



## Consumers' Knowledge, Attitudes and Behavior Assessment About Food Safety: The Case Study of Hatay Province of Turkey

Yalçın Yılmaz<sup>1</sup>, Arif Semerci<sup>2</sup>, Nuran Tapkı<sup>3\*</sup>, Erdal Dağistan<sup>2</sup>, Dilşat Bozdoğan Konuşkan<sup>4</sup>

<sup>1</sup>District Governor, 16800 Orhangazi/Bursa, Turkey

<sup>2</sup>Mustafa Kemal University, Faculty of Agriculture, Department of Agricultural Economics, 31034 Hatay, Turkey

<sup>3</sup>Mustafa Kemal University, Agricultural Research and Application Center, 31034 Hatay, Turkey

<sup>4</sup>Mustafa Kemal University, Faculty of Agriculture, Department of Food Engineering, 31034 Hatay, Turkey

### ARTICLE INFO

#### Article history:

Received 25 June 2015

Accepted 13 July 2015

Available online, ISSN: 2148-127X

#### Keywords:

Consumer behavior

Food purchasing

Likert scale

Food safety

\* Corresponding Author:

E-mail: ntapki@hotmail.com

### ABSTRACT

The development of food sensitivities began to increase along with societal growth. Consumer awareness is gradually increasing with the expansion of accurate and balanced information. In an increasingly consuming world, the knowledge, attitudes, and behaviors of individuals during the purchasing of food products are important. Findings from research of this kind positively impact the strategies of companies offering the products on the market. The purpose of this study is to examine the level of knowledge and attitudes of individuals living in the Hatay province and what they consider when buying food items. The data were obtained by face to face interviews of 334 consumers in 2008, and were analysed using a 5-point Likert scale. The average monthly spending of consumers in the survey research is 747.48 USD with food expenses in first place at 32.92% among the total amount of spending. Food product manufacturing, expiration date, storage and conditions were all taken into account for purchasing confidence. Supermarkets were found to be the most trusted shopping places; and of the consumers surveyed, 70.55% are affected positively or negatively by food-related news articles.

Türk Tarım – Gıda Bilim ve Teknoloji Dergisi, 3(8): 672-679, 2015

## Gıda Güvenliği Hakkında Tüketici Bilgi, Tutum ve Davranışlarının Değerlendirilmesi: Türkiye Hatay İli Örneği

### MAKALE BİLGİSİ

Geliş 25 Haziran 2015

Kabul 13 Temmuz 2015

Çevrimiçi baskı, ISSN: 2148-127X

#### Anahtar Kelimeler:

Tüketici davranışı

Gıda satınalma

Likert ölçeği

Gıda güvenliği

### ÖZET

Gıda hassasiyetinin gelişimi toplumsal büyüme ile birlikte artmaya başladı. Tüketici bilinci giderek doğru ve dengeli bilginin genişlemesi ile artmaktadır. Artan bir şekilde tüketen dünyada gıda ürünlerini satın alma sırasında bireylerin bilgi, tutum ve davranışları önemlidir. Bu tür araştırma bulguları piyasaya ürün sunan şirketlerin stratejilerini olumlu şekilde etkiler. Bu çalışmanın amacı Hatay Bölgesinde yaşayan bireylerin davranış ve bilgi düzeylerini ve gıda maddeleri satın alırken ne düşündüklerini incelemektir. Veriler 2008 yılında 334 tüketici ile yüz yüze görüşme yoluyla ve 5'li likert ölçeği kullanılarak analiz edilmiştir. Anket araştırmasında tüketicilerin ortalama aylık harcaması 747,87 USD olup, %32,92 ile gıda harcamaları ilk sıradadır. Güvenli gıda alımında, gıda ürünleri imalatı, son kullanma tarihi ve depolama gibi tüm koşullar dikkate alınmıştır. Süper marketlerin en güvenilir alışveriş yerleri olduğu bulunmuştur ve araştırmaya katılan tüketicilerin %70,55'i gıda ile ilgili haber makaleleri tarafından olumlu veya olumsuz etkilenmiştir.

