

ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PRACTICES OF CONSUMERS REGARDING FOOD SAFETY IN BAHRI LOCALITY, KHARTOUM STATE, SUDAN

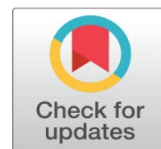


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ABSTRACT

Food borne illnesses are prevalent in all parts of the world. Contaminated food contributes to 1.5 billion cases of diarrhea in children each year, resulting in more than three million premature deaths (WHO).

This study was conducted in August 2016 in Bahri locality, Khartoum state, to evaluate the knowledge, attitudes and practices of the consumers regarding food safety.

A total of questionnaire guided face to face interview with 120 respondents were carried out. Major food safety knowledge concepts include clean and hygiene, general sanitation, safe storage of food, proper cooking of food, use of thermometer in cooking. In general, the respondents had good knowledge about some food safety related issues and not enough knowledge about other issues.

The results of the questionnaire showed that most of the respondents know the importance of washing hands before handling food 63% and wash the instruments and cleaning of the counter just after the preparation of the meal 83%. The results of the questionnaire revealed that 50% of the respondents know the importance of covering hands with a bandage and gloves when preparing food with cuts on their hands. Also, it reveals that 80% of the respondents didn't know the proper way of thawing, and 84.2% of the respondents didn't know food thermometer which is used to ensure proper cooking. This study recommends that consumers should know and apply the five keys to safer food and implementing more training programs to the consumers to improve knowledge, attitudes and practices towards food safety.

Keywords: Bahri Locality, Food, Questionnaire, Knowledge, Respondents

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1. INTRODUCTION

Food is a basic human need and the major source of nutrients needed for human existence, so the consumers demand fresh, tasty, healthy and wholesome food products. Nevertheless, safety is in this framework considered an absolute requirement; placing unsafe food on the market is not an option in the consumer's mind [Arie et al. \(2010\)](#). Food choice is often influenced more by psychological interpretation of product properties than the physical properties of product themselves and food quality has been an important factor [Rozin et al. \(1986\)](#). Consumers often use their sense in their descriptions of safe food and feel that food that looks or smells bad should not eat.



Consumers need to make informed choices about their food and how it is handled and prepared. Considerable amount of food preparation handling and storage take place in the domestic environment, especially at our homes, so by understanding the behaviors of the consumers and assuring the education of the consumers regarding the risk of unsafe food-handling practices is an essential element of the prevention of food –borne diseases [Surjulal and Badrie \(2004\)](#).

Food safety has emerged as an important global issue with international trade and public health implications. In less developed and developing countries, the food safety issues are increasing day by day due to various factors like the increase in the age of human populations, unplanned urbanization, migration and mass production of food due to population growth and changed food habits.

If the consumers are not taking healthy and safe food, then there will be probability of a greater number of cases of food borne diseases. When they will be ill, then these patients will invest to cure themselves. If the food which will be available to them is safe, then there will be fewer chances of food borne diseases.

People around the world become diseased from the food they consume. This illness is known as food-borne illness and is caused by harmful microorganisms and /or toxic chemicals [WHO \(2006\)](#).

Food borne illnesses occur due to eating contaminated food or drink. Large numbers of microbes and substances may contaminate foods. There are more than 250 known food borne illnesses, the most of them are infectious and are occur due to bacteria, viruses and parasites. Foodborne illness has more impact on health and economy in developing countries than in developed countries but answering data is not available, according to the World Health Organization the global incidence of illness is difficult to estimate, but it has been reported in 2005 alone 1.8 million persons died from diarrheal diseases. Contaminated food leads to 1.5 billion cases of diarrhea in children annually, resulting in more than three million premature deaths [WHO \(2010\)](#). Food borne illnesses have led to a significant morbidity and mortality all over the world.

Between all foods borne pathogens, the largest number of cases was reported for campylobacter and salmonella, 198,252 and 108,614, respectively, largely relate to fresh poultry meat, poultry, eggs and pork [\[EFSA\] \(2011\)](#). It is best known that meat, as a rich nutrient media, offers a suitable ambient favorable for the spreading of microorganisms fouling meat and common food borne pathogens, in order to maintain meat safety and quality, enough maintenance technologies must be applied [Aymerich et al. \(2008\)](#).

Food safety is a supra primacy for authorities and spent all over the world. food safety objectives (FSO) and hazard analysis and critical control point (HACCP) systems are being submit all over the world. the European union (EU) is now fetching full-scale hygienic legislative bundle in addition to the established microbiological standards [Commission Regulation \(2005\)](#) into effect. It is sprightly food safety instructions commitment to when handling, dissolving, and stewing decays overcome.

