

Socioeconomic factors shaping consumer preferences for vegetable oil: the case of Tokat province

Asena ERTÜRK*  Gülistan ERDAL 

Tokat Gaziosmanpaşa University, Faculty of Agriculture, Department of Agricultural Economics, Tokat, Turkey

*Corresponding author e-mail: asenaerturk.3417@gop.edu.tr

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Abstract: The study aims to examine consumer preferences for vegetable oil consumption in the urban area of Tokat province. The main material of the research consists of primary data obtained through a survey of consumers residing in the urban area of Tokat province. The sample size was determined as 271. The data obtained were evaluated using frequencies, percentages, cross-tabulations, and Chi-square analysis. According to the research results, 85.6% of consumers use sunflower oil, and 62.0% use olive oil. Among sunflower oil consumers, the most important reasons for preference were price affordability (68.1%), habit (51.3%), and taste (38.4%). In olive oil consumption, however, the most important reasons for preference were health perception (83.3%) and taste (66.7%). The findings show that price, health perceptions, and habits play important roles in consumers' preferences for vegetable oil. The results provide important information on consumer preferences for vegetable oil consumption at the provincial level.

Keywords: Consumer behavior, Vegetable oil consumption, Olive oil consumption, Sunflower oil consumption

Tüketicilerin bitkisel yağ tercihlerini şekillendiren sosyoekonomik faktörler: Tokat ili örneği

Öz: Bu çalışmanın amacı Tokat ili kentsel alanda tüketicilerin bitkisel yağ tüketimine yönelik tercihlerini incelemektir. Araştırmanın ana materyalini Tokat ili kentsel alanda ikamet eden tüketicilerden anket yöntemi ile elde edilen birincil veriler oluşturmaktadır. Örnek hacmi 271 olarak belirlenmiştir. Elde edilen veriler frekans, yüzde, çapraz tablolar ve Ki-kare analizi kullanılarak değerlendirilmiştir. Araştırma sonuçlarına göre tüketicilerin %85.6'sının ayçiçeği yağı ve %62.0'sinin zeytinyağı tükettiği belirlenmiştir. Ayçiçeği yağı tüketiminde en önemli tercih nedenlerinin fiyat uygunluğu (%68.1), alışkanlık (%51.3) ve lezzet (%38.4) olduğu tespit edilmiştir. Zeytinyağı tüketiminde ise en önemli tercih nedenlerinin sağlıklı olması (%83.3) ve lezzet (%66.7) olduğu belirlenmiştir. Bulgular, tüketicilerin bitkisel yağ tercihinde fiyat, sağlık algısı ve alışkanlık gibi faktörlerin önemli bir rol oynadığını göstermektedir. Elde edilen sonuçlar, il düzeyinde tüketicilerin bitkisel yağ tüketim tercihleri hakkında önemli bilgiler sunmaktadır.

Anahtar kelimeler: Tüketici davranışı, Bitkisel yağ tüketimi, Zeytinyağı tüketimi, Ayçiçek yağı tüketimi

1. Introduction

Supply shortages of animal-derived fats and the consequent increase in their prices have increased the demand for vegetable oils (Gündüz, 2021). In recent years, a significant portion (92.1%) of the fats necessary for human nutrition has been met by vegetable oils (Kolsaracı et al., 2015; Onat et al., 2017). Vegetable oils hold special importance due to their low saturated fat content, the presence of free fatty acids necessary for cell structure, and their capacity to dissolve fat-soluble vitamins in the human body; they provide significant benefits for human health and high

nutritional value (Gündüz & Esengün, 2010; Irmak & Ercan, 2017).

