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Research Article/Araştırma Makalesi

Determining consumers' attitudes towards organic products by factor analysis: The example of organic product markets

Faktör analizi ile tüketicilerin organik ürünlere yönelik tutumlarının belirlenmesi: Organik ürün pazarları örneği

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ABSTRACT

This study was carried out in order to reveal the attitudes of consumers toward organic products in the provinces of Istanbul, where Turkey's first and largest organic product market is located, and Izmir, where organic production first started. For this purpose, face-to-face surveys were conducted with 271 consumers who went to the organic product market using the proportional sample volume formula. Frequency tables were used in the analysis of demographic data obtained from the questionnaires. The Factor Analysis method was used to measure consumers' behavior toward organic products. It was determined that the majority of organic product consumers who participated in the survey were women (60.1%), married (66.8%), university graduates (57.6%), and individuals with high income (89.6%). After removing the missing, outlier, and extreme values, 251 questionnaires and 13 statements were used in the Factor Analysis. Within the scope of the results obtained, it was determined that reliability, experience (comparison), research (cognitive) and health factors directly affect the consumption of organic products in the attitudes of consumers in Istanbul and Izmir provinces towards organic products. It has been determined that it is important to increase the number of organic product markets throughout the country and to develop public service announcements highlighting these characteristics of organic products to increase organic product consumption.

Key Words: Organic bazaar, Organic consumer, Consumer behaviour, Factor analysis

ÖZ

Bu çalışma, Türkiye'nin ilk ve en büyük organik ürün pazarının bulunduğu İstanbul ve organik üretimin ilk başladığı İzmir illerinde tüketicilerin organik ürünlere yönelik tutumlarını ortaya koymak amacıyla yapılmıştır. Bu amaç kapsamında, oransal örnek hacim formülü kullanılarak organik ürün pazarına giden tüketicilerden 271'i ile yüz-yüze anketler yapılmıştır. Anketlerden elde edilen demografik verilerin analizinde frekans tabloları kullanılmıştır. Tüketicilerin organik ürünlere yönelik davranışlarını ölçmek için Faktör Analizi yöntemi kullanılmıştır. Ankete katılan organik ürün tüketicilerinin büyük çoğunluğunun kadın (%60.1), evli (%66.8), üniversite mezunu (%57.6) ve yüksek gelir seviyesinde (%89.6) bireyler olduğu belirlenmiştir. Eksik, aykırı ve uç değerler atıldıktan sonra Faktör Analizinde 251 anket ve 13 ifade kullanılmıştır. Elde edilen sonuçlar kapsamında İstanbul ve İzmir illerindeki tüketicilerin organik ürünlere yönelik tutumlarında güvenilirlik, deneyim (karşılaştırma), araştırma (bilişsel) ve sağlık faktörlerinin organik ürün tüketimini doğrudan etkilediği belirlenmiştir. Organik ürün tüketimini artırmak için ülke genelinde organik ürün pazarlarının sayısının artırılmasının ve organik ürünlerin bu özelliklerini öne çıkaran kamu spotlarının geliştirilmesinin önemli olduğu tespit edilmiştir.

Anahtar Kelimeler: Organik pazar, Organik tüketici, Tüketici davranışı, Faktör analizi

Introduction

Increasing environmental and health problems around the world have multiplied the demands for organically grown products (fruits, vegetables, meat dairy products, etc.). Especially the Covid-19 pandemic, one of the most recent disasters of our time, has brought up the strong immune system. This leads people to healthier, fewer additives, and more reliable products (Gil et al., 2000). The trend towards healthy products draws great attention in Turkey as well.

Turkey is a geographical bridge connecting the continents of Europe and Asia, with 96% in the Asian continent (Anatolia) and 4% in the European continent (Thrace). Turkey has special importance in world trade and transportation as it has a single 160 nautical mile-long waterway connecting the Bosphorus, the Sea of Marmara and the Dardanelles, and the Black Sea to the Mediterranean and other seas (Sanli, 2018).

