emphasize the importance of food safety and hygiene in the prevention of food borne illnesses (Mudey *et al.*, 2010).

Despite the efforts made on food safety and environment, 2.1 million adults and 3 million children, including 2 million in developing countries, die each year from water consumption or contaminated food (Sabir *et al*., 2013). Approximately 10 to 20% of food-borne disease outbreaks result from contamination of foods by the food handler (Gizaw *et al*., 2014). Inadequate food safety laws, weak regulatory systems, lack of financial resources to invest in safer equipment, inadequate knowledge of food borne diseases and their causes, improper handling of food and unhygienic environments among others have been identified as some of the causes of food borne illnesses (Haileselassie *et al*., 2013).

Food handlers are defined as individuals who are totally or partially involved in the food preparation process that come into contact with food and food contact surfaces. Food preparers also are made up of those who harvest, slaughter, store, transport, process, and prepare food. Therefore, handlers' awareness of their critical role and responsibility in food safety, and their knowledge and skills, are of crucial importance for handling food safely

(Saad *et al*., 2013).

Contemporary Studies on food safety knowledge in Nigeria essentially run the gamut from descriptively analysing food safety knowledge and, in some instances, determining factors that affect the probability of having this knowledge (Eze and Anyaegbunam, 2014; Adebowale and Kassim 2017; Iwu *et al.*, 2017). Generally, there is a dearth of studies bordering on food safety knowledge of households in South East Nigeria, specifically in Akwa Ibom State. This is the premise upon which this study was carried out to determine the factors affecting food safety knowledge of households in Akwa Ibom State. The study will, furthermore, describe the prevalence, margin and intensity of their food safety knowledge. Specifically, the disaggregated mean prevalence, weighted mean prevalence, margin and intensity of food safety knowledge are unique measures in terms of application to the subject of food safety knowledge.

Methodology

Sampling Procedure

The study was conducted in Akwa Ibom State. The State is located in the South-South geopolitical and South East ecological zones of Nigeria. It is one of the Niger Delta States. The State lies between latitude 4º33" and 5º33" North, and longitude 7º35" and 8º25 East. The estimated total area is put at 7,245,935km^2, and has a shoreline of 129km on the Atlantic Ocean to the South. It shares borders with Cross River State to the East, Abia State to the North, and Rivers State to the West (Ajana, 1996 and Uwatt, 2000). The 2006 provisional census puts the population at 3,920,208, out of which 2,044,510 are males while 1,875,698 are females.–Primary data was obtained using a structured questionnaire that was administered to households. Furthermore, a multistage sampling procedure was applied in this study. In the first stage, three Agricultural Zones were randomly selected out of the six Agricultural Zones, namely: Uyo, Eket and Ikot Ekpene. Next, three Local Government Areas (LGAs) each were purposively selected to give urban, semi-urban and rural representation to the study. Thirdly, six communities were randomly selected from each of the selected LGAs. In the last stage, 10 households were randomly selected, giving a total of 540 households (180 from each zone). However, 457 questionnaires were duly and properly completed and analysis was based on this number.

Estimating Prevalence, Margin and Intensity

As a precursor to describing the prevalence, margin and intensity of food safety knowledge, a food safety knowledge index was developed, as explained in the following section. Next the core measures: prevalence, margin and intensity are defined in detail.

Food Safety Knowledge Index

The Food Safety Knowledge items (Appendix 1) were adapted from World Health Organization's Safety Food Manual (WHO, 2006) and other related empirical literature (Sharif and Al-Malki, 2010; Meysenburg *et al.,* 2014; Lee *et al.*, 2017; Eze and Anyaegbunam, 2014).Three measures akin to frequencies and means are explained in this section. Twenty nine (29) knowledge items (Appendix 1), were used for this study and categorised as follows: 0 – 9 (low), 10 – 19 (medium), 20 – 29 (high). An index (*fski*) was obtained for each household, being the number of knowledge items the households report correctly, expressed as a function of the total number of knowledge items. Three critical indices are used as a basis for reporting the prevalence, margin and intensity of uninformed (and informed) households in the study area – one equal to the maximum medium score (19/29 = 0.6551), the mean *fski* and ⅔ of the mean *fski*. Household food preparers are dichotomised into uninformed and informed. Those with *fski* values below the critical indices are described as uninformed. On the other hand, those with critical indices equal to and above the critical indices are termed informed.

