Research Article

iMedPub Journals
http://www.imedpub.com

Journal of Food Science and Toxicology

2022
Vol.6 No.4

Investigating the Awareness and Performance of a Petrochemical Company Employees Relating Food Safety and Health in Iran

Seyedeh Sedigheh Hashemi* and Mohammad Reza Mozafarian

Department of Food Science and Engineering, Bushehr Institute of Kherad Higher Education, Bushehr, Iran

Corresponding author: Seyedeh Sedigheh Hashemi, Department of Food Science and Engineering, Bushehr Institute of Kherad Higher Education, Bushehr, Iran, Tel: 09353359789

mrs.sedighehashemi@gmail.com

Citation: Hashemi SS, Mozafarian MR (2022) Investigating the Awareness and Performance of a Petrochemical Company Employees Relating Food Safety and Health in Iran. J Food Sci Toxicol Vol:6 No:4

Abstract

Foodborne illness or food poisoning is one of the growing problems in public health, causing severe and even fatal complications in developed and developing countries. Therefore, this study was conducted to investigate the level of awareness, attitude and performance of petrochemical company employees regarding foodborne diseases. In this descriptive-cross-sectional study, 120 employees of a petrochemical company were examined by referring to them. The questionnaire data collection tools included demographic variables, assessment questions, awareness, attitudes, and performance. Data analysis was performed using SPSS software version 21. According to the results of the study, the average age of the studied people is 109.25 32 10.32 years. Overall, employees had average to good grades of awareness, attitude, and performance. Based on the findings of this study and the lack of knowledge about some diseases, important factors such as *Salmonella* and *Escherichia coli* and other microbes transmitted through food, the need for training in relation to food risk factors to employees It is clear that the best way to reduce food poisoning is to teach people the right and efficient way.

Keywords: Awareness; Performance; Food poisoning; Food hygiene; Petrochemical industry

Received date: April 06, 2022, Manuscript No. IPFST-22-13028; **Editor assigned date:** April 11, 2022, PreQC No. IPFST-22-13028 (PQ); **Reviewed date:** April 26, 2022, QC No. IPFST-22-13028; **Revised date:** June 06, 2022, Manuscript No. IPFST-22-13028 (R); **Published date:** June 14, 2022, DOI: 10.36648/IPFST.6.4.001

Introduction

Food hygiene and safety is an important principle to prevent human infection and to protect the environment from contamination [1]. In developing and developed countries, annual irreparable damage such as death is caused by foodborne illness and food poisoning caused by chemical and microbial agents in food [2-5]. Be the World Health Organization views foodborne illness as one of the most important health problems in the contemporary world [6]. The number of published reports on the prevalence of foodborne illness has increased, often due to pre-preparation, preparation, and poor distribution of food meals by food-related staff [7]. Many people are poisoned due to a lack of health awareness as well as food storage under unsanitary conditions, so that the spread of foodborne illnesses in both developed and developing countries are increasing [8]. According to the Centers for Disease Control and Prevention (CDC) in the United States, 75 million people suffer from foodborne illness each year, and more than 3,255,000 of them are hospitalized. 5,000 people die [9,10]. Also, the available statistics on the types of poisoning caused by eating contaminated and rotten food and the long-term effects of improper consumption of food such as diabetes, obesity, high cholesterol and osteoporosis indicate the high importance of food hygiene [11]. Due to this, the factors that are usually involved in the spread of foodborne illnesses include poor food storage (temperature/time), contamination of used tools, lack of personal hygiene, and food preparation from raw materials. It is unhealthy and the cooking time is insufficient [12]. Therefore, it is important to check people's awareness and attitude towards food hygiene and safety. In this regard, various studies have been conducted on people's awareness and attitude and performance in the field of food hygiene from production to consumption, the results of which indicate the important and effective role of education on awareness and attitude and as a result people's performance. Most of the studies conducted in Iran and other countries showed that most of the participants in these studies have a good knowledge of personal and public health, while the level of awareness of these people in the field of food pathogens and methods. Safe food storage is insufficient [13-24]. Also, according to research conducted by Al-Shabib, et al. in Saudi Arabia, and relativism, et al. In Canada, unlike other studies, more information is available to participants in research on proper food

storage temperature, health. Personal and foodborne illness were sufficiently reported [25,26]. Food contamination due to limited knowledge of food safety control methods causes foodborne illness [27]. Therefore, measuring the level of awareness and the attitudes of people related to food in the communities in question are very important in determining educational priorities in the field of food hygiene and safety [28]. Due to the importance of food safety and safety, as well as the effective role of increasing people's awareness in preventing foodborne illnesses, and considering that the awareness and attitude of a petrochemical company employees in this field has not been studied so far, the present study The purpose of reviewing the awareness, attitude and performance of employees working in a petrochemical company as the largest petrochemical company in the south pars economic energy zone located in Assaluyeh city has been done in relation to food hygiene and safety.