\* Sorumlu Yazar:

E-mail: ntapki@hotmail.com

## Introduction

Today there is a significant increase in food-borne diseases at an international level. Some causes for this are: industrialization and mass production, developing technologies, pollution, population growth, changing consumption habits (fast food), low levels of education and income, insufficient physical investments in food production units, poor regulations, and insufficient supervision. Protecting public health by producing healthy foods is directly related to compliance to the rules of hygiene in all food production and marketing stages (Alpuğuz et al., 2009; Cross, 1999).

Food safety is defined by obeying necessary rules and taking measures during food production, processing, storage, transportation, and handling in order to ensure the distribution of healthy food (Giray and Soysal, 2007; Unusan, 2007). Food safety is of crucial importance to the consumer, food industry and economy (Jevsnik et al., 2008).

Foods may become harmful to health because of factors such as: biological (microbiologic, etc.), chemical (food additives and pesticides), and physical (rocks, soil, insects, etc.). Consumers' wrong handling and inappropriate conditions during and prior to food consumption may increase these risk factors. The measures taken by the consumers until the final stage of consumption play an important role in the prevention of food-borne illnesses as well as the official regulations by the competent authorities (Alpuğuz et al., 2009; Losasso, 2012).

Consumer education and the amount they can afford to spend on food are some of the important factors in ensuring food safety (Alpuğuz et al., 2009). Controlling food is important to the protection of consumer health and the prevention of deceptions in marketing. (Akbay and Boz, 2005; Kızılaslan and Kızılaslan, 2008).

The level of food health available for consumption is determined with inspections carried out at many stages. The best control monitors are the producer himself, the legal control agencies, and the customers.

Consumers have fundamental rights such as access to adequate food at all times, safe food, information about food safety and sources, education about nutrition, and living in a healthy environment that supports the prevention of food-related problems (Kılıç 2008). The information given about a product by food companies is important for consumer protection, decision-making processes, and competition. Labels which are the most common form of this transfer of knowledge facilitate consumers to make healthy and informed choices by means of information about the ingredients, price, expiration date, origin and nutritional value of the product (Yılmaz et al., 2009; Uçar et al., 2012; Sit and Birch, 2014).

Public awareness about food safety has increased consumer choices and behaviors around the importance of being the buyer. Consumer behavior defines how they buy, when they buy, and why they buy certain products. Determining this behavior allows production in the direction of the consumer's needs (Topuzoğlu et al., 2007; Gül et al., 2012).

This type of research is needed due to the limited

number of studies in the field of consumers and food safety in Turkey. Hatay province, having two border crossing points into the Middle East, is among the leading areas in domestic and international food trade containing the largest port and second largest trucking industry in the country.

## Materials and Methods

The evaluation of consumers' food safety knowledge, attitudes, and behaviours were conducted in the province of Hatay province located in the Mediterranean region of Turkey in 2008. The study contains the primary data obtained from 334 consumers by face to face interviews on a regional sample of Turkey in 2008. Relative statistical analysis was used for the evaluation of the data. The sample size was found with 95% significance by the formula as shown below (Collins, 1986):

$$n = t^2 \frac{pq}{E^2}$$

n: Sample volume

t: 1.96 (the standard t value for 95% significance level).

p: The sample rate based on prior knowledge or estimation. It is recommended to use the p value as 50% which will give the highest value for p (1-p) multiplication in order to have the sample size as large as possible.

q: (1-p): The sample size rate that haven't got the related characteristics.

E: Margin of error level. In this study it is 5%.

The numbers of survey sample were determined as 384 for the province of Hatay province. The actual evaluated number of questionnaires was 334 after unreliable data were discarded. For the evaluation and analysis of consumer data, the Likert scale questionnaire was used as well as simple statistical descriptors (Likert, 1967).