Percentage Prevalence

The first measure of prevalence is simply a percentage of households who fall below (uninformed) and above/equal to (informed) the critical scores. This measure uses an indicator function that takes on a value of 1 for uninformed (and informed) households, alternatively and expresses it as a proportion of the total number of households. Multiplying the values obtained by 100 gives the percentage prevalence. This is given as:

$$fski_{pp} = \sum_{i=1}^{N} 1(fski < 0.70)\,{}^{1}/_{N} \quad \text{.....1}$$

$$fski_{pp} = \sum_{i=1}^{N} 1(fski \geq 0.70)\,{}^{1}/_{N} \quad \text{.....2}$$

N = total number of households (= 457)

N/B: 0.70 (mean *fski*) is successively substituted for 0.66 (maximum medium *fski*) and 0.47(two thirds mean *fski*)-the other two critical scores earlier defined.

Disaggregated mean Prevalence

A second measure of prevalence is also obtained. This is essentially a mean computed based on actual values of *fski* (as opposed to the use of an indicator function that assigns 1 to households that are uninformed and informed, alternatively, with regards to food safety). Multiplying the values of the disaggregated mean prevalence by twenty nine (29), the total number of foods safety knowledge items presented, the exact number of knowledge items that the uninformed and informed are correctly informed about is obtained. This measure is obtained as follows:

$$fski_{pa} = \sum_{i=1}^{N} (fski < 0.70)\,{}^{1}/_{n} \quad \text{.....3}$$

n=number of households with $fski < 0.70$

$$fski_{pa} = \sum_{i=1}^{N} (fski \geq 0.70)\,{}^{1}/_{n} \quad \text{.....4}$$

n=number of households with $fski \geq 0.70$

N/B: 0.70 is successively substituted for 0.66 and 0.47-the other two critical scores earlier defined.

Weighted Mean Prevalence

A third measure of prevalence of uninformed (and informed) household food preparers' with respect to food safety knowledge is essentially a weighted mean for households in both categories. The weights used are the sum of the *fski* of households that are uninformed (and informed) expressed as a proportion of the total *fski* for all households in the study area;

$$fski_{wpa}_{<0.70} = mean\ fski \times \frac{\sum fski < 0.70}{\sum fski} \quad \text{.....5}$$

$$fski_{wpa}_{\geq 0.70} = mean\ fski \times \frac{\sum fski \geq 0.70}{\sum fski} \quad \text{.....6}$$

N/B: 0.70 is successively substituted for 0.66 and 0.47-the other two critical scores earlier defined.

Margin

The mean margin and mean proportionate margin are the measures of the margin, which is basically a deviation from the threshold score by uninformed households in the study area, are reported in this section. These two measures are computed based on the number of uninformed households and all households in the study area. The rationale for this is that the number of uninformed households and all the households provide the basis for conclusion in terms of targeted interventions (ones geared towards uninformed households) and untargeted ones (ones spread across all households).

Mean Margin

This measure of the margin is obtained as follows:

$$fski_{mm} = \sum_{i=1}^{N} (0.70 - < 0.70) \frac{1}{N} \quad \text{.....7}$$

N = total number of households (= 457)

$$fski_{mm} = \sum_{i=1}^{N} (0.70 - < 0.70) \frac{1}{n} \quad \text{.....8}$$

n = number of households with *fski*< 0.70

N/B: 0.70 is successively substituted for 0.66 and 0.47-the other two critical scores earlier defined.

The corresponding values of n for these critical indices are similarly substituted.

Mean Proportionate Margin

This measure of the margin is given as follows:

$$fski_{mpm} = \sum_{i=1}^{N} \left(\frac{(0.70 - < 0.70)}{0.70} \right) \frac{1}{n} \quad \text{.....9}$$

n = number of households with *fski*< 0.70

$$fski_{mpm} = \sum_{i=1}^{N} \left(\frac{(0.70 - < 0.70)}{0.70} \right) \frac{1}{N} \quad \text{.....10}$$

N = total number of households (= 457)

N/B: 0.70 is successively substituted for 0.66 and 0.47-the other two critical scores earlier defined.

