

Determination of Egg Consumption Behaviors of Consumers in Bursa Province

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Abstract

In this study, it is aimed to determine the egg consumption behaviors of consumers in Bursa. For this purpose, data obtained from face-to-face surveys with 460 people determined by simple random sampling from citizens residing in Bursa province in 2021 were used. It was revealed that 30% of families consume 10-15 eggs, 27% consume 20 or more eggs, 25.7% consume 15-20 eggs, and 17% consume 5-10 eggs per week. In the research, 47% of consumers preferred medium and 47% large eggs. At the same time, 55% of the consumers stated that the packaging style affects their purchasing preferences, whereas 45% stated that it did not. In the research, 31.3% of the consumers stated that they preferred brown-shelled eggs and 22.6% of them preferred white-shelled eggs. On the other hand, it was determined that the color of the eggshell was not effective in the purchasing preference of 46.1% of the consumers. Also, 69.6% of consumers stated that the color of egg yolk was effective in their preferences and 72.4% of them stated that they preferred dark yolk eggs. While 57% of consumers stated that covid-19 cases did not affect egg consumption, 26.1% stated that egg consumption increased.

Keywords: egg, surveys, consumer behaviors, Bursa province

Bursa İlindeki Tüketicilerin Yumurta Tüketim Davranışlarının Belirlenmesi

Öz

Bu çalışmada, Bursa ilindeki tüketicilerin yumurta tüketim davranışlarının belirlenmesi amaçlanmıştır. Bu amaçla, 2021 yılında Bursa ilinde ikamet eden vatandaşlardan basit tesadüfi örnekleme yoluyla belirlenen 460 kişi ile yüz yüze yapılan anketlerden elde edilen veriler kullanılmıştır. Ailelerin %30'unda haftada 10-15 adet, %27'sinde 20 ve üstü adet, %25,7'sinde 15-20 adet ve %17'sinde 5-10 adet yumurta tüketildiği belirlenmiştir. Araştırmada tüketicilerin %47'si orta ve %47'si de büyük yumurtaları tercih etmiştir. Tüketicilerin %55'i ambalaj şeklinin satın alma tercihlerini etkilediğini, buna karşın %45'i etkilemediğini belirtmiştir. Araştırmada, tüketicilerin %31,3'ü kahverengi kabuklu yumurtaları ve %22,6'sı da beyaz kabuklu yumurtaları tercih ettiklerini belirtmişlerdir. Buna karşın, tüketicilerin %46,1'inin satın alma tercihinde yumurta kabuk renginin etkili olmadığı belirlenmiştir. Tüketicilerin %69,6'sı yumurta sarısı renginin tercihlerinde etkili olduğunu ve %72,4'ü de koyu sarılı yumurtaları tercih ettiklerini belirtmişlerdir. Tüketicilerin %57'si Covid-19 vakalarının yumurta tüketimini etkilemediğini belirtirken, %26,1'i yumurta tüketimini arttığını belirtmiştir.

Anahtar Kelimeler: yumurta, anket, tüketici davranışı, Bursa ili

Introduction

Due to the rapid increase in the world population, the need for animal and plant-based nutrients has increased. Meeting this need can only be achieved by increasing animal and plant-based nutrients. An increase in agricultural production can only be possible by increasing the product obtained from the unit area or from the unit animal. It can be said that consumption of plant origin nutrients is sufficient in Turkey, however, the consumption of animal origin food is not sufficient.

Today, there are still many people in the world who cannot be fed in a balanced way, especially those who suffer from animal origin protein deficiency. For a person to have an adequate and balanced diet, at least 35-40% of the protein taken into the body must be met by protein of animal origin because proteins of animal origin contain essential amino acids required for human beings in a sufficient and balanced way. At the same time, the digestibility of these proteins by humans and their usefulness to the body are superior and of higher biological value than proteins of vegetable origin. Consumption of food of animal origin in Turkey is 3-5 times less than in European Union countries and 8-10 times less than in the United States of America (Yılmaz et al., 2012).

In 2018, there were 1080 commercial enterprises, 3.211 poultry houses and 124.055 million hens in Turkey (Tuik, 2018). After the 1980s, the contracted production model started in the poultry sector in Turkey. Today, the poultry industry both meets Turkey's egg and chicken meat needs and has become able to contribute to the country's economy by exporting these nutrients (Çiçekgil, 2018).