The beginning of organic agriculture in Turkey was first realized in the period 1984-1985, based on the agreements made between the producers in Turkey and the European importers. Organic farming practices, which started with the projects put forward by the importing companies in the country to produce, continued with the exporting companies acting independently from the importing companies and creating their own markets (Merdan, 2014). With the increase in the demand for organic products in recent years, organic product markets have been established at 20 points throughout the country, especially in the provinces of Istanbul and Izmir (TOB, 2021).

Products grown, processed and stored without the use of harmful factors such as genetic modification, genetic regulators, growth hormone, synthetic fertilizer, and chemical-based pesticides are generally referred to as organic products (Jones et al., 2001). The increase in demand for organic products has also positively affected organic product varieties and has spread to a wide range, recently. For example, it is possible to find products organically such as fresh and dried vegetables and fruits, animal products (white and red meat, milk and dairy products), bread, frozen or baked foods, processed and packaged foods, cosmetic products, cleaning products, diapers, toys, medical and aromatic plants, stationery made from wood (books, paper, some office supplies, etc.), furniture, textile products (yarn, clothing, etc.) (Sahin, 2019).

Special maintenance carried out in the production processes of organic products and the cultivation process of the products, low efficiency in production, storage conditions, the multiplicity of agents, retailer margins and high costs in terms of shelf life are inevitably reflected in the consumer. High price status is one of the reasons that is considered undesirable for consumers in terms of supply-demand balance and causes organic product consumption to remain at minimal levels (Gil et al., 2000). However, organic product bazaars ensure that organic products reach the consumer at more reasonable prices because it is a tool that allows the producer and the consumer to be in direct contact. Weekly organic product bazaars are established in Turkey, where only certified products are sold, where the authorities of producers, intermediaries, municipalities and/or non-governmental organizations are in charge, enabling the development of the domestic bazaar of organic products. These bazaars allow for the establishment of a bond between the producer and the consumer of organic products, the creation of trust beyond the documents, and increasing confidence thanks to transparent control mechanisms (Bugday Dernegi, 2018).

In this study, the attitudes of consumers towards organic products in Istanbul, where Turkey's first and largest organic product market is located, and Izmir, where organic production first started, were investigated. Knowing who the organic product producer coming to the market is and what him wants is of great importance in deciding what direction the production will take (Bourn and Prescott, 2002; Padel and Foster, 2005). Face-to-face surveys were made with 271 of the consumers who go to the organic product bazaar. Within the scope of the questions asked

in the surveys, 24 Likert scale-based expressions were asked to measure the attitudes of consumers to organic products and the data obtained from these expressions were subjected to Factor Analysis. As part of the results obtained, it was determined that reliability, experience (comparison), research (cognitive), and health factors directly affect the consumption of organic products in the attitudes of consumers in Istanbul and Izmir provinces towards organic products.

Material and Method

The data used in the study were obtained from face-to-face surveys with consumers in organic markets operating in Karsiyaka and Balcova districts in İzmir and Sisli and Kartal districts in Istanbul, Turkey. The proportional sample size formula was used to determine the number of people who would enter the study sample from consumers (Newbold, 1995). This formula (1);

$$n = \frac{Np(1-p)}{(N-1)\sigma_{px}^2 + p(1-p)} \quad (1)$$

in this formula, n was used for sample size; N was used for the number of people in Balcova, Karsiyaka, Sisli and Kartal; p was used for the proportion of people coming to the organic bazaar and σ_{px}^2 was defined as the variance of the ratio. The total number of households in Sisli, Kartal, Balcova and Karsiyaka was approximately 285 735. P=0.50 was taken to reach the maximum in the number of interviews (sample size) from consumers coming to the organic bazaar. Sample size for 5% margin of error and 90% confidence range is calculated as 271.

The distribution of sample size by districts and organic bazaars in these districts is given in Table 1. Within the scope of the study sample, in 2017 with 66 consumers from Bostanli organic bazaar in Karsiyaka district of Izmir province, with 13 consumers from Mavisehir/Mavibahce organic bazaar and with 19 consumers from Balcova organic bazaar in Balcova district, with 98 consumers in total were surveyed through face-to-face interviews in Izmir. In Istanbul, 65 consumers in Sisli/Ferikoy organic bazaar and 108 consumers in Kartal organic bazaar and 173 consumers in total were surveyed. 271 people interviewed in Izmir and Istanbul were consumers who go to the organic bazaar.