The corresponding values of n for these critical indices are similarly substituted.

Intensity

This measure is obtained as follows:

$$fski_{in} = \sum_{i=1}^{N} \left(\frac{(0.70 - < 0.70)}{0.70} \right)^2 \frac{1}{n} \quad \text{.....11}$$

n = number of households with *fski*< 0.70

$$fski_{in} = \sum_{i=1}^{N} \left(\frac{(0.70 - < 0.70)}{0.70} \right)^2 \frac{1}{N} \quad \text{.....12}$$

N/B: 0.70 is successively substituted for 0.66 and 0.47-the other two critical scores earlier defined.

The corresponding values of n for these critical indices are similarly substituted.

Estimating Factors affecting Food Safety Knowledge

The probability of a household being informed about food safety is influenced primarily by socio-economic characteristics and other factors seen in empirical literature. Basically;

$$E(Y|x_i) = \Pr(Y = 0 \leq Y \leq 1|\ x_i) = F(\beta_0 + \beta_i X_i)$$

$$= \int_{-\alpha}^{\beta_0 \beta_i x_i} (2\pi)^{1/2}\, e^{\frac{\beta_0 + \beta_i x_i}{2}}\, d(\beta_0 + \beta_i X_i) \text{.....} 13$$

The β terms are typically calculated using a technique known as maximum likelihood estimation. This estimation finds values for the parameters (βs) that maximize the probability of observing the Y values in the sample with the given X values. In this study, fractional probit regression, a variant of the traditional probit regression is used. Food safety knowledge of household food preparers is expressed as a proportion of a maximum possible value and is hence a value that lies between 0 and 1.

The coefficients produced by estimating a probit model provide the change in the Z (standard normal) value for a unit change in the dependent variables. In order to obtain the impact of the independent variables on the probability of observing the outcome (having food safety knowledge), marginal effects are further estimated. The factors affecting the probability of a household food preparer being informed about food safety are the explanatory variables for the fractional probit model. The variables of the model are as explicitly presented thus:

Y = food safety knowledge index ($0 \leq Y \leq 1$)

X_1 = Age (years)

X_1 = Age (years)
X_2 = Educational level(years)
X_3 = Householdsize (number of persons)
X_4 = Monthly income(Naira)
X_5 = Children below 5 years(number of persons)
X_6 = Adults above 65 years(number of persons)
X_7 = Confidence in safety labels (dummy variable; 1 = yes; 0 = no)
ϵ = error term
$\beta_1, \beta_2, \beta_3 .... \beta_7$ are estimated coefficients

Results and Discussion

Descriptive Statistics

The mean age and monthly income of household food preparers in the study area, (Table 1) is 41 and N94793 respectively. Additionally, Table 3 shows that the households in the study area have an average size of 5 persons, with the average number of children below five years present in the household as 1 person.

Table 1: Summary Statistics of the continuous variables

Variables	Mean	Standard Deviation	Minimum	Maximum
Age(years)	41	11	18	78
Monthly income(figures in Naira)	94793.03	71297.76	10000	850000
Education(years)	13	4	0	23
Household Size(figures)	5	1	1	9
Children below five (5) years(figures)	1	1	0	6
Adults above 65 years(figures)	1	1	0	5

Source: Field Survey, 2018

The results of the descriptive statistics in Table 2 show that the variables: marital status, gender and employment status are completely determined and hence excluded from the fractional probit regression.