Materials and Methods

This descriptive cross-sectional study was performed on the staff of a petrochemical company in Assaluyeh. The study population was 120 using Cochran's formula. The researcher completed the pre-designed questionnaire by interviewing individuals. The questionnaire was divided into four sections. The first part included 14 questions about demographic variables and teaching experience and about food hygiene, as well as the history of food poisoning and the amount of food consumed outside, the second part included 15 awareness questions with a score range of 15-0. The third section included 15 attitude questions with a score range of 45-15 and the fourth section included 20 performance questions with a score range of 0-20. After collecting the data to quantify the results, the scope of knowledge in the three weak groups (grades 4-7), average (score 11-8) and good score (15-15) and in the field of attitude in the three weak groups (score 32-16), average (score 39-33) and good performance (score 40-45) and in terms of performance in three weak groups (score 10-12), average (score 16-13) and good performance (score 20-17) was considered. Regarding the questions of the level of awareness, each correct answer was given a score of one and each incorrect answer and I don't know was given a score of zero. The correct answer to each question was considered as having awareness and the wrong answer as lack of awareness. For attitude questions, scoring in each phrase was performed using a three-level Likert scale and a grading scale of 1 to 3, which is shown to agree with, agree, and disagree with. The correct answer to the attitude questions was considered as a positive attitude and the wrong answer was considered as a negative attitude. For performance questions, each correct answer was given a score of one and each incorrect answer was given a score of zero. The correct answer to the performance questions was considered as having a health function and the wrong answer was considered as not having a health function. After completing the questionnaires, the collected data were analyzed using SPSS software version 21 and ANOVA statistical tests, T-Test, correlation coefficient and $\chi 2$ at the level of 0.05. The questionnaire was evaluated and finally approved by a group of experts related to the subject, including a specialist in health and food safety, food industry, nutrition and health education, and health promotion. Alpha Cronbach's coefficient for the questionnaire was 3.81, which indicated its validity and reliability.

Results

In this study, 72.8% of the respondents were men and 29.2% of the respondents were women. The mean age of the study population was 109.25 32 10.32 years. Twenty-five people (20.8%) in the study population had a bachelor's degree or less, and 42 (35%) attended health and food safety courses, and 85 (70.8%). Also, a history of food poisoning in which only 42 people (35%) had a history of seeing a doctor for treatment of food poisoning (Table 1).

Table 1: Demographic characteristics of the study population.

Variable	According to the variable	Number	Percent
Gender	Men	85	70.8
	Female	35	29.2
Age category	>30	25	20.8
	31-40	38	31.7
	41-50	42	35
	>50	15	12.5
Education	Diploma and less	25	20.8
	Associate Degree	31	25.8
	Bachelor	48	40
	Masters degree and higher	16	13.3
Participate in food safety and health training courses	Yes	42	35
	No	78	65
History of food poisoning	Yes	85	70.8
	No	35	29.2
A history of seeing a doctor to treat food poisoning	Yes	42	35
	No	78	65

A study of the level of awareness and performance of individuals in the field of food safety and security showed that the average awareness score among participants was 1.101, 32 and 1.32 out of a maximum score of 10. While the average performance scores of individuals was 26.25, 25 and 2.25 out of the maximum score of more than 40% of people answered 3 questions incorrectly or did not comment. These 3 questions are related to people's awareness of the resistance of toxins produced by microbes that cause food poisoning to cooking heat, awareness about the increased risk of poisoning by eating raw eggs, as well as people's awareness of the risk of food poisoning. It was associated with cooked foods that were refrigerated for 3 to 2 days (Table 2).

Table 2: Frequency distribution answers to awareness questions.