Egg consumption per person was 333 in Japan, 307 in China, 305 in Russia, 280 in Argentina, 277 in the United States of America and 230 in Germany in 2019. In Turkey, per person egg consumption, which was 113 eggs/year in 1997, increased to 214 eggs/year in 2017 (Tuik, 2018; Yumurta Üreticileri Merkez Birliği, 2017).

There are 107 poultry houses and 6.139.251 laying hens in 30 closed commercial enterprises in Bursa, where the study was conducted. Again, there are 29 hen houses and 54.540 laying hens in 29 open commercial enterprises, while there are 50 hen houses and 772.000 laying hens in 10 breeding enterprises (Tuik, 2018).

Knowing the purchasing behaviors of consumers regarding eggs, which has an important place in human nutrition, is very important in terms of determining breeding and feeding models in poultry and developing new strategies. In this study, it was aimed to determine the egg consumption behaviors of consumers in Bursa. The fact that such a study has not been carried out in Bursa is also important in terms of the originality of the study.

Materials and Methods

Materials

In this study, face-to-face interviews were used as data collection methods and surveys were used as data collection tools. The surveys were conducted in Bursa between January and June 2021.

Methods

Study Population and Sampling

The scope of the study consisted of citizens residing in the province of Bursa in 2021. In this study, surveys were conducted with a total of 460 people determined by simple random sampling. The equation used is given below (Akbaş et al., 2007).

$$n = (t^2 * p * q) / d^2$$

n: Sample size

t₂ = Confidence coefficient (this coefficient was taken as 1.96 for 95% confidence)

p = Ratio value of the population (0.50)

$q=1-p =0,50$

d_2 = Accepted sampling error.

Statistical analysis

The frequency values (n and %) of the answers given by the consumers were calculated. All calculations were made with SPSS statistical package program.

Results and Discussion

Demographic Characteristics of Participants

In this study, 45.9% of the participants were male, 54.1% were female. At the same time, 37.6% of the families consisted of 4 people and 31.1% of them consisted of 3 people. The average household size was determined as 3.59 peoples. It was determined that 62.9% of the participants were between 35-54 age and 68.7% of them were employees, while 18% of the unemployed were housewives. While 5.2% of the participants were primary school graduates, 6.7% were secondary school graduates, 22.8% were high school graduates and 65.2% were university graduates. In the research, 28.7% of the participants were civil servants, 4.1% were students, 9.8% were workers, 8.3% were self-employment 6.3% were retired and 6.3% were other occupational groups. It was determined that 71.3% of the participants owned a house and 80.2% lived in an apartment. While 28% of the participants stated that they had an income between 3501-5500 TL, 53% stated that they had 5500 TL or more per month. It has been determined that the monthly food expenditure of 53.6% of the participants was between 1001-2500 TL. Frequency values (n and %) related to demographic characteristics of the participants are given in Table 1.

Table 1. Demographic Characteristics of The Participants

Demographic Characteristics	Options	Frequency	
		n	%
Participants' Gender	Female	249	54,1
	Male	211	45,9
	Total	460	100
	Between 18-24	29	6,3
Participants' Age (year)	Between 25-34	97	21,1
	Between 35-44	176	38,3
	Between 45-54	113	24,6
	Between 55-64	40	8,7
	65+	5	1,1
	Total	460	100,0
Educational Status of the Participants	Primary school	24	5,2
	Secondary school	31	6,7
	High school	105	22,8
	University	300	65,2
	Total	460	100,0
Occupation of the Participants	Worker	45	9,8
	Civil servant	132	28,7
	Self-employment	38	8,3
	Retired	29	6,3
	Unemployed	4	0,9
	Housewife	80	17,4
	Student	19	4,1
	Tradesmen	29	6,3
	Other	84	18,3
	Total	460	100,0
Employment Status of the Participants	Yes	316	68,7
	No	144	31,3
	Total	460	100,0
Ownership Status of the House	Homeowner	328	71,3
	Tenant	132	28,7
	Total	460	100,0
Type of House	Apartment	369	80,2
	Single house	91	19,8
	Total	460	100,0
	1	15	3,3
Number of People in the Household	2	49	10,7
	3	143	31,1
	4	173	37,6
	5	62	13,5
	6+	18	3,9
	Total	460	100,0
Participants' Total Monthly Income (TL)	Minimum wage or less	33	7,2
	Between 2825-3500	55	12,0
	Between 3501-4500	63	13,7
	Between 4501-5500	65	14,1
	5500 and above	244	53,0
	Total	460	100,0
	Between 250-500	14	3,0
	Between 501-750	46	10,0
	Between 751-1000	49	10,7
	Between 1001-1500	90	19,6
Participants' Monthly Food Expenditure Amount (TL)	Between 1501-2000	84	18,3
	Between 2001-2500	72	15,7
	Between 2501-3000	46	10,0
	3001 and above	59	12,8
	Total	460	100,0