Table 1. Sample size and distribution

IZMIR	Number of Households	Number	%
Balcova	19 530	19	6
Bostanlı	69 603	66	25
Mavisehir	13 710	13	5
ISTANBUL	**Number of Households**	**Number**	**%**
Kartal	114 388	108	40
Sisli	68504	65	24
TOTAL	**285 735**	**271**	**100.0**

The Factor Analysis method was used to determine the attitudes of consumers toward organic products (foods). Factor analysis is divided into two sections. The first is Exploratory, and the second is Confirmatory factor analysis (Stevens, 2009). The method used in this study is Exploratory Factor Analysis. In order to prepare the research data for Factor Analysis, data searching was performed. Mahalanobis D2 test was used to determine the extreme values in responses to attitude statements (Tabachnick and Fidell, 2007; Cihat et al., 2020) towards organic products. Mahalanobis D2 test is used in multivariate analysis to determine observations with extreme values taking into account all variables (the consumer's answers for each statement) (Merter and Vannatta, 2010). As a result of the test, it was determined that 20 observations had extreme values and the number of observations decreased to 251. At the stage of obtaining these factors, the aim is to obtain a small number of factors that will represent the relationships between the variables to the highest degree. In factor rotation, it is to obtain nameable and interpretable factors. Orthogonal (right-angle) rotation is the most used method in rotation. The factors obtained in orthogonal rotation are not in correlation with each other. In non-orthogonal (obligue) rotation, the factors are in correlation with each other. In other words,

they are not independent of each other. Orthogonal rotation was used in this study. Three techniques are used in orthogonal rotation. These are varimax (the most used technique), equamax and quartimax, respectively. Varimax rotation was used in the study (Kalaycı, 2006; Malhotra, 2010; Sahin, 2019).

Factor Analyze (FA) (Tabachnick and Fidell, 2001; Askan et al., 2021; Topcu and Cavdar, 2022), which is used for data reduction or summarizing without discriminating between dependent and arguments, determines the decisive factors to describe the correlations between variables (Malhotra, 2010; SPSS-20.0, 2020). When determining the number of factors obtained from factor analysis, factors with greater than one eigenvalue were taken into account, and the low ones were not included in the analysis (Hair et al., 1998). It was examined whether the 24 statements presented to consumers on the attitude scale met the criteria in factor analysis. As a result of this process, 11 statements considered problematic on the attitude scale were excluded from the analysis. It is understood that these statements do not define the attitude of consumers towards organic products and do not reflect the basic components of consumer attitude.

Results and Discussion

When looking at the gender of the consumers (271 people) surveyed, 60.1% were women and 39.9% were men. When looking at the distribution by province, 54.3% of the consumers (173 people) in Istanbul are women and 45.7% are men, while 60.1% of consumers (98 people) in Izmir are women and 39.9% are men. This indicates that most women come to the organic product bazaars to shop. In addition, the average age of consumers was found to be about 45. While the oldest consumer age participating in the survey is 75 and the smallest is 20. At least 1 person lives in the households of consumers, at most 7 people, about an average of 3 people.

It was determined that 66.8% of the consumers surveyed in the organic product bazaar were married, 25.8% were single and 7.4% were divorced or their spouses had passed away. In this case, it is possible to say that married people are more in demand for organic bazaars and therefore organic products.

While 89.6% of consumers have a high income of 4000TL or more, 8.1% are in the income group between 2000TL and 3999TL, and 2.3% are in the low-income group, equal to or less than 1999TL. In addition, in the distribution by provinces, 81.5% of consumers in Istanbul and 94.4% of consumers in İzmir are in the high-income group.

When the education levels of consumers were examined, it was found that the vast majority of them had a university degree with 57.6% (156 people), 19.9% (54 people) had a postgraduate education, and 15.1% (41 people) were high school graduates. This reveals that the educational levels of the consumers from the organic product bazaar are high.