Row	Question	Correct		Wrong		No Idea	
		Number	Percent	Number	Percent	Number	Percent
1	Food poisoning is caused by pathogenic microbes.	78	65	36	30	6	5
2	Some toxins produced by food poisoning microbes are resistant to the heat of cooking.	69	57.5	43	35.8	8	6.67
3	Drinking raw milk greatly increases the risk of food poisoning.	68	56.7	42	35	10	8.33
4	Eating raw eggs greatly increases the risk of food poisoning.	75	62.5	39	32.5	6	5
5	Eating raw or undercooked meat greatly increases the risk of food poisoning.	69	57.5	46	38.3	5	4.17
6	Eating raw and sitting vegetables greatly increases the risk of food poisoning.	75	62.5	43	35.8	2	1.67
7	Eating unpeeled and unpeeled fruits greatly increases the risk of food poisoning.	66	55	52	43.3	2	1.67
8	People who deal with food can become infected with food germs and food poisoning if they perform unhealthy habits and habits.	78	65	41	34.2	1	0.83
9	Well-cooked foods do not contain any microbes that can cause food poisoning.	89	74.2	25	20.8	6	5
10	Eating leftover cooked food that is free of wraps and covers and kept at room temperature for 24 to 12 hours greatly increases the risk of food poisoning.	55	45.8	55	45.8	10	8.33
11	White cheese made from raw milk (unheated) greatly increases the risk of food poisoning.	68	56.7	43	35.8	9	7.5
12	Consumption of pasteurized milk does not pose any risk of food poisoning.	45	37.5	74	61.7	1	0.83
13	Keeping food at room temperature reduces the growth and multiplication of microbes and thus prevents food spoilage and food poisoning.	95	79.2	25	20.8	0	0
14	Drinking surface water such as river water, river water, and rain water that has not been subjected to any processes such as boiling or chlorination greatly increases the risk of food poisoning.	75	62.5	43	35.8	2	1.67
15	Cooked foods stored in the refrigerator for 2-3 days are completely consumable and do not pose any risk of food poisoning.	84	70	33	27.5	3	2.5

The answers to the questions about food poisoning are given in Table 3. The results showed that over 60% of the statistical population had a positive attitude in 6 out of 15 questions. Attitude was 15 (82.5%) in the questionnaire and 14 (70.8%) in the questionnaire.

Table 3: Frequency distribution answers to attitude questions.

Row	Question	Correct		Wrong		No Idea	
		Number	Percent	Number	Percent	Number	Percent
1	Raw milk (unheated) is healthier and more nutritious than pasteurized milk or boiled milk.	25	20.8	89	74.2	6	5

2	If cow's or sheep's milk is eaten immediately after milking, there is no risk of disease.	12	10	104	86.7	4	3.33
3	If camel's milk is eaten immediately after milking, there is no risk of disease.	41	34.2	74	61.7	5	4.17
4	Raw eggs are healthier and more nutritious than cooked eggs.	35	29.2	83	69.2	2	1.67
5	There is no risk of developing a disease associated with eating raw eggs.	12	10	107	89.2	1	0.83
6	There is no risk of young animals eating raw meat.	41	34.2	78	65	1	0.83
7	Cleaning fruits and vegetables makes them safe and safe to eat.	68	56.7	42	35	10	8.33
8	Eating cooked food that has been stored in a wrapper or cover at room temperature for a day does not pose a risk of illness.	75	62.5	39	32.5	6	5
9	Eating sit-down plants and vegetables that have been harvested directly from the farm does not pose a risk of disease.	77	64.2	38	31.7	5	4.17
10	Children's stools that are not sick are free of pathogenic microbes.	59	49.2	57	47.5	4	3.33
11	Rainwater collected in tanks that have not been subjected to any process (such as chlorination and heating) can be drunk without any risk.	45	37.5	72	60	3	2.5
12	Individuals who are involved in cooking or preparing food and have no clinical symptoms of the disease may cause food contamination and food poisoning.	56	46.7	59	49.2	5	4.17
13	To prevent food poisoning, it is necessary to wash your hands with soap and water before eating.	78	65	38	31.7	4	3.33
14	In order to prevent food poisoning, it is necessary to wash fruits and vegetables thoroughly with tap water.	85	70.8	33	27.5	2	1.67
15	To prevent food poisoning, it is necessary to wash your hands with soap and water before preparing food.	99	82.5	19	15.8	2	1.67

The answers to the food poisoning performance questions are given in Table 4. The results showed that more than 90% of the study population had a good performance in 14 of the 20 related questions (they had chosen the correct answer). For example, question 1 (79.2%), question 2 (74.2%) and question 6 (62.5%), yes answer and also (95.8%) of people in answer to question 12 do not answer had chosen. However (29.2%) of the study population had an unhealthy performance in answer to question 11 ("Do you eat eggs in a semi-cooked (honey) way?").