In one deliberating food handlers were characterized as the major reason of food impureness [Campos et al. \(2009\)](#). Hand washing has been conceded as a necessary ingredient in the prevention of the diffusion of microbial contagiousness [Fendler et al. \(1998\)](#). If food handlers disregard the prominence of washing hand during food preparation, some bacteria like Escherichia-coli, staphylococcus aureus can be present on the hands of food handlers [Lues and Tonder \(2007\)](#). With the presence of these bacteria, the hands of food handlers can be played as carrier to disseminate noxious microorganisms through cross contamination [Bas et al. \(2006\)](#).

Ehiri et al. (1996), pointed out that, knowledge himself is not adequate corroboration positive attitudes and safe behaviors between food handlers.as well as knowledge, attitudes are also a consequential factor that ensures lowering destination of food borne illness. Howes et al. (1996), indicate the engagement of positive behavior, attitudes and sustainable education of food handlers toward the fending of safe food handling practices.

The Objectives of current study were: to describe the demographic characteristic of the respondents, describe the knowledge of the respondents with regard to food safety and hygiene and to assess the knowledge, attitudes and practices of respondents toward meat regarding food safety and hygiene in Bahri locality.

2. MATERIALS AND METHODS

2.1. STUDY AREA (SEE THE MAP)

This study was carried out in August 2016 at Bahri - locality, Khartoum state in order to evaluate food hygiene Knowledge, Attitudes, and Practices of consumers towards food safety. A total number of 120 respondents were selected randomly from different areas of Bahri -locality.



Figure 1 Bahri - locality, Khartoum north, Khartoum, Sudan

Bahri locality is a city in Khartoum state, located 11115.63333 N, 32.55E in the north of Khartoum city, the capital of Sudan. It is located on the north bank of the Blue Nile and the east bank of the River Nile, near the confluence of the Blue Nile with the White Nile and bridges connect it with both Khartoum to its south and Omdurman to its west.

2.1.3. POPULATIONS

It had a population of 1,012,211 at the last Sudanese census in 2008. It is part of a three- city agglomeration (with Khartoum proper and Omdurman) with a combined population of 4,272,728 in 2008.

2.1.4. ECONOMY AND INDUSTRY

The industrial center of the region and the country, the neighborhood contains dockyards, marine and rail workshops, and sawmills. Khartoum North trades in cotton, grains, fruits, and livestock, industries include tanning, brewing, brickmaking, textile weaving, and food processing.

2.2. METHODOLOGY

2.2.2. STUDY DESIGN

The study designed as descriptive individual study using different independent variables.

2.2.3. STUDY POPULATION

The study covered 120 respondents randomly during the study period.

2.3. SAMPLING, DATA COLLECTION AND STATISTICAL ANALYSIS

Data was collected through questionnaire and face to face interviews with the respondents. A questionnaire has been developed to check the food safety knowledge, attitudes and practice.

The relationship among consumers concerns and knowledge on food safety will be determined by using a face-to-face conversation questionnaire (appendixes). Level of consumers knowledge about food safety selected according to [Beck and Garden \(2010\)](#) and by the concepts set by [Byrd et al. \(2007\)](#) and according to the five keys to safer food which are mentioned by [WHO \(2010\)](#).

A total of 120 consumers will be interviewed face to face in Bahri- locality. Questionnaire will be designed to obtain information's on food safety perception, and awareness of food- borne illnesses, contamination of food and hazards, food handling and safety practices at homes.

Exploratory data analysis will be done by using SPSS (statistical package for the social science) version 20 statistical software which included simple descriptive statistical analysis which displays the frequency distribution for all 4 tables that described in questionnaire.

Univariate analysis tables that used nonparametric chi-square test, describe the number of consumers, percentage, degree of freedoms and chi-square p-value (<0.10) which explain if there is significant difference between knowledge on food safety and demographic characteristic of consumers, healthier life style, and the degree of responsibility of different entities regarding food safety.

3. RESULTS

Food safety begins at the earliest planning stages. The correct fit-out will assist in providing food premises that are easy to be cleaned and maintained and facilitate the production of safe food.

The present study reveals the knowledge, attitude and practices of consumers in Bahri locality.