Global oilseed production increased by 32% between 2010 and 2019, reaching 1.1 billion tonnes. In global production, palm oil (37.25%) and soybean oil (30.30%) have the largest shares. When examining production dynamics in Turkey, sunflower production holds a significant place, in contrast to the global trend. As of 2019, oilseed sunflower alone accounts for 48.93% of Turkey's oilseed production, which reached approximately 3.9 million tonnes (Anonymous, 2020). Individuals' nutritional habits are shaped by the interplay of multidimensional factors, including

lifestyle practices, cultural heritage, and health sensitivities (Kaya et al., 2023). In this context, consumption trends for vegetable- and animal-derived fats also vary with the factors mentioned above (Akçay & Vatansever, 2013). Especially in Turkey, the amount of fat consumed and the variety of preferred products are determined by a wide range of socioeconomic variables, from regional production patterns to household income levels, and from social structure to changes in food prices (Kaya et al., 2023).

A consumer is defined as an individual who purchases products or services to meet their own and their family's wants and needs and has the purchasing power to do so (Durmaz & Bahar, 2011). Consumer behavior refers to an individual's decisions regarding the purchase and use of products and services, as well as the mental and physical activities that accompany these decisions. Although consumer behavior varies at the individual level, it is shaped by the combined effects of socioeconomic, demographic, sociocultural, and psychological factors, as well as institutional and cultural dimensions (Karabaş & Gürler, 2012). Elements such as marital status, education, habits, taste preferences, and general preferences play a decisive role in shaping consumption patterns (Brazdova, 1994; Urak et al., 2018).

In the literature, sunflower oil is the most preferred among household oils in Turkey (Avcı & Gül, 2021). However, factors such as culinary culture, taste preferences, and regional production opportunities can directly affect the composition of fat consumption. For example, in the Aegean and Mediterranean regions, where olive cultivation is widespread, the use of olive oil has been determined to be more common (Küçükkömürler & Uluksar, 2018).

There are various regional studies in Turkey examining consumer preferences for Vegetable oil consumption. Some of these studies address general vegetable oil consumption habits, while others focus on a specific type of oil. Regarding general consumer preferences, Öztekin (2006) examined the vegetable oil consumption behaviors of consumers living in Tekirdağ; Gündüz and Esengün (2010) in Samsun; Karakaş (2020) in Çorum; Avcı (2021) in Konya; Oruç et al. (2023) in Samsun. Additionally, in studies focusing on olive oil consumption, Ağır et al. (2018) analyzed consumer preferences for olive oil in İzmir-Dikili, Tapkı et al. (2020) in Hatay city center, and Küçükkömürler and Uluksar (2018) in Muğla province. These studies

reveal that consumer preferences for vegetable oil may vary with regional socioeconomic conditions and local production structures.

The literature indicates that sunflower and olive oil are among the most widely preferred oils across diverse markets. Tokat province is one of Turkey's important sunflower-producing provinces, accounting for approximately 3.75% of the country's sunflower production (Anonymous, 2024). However, the dynamics of the vegetable oil consumption in the region appear to have been sufficiently examined. It is considered that Tokat's production capacity and proximity to raw materials may influence local consumers' consumption habits. This study aims to fill the existing gap in literature by determining sunflower and olive oil consumer preferences among residents of the urban area of Tokat province and the socioeconomic factors influencing these preferences.

2. Materials and Methods

The main material of the study consists of primary data obtained through a survey study conducted with consumers residing in the urban area of Tokat province. A probability sampling method was used to determine the sample size, as indicated in Equation (1) (Çiçek and Erkan, 1996). As of 2022, the population of Tokat city center is 158.646 people (Anonymous, 2022).

$$n = \frac{N(p.q)}{(N-1)D^2 + (p.q)} \quad (1)$$

In the equation;

n = sample size, N = number of units in the population (158.646)

D = d/t (d: acceptable margin of error taken as 5%; t: confidence limit taken as 1.65 for a 90% confidence level), p and q represent the probability of the event occurring and not occurring.