When occupational groups are examined, a large part (23.2%) is in the self-employed group. 19.6% are private sector employees, 17% are retired, 11.4% are public sector employees, 10% are tradesmen, 8.1% are teachers, 4.4% are academics, 2.6% are employers and 3.3% are housewives. In the distribution by province, the vast majority (36.4%) in Istanbul are self-employed people and the vast majority (37.7%) are teachers in Izmir. In second place, private sector workers in Istanbul constitute 26% and tradesmen in Izmir with 22.4%. While 0.6% of the consumers in Istanbul are students, 8.2% of the consumers in Izmir are private sector employees. No unemployed group has been found in organic product consumers.

When the regional cuisines preferred by consumers in their own households were examined, it was revealed that a large proportion (48.7%) chose Aegean region cuisine. Following this, it was determined that 14.8% of consumers preferred Mediterranean region cuisine, 11.1% preferred Marmara region cuisine, 7.7% preferred Southeast Anatolia, 7% preferred Central Anatolia, 5.9% preferred Eastern Anatolia and at least 4.8% preferred Black Sea region cuisine (Table 2).

Table 2. Demographics of consumers

Gender Status	PROVINCE				OVERALL	
	IZMIR		ISTANBUL			
	Number	%	Number	%	Number	%
Women	69	70.4	94	54.3	163	60.1
Men	29	29.6	79	45.7	108	39.9
Total	98	100	173	100	271	100
Age	**Lowest Value=** 20; **Highest Value=** 75; **Average=** 45.03S; S**tandard Deviation =** 12.10					
Number of Households	**Number=** 271; **Lowest Value=** 1; **Highest Value=** 7; **Average=** 2.59; **Standard Deviation=** 1.13					
Marital Status	**PROVINCE**				**OVERALL**	
	IZMIR		**ISTANBUL**			
	Number	**%**	**Number**	**%**	**Number**	**%**
Single	15	15.3	55	31.8	70	25.8
Married	78	79.6	103	59.5	181	66.8
Divorced or wife/husband dead	5	5.1	15	8.7	20	7.4
Total	98	100	173	100	271	100
Income Level	**PROVINCE**				**OVERALL**	
	IZMIR		**ISTANBUL**			
	Number	**%**	**Number**	**%**	**Number**	**%**
Low Income (≤1999TL)	1	0.9	3	4.6	4	2.3
Middle Income (2000TL-3999TL)	5	4.6	9	13.8	14	8.1
High Income (4000TL and above)	102	94.4	53	81.5	155	89.6
Total	108	100	650	100	173	100
Educational Level	**PROVINCE**				**OVERALL**	
	IZMIR		**ISTANBUL**			
	Number	**%**	**Number**	**%**	**Number**	**%**
Literate	5	5.1	-	-	5	1.8
Primary Education	7	7.1	5	2.9	12	4.4
Secondary School	3	3.1	-	-	3	1.1
High School	19	19.4	22	12.7	41	15.1
University	58	59.2	98	56.6	156	57.6
Postgraduate	6	6.1	48	27.7	54	19.9
Total	98	100	173	100	271	100
Occupational Group	**PROVINCE**				**OVERALL**	
	IZMIR		**ISTANBUL**			
	Number	**%**	**Number**	**%**	**Number**	**%**
Civil Servant	19	19.4	12	6.9	31	11.4
Private Sector Employee	8	8.2	45	26.0	53	19.6
Tradesmen	22	22.4	5	2.9	27	10.0
Retired	-	-	10	5.8	46	17.0
Teacher	36	36.7	9	5.2	22	8.1
Academic	-	-	12	6.9	12	4.4
Employer	-	-	7	4.0	7	2.6
Housewife	-	-	9	5.2	9	3.3
Self-Employed	13	13.3	63	36.4	63	23.2
Student	-	-	1	0.6	1	0.4
Total	98	100	173	100	271	100
Preferred Regional Cuisine	**PORVINCE**				**OVERALL**	
	IZMIR		**ISTANBUL**			
	Number	**%**	**Number**	**%**	**Number**	**%**
Aegean	76	77.6	56	32.4	132	48.7
Marmara	2	2.0	28	16.2	30	11.1
Black Sea	2	2.0	11	6.4	13	4.8
Central Anatolia	3	3.1	16	9.2	19	7.0
Eastern Anatolia	4	4.1	12	6.9	16	5.9
Southeastern Anatolia	1	1.0	20	11.6	21	7.7
Mediterranean	10	10.2	30	17.3	40	14.8
Total	98	100	173	100	271	100

