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Consumer Awareness on Food Poisoning

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Abstract: This study aims to determine the level of knowledge of consumers on types of food poisoning and whether or not they have had food poisoning in the past. The research sample consisted of 232 people. The research data were collected using a questionnaire, face-to-face interviews and observation. The data were analyzed using SPSS 13.0 for Windows. Chi-square test was applied in order to determine whether a statistical difference between the participants existed or not, by taking their education levels as the variable and the results were tabulated using $p = 0.005$ and $p = 0.01$ significance values as principle. It was determined that 46.6% of the participants had experienced a problem because of food and 29.5% of these were nausea problems, 28.7% of them got poisoned because of the food consumed in their cafeteria at work and 29.6% was because of chicken, 85.2% of the consumers were poisoned in the summer, 33.3% were poisoned in 2007, 81.5% had not gone to a health center, of those who had gone to a health center 75.0% were identified as poisoned. As the education level of the consumers increase, they start to have some knowledge on HACCP but this knowledge is incomplete ($p < 0.01$).

Key words: Food poisoning, HACCP, education level

INTRODUCTION

Food poisoning is the result of consuming contaminated food and drinks. Not following hygienic rules in the process from the preparation to consumption of food, or the inappropriate storing of food, can be harmful for health. Chemical materials, natural food poisons, parasites and microorganisms can cause food illnesses and poisonings. (Merdol *et al.*, 2000; Ozkan, 2007). Seventy two hours after consuming a common meal, if two or more people show similar symptoms, food poisoning can be inferred. The illness can be seen among people who are in the same place and have consumed the same food; as well as among people who consume the same contaminated food in different places (Ugur, 2008).

Food poisonings can result from:

- Insufficient cooking or heating of the food
- Obtaining food from unreliable sources
- Cooling and storing the food in inappropriate places (Badrie *et al.*, 2006).

Food poisonings affect masses, especially in places like schools, hospitals and offices where food is produced and consumed in large quantities. The rotting of food can be prevented by using appropriate storing, preparing, cooking, cleaning and servicing rules depending on the type of food (Merdol *et al.*, 2000; Denise, 2006). Also the cooking personnel have the responsibility for preventing food poisonings and protecting human health. As well as having health personnel, it is also important to obey the cleaning rules

as far as hand, body and dress cleanings are concerned (Cigerim and Beyhan, 1994).

Food poisoning symptoms vary depending on the factors. However, there are some common symptoms like nausea, vomiting and stomach ache. The degrees of the symptoms and the result of the illness change depending on the infectious agent taken or toxin type and amount (Hemminger, 2000; Gulay, 2007). Bacterial reasons make up of 60-90% of all the food poisonings. Showing big differences from country to country, region to region; an increase in food poisonings in summer time has been mentioned (Pahse, 2007).

When considering in the whole world, the number of deaths due to diarrhea is the second highest after cardiovascular illnesses. It is mentioned that determining deaths caused by food is hard to identify, but still it is known that 2.1 million people have died just because of this reason in 2000 and the food based infection rates in the developed countries are about 30% annually. In the United States of America, every year, about 76 million food based illnesses are being reported; 325,000 patients stay in the hospital and 5,000 of them are lost due to several reasons (RSHM, 2008). In England, every year, 9.4 million food based intestine and gastro intestine illnesses are being seen (Debbie, 2004). Reliable data on developing or under developed countries is not available, but it is estimated that the situation is even worse in these countries. It is mentioned that the number is about nine thousand in Turkey every year (Ugur, 2008).

Food poisonings affect the public health and the economy in a negative way. Due to the negative effects

in human health, there are work hour losses related to inefficient working or not being able to work. The health costs can cause bigger economical losses and may result in deaths (Cerit *et al.*, 2001). In this planned study, determining the situations where the consumers have food poisonings due to basic reasons and their level of knowledge about this subject is targeted.

MATERIALS AND METHODS

Research design: This study was carried out between March and May 2007 in Ankara, Turkey, in order to determine the level of knowledge of the consumers about food poisonings and whether or not they have had food poisoning in the past.