3.1. DEMOGRAPHIC CHARACTERISTICS

3.1.1. RESPONDENT'S GENDER, AGE AND EDUCATIONAL LEVELS

In this study, a majority (87.5 %) of consumers were found to be females while the rest (12.5%) were males (Table 1). 56.7% were found to be in age 20-40 and the highest percentage of 41.7% for university education.

Table 1 Show the Gender, Age and Educational Levels of the 120 Consumers Targeted by This Study

Characteristics	Numbers	Percent (%)
Age (years)		
< 20	7	5.8
20_40	68	56.7
>40	45	37.5
Gender		
Male	15	12.5
Female	105	87.5
Education Level		
Elementary	27	22.5
High school	43	35.8
University	50	41.7

3.1.2. PRACTICE TABLE

Table 2 Shows Food Handling and Storage Before Preparation

Statement	Response%			
	Always	Sometimes	Rarely	Never
I carefully check the purchase whether it is damage or not	98 (81.7)	8 (6.7)	5 (4.2)	9 (7.5)
While purchasing frozen foods, I check whether the product is really frozen or not	37 (30.8)	19 (15.8)	26(21.7)	38 (31.7)
Are you careful about keeping raw meat or fish away from ingredients that are eaten raw like salad?	103 (85.8)	6(5)	5(4.2)	6 (5)
Do you purchase food from an approved vender	13 (10.8)	27 (22.5)	26 (21.7)	54 (45)
Before any food is prepared, the safety of the food is assessed by the food looks and smells	100 (83.3)	6 (5)	3 (2.5)	11(9.2)
Store fresh produce in the refrigerator above raw meat or poultry	12 (10)	3(2.5)	4 (3.3)	101 (84.2)
Expiration date	52 (43.3)	59 (49.2)	4 (3.3)	5 (4.2)

Table 2 shows most consumers (81.75) were found to always carefully check the purchase whether it is damage or not, while 4.2% were rarely carefully to check the purchase whether it is damage or not. The highest percentage of consumers (31.7%) were never check whether the product is really frozen or not while 15.8% were sometimes check the purchase whether it is frozen or not.

85.8% of consumers were careful about keeping raw meat or fish away from ingredients that are eaten raw like salad, while 4.2% were rarely careful about keeping raw meat or fish away from ingredients that are eaten raw like salad.

45% of the consumers were never purchase food from an approved vender, while 10.8% always do it. Most of the consumers 83.3% were found to assess the safety of the food before preparation by the food looks and smells, while 2.5% rarely assessed the safety of the food before preparation by the food looks and smells.

84.2% were never store fresh product in the refrigerator above raw meat or poultry, while 2.5% were sometimes store fresh product in the refrigerator above raw meat or poultry. 49.2% were sometimes check the expiration date of the products, and 3.3% were rarely check the expiration date of the product.

Table 3 Shows Clean and Hygiene Practice of The Respondents

Statement	Response%			
	Always	Sometimes	Rarely	Never
Do you wash your hands before you handle food?	76 (63.3)	13 (10.8)	18 (15)	13 (10.8)
Do you use hand sanitizer?	8(6.7)	8(6.7)	13(10.8)	88(73.3)
Are your food areas are cleaned with hot water and soap?	25 (20.8)	25(20.8)	33 (27.5)	37(30.8)
Do you wash the utensils and clean the counter just after the preparation of the meal?	99(82.5)	13(10.3)	4(3.3)	4(3.3)
To check the spoilage of the food in refrigerator from 2-3 days ago, I taste them	40(33.3)	10(8.3)	13(10.8)	57(47.5)
Do you cover your hands with a bandage and glove when you prepare food with cuts on your hands?	60(50)	10(8.3)	14(11.7)	36(30)

Table 3 shows the highest percentage of the respondents 63.3% were found always wash their hands before they were handling food, same percentage of the consumers 10.8% were sometimes and never wash their hands before they were handling food. Most of the respondents 73.3% were never use hand sanitizer, 6.7% were sometimes and always use hand sanitizer.

30.8% of the consumers were never clean food areas with hot water and soap, 20.8% of them were always and sometimes clean food areas with hot water and soap. 82.5% of the consumers were always wash the utensils and clean the counter just after the preparation of the meal, while 3.3% of them were rarely and never wash the utensils and clean the counter just after the preparation of the meal.

47.5% of the consumers were never check the spoilage of the food in refrigerator from 2-3 days ago by taste the food, while 8.3% were sometimes do it. 50% of the consumers were always cover their hands with a bandage and gloves when they prepare food with cuts on their hands, 8.3% were sometimes cover their hands with a bandage and gloves when they prepare food with cuts on their hands.