While the literature was searched, the demographic structure results of organic product consumers were examined and it was determined that these results matched the data we obtained (Bıyıkoglu, 2010; Etiicli et al., 2016; Gungor, 2019).

Whether the 24 statements presented to the consumers with the attitude scale met the criteria in the factor analysis was examined. As a result of this process, 11 expressions that were thought to be problematic in the attitude scale were excluded from the analysis. These statements and the reasons for their exclusion from the analysis are given in Table 3. It can be said that these statements do not define the attitude of consumers towards organic products and do not reflect the basic components of consumer attitude.

Table 3. Statements extracted from factor analysis and their reasons

Expressions	Problem	Condition
Organic products taste better than traditional products.	Common variance	Does not satisfy the condition of being greater than 0.50
Organic products are more expensive than traditional products.	Sample fit measure	Does not satisfy the condition of being greater than 0.50
More land should be allocated for organic farming.	Common variance	Does not satisfy the condition of being greater than 0.50
Organic products are important for my family to get the necessary nutrients.	Common variance	Does not satisfy the condition of being greater than 0.50
Chemical fertilizers were not used while growing organic products.	Common variance	Does not satisfy the condition of being greater than 0.50
Organic products help reduce the risk of getting sick.	Complex structure problem	Variable cannot load more than 0.40 from more than one dimension
Consuming organic products is safer than consuming traditional products.	Complex structure problem	Variable cannot load more than 0.40 from more than one dimension
The biggest factor in my preference for organic products is that they are beneficial to human health.	Complex structure problem	Variable cannot load more than 0.40 from more than one dimension
Supermarkets should have more variety of organic products.	Common variance	Does not satisfy the condition of being greater than 0.50
Consuming organic products is healthier than consuming traditional products.	Complex structure problem	Variable cannot load more than 0.40 from more than one dimension
As a consumer, I am always ready to pay more for organic products.	Common variance	Does not satisfy the condition of being greater than 0.50

**1: Absolutely not important, 5: Absolutely important*

The final factor analysis was performed using 251 observations and 13 statements. The number of observations corresponds to the ratio of 1:5 (five observations for each variable), which expresses the minimum number of observations required for factor analysis. In the factor analysis part of the surveys, 4 dimensions with an eigenvalue greater than 1 were derived (Table 3 and 4). The total described variance was found to be sufficient with 69.56%. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.726. The Bartlett test of sphericity ($p<0.01$) is meaningful. The results indicate that it is appropriate to determine the dimensions underlying consumers' attitudes toward organic products by Factor Analysis. As a result of the reliability analysis for the dimensions obtained from the factor analysis, it is determined that Cronbach's Alpha coefficient is between 0.70 and 0.88 (Table-4). This result indicates that the scale of internal consistency is good (Malhotra, 2010).

Each factor is classified under certain headings by taking advantage of the characteristics of the four factors obtained as a result of the analysis. The titles of these four factors show the attitudes of consumers towards organic products; safety, experience (comparison), research (cognitive), and health.