Table 4: Frequency distribution Answers to performance questions.

Row	Question	Correct		Wrong		No Idea	
		Number	Percent	Number	Percent	Number	Percent
1	Do you wash fresh fruits and vegetables with tap water before eating?	95	79.2	25	20.8	95	79.2
2	Do you wash your hands with soap and water before eating?	89	74.2	31	25.8	89	74.2
3	Do you wash your hands with soap and water before preparing food?	69	57.5	51	42.5	69	57.5

4	Do you wash your hands with soap and water after cleaning or touching raw vegetables?	78	65	42	35	78	65
5	Do you wash your hands with soap and water after each defecation?	95	79.2	25	20.8	95	79.2
6	Do you wash your hands after contact with animals?	75	62.5	45	37.5	75	62.5
7	Do you eat fresh fruits and vegetables while sitting?	54	45	66	55	54	45
8	Do you just clean them before eating fresh fruits and vegetables?	45	37.5	75	62.5	45	37.5
9	When you go on a trip, do you eat vegetables and herbs after picking them from the ground without washing?	65	54.2	55	45.8	65	54.2
10	Do you eat raw eggs?	12	10	108	90	12	10
11	Do you eat eggs half cooked (honey)?	35	29.2	85	70.8	35	29.2
12	Do you eat raw meat?	5	4.17	115	95.8	5	4.17
13	Do you eat half-cooked meat?	45	37.5	75	62.5	45	37.5
14	Do you consume cow's or goat's milk raw (unheated)?	31	25.8	89	74.2	31	25.8
15	Do you consume camel's milk raw (unheated)?	10	8.33	110	91.7	10	8.33
16	Do you consume raw white cheese made from unpasteurized raw milk?	15	12.5	105	87.5	15	12.5
17	Do you eat cooked food that has been at room temperature for 6 hours without reheating?	75	62.5	45	37.5	75	62.5
18	Do you serve food in a restaurant or cafeteria that does not look clean?	45	37.5	75	62.5	45	37.5
19	Do you use rainwater or river water that has been collected and stored in tanks without any treatment or process (such as chlorination or heating)?	35	29.2	85	70.8	35	29.2
20	Do you eat food (such as meat, rice, and soup) that has been prepared in a large container for several people?	34	28.3	86	71.7	34	28.3

Discussion

The results of the present study showed that the study population was less aware of some factors. For example, 45% of the study population did not have enough knowledge about consuming food stored in the refrigerator after 2 to 3 days and in their opinion these foods could not be used, or 74.2% of them had a misconception that the heat destroyed all the toxins produced by microbes. While some of these toxins are heat resistant. Although this is a specialized issue, it shows the importance of the fact that some bacteria are able to survive even at cooking temperatures because they produce heat-resistant toxins that remain in the heating process. Endangers people's health [29]. The results of this study also showed that the study population was not aware of the consumption of raw eggs, so that 25.2% of the women studied were not aware of the poisoning by raw eggs. Research by Bradburn, et al. shows that 50-40% of people in the United eat eggs raw. The use of raw eggs increases the risk of *Salmonella* infection [30]. In addition, egg whites, especially raw, are one of the ingredients that can cause allergies and may cause skin or eye problems. This is more common in children, so it is recommended that children not be given egg whites until they are one year old. A study by Osayley, et al. found that 43.9% of students were unaware of how *Salmonella* was destroyed as a pathogen in foodborne infections [31]. Other research shows that more than 50% of students are unaware of diseases caused by eggs or raw milk products. Also, 50% of them were unaware of the resistance of some bacterial toxins to heat, which is almost consistent with the results of the present study. A study conducted by Nesbit, et al. in Canada found that 80% of participants were aware of foodborne illness, especially raw eggs, and only over 60 they were unaware of the dangers of consuming raw eggs, which is inconsistent with the present study. In this study, it was found that although 74.2% of the