Table 2: Descriptive Statistics of Dummy Variables

Marital Status	**Frequencies**	**Percentages**
Single	40	8.75
Married	417	91.25
Total	**457**	100
Employment Status		
Unemployed	12	2.63
Employed	445	97.37
Gender		
Male	1	0.22
Female	456	99.78
Confidence in Safety Labels		
Confident	336	73.52
Not Confident	121	26.48

Source: Field Survey, 2018

Prevalence

Percentage Prevalence: The figures, 0.2407 and 0.7593 (Table 3), imply that, based on the critical index of 0.66, 24.07% and 75.93% of households in the study area are uninformed and informed respectively. Based on the mean *fski* (0.70, as critical index), as further seen in Table 5, 44.64% and 55.36% of households in the study area are uninformed and informed respectively. Also, results (Table 3) show that using 2/3 of the mean *fski* (0.47, as critical index), 2.63% and 97.37% of households in the study area are uninformed and informed respectively. The percentage of informed households based on the critical index (0.66) follows the results of Abushelaibi *et al.,* (2016) who noted that in assessing food safety knowledge, 87% of participants appreciated the importance of food safety. Similarly, Ulusoy and Colakoglu, (2018) indicated that 90.8% of participants in a Food Safety Knowledge study in Istanbul are aware that food hygiene implies to mitigate the illness-causing factors in food. In a related vein, Chen *et al*., (2018) indicated that 60% average level of food safety knowledge among plant dairy workers in China. Lee *et al*., (2017) in an assessment of food safety knowledge, attitude, self-reported practices and microbiological hand hygiene of food handlers, reported moderate levels of food safety knowledge (61.7%). Meysenberg *et al*., (2014) in a study of food safety knowledge, practices and beliefs of primary food preparers among families, reported an average score of 73%. In consonance, Sharif and Al-Malki (2008), reported 74.95%, Moreb *et al*., (2017) 67%, and Hertzman and Barrash (2007) 71.5%.

Disaggregated Mean Prevalence: From Table 3, it can be seen that at critical index 0.66, these figures, 0.55 and 0.75 are the mean food safety knowledge indices assuming the population is segmented with uninformed households in one segment and informed households in another respectively. These figures imply that the uninformed and informed are rightly informed about sixteen (16) and twenty two (22) food safety knowledge items respectively. The percentage prevalence further suggests that, given this critical index, 24.09% and 75.93% of respondents are informed about sixteen (16) and twenty two (22) food safety knowledge items respectively. Therefore, given the maximum medium score (0.66, as critical index), the precise gap between the uninformed and the informed is six (6) knowledge items. Given critical index of 0.7, 0.61 and 0.77 are the mean food safety knowledge indices assuming the population was dichotomized into uninformed and informed households respectively. These figures suggest that uninformed and informed have correct knowledge of thirteen (13) and seventeen (17) of the twenty nine food safety knowledge items presented. Gleaning from the figures in the percentage prevalence, it can be holistically reported that, given the mean critical index, 44.64% and 55.36% of household food preparers are informed about thirteen (13) and seventeen (17) knowledge items respectively. The figures further imply that taking the mean *fski*, (0.7, as critical index) the exact gap between the uninformed and the informed are four (4) knowledge items. Results in Table 3 also reveals that using 2/3 of the mean *fski* (0.47 as critical index), this disaggregated mean *fski* for both uninformed and informed households, the values 0.35 and 0.71 are the mean *fski* assuming the population is divided into uninformed and informed households respectively. Based on these figures, uninformed and informed household food preparers are correctly informed about eight (8) and sixteen (16) food safety knowledge items. Furthermore, given the values of the percentage prevalence, it can be surmised that based on two thirds of the mean as critical index, 2.63% and 97.37% of household food preparers are informed about eight (8) and sixteen (16) knowledge items respectively. Therefore the gap between the uninformed and informed is eight (8) knowledge items.

Weighted Mean Prevalence: Furthermore, results (Table 3) show that (at critical index 0.66) uninformed and informed households contribute 19.07% and 80.93% to the value of the total *fski* respectively. In actual figures, alternatively, the contribution of uninformed and informed households to the mean is 0.13 and 0.57 respectively. It can further be seen that uninformed and informed households (at critical index 0.70) in the study area contribute 38.89% and 61.11% to the value of the total *fski* respectively. Additionally, uninformed and informed households contribute 0.27 and 0.43 respectively in actual figures to the value of the mean. In the study area (given critical index 0.47), as seen in Table 5, uninformed and informed households contribute 1.33% and 98.67% respectively to the value of the total *fski* whereas 0.01 and 0.69 are the actual figures contributed by uninformed and informed households to the mean.