Survey participants were asked to rate statements regarding food safety knowledge, attitudes, and behaviors. They were asked to rate the statements from strongly agree to strongly disagree. Numerical values of the options used in the survey are defined as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

In addition the data used in the study were tabulated and interpreted using the mean and standard deviation values. The consumers were divided into 3 groups according to their monthly income categorized as: TL999 and below, TL1000 - TL1999, and TL2000 and above. The evaluation of survey results were conducted separately for each income level group.

## Results and Discussions

### *Socio-economic structure of the consumers*

Households' demographic characteristics are given in Table 1. An average household consists of about 4.46 people, 35.33% are female and 64.67% are male.

There are considerable differences between groups in regards to education. About 29.64% are attended university, 38.62% are completed high school, 11.08% are completed secondary school and 20.66% are primary school educated. Education level increases with economic status.

*Distribution of the consumers according to income and expenditure*

Information about groups is generated by taking into account the monthly income of consumers as shown in Table 2. The distribution of income groups is as follows: 37.43% of consumers (125 consumers) form Group 1 with TL999 and below, 40.42% (135 consumers) form Group 2 with TL1000 - TL1999, and 22.15% (74 consumers) form Group 3 with TL2000 and above. A 4.73-fold difference is observed between the highest and lowest-income groups according to their average monthly incomes. An average of 67.72% of family income is spent while 32.28% can be saved (Table 2).

Expenses were taken into account as food, clothing, education, health, housing, and other expenditure items. Table 1 showed that the most significant share of spending among the components was food (32.92%), while other major expenses were in education (08.18%) and clothing (15.74%). The data were converted to USD for comparison to other research data in the table. The average monthly income for the surveyed households was 1131 USD, and the average total monthly spending was 748 USD. Other expenses included: 246 USD for food, 135 USD for education expenses, and 118 USD for

clothing.

Distribution of expenditures for the population lives in Hatay province showed a higher level of education and clothing expenditures compared to those across the country. The total amount of household food expenses was higher (28.6%) than in a study conducted in the province of Kahramanmaraş (Akbaş and Boz, 2005). In the UK, money spent on food (15.6%) came third place after rent and transportation costs in a survey conducted in 2007 (Gülsoy, 2009). The explanation for this is that food spending is proportionately lower in high-income groups and income per person in the UK is greater than in Turkey.

*Reading the information labels of food products from the market*

The frequency in which consumers read the information located on the packaging of food products was analysed (Table 3). Ingredients, expiration dates, and storage conditions of purchased foods were among the topics questioned in all groups. These results indicated the awareness level of the customers (Table 3).

62.31% of consumers were able to find the information which they seek on product labels and 37.70% stated that the information offered was incomplete. Information availability is important for customer satisfaction. When consumers were asked their approach to new food products, 76.52% responded positively but 23.49% is found unwilling to purchase them. Group 3 was more open to trying new foods placed on the market but Group 2 preferred traditional foods.

Table 1 Households' demographic characteristics

Criteria	1. Group	2. Group	3. Group	Total
Average Number of Households	4.56	4.56	4.09	4.46
Sex	Rate (%)	Rate (%)	Rate (%)	Rate (%)
Female	35.20	35.56	35.14	35.33
Male	64.80	64.44	64.86	64.67
Total	100.00	100.00	100.00	100.00
Education	Rate (%)	Rate (%)	Rate (%)	Rate (%)
Primary school	36.80	14.81	4.05	20.66
Secondary school	12.80	11.85	6.76	11.08
High School	40.80	38.52	35.14	38.62
University	9.60	34.81	54.05	29.64
Total	100.00	100.00	100.00	100.00

Table 2 Consumer groups according to monthly family income and expenditure.