Egg Consumption Behaviors of Participants

The frequency values (n and %) of the participants' egg consumption behaviors are given in Table 2.

No	Questions	Options	Frequency	
			n	%
1	Do you consume eggs?	Yes	453	98,5
		No	7	1,5
		Total	460	100,0
2	How many eggs are consumed in a week in your household?	Don't consume	2	0,4
		Between 5-10	78	17,0
		Between 10-15	138	30,0
		Between 15-20	118	25,7
		20 and above	124	27,0
		Total	460	100,0
3	Where do you buy the eggs?	Market	268	58,3
		Grocery store	14	3,0
		Bazaar	90	19,6
		Producer	83	18,0
		Own production	5	1,1
		Total	460	100,0
4	Which production system do you prefer for eggs produced?	Cage	59	12,8
		Free-range system	107	23,3
		Organic system	101	22,0
		Village egg	193	42,0
		Total	460	100,0
5	Which shell color do you prefer for eggs?	White	104	22,6
		Brown	144	31,3
		It does not matter	212	46,1
		Total	460	100,0
6	Which size egg do you prefer?	Small	12	2,6
		Middle	216	47,0
		Large	216	47,0
		Extra large	16	3,5
7	Does the color of egg yolk affect your preference?	Total	460	100,0
		Yes	320	69,6
		No	140	30,4
8	Which yolk color do you prefer in the egg?	Light yolk	127	27,6
		Dark yolk	333	72,4
		Total	460	100,0
9	Does the shape or appearance of the egg packaging affect your purchasing preference?	Yes	253	55,0
		No	207	45,0
		Total	460	100,0
10	Which egg packaging do you prefer?	Open viol	49	10,7
		Covered with gelatin viol	95	20,7
		Closed cardboard viol	277	60,2
		Covered with plastic viol	39	8,5
		Total	460	100,0
11	What form of presentation do you buy on the egg?	Package with 6 eggs	8	1,7
		Package with 10 eggs	42	9,1
		Package with 15 eggs	220	47,8
		Package with 30 eggs	190	41,3
		Total	460	100,0
12	Where do you buy organic or free-range eggs?	From supermarket	147	32,0
		From selling organic products markets	104	22,6
		Produces itself	42	9,1
		From bazaars	167	36,3
12	What do you pay attention to eggs produced in organic or free-range system?	Total	460	100,0
		Label	165	35,9
		Logo	55	12,0

13		Packaging	46	10,0
		Appearance	194	42,2
		Total	460	100,0
		10%	122	26,5
		20%	127	27,6
		30%	63	13,7
		50%	57	12,4
		100%	12	2,6
14	How much more money can you pay for an organic or free-range system egg than other eggs?	Don't pay more	79	17,2
		Total	460	100,0
		Every day	19	4,1
		Once a week	319	69,3
		Twice a week	60	13,0
15	What is the frequency of your egg purchasing?	Twice a month	62	13,5
		Total	460	100,0
		In oil-omelet etc.	189	41,1
		Boiled, soft-boiled	232	50,4
16	How is egg consumed the most in your household?	In Cakes, Patty	37	8,0
		At meals	2	,4
		Total	460	100,0
		Increased my egg consumption	120	26,1
		Reduced my egg consumption	15	3,3
		Did not affect my egg consumption	262	57,0
17	Have the cases of covid-19 affected your egg consumption habits?	I have no idea	63	13,7
		Total	460	100,0
		Influences positively	48	10,4
		Influences negatively	162	35,2
		Don't affect	174	37,8
18	What kind of changes may occur in your egg consumption in case of a possible economic recession if the pandemic process is prolonged?	I have no idea	76	16,5
		Total	460	100,0
		Yes	23	5,0
		No	403	87,6
19	Has there been any changes in your preference for the egg mark you bought during the pandemic process?	I have no idea	34	7,4
		Total	460	100,0
		Yes	28	6,1
		No	348	75,7
20	Has there been any changes in your preferred egg production system during the pandemic process?	I have no idea	84	18,3
		Total	460	100,0

