



DETERMINATION OF CONSUMERS' BEHAVIORS IN FOOD PURCHASING, CONSERVATION, CONSUMPTION AND FOOD SAFETY

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ABSTRACT

The purpose of this research was to determine consumers' behaviors regarding food purchasing, conservation, consumption and food safety in urban areas of Samsun province, Turkey. Data were collected through questionnaires from 384 consumers who were involved in purchasing and handling food in their families. Research results revealed that more than half of the respondents were aware of the concept of food safety. The main issues that consumers consider when buying food are the expiry date, brand and packaging. Television was the most frequently used source of food safety information. The results of regression analysis showed that being a woman, duration of education, and family income positively affected food safety awareness. In order to ensure food safety, it is necessary to establish a system under which both all food items are traceable and proper inspection process are carried out. Beside legal sanctions for wrong practices, there is also a need to raise awareness and increase the social responsibility of the people involved in the production and marketing of food items. Since food production is largely dependent on consumer demand, which is therefore one of the key elements in the sector, firms should develop marketing strategies that take account of consumers demands and the sensitivity of the community regarding the issue of reliable food. For this purpose, the awareness level of consumers about food safety needs to be increased by using information sources that are commonly used by consumers.

Key Words: : Consumer behavior, food safety, urban area, Samsun, Turkey.

JEL Codes: I10, M31, Q18.

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GIDA SATIN ALMA, SAKLAMA, TÜKETME VE GIDA GÜVENLİĞİ KONUSUNDA TÜKETİCİ DAVRANIŞLARININ BELİRLENMESİ

ÖZET

Araştırmanın amacı, Samsun ili kentsel alandaki tüketicilerin gıda satın alma, saklama, tüketme ve gıda güvenliğiyle ilgili davranışlarının belirlenmesidir. Veriler, ailelerde gıda satın alma ve hazırlamada etkili olan 384 tüketiciden anket yoluyla elde edilmiştir. Araştırma sonuçları, tüketicilerin yarısından fazlasının gıda güvenliği kavramından haberdar olduklarını ortaya koymaktadır. Tüketicilerin gıda satın alırken en fazla dikkat ettikleri konular; son kullanma tarihi, marka ve ambalajdır. Tüketicilerin gıda güvenliği konusunda en sık başvurdukları bilgi kaynağı televizyondur. Regresyon analizi sonuçları kadın olmanın, eğitim süresinin ve aile gelirinin gıda güvenliği bilincini pozitif yönde etkilediğini göstermektedir. Gıda güvenliğinin sağlanması için, bütün gıdaları kapsayacak şekilde kontrol ve denetim mekanizmasının var olduğu izlenebilir bir yapının oluşturulması gerekmektedir. Bunun için yasal yaptırımlarla birlikte, gıdaların üretim ve pazarlamasında yer alan kişilerin bilinç düzeylerinin ve sosyal sorumluluklarının artırılmasına ihtiyaç vardır. Gıda üretiminin büyük ölçüde sektördeki temel unsurlardan biri olan tüketici talebine bağlı olması, firmaların tüketici odaklı ve toplumdaki güvenilir gıda hassasiyetini dikkate alan pazarlama stratejilerini geliştirmeleri konusunda çaba harcamalarını zorunlu kılmaktadır. Bu amaçla gıda güvenliği konusunda en fazla başvurulan bilgi kaynakları kullanılarak, tüketicilerin gıda güvenliği bilinç düzeyleri artırılmalıdır.