Criteria	I. Group		II. Group		III. Group		Average	
	Value (TL)	Rate (%)	Value (TL)	Rate (%)	Value (TL)	Rate (%)	Value (TL)	Rate (%)
Food expenses	229.02	41.99	308.96	33.12	506.88	28.75	322.34	33.20
Clothing expenses	76.24	13.96	142.26	15.27	309.58	17.11	154.16	15.74
Education expenses	77.92	14.27	154.96	16.64	387.67	21.43	177.06	18.08
Health expenses	33.36	6.11	63.10	6.77	104.79	5.79	61.08	6.24
Social expenses	11.60	2.12	40.11	4.31	88.84	4.91	40.09	4.09
Rent expenses	50.20	9.19	93.30	10.02	116.30	6.43	82.16	8.39
Transportation expenses	35.52	6.51	67.04	7.20	163.78	9.05	76.42	7.80
Monthly communication expenses	31.91	5.84	62.19	6.68	118.22	6.53	63.11	6.45
Total expenses	545.99	100.00	931.44	100.00	1809.34	100.00	979.20	100.00
Total monthly income	644.92	-	1321.70	-	3047.26	-	1445.93	-
Monthly income/expense ratio(%)	84.65		70.47		59.38		67.72	

(\*) 1 USD = 1.31 TL.

One of the goals of this study was to demonstrate whether consumers have been aware of food additives in foods purchasing. The findings revealed that 69% of consumers were concerned as to whether there were additives in foodstuffs and in this regard, the most concerned consumers were in Group 2 (72.93%). Whether consumers had an understanding about which type of food products' additives could have a negative impact in terms of health was also investigated (Table 4).

Consumers stated that additives especially in carbonated and energy drinks would have negative effects on health in the course of time. Consumers in the survey have a certain level of hesitation about food product reliability. The consumer groups who believed purchased foods were reliable varied between 62.86% to 56.69% (Table 5). Consumers who believe that foods have been unreliable were at a rate of 12.97% (Table 5).

Consumers' opinions on changing and evolving food

technologies varied as shown in Table 6. The number of consumers thinks food products are more reliable today than past in terms of food safety are 48.02%. The rate of those who think that there is no change in the reliability of the food products are 13.70% (Table 6).

Consumers were found to be particular about the brands they choose in their purchases. Of the consumers surveyed, 80.30% had brand preferences. This ratio is higher in the high income group. It can be said that there is a direct relationship between income groups and brands. This is particularly associated with the increasing importance of food safety. Consumer opinions of the reliability of certain foods are given in Table 7. Consumer approach to foods in terms of reliability changes significantly depending on income levels. Considering all product groups, the level of consumer confidence decreased around prepared foods, frozen foods and canned foods (Table 7).

Table 3 What kind of information is read on labels and the reading frequency of consumers?

The information contained on the product	Groups						Average	
	I. Group		II. Group		III. Group			
	SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>	
Production and expiry date	4.25	1.25	4.41	1.31	4.59	0.80	4.39	1.09
Storage conditions	3.31	1.32	3.49	1.42	3.72	1.32	3.48	1.32
List of ingredients	2.82	1.33	3.04	1.11	3.38	1.14	3.03	1.30
BHI <sup>2</sup>	2.98	1.27	3.30	1.32	3.44	1.18	3.21	1.22
The amount of calories	2.10	1.29	2.69	1.17	2.73	1.28	2.47	1.28
Cholesterol content	2.07	1.39	2.67	1.25	2.97	1.31	2.51	1.40
Sugar content	2.19	1.32	2.53	1.35	2.97	1.26	2.50	1.33
User info	2.68	1.45	2.97	1.42	2.95	1.34	2.86	1.42
Production place	2.83	1.51	3.23	1.07	3.08	1.46	3.05	1.48

1=never read, 2=rarely read, 3=sometimes read, 4=often read, 5=always read

<sup>1</sup>SD: Standard Deviation, <sup>2</sup>BHI: Benefits in terms of health information

Table 4 Which food group's additives do you think will make a negative impact on your health?