As seen in Table 2, it was determined that 98.5% of the consumers consumed eggs in their households and 58.3% of them obtained the eggs from the supermarket. It has been determined that the after the market most preferred egg supply way was the farmers market (19.6%) and the producer (18%), respectively. In this study, the finding that 98.5% of the consumers consumed egg in their households was found similar to the reported values by Cevger et al. (2008), Mızrak et al. (2012), İskender and Kanbay (2014), Alkan and Derebaşı (2018), and Aytıp and Işık (2020). In the research, it was thought that the main reason for the preference of the market as a place of supply for eggs (58.3%) was the fact that the markets were more dominant and more accessible as a place of food supply. The finding that the egg supply place was a market in this research was parallel to the reported values by Erdoğan (2013), Mızrak et al. (2012), İskender and Kanbay (2014), and Aytıp and Işık (2020). In contrast, Altan et al. (1993), and Alkan and Derebaşı (2018) reported different finding from our results in terms of egg purchasing place. Consumers were asked "*how many eggs are consumed per week in your household*", and 30% of the consumers stated that they consumed 10-15 eggs, 27% of consumers 20 or more eggs, 25.7% of consumers 15-20 eggs and 17% of consumers 5-10 eggs per week in their household.

It was determined that 42% of the consumers preferred village eggs, 45.3% consumers preferred eggs produced in the organic and free-range system, and 12.8% consumers preferred eggs produced in the cage system. It is thought that consumers most likely perceive village eggs as eggs obtained from hens that can roam freely outside the cage system. In this study, a result of consumers'

preference for village eggs was found different from the reported findings by Bejaei et al. (2011), Durmuş et al. (2007) and Mızrak et al. (2012), but it was similar to the result of reported by İskender and Kanbay (2014).

In the research, 31.3% of the consumers reported that they preferred the brown shell-colored eggs and 22.6% of the consumers preferred the white shell-colored ones. On the other hand, 46.1% of consumers stated that the color of the eggshell was not effective in their purchasing preferences, and they said that they bought both. There is no relationship between the eggshell color and the nutrient content of the egg. However, as in this study, it was reported in some studies that consumers generally prefer brown shelled eggs (Durmuş et al., 2007; İskender and Kanbay, 2014). The reason for these behaviors is thought to be due to the fact that consumers find brown shelled eggs more robust and that this color was more attractive. In this study, we determined that 47% of consumers prefer medium (47%) and large (47%) large eggs. These finding was found to be similar to the results reported by İskender and Kanbay (2014), and Alkan and Derebaşı (2018). Again, Durmus et al. (2007) reported that 49.68% of consumers prefer large eggs and 47.77% consumers prefer medium sized eggs.

In the research, 69.6% of consumers stated that the color of egg yolk was effective in their preferences and 72.4% of them stated that they preferred dark yolk eggs. This result was found to be different from the results of reported by Durmuş et al. (2007) and, İskender and Kanbay (2014). Again, in the study conducted by Alkan and Derebaşı (2018), 75.26% of consumers stated that the color of egg yolk was effective in their preferences and 78.55% of them preferred dark yolk eggs. The preference for dark yolk eggs is thought to be due to the belief among the consumers that dark yolk eggs are tastier and have higher nutritional values, although this belief is not true.