Anahtar Kelimeler: *Tüketici davranışları, gıda güvenliği, kentsel alan, Samsun, Türkiye.*

JEL Kodları: *I10, M31, Q18*

1. INTRODUCTION

The concepts of food security and food safety have been frequently discussed globally. Food security refers to the access to enough food while food safety concerns the notion that consumed food does not pose a threat to human health. While food safety is a topic more emphasized by nations that have already solved the issue of food security, this issue still remains the highest priority in the countries where adequate food supply is not available. However, food safety and food security must be provided together to provide people with the possibility of a physically, mentally, and socially healthy living environment. Indisputably, it is not possible to talk about a healthy life in the countries where one of these two subjects is ignored, i. e., both concepts should be ultimate goals for every country. Access to safe and nutritious food is also considered a basic individual right (Uyttendaele et al., 2016). The statistics show that foodborne diseases have become serious issues worldwide, particularly in developing countries. The global burden of food-borne diseases is clearly illustrated by the 31 food-borne hazards that caused 600 million food-borne illnesses and 420,000 deaths in 2010 (WHO, 2015). One of the major drivers of food safety policies is the increase in consumers' concerns that is attributable to health and safety related causes (Kim, 2012).

The emergence of foodborne diseases such as foot and mouth disease, mad cow disease, and bird flu has raised more concerns about food safety. Furthermore, in a particular case, there is a widely held belief in Turkey, particularly in the early 2000s, that contaminated food triggers various types of cancer, and that has highlighted concerns about food safety. At the same time, with the changing sociocultural and economic conditions, consumers have become more conscious of the issues pertaining to food safety and have started to question the effects of food on human health. All of these developments make it important to understand and consider the attitudes and behaviors of consumers in food purchasing decisions, especially regarding packaging, taste, quality and freshness of products.

Jongwanich (2009) stated that the changes in the food market are not only the result of food safety incidents and increasing health consciousness but are also related to increasing incomes and urbanization. Global food safety will also face global challenges including climate change, the emergence of new pathogens and toxicants, an increasing population of 'at risk' (immunocompromised and aging) consumers and changing patterns of food consumption as fresh and minimally processed foods are become increasingly preferred by consumers (King et al., 2017).

Consumer purchasing behavior and decisions depend on many different characteristics of products. As stressed in Maslow's hierarchy of needs, human needs range from physiological needs to self-actualization needs. Therefore, the psychological and sociocultural characteristics of people differentiate their expectations of products and cause different and complex, structured consumer behaviors (Tayfun and Yıldırım, 2010). Similarly, Walters (1978) defined consumer behavior as a set of decisions and activities that involve the purchase and use of different products and services.

In order to understand the real phenomenon of consumers' decisions on the buying of different goods and services, scientists have stressed the effectiveness of many different models. For instance, Walters (1978) stated that consumer decision-making models specify exact cause and effect that relate to consumer behavior. Thus, consumers' behaviors and attitudes towards safe food should be taken into account in order to completely define the term food safety and to determine the misguided beliefs and behaviors of consumers (Ergönül, 2013).

More research has been done in the last decade on consumers' consciousness and attitudes towards food safety (Ergönül, 2013; Onurlubaş and Gürler, 2016; Liu and Niyongira, 2017; Salicik and Kumral, 2017; Niyaz and Demirbaş, 2018). In this study, the behaviors of consumers living in the urban areas of Samsun province, Turkey were analyzed and factors affecting their awareness of food safety were determined. Although many studies on food safety have focused on consumers, no studies have been carried out in Samsun province of Turkey which has a population of more than one million. Since consumers are involved in the last chain of the food sector, conducting studies to determine their level of awareness of all the factors involved in the supply, conservation and consumption of food, including ideas on food production, can provide different perspectives on the food safety problem, including

potential solutions. Therefore, the primary purpose of this study was to determine consumer behaviors regarding food safety in the urban areas of Samsun province, Turkey. The specific objectives included the determination of the following:

- (I) Socioeconomic characteristics of consumers
- (II) Awareness of the consumers about the concept and definition of food safety
- (III) Main issues that the consumers pay attention to during the purchase, storage and consumption of food
- (IV) Consumers sources of information about food
- (V) Food issues that consumers are most concerned about
- (VI) Factors affecting consumers awareness scores.

The results were expected to provide useful information about consumers for producers, food processors, wholesalers, retailers, scientists, extension practitioners and policy-makers.