The sampling group of the research consists of 232 volunteers who work in 8 central districts of Ankara and work in a job branch.

The data was collected by face to face interviews. The survey was piloted with 25 people and some minor word changes in some questions were made.

Instrumentation: In order to determine food oriented complaints, the symptoms, reasons and the source of the food oriented complaint, a 21-statement multiple-choice scale has been used. In the scale 2 statements are about "food oriented complaint", 5 statements are about "experienced complaint", 5 statements are about "the place of food consumption" and 9 statements are about "the source of the food based complaint".

To determine which factors consumers pay attention to when choosing their eating places outside home and after experiencing a food oriented health problem, 11 statements were used.

Statistical analysis: The obtained data were examined using the SPSS 13.0 software. Tables showing the numbers and percentages regarding the questions were made. Since multiple selections were allowed in some questions, the total was not 232 all the time. Chi-square (X^2) test was applied in order to determine whether there exists a statistical difference between the participants or not, by taking their education levels as the independent variable and the results were tabulated by using $p = 0.005$ and $p = 0.01$ significance values as principle.

RESULTS

A total of 232 analyzable questionnaires were obtained. They were selected randomly from volunteers who worked in 8 central districts of Ankara and work in a job branch.

In total, 232 participants were interviewed, about over half of whom are female, 38.4% are in the age group of 30-39, 67.2% are educated at university level or higher, 33.8% are officers, 65.5% are married, 26.3% have a monthly income level of \$1001 to \$1500 (Table 1).

When the criteria that the consumers pay attention to while choosing the eating place outside the home were listed, it was found that the first one was quality and trust for the food, second was cleanness of the place, the third one was the taste of the food, the fourth one was whether or not documents like ISO exists in the place and the fifth one was the cleanness of the personnel (Table 2).

In this study, 46.6% of the participants had experienced a problem because of food and 29.5% of them were nausea problems, 28.7% of them got poisoned because of the food consumed in their office cafeteria and 29.6% of poisonings were of chicken (Table 3).

It was determined that 85.2% of the consumers were poisoned in the summer, 33.3% were poisoned in 2007, 81.5% have not gone to a health center, of those who had gone to a health center 75.0% were identified as poisoned (Table 4).

58.0% of participants who are primary school or middle school graduates have declared that they have no information about microorganisms. For the university graduates (or higher), the most known microorganism was bacillus cereus (20.7%), the second one was salmonella (19.1%) and the third was *E. coli* (11.9%). It was determined that there exists a statistically meaningful correlation between the education level of the participants and their knowledge about microorganisms ($p \leq 0.005$) and that their knowledge about microorganisms increases with their level of education.

The HACCP system and the knowledge of this system by the participants was examined depending on their education levels and it was found that; 89.5% of the primary and middle school graduates; 42.2% of the university graduates did not have any knowledge about the HACCP system. Those who knew about it the most think that HACCP ensures the hygiene and the sanitation of food from the buying period to the servicing period of the food (9.2% for primary school and middle school graduates, 33.0% for university graduates). As the education levels of the consumers increase, they start to have some knowledge about HACCP, but the knowledge is incomplete ($p < 0.01$).

When the consumers who had experienced a food oriented health problem in the past are choosing an eating place afterwards, they pay attention mostly to the cleanness of the place, secondly the quality and trust for the food, thirdly whether or not documents like ISO exist in the place, fourthly the cleanness of the personnel and finally physical appearance (Table 5).