3.1.3. ATTITUDES TABLE

Table 4 Shows General Behaviors of The Consumers Against Food Safety Issues in The Kitchen			
Statement	Agree	Disagree	No idea
Left over:			
Divided them into small portions put into refrigerator	73 (60.8)	47 (39.2)	0
Put them into larger container	50 (41.7)	70 (58.3)	0
You have no left problem	39 (32.5)	81 (67.5)	0
Thawing:			
In refrigerator conditions	32 (19.2)	97 (80.8)	0
Put the frozen food in a nylon bag and immerse in hot water	40 (33.3)	80 (66.7)	0
Put the frozen food just on the counter	91 (75.8)	29 (24.2)	0
Keeping cooked meat at room temperature for 4-5 hours	76 (63.3)	43 (35.8)	0
Raw and cooked foods should be stored separately to reduce the risk of food contamination	113 (94.2)	7 (5.8)	0
Cooked meat can be left at room temperature over night to cool before refrigerating	61(50.80)	59 (49.2)	0

Left over

60.8% of the consumers were agree to divide left over into small portions and put into refrigerator while 39.2% were disagree, 41.7% agree to put them into larger container while 58.3% were disagree and 32.5% have no left-over problem while 67.5% have left over problem.

Thawing

80.8% of the consumers were disagreeing of thawing in refrigerator conditions, while 19.2% agree of thawing in refrigerator conditions. 66.7% disagree to put the frozen food in nylon and immerse in hot water, while 33.3% agree to put the frozen food in nylon and immerse in hot water. 75.8% agree to put the frozen food just on the counter, while 24.2% disagree to put the frozen food just on the counter.

63.3% of the consumers agree to keep cooked meat at room temperature for 4-5 hours, and 35.8% disagree to keeping cooked meat at room temperature for 4-5 hours. 94.2% agree to store raw and cooked foods separately to reduce the risk of food contamination, while 5.8% disagree to store raw and cooked foods separately to reduce the risk of food contamination.

50.8% of the consumers agree to leave cooked meat at room temperature over night to cool before refrigerating, and 49.2% disagree to left cooked meat at room temperature over night to cool before refrigerating.

3.1.4. KNOWLEDGE TABLE

Table 5 Shows Knowledge About Food Safety			
Statements	Correct	Incorrect	Don't know
Refrigerating food only slows bacterial growth	58 (48.3)	13 (10.8)	45 (37.5)
Proper cooking includes meat cooked at 40°C	18 (15)	16 (13.3)	86 (71.7)
Cooked meat can be left at room temperature over night to cool before refrigerating	40 (33.3)	67 (55.8)	10 (8.3)
Meat thermometer are useful for ensuring food is cooked thoroughly	13 (10.8)	5 (4.2)	101 (84.2)
Well-cooked foods are free of contamination and don't cause risk to consumers	100 (83.3)	12 (10)	7 (5.8)
Freezing the food kills microorganisms in them	30 (25)	11 (9.2)	74 (61.7)
Raw meat is a great risk for the consumer	86 (71.7)	22 (18.3)	12 (10)
Using same equipment for both raw and cooked foods no cause food safety risks to consumers	25 (20.8)	70 (58.3)	24 (20)
Raw food should be kept separately from cooked food	108 (90)	8 (6.7)	4 (3.3)
Improper storage of food may be hazardous to health	104 (86.7)	6 (5)	10 (8.3)
We should Consume low fat foods	95 (79.2)	17 (14.2)	8 (6.7)
Limit my fresh vegetables and fruits consumption	40 (33.3)	53 (44.2)	27 (22.5)
Limit my poultry meat consumption	100 (83.3)	20 (16.7)	0
Limit my fish and fishery product	109 (90.8)	11 (9.2)	0
Limit my egg consumption	25 (20.8)	95 (79.2)	0
Limit my red meat consumption	5 (4.2)	115 (95.8)	0

The above [Table 5](#) shows there were 48.3% out of 120 person answer correct, 10.8% answer incorrect and 37.5% answer they don't know that refrigerating food only slows bacterial growth.

71.7% out of 120-person don't know proper cooking includes meat cooked at 40°C, while 15% answer correct proper cooking includes meat cooked at 40°C and 13.3% answer incorrect proper cooking includes meats cooked at 40°C.