Products	Groups						Average	
	I. Group		II. Group		III. Group			
	SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>	
Canned	2.63	1.35	3.15	1.28	3.14	1.29	2.95	1.33
Oils and fats	3.27	1.36	3.36	1.20	3.34	1.24	3.32	1.27
Dairy products	1.87	1.36	2.16	1.28	2.04	1.27	2.03	1.31
All kinds of meat products <sup>2</sup>	2.81	1.39	3.39	1.19	3.32	1.35	3.16	1.33
Frozen foods	3.07	1.42	3.42	1.21	3.27	1.30	3.26	1.31
Sugar and sugar products	2.78	1.30	3.16	1.07	3.21	1.28	3.03	1.22
All kinds of fruit juices <sup>3</sup>	3.18	1.54	3.41	1.18	3.56	1.27	3.36	1.35
All kinds of sodas	3.60	1.41	3.75	1.19	3.84	1.21	3.71	1.28
All kinds of energy drinks	3.48	1.66	3.59	1.51	3.58	1.70	3.55	1.61
Other foods	0.54	1.41	0.56	1.33	0.71	1.51	0.58	1.40

1=none, 2=a little, 3=some, 4=a lot, 5=very much

<sup>1</sup>SD: Standard Deviation, <sup>2</sup>All kinds of meat products (ham, sausage, pepperoni, meatballs etc.), <sup>3</sup>All kinds of fruit juices and powdered drinks

Table 5 Are you worried about whether or not foods are reliable?

Groups	Yes		No		Partially		Total	
	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)
I. Group	73	61.34	18	15.13	28	23.53	119	100.00
II. Group	72	56.69	16	12.60	39	30.71	127	100.00
III. Group	44	62.86	7	10.00	19	27.14	70	100.00
Total	189	59.81	41	12.97	86	27.22	316	100.00

<sup>1</sup>NC: Number of consumer

Table 6 In general, what do you think about if foods are safe in terms of health?

Groups	Less secure than in previous years		The same security compared to previous years		More secure than in previous years		No, not safe		Total	
	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)
I. Group	43	34.96	13	10.57	52	42.28	15	12.20	123	100.00
II. Group	34	25.56	18	13.53	64	48.12	17	12.78	133	100.00
III Group	11	15.07	12	16.44	42	57.53	8	10.96	73	100.00
Total	88	26.75	43	13.07	158	48.02	40	12.16	329	100.00

<sup>1</sup>NC: Number of consumer

Table 7 Consumer opinions about foods reliability

Products	Groups						Average	
	I.Group		II. Group		III. Group			
	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	
Fresh vegetables	4.05	1.16	3.82	1.29	4.22	1.11	3.99	1.21
Fresh fruit	4.15	1.09	3.92	1.16	4.32	1.00	4.09	1.11
Veal	3.35	0.98	3.38	0.92	3.59	0.74	3.41	0.91
Mutton	3.11	1.05	3.30	0.98	3.21	1.01	3.21	1.01
Chicken	3.45	1.05	3.39	1.02	3.74	0.90	3.49	1.01
Fish	3.71	1.20	3.59	1.23	4.03	0.93	3.73	1.17
Dairy products	3.81	1.18	3.56	1.16	3.85	1.01	3.72	1.14
Canned	2.41	1.16	2.51	1.17	2.67	1.13	2.51	1.16
Egg	3.78	1.07	3.64	1.11	3.75	1.06	3.72	1.09
Rice	3.96	0.95	3.90	1.00	3.99	0.86	3.94	0.95
Macaroni	3.81	0.96	3.83	0.90	3.73	0.99	3.80	0.94
Olive oil	4.14	1.04	3.87	1.15	4.14	0.87	4.03	1.06
Frozen foods	2.24	1.11	2.47	1.11	2.51	1.13	2.39	1.12
Prepared foods	2.11	1.09	2.30	1.07	2.25	1.10	2.22	1.09
Bakery products	3.05	1.10	2.88	1.15	2.79	0.92	2.92	1.09
Sunflower oil	3.43	1.08	3.35	1.26	3.18	1.18	3.34	1.18

1: never safe, 2: sometimes safe, 3: undecided, 4: safe, 5: very safe

<sup>1</sup>SD: Standard Deviation

Table 8 How healthy do you think the following products are?