In recent years, eggs have been offered for sale in different shapes and packaging. In the research, 55% of the consumers stated that the packaging style affects their egg purchasing behaviors, whereas 45% did not. Again, it was determined that 60.2% of the consumers preferred the closed cardboard viol as their packaging preference, followed by the covered with gelatin viol (20.7%). It is thought that the closed cardboard viol is preferred because it opens easily and allows the eggs to be physically controlled, and the covered with gelatin viol is preferred because it allows the egg to be seen with the eye. In this study, 55% of the consumers stated that the packaging shape and appearance of the egg affect their purchasing behaviors. This finding was found to be similar to the results reported by Durmuş et al. (2007), and Mızrak et al. (2012). At the same time, in the research, the result that 60.2% of consumers prefer closed cardboard viols showed similarity with the result of Alkan and Derebaşı (2018) that 48.84% of consumers prefer closed cardboard viols.

In the research, it was determined that 47.8% of the consumers preferred the 15 eggs presentation style and 41.3% preferred the 30 eggs presentation style. While this result was found to be different from the result reported by Durmuş et al. (2007), it was completely similar to the result reported by Alkan and Derebaşı (2018) that 47.80% of the consumers preferred the 15-egg presentation style.

36.3% of consumers stated that they buy the eggs that produced in organic or free-range system from the market, 32% from the supermarkets, and 22.6% from the markets that sell organic products. At the same time, when purchasing organic or free-range eggs, 42.2% of the consumers stated that they bought the egg by looking at the appearance, 35.9% by looking at the label of the egg, and 12% by looking at the logo of the egg. Goddard et al. (2007) reported that elderly consumers were not interested in eggs that produced in organic and free-range system, but they were more interested in functional eggs. Bejaei et al. (2011) reported that consumers think that eggs produced in the free-range system or organic system have more nutritional value than the eggs produced in the cage system, and that the consumption preference of the eggs produced in the cage system is decreasing day by day, mostly due to animal welfare concerns.

For organic eggs, 27.6% of consumers stated that they could pay 20% more, 26.5% consumers as 10% more, 13.7% consumers as 30% more, 12.4% consumers as 50% more and 2.6% consumers as 100%

more. On the other hand, 17.2% of consumers stated that they do not want to pay more in by no means. It was concluded that only 17.2% of the consumers determined in this study did not want to pay more similar to the result reported by Mızrak et al. (2012). This was also parallel with the findings in some studies (Goddart et al., 2007; Gracia et al., 2014; Mesias et al., 2011) that consumers are willing to pay more for organic eggs. However, Durmuş et al. (2007) stated that 60% of consumers did not want to overpay for organic eggs. Also, it has been determined that 69.3% of consumers buy eggs once a week. This result was similar to the result reported by Alkan and Derebaşı (2018), that 66.49% of consumers buy eggs once a week. In the study, 50.4% of the consumers reported that they consumed eggs as boiled and soft-boiled eggs for breakfast, and 41.1% of the consumers as omelet in oil. These results were similar to the results of 63.5% of the consumers reported by Çelik and Şengül (2001), consume boiled and oiled egg for breakfast in the morning. However, this result was different from the values reported in some studies in the literature (Alkan, & Derebaşı, 2018; Durmuş et al., 2007; Mızrak et al., 2012).

Conclusion

Epidemics are health events with global affects that cause changes in the economy, education system, management systems and lifestyle in the world. In addition, looking at the epidemics in history, it has been the cause of new developments in many subjects, from nutrition to architecture and the collapse of states. We can easily say that not only education, working methods, social relationship and consumption preferences, but also eating habits or behaviors have changed during the coronavirus epidemic. Adequate and balanced nutrition is the most important part of a healthy life. "Nutrition therapy" is recommended for the cure of many diseases, including acute, chronic, and infectious diseases. For this reason, it is very important to pay attention to the principles of healthy nutrition in normal times as in quarantine periods. In the process of epidemics, not only sick individuals, but also healthy individuals, especially to support their immune systems, need to be fed adequately and balanced. Eggs, which are sources of animal protein, have a very important place in the adequate and balanced nutrition of people during epidemics or normal periods. For this reason, all necessary conditions should be fulfilled for people to consume enough eggs and this situation should be handled as a state policy in Turkey. It should not be forgotten that healthy societies only consist of healthy people.

Author Contribution

Özlem Berber, collected and analyzed data. *Sezai Alkan*, supervised data collection and analysis and was responsible from all stages of manuscript preparation.

Ethic

There are no ethical issues with the publication of this article.

Conflict of Interest

The authors state that there is no conflict of interest.

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