study population was aware of the poisoning by raw milk, 20.8% of the study population was still not aware of this. Also, 34.2% of these people mistakenly had a positive attitude towards consuming camel's milk immediately after breastfeeding or did not have an opinion that was consistent with the study conducted by Sharif and Al-Maliki. The study also found that more than 50% of students had a negative attitude toward the dangers of camel's milk consumption immediately after breast feeding. Basically, the health problem with milk is related to tuberculosis and brucellosis, which are caused by *Mycobacterium tuberculosis* and *Mycobacterium* bovis, respectively. *Corinne bacterium bovis* is also isolated from raw milk, which is a diphtheria-causing bacterium. The presence of intestinal diseases such as *Salmonella* and *Campylobacter* in raw milk is common, and the most effective way to control them is pasteurization [32]. The attitude of the study population towards food poisoning was determined by obtaining an overall score of 37.5 54 2.54 out of a maximum score of 45. Although 55.4% of employees had a good score, 45.6% of people had a moderate and poor attitude in this regard. In the present study, 56.7% of the study staff mistakenly believed that eating fruit and vegetables alone would make it safe to consume, or 62% of women would have the wrong attitude towards food storage at room temperature. It was thought that consuming food containing the envelope or cover properly kept at room temperature would prevent poisoning, which is due to low awareness. These people did not know enough about the growth of pathogenic bacteria at room temperature and thought that simply covering the lid would prevent contamination or growth of the bacterium, which is similar to the information obtained from previous studies, so that 34 A% of students at the University of Taif in Saudi Arabia also believed that storing food for a day at room temperature and in closed containers did not pose any risk of disease. In this study, although 52.5% of the subjects studied had a good intelligence score and 55.4% had a good attitude score, a higher percentage of these individuals (88.7%) performed well. Average score of 51.11 45 45.11 among the employees studied indicates good performance of these individuals. Research also shows that 60% of people with higher education than a diploma are familiar with food poisoning. A study conducted by Pichler, et al. in Austria found that 76% of people had a good knowledge of food safety and health, which was significantly higher in people who took training courses than in people who did not. They did not take any training courses at work and these results are somewhat consistent with the present study. In the present study, 65% of people believe that it is necessary to wash their hands with soap and water before eating to prevent food poisoning, and in practice, more than 74.2% of people before eating. They washed their hands thoroughly with soap and water and 57.5% of the people cleaned their hands with soap and water before preparing food. It is compatible in different countries such as the United States, Ghana, Brazil, China, Malaysia, Taiwan and the three European countries of Greece, Serbia and Portugal, and shows the high level of awareness of the people studied. In general, the results, statistics and figures show that a high percentage of the study population gained high scores in the performance sector, followed by attitudes and then awareness. This suggests that the study community has a good performance in maintaining the health of themselves, their family members, as well as the prevention of foodborne illness.

Conclusion

It seems that due to the good performance of the study group, more training is needed to achieve adequate awareness of food safety and control or reduce foodborne illness. These trainings should include information on appropriate food preparation methods, prevention of cross-contamination, proper cleaning methods, as well as cleaning and disinfection of fruits, vegetables and vegetables, control and reduction of disease factors as much as possible. Beza and other factors related to foodborne illness. Therefore, with the efforts of relevant organizations and bodies, it is necessary to include educational programs in the form of educational classes in health centers or the inclusion of courses in schools and universities, or in the form of educational programs in the media. Consider a group called Health and Food Safety. The data from these results can be used to prioritize further research.

References

1 Notermans S, Gallhof G, Zweitering M, Mead G (1995) Identification of critical control points in the HACCP system with a quantitative effect on the safety of food products. Food Microbiol 12:93-98

2 Smith VK, Mansfield C, Strong A (2014) How should the health benefits of food safety programs be measured. Adv Health Econ Health Serv Res 24:161-202

3 Abbot JM, Byrd-Bredenne C, Schaffn D, Bruhn CM, Blalock L (2009) Comparison of food safety cognitions and self-reported food-handling behaviors with observed food safety behaviors of young adults. Eur J Clin Nutr 63:572-579

4 Morris JG (2011) How Safe Is Our Food? Emerg Infect Dis 17:126-128

5 Ahmed MK, Khadiga AI, Farah AA, Hasnaa AA (2018) Assessment of the Knowledge, Attitude and Practice about Food Safety among Saudi Population in Taif. Biomed J Sci and Tech Res 8:6413-6419

6 Rouhollah S, Majid H, Reza J, Hashem H, Atefeh S, et al. (2018) A survey on the knowledge and attitudes of Dehloran health network personnel about food safety and health. J Adv Environ Health Res 6:27-33

7 Medeiros CO, Cavalli SB, Salay E, Proença RPC (2011) Assessment of the methodological strategies adopted by food safety training programmes for food service workers: A systematic review. Food Control 22:1136–1144

8 Labib S, Talal A (2010) Knowledge and attitudes towards food safety among Canadian dairyproducers. Prev Vet Med 9:65-76

9 Garden-Robinson J, Eighmy M, Lyonga A (2010) Use of electronic group method in assessing food safety training needs and delivery methods among international college students in the US. Appetite 55:746-749

10 Jahed G, Golestanifar H, Ghodsi R, Mohammadi M (2012) The knowledge and attitude of students in relation with health and food safety. J Res Health 2:72-79

11 Jay JM, Loessner MJ, Golden DA (2008) Modern Food Microbiology. (7th edition), Springer Science and Business Media, New York.