The survey data used in this study were collected through face-to-face interviews with consumers residing in the urban area of Tokat province between February and March 2022. As a result of the calculations, the Sample size was determined to be 271. During data collection, different neighborhoods representing the urban area of Tokat province were identified. To ensure that the sample reflected the population's socioeconomic structure, surveys were conducted in these neighborhoods, taking household distribution into account.

In these regions, consumers were randomly selected

and invited to participate in the survey, ensuring that individuals from different income and education groups were included in the study. The data obtained in the study were analyzed using SPSS Statistics software. The findings were presented and interpreted with frequency distributions, percentage calculations, and cross-tabulation analyses. Additionally, the adequacy of consumers' vegetable oil consumption, factors affecting consumer preferences, changes in consumption after price increases, and levels of agreement with general statements regarding vegetable oil consumption were evaluated using a five-point Likert scale.

A Chi-square test was used to assess whether there was a statistically significant association between vegetable oil consumption and consumers' socioeconomic and demographic characteristics (such as age, gender, education level, income level, household expenditures, and occupation). The formula (2) used to calculate the Chi-square statistic is given below (Gujarati, 2001):

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i} \quad (2)$$

Where χ^2 represents the Chi-square test statistic, O_i indicates observed frequencies, and E_i indicates expected frequencies.

In this study, to facilitate the comparative analysis of consumption behaviors, households were divided into three different groups based on the frequency

distribution of their monthly incomes. Consumers were categorized into low-income (740.74 \$ and below), middle-income (740.81–1.481.48 \$) and high-income (1.481.56 \$ and above) groups.

3. Results and Discussion

In the study, demographic factors of consumers (such as gender, education, marital status, social security, family structure, occupation, and age) were first examined. Of the 271 participants in the survey, 64.6% are female, and 35.4% are male. Regarding education level, 26.2% of participants have a secondary school education or lower, while 25.5% are high school and associate degree graduates, and 48.3% are university graduates. It is observed that 77.1% of the participants are married, and 22.9% are single. When the number of family members is examined, 4.9% of consumers belong to families of 1-3 people, and 56.1% belong to families of 4 or more people. In terms of occupational distribution, 36.5% of participants work in the public sector, 30.6% are housewives, 12.9% work in the private sector, 5.2% are retired, 3.3% are self-employed, and 11.4% are unemployed. Regarding age, the average age of female participants was observed to be 41.7, male participants 39.3, and the overall average age 40.9.

Table 1. Distribution of consumer income and food expenditures (\$/month)

	Income Groups			
	Low Income	Middle Income	High Income	General
Average income (\$/month)	525.59	1.182.10	2.468.33	1.302.98
Average food expenditure (\$/month)	187.73	312.50	480.50	314.04
Ratio of food expenditure to income (%)	35.7	26.4	19.4	24.1

The categorized socioeconomic profile of 271 participants based on their income levels and food expenditures is detailed in Table 1. The sample was divided into three predetermined groups: low-income group (36.5%, f=99), middle-income group (35.4%, f=96), and high-income group (28.1%, f=76), with average monthly incomes of \$ 525.59, \$ 1,182.10, and \$ 2,468.33, respectively. This classification provides a fundamental basis for analyzing consumers' economic status and the impact of their income levels on food expenditure patterns.

Data on which oils consumers consume are presented in Table 2. It is observed that 85.6% of consumers consume sunflower oil monthly, and 62.0% consume

olive oil. The relationship between consumer preferences and purchase points in oil consumption is important for marketing strategies and sales. Among consumers, the highest purchase rate for sunflower oil is obtained from supermarkets at 88.8%, and the most preferred place for olive oil purchases, with the highest rate, is also supermarkets at 57.7%. Additionally, the direct purchase rate from producers for olive oil is 33.9%. Chi-square analysis revealed a statistically significant difference at the 1% level ($p < 0.01$) between consumers' income levels and their packaging size preferences for monthly sunflower oil consumption. Examination of the data in the table showed that consumers with low incomes largely prefer packaging

sizes of 5 L or more (74.7%). While those who prefer packaging sizes of 5 liters and above rank first across all groups, the preference for smaller packaging sizes increases as income levels rise. While only 7.7% of consumers in the low-income group preferred 1 L, this rate was 22.7% in the high-income group. During the survey, consumers stated that oils in 5 L or larger packaging sizes are more economical than those in smaller packaging sizes. This situation is thought to reflect on income levels.