2. MATERIALS AND METHODS

The main material used in this study was information provided by face-to-face interviews conducted with consumers in the urban areas (Atakum, Canik and İlkadım districts) of Samsun province of Turkey who were influential in their families' food purchasing decisions. A simple random sampling method was used to determine the number of questionnaires used (Collins, 1986);

$$n = \left(\frac{Z_{\alpha/2}}{d} \right)^2 * p * q$$

$$n = (1.96/0.05)^2 * 0.5 * 0.5 = 384$$

In this formula, n represents the sample size, z ($\alpha/2$) is the normal distribution table value corresponding to 95% confidence level, p is the probability of occurrence of the observed event (0.50) (since there was no preliminary information about consumers' food safety consciousness level the value was assumed to be 0.50), q is the probability of non-occurrence of the observed event ($q=1-p$), and d is the permissible error margin (accepted error margin is 5%). In the present case, the number of consumers surveyed was determined to be 384. Data were collected in 2018.

In the calculation of the food safety awareness scores of consumers, their responses to the questions prepared on a five points Likert scale were used. Their answers to the questions related to the stages of buying, storing, and consuming food items were scored as: never=1, seldom=2, occasionally=3, generally=4 and always=5. Responses for all the questions in this section of the survey were taken into account and a food safety awareness score for each consumer was calculated. This score was used as a dependent variable in the least square regression model. The explanatory variables were

gender, age, education, income, number of children under six years of age and household size. These variables were selected with the criterion of having a correlation higher than 0.2 with the dependent variable. The model was tested for overall significance by using the F-test value.

By interpretation of the means calculated from the Likert-scaled questions, an interpretative scale was developed as 1.00-1.49=absolutely disagree/never, 1.50-2.49=disagree/rarely, 2.50-3.49=occasionally, 3.50-4.49=agree/usually and 4.50-5.00=strongly agree/always (Boz and Palaz, 2007; Palaz and Boz, 2008). The reliability of the Likert scale questions was tested with Cronbach's Alpha internal consistency coefficient which was 0.89, indicating that the instrument used for data collection was highly reliable.

3. RESEARCH FINDINGS

The socioeconomic characteristics of respondents are given in Table 1. Respondents who were deemed responsible for food purchasing decisions in their families were women (63.54%) and men (36.56%). Their average age was 42.94 and the average of schooling years was 10.12 years. A total of 40.11% were government employees and/or workers and 33.32% were housewives. Average family size was 3.41 persons. The average family income of the consumers was 2,910.81 TL/month, of which 17.91% was allocated for food and non-alcoholic beverage expenditures (Table 1).

Table 1. Socioeconomic Characteristics of Respondents in a Survey of Spending Habits of Consumers

	Mean
Gender (%)	
Woman	63.54
Man	36.46
Age (years)	42.94
Schooling (years)	10.12
Occupation (%)	
Government employee or worker	40.11
Housewife	33.32
Retired	16.41
Trader or self-employed	10.16
Income level (TL/month)	2910.81
Share of food and soft drinks expenditures in total expenditures (%)	36.72
Share of food and soft drinks expenditures in total income (%)	17.91
Family size (persons)	3.41
Number of children under the age of six (persons)	0.26

More than half of the respondents (55.47%) were aware of the concept of food safety and 44.53% were not (Table 2). The food safety awareness proportion was 48.39% in a study conducted in Tokat province, Turkey (Bal et al., 2006) and 55.40% in a study conducted in İzmir province, Turkey (Özdemir and Topsümer, 2017). In the present study, those who were aware of the food safety concept described

'safe food' as healthy food (44.13%), certified food (19.25%), unexpired food (16.43%), food containing no additives (11.27%), quality food (4.69%), and hygienic food (4.23%) (Table 2). According to a survey conducted in Tokat province, 68.70% of consumers who were aware of the concept of food safety knew a definition of the concept (Onurlubaş and Gürler, 2016).