12 Pichler J, Ziegler J, Aldrian U, Allerberger F (2014) Evaluating levels of knowledge on food safety among food handlers from restaurants

and various catering businesses in Vienna, Austria 2011/2012. Food Control 35:33–40

13 Osaili TM, Al-Nabulsi AA, Allah Krasneh HD (2018) Food safety knowledge among foodservice staff at the universities in Jordan. Food Control 89:167–176

14 Rebouças LT, Santiago LB, Martins LS, Rios Menezes AC, Araujo MdaPN, et al. (2017) Food safety knowledge and practices of food handlers, head chefs and managers in hotels' restaurants of Salvador, Brazil. Food Control 73:372–381

15 Webb M, Morancie A (2015) Food safety knowledge of foodservice workers at a university campus by education level, experience, and food safety training. Food Control 50:259–264

16 Parry-Hanson Kunadu A, Ofosu DB, Aboagye E, Tano-Debrah K (2016) Food safety knowledge, attitudes and self-reported practices of food handlers in institutional foodservice in Accra, Ghana. Food Control 69:324–330

17 Rossi MdeSC, Stedefeldt E, da Cunha DT, de Rosso VV (2017) Food safety knowledge, optimistic bias and risk perception among food handlers in institutional food services. Food Control 73:681–688

18 Liu S, liu Z, Zhang H, Lu L, Liang J, et al. (2015) Knowledge, attitude and practices of food safety amongst food handlers in the coastal resort of Guangdong, China. Food Control 47:457–461

19 Abdullah Sani N, Siow ON (2014) Knowledge, attitudes and practices of food handlers on food safety in food service operations at the Universiti Kebangsaan Malaysia. Food Control 37:210–217

20 Smigic N, Djekic I, Martins ML, Rocha A, Sidiropoulou N, et al. (2016) The level of food safety knowledge in food establishments in three European countries. Food Control 63:187–194

21 Ko WH (2013) The relationship among food safety knowledge, attitudes and self-reported HACCP practices in restaurant employees. Food Control 29:192–197

22 Meysenburg R, Albrecht J, Litchfield R, Ritter-Gooder P (2014) Food safetyknowledge, practices and beliefs of primary food preparers in families with young children. A mixed methods study. Appetite 73:121-131

23 Karimi M, Mazlomi M (2003) Knowledge and practice of health education on hygiene and food preparation and distribution center operators in Yazd city. J Toloo e Behdasht 1:16-21

24 Al-Shabib NA, Mosilhey SH, Husain FM (2016) Cross-sectional study on food safety knowledge, attitude and practices of male food handlers employed in restaurants of King Saud University, Saudi Arabia. Food Control 59:212–217

25 Murray R, Glass-Kaastra S, Gardhouse C, Marshall B, Ciampa N, et al. (2017) Canadian Consumer Food Safety Practices and Knowledge: Foodbook Study. J Food Prot 80:1711–1718

26 Moreb NA, Priyadarshini A, Jaiswal AK (2017) Knowledge of food safety and food handling practices amongst food handlers in the Republic of Ireland. Food Control 80:341–349

27 Zanin LM, da Cunha DT, de Rosso VV, Capriles VD, Stedefeldt E (2017) Knowledge, attitudes and practices of food handlers in food safety: An integrative review. Int Food Res J 100:53–62

28 Sharif L, Al-Malki T (2010) Knowledge, attitude and practice of Taif University students on food poisoning. Food Control 21:55-60

29 Byrd-Bredbenner C, Berning J, Martin-Biggers J, Quick V (2013) Food Safety in Home Kitchens: A Synthesis of the Literature. Int J Environ Res Public Health 10:4060-4085

30 DE Onis M (2006) WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weightfor- height and body mass index-for-age: Methods and development. World Health Organization, Geneva, Switzerland.

31 Osaili TM, Obeidat BA, Abu Jamous DO, Bawadi HA (2011) Food safety knowledge and practices among college female students in north of Jordan. Food Control 22:269-276

32 WHO (2007) Food safety asnd foodborne illness. Department of Food and Agriculture.