Out of 120 person there is 55.8% answer incorrect cooked meat can be left at room temperature over night to cool before refrigerating, 33.3% answer correct cooked meat can be left at room temperature over night to cool before refrigerating and 8.3% don't know cooked meat can be left at room temperature over night to cool before refrigerating. 84.2% don't know meat thermometer are useful for ensuring food is cooked thoroughly, while 10.8% answer correct meat thermometer are useful for ensuring food is cooked thoroughly and 4.2% answer incorrect. Out of 120 person there is 83.3% answer correct well-cooked foods are free of contamination and don't cause risk to consumers, while 10% of them answer incorrect and 5.8% answer they don't know well-cooked foods are free of contamination and don't cause risk to consumers.

61.7% of the consumers answer they don't know freezing the food kills microorganisms in them, 25% answer correct freezing the food kills microorganisms in them and 9.2% answer incorrect. Out of 120 person 71.7% answer correct raw meat is a great risk for the consumers, 18.3% answer incorrect and 10% answer don't know raw meat is a great risk for the consumers.

58.3% of the consumers answer incorrect using same equipment for both raw and cooked food no cause food safety risks to consumers, and 20.8% answer correct, while 20% answer don't know using same equipment for both raw and cooked food no cause food safety risks to consumers.

90% out of 120 person answer correct raw food should be kept separately from cooked food, and 6.7% answer incorrect, while 3.3% answer don't know raw food should be kept separately from cooked food.

86.7% out of 120 person answer correct improper storage of food may be hazardous to health, and 8.3% answer don't know, and 5% answer incorrect improper storage of food may be hazardous to health.

Out of 120 person there is 79.2% answer correct we should consume low fat foods, 14.2% answer incorrect, while 6.7% answer don't know we should consume low fat foods.

44.2% of the consumers answer incorrect limit their fresh vegetables and fruits consumption, 33% answer correct and 22.5% answer don't know limit their vegetables and fruits consumption. 83.3% out of 120 person answer correct limit their poultry meat consumption, while 16.7% answer incorrect limit their poultry meat consumption.

90.8% of the consumers answer correct limit their fish and fishery products, while 9.2% answer incorrect limit their fish and fishery products.

79.25 out of 120 person answer incorrect limit their egg consumption and 20.8% answer correct. 95.8% of the consumers answer incorrect limit their red meat consumption while 4.2% of them answer correct limit their red meat consumption.

4. DISCUSSION

The aim of the present study was to examine knowledge, attitudes, and practices related to food safety among consumers, Bahri locality, Khartoum State, Sudan, August 2016. Socio-economic conditions of the respondents were also considered because of their vital importance for food hygiene practices.

During the research period, 120 respondents have been investigated randomly, to reveal the picture of the current situation.

Demographic characteristic revealed 56.7% of the respondents between 20-40 were 37,5% > 40 were, and 5,8 were < 20 in age. 87, 5% female and 12,5% male as shown in Table (4.1). As reflected by the study it was clear that, the educational level of the respondents was (22.5%) elementary, (35.8%) had high school, and 41,7 had university education. For better food hygiene a good educational level is required to enable the consumers to understand the concept of food hygiene.

The study revealed many critical features about the knowledge and practice of the respondents, almost 83.3% of the consumers have well knowledge and practice to assess the safety of the food before any food is prepared, by the food looks and smells. In agreement with the finding of [Antoria \(2002\)](#) that significant proportion of epidemiological diseases occurs due to unhygienic handling and poor food sanitation in restaurants, kitchens and other eating outlets, in the present study most of the respondents 73.3% were never use hand sanitizer.

In this study 63.3% of the respondents were always washing hands before starting food preparation and 50% were always wearing gloves during food preparation and they sure these procedures reduce the risk of food contamination, these finding resemble the results of [Ko \(2011\)](#) and [Rosnani et al. \(2014\)](#). [Ko \(2011\)](#) found out that the broad majority of the restaurant's employees of Fu-Jen University

in China believe that hands washing before touching food and wearing gloves for processing uncooked foods can reduce the risk of contamination. While [Rosnani et al. \(2014\)](#) pointed out to that touching food with bare hands is an awful practice with an average score of 78.9 ± 25.611 as thought by restaurant workers in Putrajaya, Malaysia.

The most important hygienic measure is cleaning of the working area. In this study 82.5% of the respondents were always wash the utensils and clean the counter just after the preparation of the meal and they sure that proper cleaning and handing of food preparation instruments decrease the hazard of food contamination. This was different from the observation of [Ko \(2011\)](#) who observed that only equal or less than four-point scales in respond to the following questions: when I washed the dishes, I would use the three-sink method, and if there were cracks on the dishes, I would still use them, and I did not need to clean the drainage every day.