DISCUSSION

It was found that, 95.7% of the participants of the study had food-based illnesses in the past and 24.3% had diarrhea in the past (Benny and Badrie, 2007). In the results of another study, it was found that more than half of the food poisonings was because of the food people

Table 1: Distribution of the demographic properties of the individuals

Demographics		n	%
Sex	Female	128	55.2
	Male	104	44.8
Age	18-29	71	30.6
	30-39	89	38.4
	40-49	58	25.0
	50-59	13	5.6
	60+	1	0.4
Education Level	Primary School or Middle School	76	32.8
	University or Higher	156	67.2
Profession	Worker	51	22.0
	Officer worker	90	38.8
	Free lawyer, doctor, engineer	5	2.2
	Lawyer, doctor, engineer in public government	16	6.9
	Teacher	32	13.8
	Academician	20	8.6
	Free agent	11	4.7
	Accountant	7	3.0
Marital Status	Married	152	65.5
	Single	80	34.5
Monthly Income	500 \$ <	3	1.3
	501-1000 \$	35	15.1
	1001-1500 \$	61	26.3
	1501-2000 \$	59	25.4
	2001-2500 \$	41	17.7
	2500 \$ ≥	33	14.2

Table 2: Distribution, depending on the level of significance, of the aspects that the consumers pay attention to while choosing their eating places outside home

Points paid attention	Level of significance					Weight average		
	1st	2nd	3rd	4th	5th	Total	%	Rank
Whether or not HACCP exists in the place or not	14	8	1	1	1	108	4.12	
Whether or not documents like ISO exists in the place or not	34	20	8	7	9	297	11.27	(4)
Physical appearance	22	16	19	11	11	264	10.02	
Service	5	13	13	20	16	172	6.56	
Taste of the food	13	17	33	28	22	310	11.76	(3)
Cleanness of the personnel	3	24	29	42	14	296	11.23	(5)
Cleanness of the place	19	29	38	30	27	412	15.64	(2)
Price	2	6	20	15	32	156	5.92	
Non existence of similar events in the same place before	2	3	1	5	5	40	1.51	
Whether or not the place is famous	12	19	2	7	8	164	6.22	
Quality and trust for the food	49	20	11	14	29	415	15.75	(1)
Total						2634	100.0	

(Weighted Sum = "1st degree frequency X5 + 2nd frequency X4 + 3rd frequency X3 + 4th frequency X2 + 5th degree frequency X1)
(Zeisel, 1982; Pinar and Ates, 1983)

ate at restaurants (55%) (Badrie *et al.*, 2006). In a study conducted by Unusan (2007) for determining the information levels of the consumers about food security; it was found that 68.8% of the poisoned people had nausea, 19.7% had vomiting and 6% had fever as a symptom. In another study, the frequencies of diarrhea in the tourism centers of 28 different countries were examined and as a result Turkey was in the 6th place (Cartwright, 2003).

Benny and Badrie (2007) indicate that only a small percentage (2.7%) of those who experience food poisoning goes to a doctor. In two different studies conducted in Turkey, 13.5% of the patients resorting to the emergency service in 2002-2003 was diagnosed

with food poisoning (Kurt *et al.*, 2004), whereas this percentage was 24.0% for 2004-2005 (Yılmaz *et al.*, 2006).

In the results of a study conducted to evaluate the health conditions in different accommodation places; it was seen that 2.8% of the tourists participating the research had food poisoning in the summer, 5.5% had complaints like nausea, vomiting and diarrhea (Evci and Tezcan, 2005). Yet in another study, the importance of informing the consumers about food security was emphasized (Deborah *et al.*, 2003).

It is mentioned that especially while chicken is being prepared in the kitchens of commercial enterprises, both salmonella and campylobacterio gets in contact with the

Table 3: Food oriented complaint situations of the consumers and their symptoms, complaints, reasons and the source with the named diagnosis

		n	%
Food oriented complaint (n = 232)	Not experienced	124	53.4
	Experienced	108	46.6
Experienced complaint (n = 271)*	Nausea	80	29.5
	Vomiting	46	17.0
	Diarrhea	63	23.2
	Stomach aches	64	23.6
	Fever	18	6.7
	Food consumption place (n = 108)	Work cafeteria	31
	Pastry shop, etc.	5	4.6
	Enterprise rested during holiday	14	13.0
	Restaurant on the auto way	14	13.0
	Restaurant outside home	44	40.7
Source of the food based complaint (n = 108)	Red meat	29	26.8
	Chicken meat	32	29.6
	Fish meat	15	13.9
	Milk and milk product	8	7.4
	Egg	3	2.8
	Floured product	3	2.8
	Frozen Food	8	7.4
	Mayonnaise	8	7.4
	Turnip juice	2	1.9