Table 3: Food Safety Knowledge of Households: Prevalence

Critical score	Percentage prevalence		Disaggregated Mean prevalence		Weighted mean prevalence(percentage contribution)	
	Uninformed	Informed	Uninformed	Informed	Uninformed	Informed
0.66	24.07	75.93	0.55	0.75	0.13(19.07)	0.57(80.93)
0.70	44.64	55.36	0.61	0.77	0.27(38.89)	0.43(61.11)
0.47	2.63	97.37	0.35	0.71	0.01(1.33)	0.69(98.67)

Field Survey, 2018 *uninformed (<critical index), informed (≥ critical index)

Margin

Mean Margin: Based on the three critical indices (0.66, 0.7 and 0.47), the figures 0.11, 0.09 and 0.12 respectively depict the mean deviation for uninformed households respectively (Table 4). Intuitively these values represent the minimum value by which any intervention should aim to raise the *fski* of households in the study area, provided that the measures are targeted only at households where *fski* are below the respective indices being considered. In other words, based on the critical indices 0.66, 0.70 and 0.47, knowledge campaigns should seek to increase the knowledge base of uninformed household food preparers by 3, 3 and 14 knowledge items respectively. Results in Table 4 further show that with critical indices 0.66, 0.7 and 0.47, the figures 0.025, 0.04 and 0.003 are the minimum values by which any intervention should seek to raise the *fski* of all households in the study area irrespective of whether the households are uninformed and informed.

Mean Proportionate Margin: From Table 4, with respect to the three critical indices (0.66, 0.70 and 0.47), the values 0.16, 0.13 and 0.25 are the mean proportionate margin of the population (where households with *fski*< 0.66, *fski*< 0.7, *fski*< 0.47 have zero margin). It is useful to think of this measure as the minimum value (expressed as a proportion of the critical index) by which *fski* of households have to be raised to bring them up to the critical value. Multiplying these values by the respective critical indices, the precise minimum value by which an intervention should seek to raise *fski* is obtained. This is provided that the intervention is targeted only at uninformed households. Also, as further seen in Table 4, based on the three

critical indices 0.66, 0.70 and 0.47, the figures 0.04, 0.06 and 0.007 are the ratio of the minimum values by which *fski* must be raised with perfect targeting (intervention aimed only at uninformed households) to the maximum value with no targeting (intervention aimed at whole population), which would entail raising the value of every households' *fski* to ensure they are not below the critical value.

Table 4: Food Safety Knowledge of Households: Margin

Critical Index	Mean Margin		Mean Proportionate Margin	
	Targeted(n)	Untargeted(N)	Targeted(n)	Untargeted(N)
0.66	0.11	0.03	0.16	0.04
0.70	0.09	0.04	0.13	0.06
0.47	0.12	0.003	0.25	0.007

Field Survey, 2018

Intensity

Results(Table 5), 0.03, 0.03, 0.18 and 0.01, 0.02, 0.005 reveal the intensity (severity) of the deviation of uninformed households from the critical indices 0.66, 0.70 and 0.47 when the mean margin and mean proportionate margin are obtained based on the number of uninformed households and all the households respectively. The most critical deviation, in terms of targeted households, is observed when two thirds of the mean, 0.47, is adopted as critical index.

Table 5: Food Safety Knowledge of Households: Intensity

Critical Index	Intensity	
	Targeted(n)	Untargeted(N)
0.66	0.03	0.01
0.70	0.03	0.02
0.47	0.18	0.005

Field Survey, 2018

Determinants of Food Safety Knowledge

Education of household food preparer and their confidence in food safety labels (Table 6), are significant at 1% and directly related to probability of a household food preparer having food safety knowledge. Generally, a more educated household food preparer will have more food safety knowledge. Specifically, as revealed by marginal effects, a 1 unit increase in the education of the household food preparer increases the probability of the preparer having food safety knowledge by 1%. Household food preparers who are confident in safety labels are more likely to have food safety knowledge. The marginal effects suggest that a food preparer confident in safety labels is 6.8% more likely to have food safety knowledge than one who is not confident.