Table 2. Awareness of the Concept and Definition of Food Safety

	Number	(%)	
Not aware of the concept of food safety	171	44.53	
Aware of the concept of food safety	213	55.47	
Total	384	100.00	
Definition of safe and reliable food	Healthy food	94	44.13
	Certified food	41	19.25
	Unexpired food	35	16.43
	Food containing no additives	24	11.27
	Quality food	10	4.69
	Hygienic food	9	4.23
	Total	213	100.00

Issues that consumers pay attention to during the purchase, storage and consumption of food are presented in Table 3. From the table it can be seen that consumers are most likely to consider the expiry date, brand and packaging in the purchase of food items. In earlier research, it was determined that the most important label information for consumers in the purchase of food was the expiry date (Özgül and Aksulu, 2006; Kaptan, 2007; Onurlubaş and Gürler, 2016; Salicik and Kumral, 2017). From a different study, 40% of consumers were aware that the meat package they purchased had a label on it that gives instructions for safe cooking and handling (Nesbitt et al., 2009). Consumers are often aware of the need to keep food at the appropriate temperature and use the appropriate shelves of the refrigerator. They generally don't re-freeze food that has been frozen earlier, and occasionally follow the preparation and cooking instructions when preparing and cooking food (Table 3). In comparison, Canadians first food safety considerations regarding food preparation and storage at home included proper refrigeration (22-23%), general washing and cleaning (12-14%), washing hands (8-9%), maintaining food at the appropriate temperature (5-7%), proper storage and separation of foods (4-7%), ensuring food is cooked properly (3-5%) and proper freezing of food (3-4%) (Léger Marketing, 2011).

Table 3. Issues That Consumers Paid Attention to During the Purchase, Storage and Consumption Periods of Food

	Issues to be considered	Mean	Standard Deviation
Purchase	Brand	4.03	1.02
	Expiration date	4.23	0.86
	Packing	4.01	1.01
	Production date	3.21	1.33
	Additives	2.24	1.17
	Energy and nutrition content	1.85	1.09
	Producer company	1.59	1.00
	Recycling mark	1.55	0.98
Storage	Keeping at appropriate temperature	3.53	1.19
	Using the proper shelf in the refrigerator for the type of food item	3.45	1.42
Consumption	Consuming before the expiry date	4.48	0.85
	Not refreezing previously frozen food	4.37	1.10
	Following food cooking and preparation instructions	3.26	1.35

Consumers' sources of information about food are presented in Table 4. From the table, the most important sources of information about food safety were television, doctors and family members. These were followed by the internet, labels on food items, newspapers and peers. In studies conducted in Eskişehir and Tokat provinces in Turkey, consumers' most important sources of food safety information were radio and television programs (Özdemir, 2009; Onurlubaş and Gürler, 2016). In a survey conducted in the Caribbean region, consumers were found to be in need of training programs on radio and television to learn more about food safety (Jackson et al., 2003). Similarly, according to a survey conducted in the West Indies, consumers acquired most information on food safety (70%) from television (Badrie et al., 2006). The results of these studies indicate that radio and television are very effective sources for providing food safety information, not only in Turkey but also in other countries.

Table 4. Consumers' Sources of Information on Food

	Mean	Standard Deviation
Television	4.51	0.74
Doctors	4.23	0.99
Family members	4.20	0.90
The Internet	3.67	1.24
Labeled food	3.62	0.81
Newspapers	3.34	1.17
Peers	2.94	1.12

The most concerning issues for consumers were food additives (90.63%) and GMO foods (85.68%). According to a survey conducted in the province of Muğla in Turkey, consumers were most worried about GMO foods (66.20%) and food additives (40.90%) (Bekar, 2013). Diet products (29.66%), sugar content of foods (32.27%) and pasteurized foods (44.39%) were the least worrying issues among

consumers (Table 5). The intake of products containing low-calorie sweeteners has increased dramatically in recent decades (Sylvetsky et al., 2012; Piernas et al., 2013), possibly in response to increased concerns about the adverse health effects linked to excessive sugar intake (Taillie et al., 2017).