Table 4. Factor analysis results

Factors	Average*	Standard Deviation	Factor Loading
Reliability (α=0.78)			
Organic product is a product that has not been subjected to any chemical treatment.	4.75	0.503	0.865
Organic products do not contain additives.	4.65	0.542	0.754
Organic products help to gain the biological balance of nature.	4.74	0.484	0.730
If I can find it, I'd be happy to consume more organic produce.	4.70	0.477	0.639
Experience (Comparison) (α=0.88)			
I don't think organic products contain more vitamins and minerals than traditional products.	1.76	1.293	0.913
I don't think there is a significant difference between organic products and traditional products.	1.77	1.303	0.908
Organic products have reduced pesticide use in agriculture**	4.41	0.812	-0.842
Research (Cognitive) (α=0.70)			
I think organic products are a temporary fad.	1.19	0.448	0.801
Organic products are no better quality than traditional products.	1.24	0.474	0.755
I don't buy organic products because they are more expensive than traditional products.	1.57	0.875	0.690
I don't think about buying organic products when there are traditional products.	1.30	0.548	0.686
Health(α=0.78)			
For human health, consuming organic products is more beneficial than consuming traditional products.	4.63	0.587	0.873
Organic products are more nutritious than traditional products.	4.58	0.643	0.853
Total Explained Variance (%)			69.560
Kaiser-Meyer-Olkin			0.726
Bartlett's Test (Chi-square)			1495.099
P			0.000
N			251

*1: I strongly disagree, 5: I strongly agree.

** The opposite scale used for expression was taken when performing reliability analysis.

When the reliability factor is examined, there are four characteristics that consumers consider in their attitudes towards organic products. These are the fact that the organic product has not been subjected to any chemical treatment, helps to gain the biological balance of nature, does not contain additives and is satisfied to consume more organic products. The experience (comparison) factor includes three characteristics: the reduction of pesticide uses in agriculture of organic products, the idea that there is no difference between the organic products and traditional product, and the idea that organic products do not contain more vitamins and minerals than traditional products. In the research (cognitive) factor, there are four characteristics with the idea that organic products are more expensive than traditional products, not better quality, that organic products are a temporary fad, and that they do not buy organic when there are traditional. In addition, the health factor includes two characteristics with the idea that consuming organic products is more beneficial and more nutritious than consuming traditional products (Table 4).

In the literature studies on consumer attitudes towards organic products, it was determined that the health factor is important and overlaps with the results of our studies (Makatouni, 2002; Magnusson et al., 2003; Armagan and Ozdogan, 2005; Karabas, 2011; Tetik, 2012; Celik, 2013; Karaman et al., 2013; Sezgin and Uzundumlu, 2019). In their 2018 study, Cam and Karakaya determined that factors such as the safety of organic products and the fact that organic products are not harmful to health are the most important factors affecting the preference for organic product consumption (Cam and Karakaya, 2018). In 2015, Yaprakli concluded that the perception of quality is effective in consumers' organic product preferences (Yaprakli, 2015). In 2007, Sarikaya determined that responsibility,

trust, value and benefit factors stand out in terms of consumers ' behavior and attitudes towards buying organic products (Sarikaya, 2007). In a study by Inci et al. in 2017, the factors affecting consumers' consumption of organic products were found to be healthy, natural and ecological, safe, price and nutritional value (Inci et al., 2017). In an article by Bahsi and Akca in 2019, the reasons why consumers use organic products were found to be healthy, not use chemical drugs, reliable, taste good, curiosity, and advice (Bahsi and Akca, 2019). The results of these studies, which were previously carried out for organic products, support the research result that we have found.

Conclusions

As part of this research, 271 consumers were surveyed face-to-face. When the demographics of consumers are examined within the scope of the surveys, the average number of individuals living in the household consists of 3 people, the average age is 45, 60% are female, 67% are married and 58% are university graduates. Most of the consumers are in the self-employed group with 23% and 20% are in the private sector group. When the region's cuisine that consumers prefer in their households was examined, it was revealed that a large part of them prefer dishes belonging to the Aegean region. Therefore, it can be said that consumers of organic products usually consist of the middle age group, married, female, university graduates, self-employed and mostly individuals who prefer dishes belonging to Aegean region cuisine. The results of Factor Analysis, which examined consumers' attitudes towards organic products, have revealed that reliability, experience (comparison), research (cognitive), and health factors have a direct effect on consumers' consumption of organic products. Considering these results, it is recommended that both the relevant municipalities and Non-Governmental Organizations highlight organic product advertising for organic product bazaars. The fact that organic products are different and healthy from other products is an important point that should be emphasized in campaigns related to the promotion of organic products. It is considered that it is important to focus on efforts to increase the organic product information of consumers and expand organic bazaars and increase the consumption of organic products.

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