*More than one choice

Table 4: The year and the season of food oriented problems of the consumers and the rates of going to a health center and the diagnoses for those who have gone

		n	%
The year in which food oriented problem took place (n = 108)	2007	36	33.3
	2006	34	31.5
	2005	20	18.5
	2004	12	11.1
	2003 and before	6	5.6
Season in which food oriented problem took place (n = 108)	Summer	92	85.2
	Winter	16	14.8
Rates of going to a health center (n = 108)	Went	20	18.5
	Didn't go	88	81.5
Diagnosis for those who had gone to a health center (n = 20)	Food poisoning	15	75.0
	Typhoid	1	5.0
	Dysentery	1	5.0
	Gastroenteritis	3	15.0

hands, dresses and the surfaces in the kitchen (Cogan *et al.*, 1999) and if the necessary hygienic rules are not followed the food prepared in those places can cause food poisonings (Kennedy *et al.*, 2005). The results of a study made in England shows that salmonella; clostridium perfringens, *E. coli* and listeria are the cause of 85.0% of the food-oriented illnesses (Debbie, 2004). In a study made to determine the opinions of the consumers about food safety, it was seen that 89.7% of people are aware of e-coli and 85.7% of salmonella among the microorganisms that cause food poisonings (Badrie *et al.*, 2006). In his study, Palmer (1992) declared that along with salmonella, camylobacter is also a negative cause for food poisonings and that the camylobacter's effects are highest except for July, August, September and October. It was declared that following hygienic rules in the preparation of food and during the cooking period will prevent food poisonings (Clayton and Griffith, 2003) and almost for all of the

consumers cleanness is the most important aspect that they pay attention to while choosing a place to eat outside their homes.

In preventing food poisonings, education on personal hygiene, following hygienic rules in public eating places, increasing controls and substructure developments are all important factors (Bulduk, 2003). While choosing a place to eat outside home, it is important for that place to have certificates like ISO that show quality. Especially in the summer time, foods like chicken, mayonnaise and creamed food, should be consumed with special care and when there is an uncertainty about the freshness of the food, it should not be consumed at all. Educating the consumers by formal and public education will create positive results for avoiding food poisonings and food oriented illnesses.

Implications- Food poisonings affect masses especially in places like schools, hospitals and offices where food is produced and consumed in large quantities. The

Table 5: The distribution, according to the level of significance, of the aspects that the consumers pay attention to after experiencing a food oriented health problem (n = 232)

Points paid attention to	Level of significance					Weight average		
	1st	2nd	3rd	4th	5th	Total	%	Rank
Whether or not HACCP exists in the place or not	15	5	-	1	-	97	6.74	
Whether or not documents like ISO exists in the place or not	25	17	4	1	4	211	14.66	(3)
Physical appearance	8	12	9	5	5	127	8.82	(5)
Service	1	4	4	5	8	51	3.54	
Taste of the food	1	8	13	16	9	117	8.13	
Cleanness of the personnel	1	7	26	15	9	150	10.42	(3)
Cleanness of the place	11	18	17	19	19	241	16.74	(1)
Price	-	1	2	4	7	25	1.73	
Non existence of similar events in the same place before	1	7	9	9	5	108	7.50	
Whether or not the place is famous	4	4	5	8	7	74	5.14	
Quality and trust for the food	27	11	6	10	21	238	16.53	(2)
TOTAL						1439	100.0	

(Weighted Sum= "1st frequency X5 + 2nd frequency X4 + 3rd frequency X3 + 4th frequency X2 + 5th frequency X1)
(Zeisel, 1982; Pinar and Ates, 1983)

rotting of food can be prevented by using appropriate storing, preparing, cooking, cleaning and servicing rules, depending on the type of the food. It is therefore essential to increase the number of studies carried on the importance of food poisoning, Hazard Analysis and Critical Control Points (HACCP) issues and to concentrate on the education of kitchen staff.

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