In the present study 30%, 11.7%, 8.3% of the respondents were never, rarely and sometimes respectively, cover their hands with a bandage or gloves when preparing food with cuts on their hands .The finding of the present study did not confirm the finding of the previous epidemiological studies that shown E-coli, Salmonella species and Staphylococcus aureus can servive on the hand for a certain period of time in case the hands were not washed or even sometimes when washed, because of that wearing gloves during food preparation is accepts to noticeably decrease the food contamination [Pether and Gilbert \(1971\)](#), [WHO \(1989\)](#). In food handlers-associated food borne outbreaks, the most greatly reported way of transition involved poor hand hygiene or bare hand contact with food [Todd et al. \(2007\)](#). Azanza and Zamora –Luna (2005) found that the knowledge and applying of the basic principles of the hygiene like washing hands during preparation of food and serving, it has led to noticeably decreasing in the level of microbial contamination in Philippines. [Van Kampen et al. \(1998\)](#) found out that shortage of hand washers and the low level of the people’s knowledge led to the preparation of unhealthy and hazard food in Jakarta.

In agreement with the finding [WHO \(2005\)](#), kinds of food that are mostly included in outbreaks of food borne diseases involve meat and meat product, milk and milk product, vegetables salads and puddings. In this study 85.8% of the respondents were found careful about keeping raw meat or fish away from ingredients that are eaten raw like salad, this result indicates most of the respondents have awareness about transmission of microorganisms from raw food like salad to cooked foods like meat or fish.

[Rosnani et al. \(2014\)](#) found out that 80.3% were not backing the proposing of storing raw and cooked food separately. Other common food-safety measures mentioned by [Rosnani et al. \(2014\)](#) included workers should not rub face or hands and hair and should not smoke during working and separate kitchen instruments that were used to serve and prepare cooked and raw foods .This finding of this study did confirm the findings of [Ko \(2011\)](#) who found that between the questions that had the highest outcome was, I think raw food and cooked food must be handled separately .The finding of the present study confirm the findings of the two previous studies [Rosnani et al. \(2014\)](#) and [Ko \(2011\)](#), 94.2% of the respondent agreed that raw and cooked foods should be stored separately to reduce the risk of food contamination .

Incorrect thawing of frozen red meat, poultry and fish could lead to some food poisoning cases between the consumers [Roberts \(1982\)](#), [WHO \(1989\)](#) and [Abdalla et al. \(2008\)](#). This finding did confirm with the present study which found that,

33.3% of the respondents were agreed, put the frozen food in a nylon bag and immerse in hot water.

Salmonella is one of the major foodborne causes of gastroenteritis and often connected with contaminated poultry meat Bryan et al. (1995). Campylobacter also is one of the most common bacterial causes of acute gastroenteritis in humans in advanced countries Allos (2001). The finding of these studies did confirm the findings of the present study which found that 71.7% of the respondents agreed that raw meat is a great risk for the consumers.

Epidemiological studies often show the wrong handling of raw poultry products or consumption of under cooked poultry products as the most likely source of exposure to Campylobacter Kapperud et al. (2003), Kapperud et al. (1993) Luber et al. (2006). National-scale genotyping of Campylobacter species in Scotland was used to quantify the relative importance of various possible sources of human infection, most clinical isolates were due to chicken meat, identifying it as the main source of Campylobacter infection in humans Sheppard et al. (2009). The finding of these studies was confirming the finding of the present study, 83.3% of the respondents answer correct well-cooked foods are free of contamination and don't cause risk to consumers.

5. CONCLUSION

The study provided valuable information about evaluation of food hygiene knowledge, attitudes, and practices (KAP) of consumers in homes at Bahri locality. Major food safety knowledge concepts including clean and hygiene, prevention of cross contamination, general sanitation, and safe storage of food and correct thawing. The responses of interviewed consumers varied considerably, in general, the respondents had good knowledge about some food safety –related issues and not enough knowledge about other issues. The results of the questionnaire showed that the majority of the respondents know the importance of washing hands before handling food and cleaning the counter just after the preparation of the meal. The results of the questionnaire revealed that half (50%) of the respondents know the importance of covering hands with a bandage and gloves when preparing food with cuts on their hands.

6. RECOMMENDATIONS

Implementing more training programs to the consumers to improve knowledge, attitudes and practices towards food safety, Consumers should know and apply the five keys to safer food. This study shows that there is a need for additional researches in the area of consumers and the possible risks they may pose regarding food safety.

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