Products	Groups						Average	
	I.Group		II. Group		III. Group			
	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	SD <sup>1</sup>	
Uncooked meats, prepared foods <sup>2</sup>	2.59	1.09	2.29	1.06	2.38	1.13	2.42	1.09
The additive-containing foods <sup>3</sup>	2.13	1.03	2.08	1.07	2.08	0.92	2.10	1.02
Imported foods	2.54	1.23	2.51	1.08	2.55	0.90	2.53	1.10
Frozen foods	2.26	1.05	2.17	0.98	2.25	1.01	2.22	1.01
Dairy products	3.18	1.07	2.96	1.15	3.19	1.08	3.09	1.11
Foods made with eggs <sup>4</sup>	2.76	1.14	2.36	1.17	2.40	1.00	2.52	1.13
Fast-Food	2.35	1.20	2.15	1.03	2.10	0.96	2.21	1.08
Off-season fruits and vegetables	2.17	1.14	2.11	1.24	2.05	1.18	2.12	1.19

1: never healthy, 2: unhealthy, 3: undecided, 4: healthy, 5: very healthy

<sup>1</sup>SD: Standard Deviation, <sup>2</sup>Uncooked meats, prepared foods (sausages, bacon, etc.), <sup>3</sup>The additive-containing foods (bacon, sausage, canned goods, juices, etc.), <sup>4</sup>Foods made with eggs (mayonnaise, etc.)

Data about the health level of products purchased by consumers are given in Table 8. When Table 8 examined, consumers demonstrate a tendency towards food products that have a reputation of being healthy and honest. Product groups which are not found healthy are foods with long shelf life and chemical preservatives such as bacon, sausage, canned goods, juices, etc. Fruits and vegetables produced outside as normal production season are also considered unhealthy (Table 8).

Consumers' choices for where to purchase foods in terms of food safety were evaluated in Table 9. Fast-food restaurants and street vendors have the lowest level of reliability (Table 9).

Supermarkets had the highest level of consumer trust. When manufacturing and marketing channels were considered in terms of food safety, production, packaging, and transfers, big differences were not seen among wholesalers, sales locations, or supermarkets (Table 10). Consumers were unsure about food safety at those stages (Table 10).

The possible impacts of food safety related news on the consumer is given in Table 11. Accordingly, 30.54% of the consumers got rid of acquired products reported as having problems, and 43.51% gained trust in the quality of food products. 21.34% of consumers stated that they started reading product labels more carefully, and 4.60%

stated that they changed their shopping locations. News such as hormone-treated foods, genetically modified crops and other negative product procedures have changed consumption habits. 70.55% of those surveyed have been identified as positively or negatively affected by the news.

Therefore, research reveals that scientific papers have created a huge impact on customers in the food industry. Markets and sellers respected by the community have to be careful to accurately inform customers about products and keep away from incorrect statements. This is extremely important especially on the promotion and advertising of products (Table 11).

Another important finding of the study is that consumers do not have enough information about institutions and organizations which relate to food product health. 75.48% of consumers surveyed do not know which institutions and organizations are authorized to control food products at different stages. This reveals that relevant organizations and institutions across the country do not have enough demonstrations, or accessible information for consumers.

Different inquiries were directed to the consumers relating to purchased food. The information obtained is given in Table 12. This research reveals that labels on products are the most important source of information during the time of purchase. Consumers do not believe that expensive food items are healthier. Spoiled food products are replaced with fresh one without legal action

taken for consumers' rights.. According to consumers, harmful food additives and the use of pesticides in agricultural products are not controlled enough. Consumers also stated in restaurant food are not prepared under hygienic conditions (Table 12).