It is important to examine how consumer preferences and evaluations vary across oil types. These evaluations can be considered when developing marketing strategies and consumer communication strategies. Of the 271 participants, 232 consume sunflower oil, and the most important reason for consumption was affordability (68.1%). This is followed by habit (51.3%),

taste (38.4%), brand (17.7%), aroma and smell (16.8%), healthiness (14.7%), and texture/consistency (12.1%), respectively.

Table 2. Consumer consumption status by oil type

	Consuming		Non-consuming	
	F	%	F	%
Sunflower	232	85.6	39	14.4
Olive oil	168	62.0	103	38.0

*Since more than one type of oil is consumed, the total exceeds 100%.

The most important reasons for preferring olive oil are its health benefits (83.3%) and its taste (66.7%). In addition to these, its naturalness (48.8%), nutritional value (31.0%), and aroma/smell (30.4%) also hold significant percentages.

Table 3. Consumer vegetable oil consumption levels by income group

			Sunflower Oil Quantity			Total
			1 L	2-4 L	5 L and above	
Income Groups	Low	F	7	16	68	91
		%	7.7	17.6	74.7	100.0
	Middle	F	11	16	48	75
		%	14.7	21.3	64.0	100.0
	High	F	15	23	28	66
		%	22.7	34.8	42.4	100.0
Total	F		33	55	144	232
	%		14.2	23.7	62.1	100.0
Chi-Square Analysis Results			Chi-Square Value x2		Probability	
			17.76		0.001	

When evaluating preferences across all oil types, sunflower oil was preferred at the highest rate (61.8%) due to its affordability; the proportion preferring taste was highest for olive oil (66.7%). The health-based reason for preference was observed to be quite high for olive oil (83.3%). According to the data obtained, brand, quality assurance labels, and special production do not play a significant role in preference.

Factors that consumers find important in vegetable oil consumption are presented in Table 4, along with their 5-point Likert averages and standard deviations. In sunflower oil consumption preference, price and taste have the highest average score of 4.2. This is followed by habits at 3.9, aroma/smell at 3.8, and texture/consistency, healthiness, quality assurance label, brand, naturalness, and nutritional value, all at 3.7.

Table 4. Factors important in consumer preferences for vegetable oil consumption (5-point Likert scale)

	Sunflower Oil		Olive oil	
	Mean	SD	Mean	SD
Appearance	3.5	1.3	3.9	1.3
Taste/Flavor	4.2	1.0	4.7	0.6
Price	4.2	1.1	3.8	1.2
Aroma/Smell	3.8	1.0	4.2	0.9
Texture/Consistency	3.7	1.1	4.0	1.0
Habit	3.9	1.1	4.0	1.1
Healthiness	3.7	1.2	4.7	0.7
Being Specially Produced	2.8	1.3	4.2	1.3
Quality Assurance Brand	3.7	1.3	4.0	1.3
Brand	3.7	1.2	3.8	1.3
Naturalness	3.7	1.2	4.3	0.7
Nutritional Value	3.7	1.1	4.4	0.9
Being Regionally Produced	2.5	1.4	3.7	1.5

SD: Standard Deviation. 1: not Important at all, 2: not important, 3: neither important nor unimportant, 4: important, 5: very Important)

It was observed that the Likert averages for factors influencing preference in olive oil consumption are quite high. Among these, taste and health scored 4.7 points. This is followed by nutritional value at 4.4, naturalness at 4.3, aroma/smell and special production status at 4.2, and texture/consistency, habit, and the presence of a quality assurance label, all at 4.0, which were stated as important.