The ideal scenario is to the minimize risks on the consumer plate without compromising the nutritional qualities of the food. To that end, there are a variety of physical and chemical methods to reduce microbial hazards in food. These include physical methods such as thermal approaches (heating, freezing and refrigerated storage), radiation (UV and gamma), filtration and drying, and chemical methods such as chlorine based compounds, ozone and hydrogen peroxide (Parish et al., 2003). Despite these advances, an increase in the level of news about food additives, microbiological problems and technological processing in the visual and written media has increased concern about food safety in the community.

Table 5. The Most Concerning Issues Regarding Food*

	(%)	
Food additives (preservatives)	90.63	
Food content problems	Fat or cholesterol	73.69
	Sugar	32.27
GMO and microbiological problems	GMO foods	85.68
	Bacteria	74.98
	Toxic substances	69.80
Technological applications	Frozen ready-to-eat foods	49.74
	Pasteurized foods	44.39
	Diet foods	29.66

* More than one reason is specified.

Factors affecting consumers' scores were analyzed with regression analysis and the results are given in Table 6. The model had statistical significance set at the 0.05 alpha level. Of the six explanatory variables included in the model, three were statistically significant ($p < 0.01$). They were gender, education level and family income. Female consumers were more conscious about food safety than males. In a study conducted in Slovenia female consumers were more aware of the responsibility of consumers for food safety than men (Jevšnik et al., 2008; Ovca et al., 2014). In addition, the length of education period and family income positively affected consumers' consciousness of food safety. The increase in the period of education of consumers by one year increased the food safety consciousness score by 1.89 and the increase of the monthly family income by one TL increased food safety consciousness by 0.01 units.

Table 6. Factors Affecting Consumers' Scores

	Coefficients	Standard error	P value
(Constant)	33.02	2.89	0.00
Gender	-3.78	0.86	0.00
Age	-0.03	0.04	0.49
Education	1.89	0.14	0.00
Household income	0.01	0.00	0.00
Number of children	0.79	0.72	0.27
Household size	-0.06	0.36	0.88
R ²	0.62		
F value	101.07		0.00

4. CONCLUSIONS AND RECOMMENDATIONS

In recent years, major factors such as foodborne illnesses, and the increased education and income levels of consumers, have led to further questioning of food safety. As a result, consumers' behaviors are also being oriented from the purchasing to consumption period. The fact that the future of food production is largely dependent on consumer demand makes it necessary for producers, processors and retailers to be aware of consumer behavior towards food safety.

The issue of food safety has become a subject of much debate on various platforms, especially in the mass media, in Turkey since around 2000. Nevertheless, in the present study, only 55.47% of the consumers who were involved in food purchasing decisions were aware of the concept of food safety. In addition, 55.87% of consumers who were aware of food safety were not been able to accurately define the concept.

In the present study, consumers mostly paid attention to expiry date, brand and packaging when purchasing food. Although they are most concerned about the additives in food items, they rarely pay attention to the list of additives when purchasing food. It has been determined that the main source of information for consumers is television. Doctor's advice is also one of the factors that affect consumer behavior. Increasing consumer awareness of food safety will continue to be influenced by the transfer of information from specialists via mass media, especially television.

This study determined that women are more conscious of food safety than men. It is beneficial to families and society that they have an active role in making food purchasing and handling decisions. However, men should feel obliged to increase their own awareness of food consciousness and safety so that children receive the food safety and handling message from both parents. Involvement of males in food safety issues means that it will not be a gender issue and overall a healthier society will more likely be created.

Since children will constitute our future society, safe food is an essential requirement for their growing up to be healthy. The greater awareness of families with children should make them more sensitive to food safety issues, from the time of purchase to consumption. For this reason it is especially

important to target families with children in awareness-raising efforts. In conclusion, there is a need for legislative changes and comprehensive education to ensure that all participants in the food sector are aware of food safety issues and act responsibly, from the production stage to the consumption of food by individuals.

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