The surveyed consumers pay more money for products produced without hormones and pesticides use. Good agricultural practices in the production of fruit and vegetables in Turkey is still not wide-spread, and the excessive use of plant fertilizers is not fully prevented. The production, sales, and storage stages of agricultural products have been inspected by officials from the Ministry of Agriculture and Livestock in accordance with legal regulations. However, consumers are not fully aware of such practices due to the fact that the utilization of them is not spread throughout the country. Consumers giving priority to agricultural products grown without the use of pesticides and hormones puts pressure on manufacturers to produce food in accordance with satisfactory agricultural practices.

As shown in Table 12 consumers stated that new technologies are used without knowing the effects they will have on people and the environment. This shows that consumers cautiously approach the use of new technologies in food production. However, there is an uncertainty among consumers that production methods used today are less environmentally damaging than in the past.

Table 9 Food sales and consumption place assessment in terms of food safety

Food sales and consumption places	Groups						Average	
	I.Group		II. Group		III. Group			
	SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>	
Fast-food	1.86	1.03	1.82	0.99	1.97	1.18	1.87	1.05
Restaurants	2.74	0.97	2.44	1.01	2.64	1.10	2.59	1.02
Supermarkets	3.68	0.89	3.52	1.13	3.38	1.01	3.55	1.02
Restaurants servicing to homes	2.64	0.99	2.43	0.93	2.45	1.00	2.51	0.97
24-hour places <sup>2</sup>	2.31	1.02	2.17	1.16	2.08	1.01	2.20	1.08
Fruit sellers	3.39	0.98	3.44	1.01	3.38	0.91	3.41	0.98
Butchers	2.83	1.08	2.71	1.15	2.75	1.05	2.77	1.10
Grocery stores	3.03	1.14	3.05	1.00	3.04	1.05	3.04	1.06
Street markets	3.08	1.19	2.96	1.08	3.22	1.12	3.06	1.13
Peddlers (kebab etc.)	1.82	0.89	1.73	0.99	1.85	2.29	1.79	1.01
Refectory	2.58	1.00	2.40	1.11	2.40	1.04	2.47	1.05
Cafes	2.68	1.05	2.45	1.16	2.64	1.18	2.58	1.13

1: never safe, 2: sometimes safe, 3: undecided, 4: safe, 5: very safe

<sup>1</sup>SD: Standard Deviation, <sup>2</sup>24-hour places (gas stations, stopovers)

Table 10 Can you evaluate following areas in the process of production, marketing and distribution channels in terms of food safety?

Production and Marketing, distribution channels	Groups						Average	
	I.Group		II. Group		III. Group			
	SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>	
Manufacturing/Processing industry	2.94	1.05	2.89	1.08	3.03	1.12	2.94	1.07
Packaging	3.13	1.07	3.13	1.06	2.97	1.00	3.10	1.05
Transport	3.10	1.00	3.08	0.96	3.08	0.98	3.09	0.98
Supermarkets, stores and counters	3.06	1.14	3.15	1.05	3.14	1.13	3.11	1.10
Cellars in houses, cellars	3.01	1.59	3.24	1.39	3.09	1.34	3.12	1.46

1: never safe, 2: not safe, 3: undecided, 4: safe, 5: very safe

<sup>1</sup>SD: Standard Deviation

Table 11 If your consumption habits have changed because of the news from communication channels, how did they change?

Groups	I gave up buying the product		I started reading labels more carefully		I prefer		I changed my place of shopping		Total	
	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)	NC <sup>1</sup>	Rate (%)
I. Group	29	34.52	16	19.05	35	41.67	4	4.76	84	100.00
II. Group	33	34.02	21	21.65	40	41.24	3	3.09	97	100.00
III. Group	11	18.97	14	24.14	29	50.00	4	6.90	58	100.00
Total/Average	73	30.54	51	21.34	104	43.51	11	4.60	239	100.00

Table 12 Do you agree or disagree with following statements?