The distribution of data from Table 4 on the radar chart in Figure 1 reveals the fundamental difference in consumers' perceptual positioning of the two oil types in the urban area of Tokat province. Upon examining the graph, it is observed that the olive oil profile exhibits a dominant stance, approaching the outer limits of the scale on the health, taste, and nutritional value axes; in contrast, sunflower oil is understood to stand out as a rational economic alternative, particularly in the dimension of price affordability, surpassing olive oil. This visual synthesis confirms that consumers categorize vegetable oils not merely as general food items, but according to their expected benefits (e.g., price affordability and functional health).

In terms of brand preferences and usage continuity, the most prominent brand for sunflower oil is Yudum (37.9%). In contrast, homemade olive oil (41.0%) is more frequently preferred.

Chi-square analysis showed a statistically significant difference at the 5% level ($p < 0.05$) between consumers' genders and their monthly preferences for sunflower oil packaging size (Table 5). According to the

data in the table, sunflower oil consumption in 5 kg and larger packaging sizes is higher among women (67.3%). Furthermore, while the proportion of women preferring the 1 L packaging size is 10.2%, this rate is 21.2% among men. According to these results, female consumers prefer larger sunflower oil packaging sizes than male consumers.

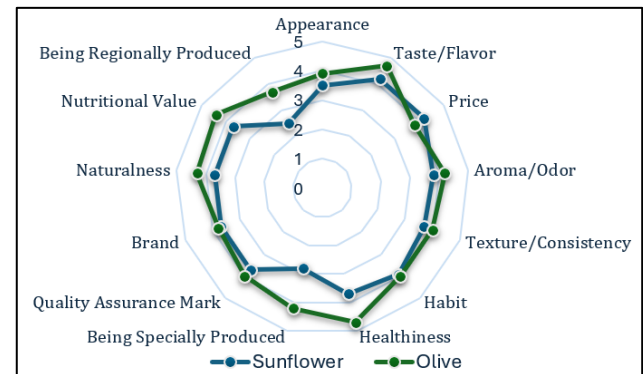


Figure 1. Factors important in consumer preferences for vegetable oil consumption

Chi-square analysis revealed a statistically significant difference at the 1% level ($p < 0.001$) between consumers' education levels and their preferences for monthly sunflower oil packaging size (Table 6). It was determined that consumers with low education levels largely prefer 5 L and larger packaging sizes (85.7%). While the preference for larger packaging sizes ranked first across all groups, the preference for smaller packaging sizes increased as the education level rose. While only 7.9% of consumers in the low-education group preferred 1 L, this rate was 18.8% in the high-education group.

Table 5. Levels of vegetable oil consumption by consumers according to gender.

		Sunflower Oil Consumption Groups			Total
		1 L	2-4 L	5 and above	
Female	F	15	33	99	147
	%	10.2	22.4	67.3	100.0
Male	F	18	22	45	85
	%	21.2	25.9	52.9	100.0
Total	F	33	55	144	232
	%	14.2	23.7	62.1	100.0
Chi-Square Analysis Results		Chi-Square Value x2		Probability	
		6.63		0.036	

When examining participants' monthly consumption habits, the most preferred packaging sizes for olive oil purchases were 1-liter (38.1%), 2-liter (32.7%), and 5-liter (18.5%). In contrast, the preference rates for 3-liter and 4-liter packaging sizes are significantly lower.

These findings indicate that consumers tend to meet their monthly olive oil needs in smaller packaging units than for other vegetable oils, such as sunflower oil, for which larger packaging is more common

Table 6. Levels of vegetable oil consumption by consumers according to education level.