The coefficient for household income is significant at 5% and indirectly related to probability of a household having food safety knowledge. This implies that a 1 unit increase in household income decreases the probability of a household having food safety knowledge by $1.46e^{-07}$%. These results are corroborated by Bektas *et al*., (2011) who found that education increases the probability of consumers in Turkey having food safety knowledge. Additionally, Akabanda *et al*., (2017) found that the more educated are more likely to have food safety knowledge on a study involving food handlers in Ghana. Furthermore, in a study of consumer food safety knowledge and practices in Turkey, Unusan (2005) found education levels to be significant in explaining attitude towards food safety. Yilmaz (2014), indicated that education is a significant factor explaining food safety knowledge, practices and behaviour in Thrace region of Turkey, as well as Moreb *et al*., (2017).

Table 6: Fractional Probit Regression Estimates of Determinants of Food Safety Knowledge

Independent Variables	P > |z| Value	Marginal effect
Age	0.951	-.0000215
Education	0.000***	.0100321
Household Size	0.682	.0012786
Household Income	0.029**	$-1.46e^{-07}$
Children below 5 years.	0.327	.0049408
Adults above 65 years	0.219	.0077513
onfidence in Safety labels.	0.000***	.0678668(*)

Statistics: prob>chi^2= 0.0000; Number of observations=457;p≤0.01,**p≤0.05;*p≤0.1***
(*)marginal effect is the discreet change of dummy variable from O to 1.
Source: Field Survey, 2018

Conclusion

The possibly morbid effects of food borne illnesses leave the subject of food safety with specific reference to knowledge a worthy area of research. This study concludes that over half of the population are informed about food safety. It further surmises that the exact gap between uninformed and informed household food preparers, given the mean as critical index, is four (4) items. This study, in estimating a fractional probit regression, found that education, household income and confidence in safety labels significantly influence the probability of a household food preparer being informed about food safety. In further detail, the study reveals that a more educated household food preparer that is confident in safety labels is more likely to have food safety knowledge than their less educated counterparts. Interestingly, the study further uncovers that household income is negatively related to the probability of a household food preparer having knowledge of food safety. These results are presented as a further and more in-depth explanation of the important subject of food safety knowledge.

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Appendix 1.
Food Safety Knowledge items

S/N	Purchasing, Handling, Preparation and Storage Knowledge Items	True	alse
1	It is important to wash hands before handling food.		
2	Kitchen towels can spread microorganisms.		
3	The same cutting board can be used for raw and cooked foods provided it looks clean.		
4	Raw foods need to be stored separately from cooked food.		
5	Cooked foods do not need to be thoroughly heated before consuming.		
6	Proper cooking includes meats cooked to 0.		
7	Cooked meat can be left at room temperature overnight to cool before refrigerating.		
8	Cooked food should be kept very hot before serving.		
9	Refrigerating food only slows bacterial growth.		
10	Safe water can be determined by the way it looks.		
11	Wash fruits and vegetables.		
12	Well cooked foods are free of contamination.		
13	Defrosted foods should not be refrozen.		
14	The best way to thaw a chicken is in a bowl of cold water.		
15	Wearing caps masks and gloves are important practices to reduce the risk of food contamination.		
16	Beards could contaminate food with food borne pathogens.		
17	Long and painted finger nails could contaminate food with foodborne pathogens.		
18	Food handlers can be a source of food borne outbreaks.		
19	Eggs must be washed immediately after delivery.		
20	Food handlers who have abrasions or cuts on their hands should not touch foods without gloves.		
21	It is alright to thaw meat on the counter.		
22	Diarrhea stomach pains vomiting fever typhoid fever are symptoms of food borne illnesses.		
23	Infants and young children are more vulnerable to food safety threats.		
24	Raw eggs are very healthy and nutritious.		
25	It is important to search for and make use of information labels.		
26	If left over food looks and smells good it is still safe to eat.		
27	It is safe to give an infant a bottle of baby formula or breast milk that has been out of the refrigerator for more than two () hours.		
28	Eating food by hand from a big bowl shared by several persons is risky.		
29	Baby faeces is free from pathogenic microbes if heshe is not sick.		