Inquiries	Groups						Average	
	I.Group		II. Group		III. Group			
	SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>		SD <sup>1</sup>	
Expiration date is an indication of the food safety.	3.43	1.26	3.33	1.21	3.18	1.27	3.33	1.24
Nowadays, food additives used are not harmful to human health	2.22	1.13	2.39	1.09	2.25	1.11	2.29	1.11
Controls on the level of residues of pesticides on food by competent departments are sufficient.	2.28	0.96	2.35	0.98	2.31	0.95	2.32	0.96
Food is prepared in a hygienic environment in restaurants.	2.40	0.99	2.41	1.12	2.24	1.09	2.37	1.07
Overall, I'm convinced that food products are safe enough.	2.50	0.94	2.82	1.02	2.61	1.06	2.65	1.01
I get all the information about nutritional values by reading the labels on food items.	3.08	1.17	3.72	4.63	3.59	1.03	3.45	3.08
Satisfaction is more important than nutritional value of the food that we consume.	2.65	1.18	2.80	2.88	2.19	0.95	2.61	2.02
Food items can not claim to be healthy in restaurants.	3.53	1.07	3.36	0.89	3.58	0.96	3.47	0.98
Food products sold in supermarkets and shopping malls have more quality.	3.38	1.07	3.35	1.00	3.49	0.88	3.39	1.00
Brand name food products are always safe.	3.25	1.24	3.37	1.05	3.20	1.01	3.29	1.12
I would have returned it if food product is damaged.	4.00	1.19	4.05	1.05	4.07	1.08	4.04	1.11
In general, the more expensive the food the more healthy.	2.67	1.26	2.84	1.12	2.80	1.09	2.77	1.16
Existing competition in the food industry leads to the production of healthier products.	3.25	1.28	3.42	1.11	3.27	1.18	3.32	1.19
I am ready to pay more for food products without hormones	3.37	1.30	3.50	1.08	3.99	0.94	3.56	1.16
Retailers gives more importance to the reliability of products than the cost of food.	2.72	1.19	2.79	1.16	2.52	1.19	2.70	1.18
Food cost is low for consumers eating healthy.	3.74	1.20	3.72	1.08	3.93	0.94	3.77	1.09
I would try to take advantage of special discounts on food products in supermarkets.	3.75	0.99	3.74	0.97	3.46	0.98	3.68	0.99
Production methods today are less environmentally damaging than in the past.	2.86	1.36	2.99	1.16	3.44	1.14	3.04	1.25
Today, new technologies are used without controlling their effects on the environment	3.70	1.05	3.59	1.01	3.89	0.95	3.70	1.02
In general, the effects of production on the environment are normal.	2.33	1.04	2.68	0.99	2.70	1.11	2.55	1.05

1: strongly disagree, 2: disagree, 3: undecided, 4: agree, 5: strongly agree

<sup>1</sup>SD: Standard Deviation

## Conclusions

This study was conducted in the Hatay province, Turkey in 2008 in order to reveal consumers' knowledge, attitudes and behaviors about food safety. The results obtained demonstrate that consumers are aware of food safety, but need to be more informed. Publications especially in the national media are impactful on consumers. In this regard; consumer associations, the Food Agriculture and Livestock Ministry, and affiliates who work in the food industry have an important responsibility to publicise and inform about food safety. Celebrities and prominent figures can be used in advertising.

The largest percentage of household income is spent on food. When income increases, food consumption increases in absolute terms but decreases proportional to the level. Food expenditures are lower in the developed world. When consumer income levels increase, brand preferences come to the forefront, but consumer demands turn to low-calorie foods with a higher nutritional value (protein, vitamin, and mineral rich foods) rather than high calorie foods (high contents of starch and fat).

Policies which promote healthy and safe food production and consumption should be developed to increase awareness of consumers. Promotional and informational operations must be focused on the inspectors involved in monitoring activities, including roles and responsibilities, at every stage of food production and consumption. Research results targeting consumer preferences should be considered in order to create a consistent, sustainable food policy.

Food safety which has been an important issue from past to present will continue to be a major problem in the future. Aware, informed and determined consumers are very important in overcoming and dealing with this dilemma.

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