		Sunflower Oil Consumption Groups			Total
		1 L	2-4 L	5 L and above	
Middle School and below	F	5	4	54	63
	%	7.9	6.3	85.7	100.0
High school and associate degree	F	7	13	37	57
	%	12.3	22.8	64.9	100.0
University	F	21	38	53	112
	%	18.8	33.9	47.3	100.0
Total	F	33	55	144	232
	%	14.2	23.7	62.1	100.0
Chi-Square Analysis Results		Chi-Square Value x2 26.15		Probability 0.000	

Chi-square analysis revealed no statistically significant difference between consumers' income levels and their monthly olive oil packaging preferences ($p > 0.05$) (Table 7). However, the percentage distribution shows that the preference for 1-liter packaging is higher

among low-income consumers, while the preference for 2–4-liter packaging is higher among high-income consumers. Additionally, the proportion of consumers preferring 5-liter and larger packaging sizes appears to be relatively higher in the middle-income group.

Table 7. Levels of olive oil consumption by consumers according to income group.

		Income Groups			Total
		Low	Middle	High	
Olive Oil Quantity	1 L	F	20	24	64
		%	48.8	33.8	38.1
	2-4 L	F	13	30	73
		%	31.7	42.3	43.5
	5 L and above	F	8	17	31
		%	19.5	23.9	18.5
Total	F	41	71	56	168
	%	100.0	100.0	100.0	100.0
Chi-Square Analysis Results		Chi-Square Value x2 7.30		Probability 0.121	

Table 8. Adequacy of consumers' sunflower and olive oil consumption.

	Sunflower Oil (%)	Olive Oil (%)
Quite Insufficient	4.7	4.8
Insufficient	5.2	12.5
Neutral (Neither/Nor)	9.5	12.5
Sufficient	67.2	54.8
Extremely Sufficient	13.4	15.5
Mean	3.79	3.64
Standard Deviation	0.91	1.04

*(1; Highly Inadequate, 2; Inadequate, 3; Neither Adequate nor Inadequate, 4; Adequate, 5; More Than Adequate)

When examining the adequacy of consumers' monthly vegetable oil consumption, the Likert scale averages were calculated as 3.79 for sunflower oil and 3.64 for olive oil (Table 8). Considering that the midpoint of the Likert scale is 3.00, these values indicate that consumers generally perceive their vegetable oil consumption as adequate. However, the slightly higher

average score for sunflower oil suggests that consumers feel more confident about the adequacy of their sunflower oil consumption than of their olive oil consumption.

A statistically significant difference was found at the 1% level ($p < 0.01$) between consumers' income levels and the adequacy of their monthly sunflower oil consumption (Table 9). When examining the data in the table, it is seen that, according to the general average, 67.2% of consumers find their sunflower oil consumption adequate, and 13.4% find it highly adequate. According to the overall result, 80.6% of consumers (adequate/highly adequate) find their sunflower oil consumption sufficient, while 9.9% (inadequate/highly inadequate) find it insufficient. As income levels increase, the proportion of consumers who report their sunflower oil consumption as adequate also increases. While 72.5% of low-income consumers stated that their consumption was adequate/highly adequate, this rate was 92.4% among

high-income consumers. Furthermore, only 1.5% of high-income consumers stated that their consumption was inadequate. This rate is 19.8% among low-income consumers. Notably, the rate of inadequate

consumption of sunflower oil, a staple food, is higher among low-income consumers than among other income groups.

Table 9. Adequacy of consumers' sunflower oil consumption.

	Income Groups							
	Low		Middle		High		General	
	F	%	F	%	F	%	F	%
Quite Insufficient	8	8.8	2	2.7	1	1.5	11	4.7
Insufficient	10	11.0	2	2.7	0	0.0	12	5.2
Neutral (Neither/Nor)	7	7.7	11	14.7	4	6.1	22	9.5
Sufficient	54	59.3	54	72.0	48	72.7	156	67.2
Extremely Sufficient	12	13.2	6	8.0	13	19.7	31	13.4
Total	91	100.0	75	100.0	66	100.0	232	100.0
Chi-Square Analysis Results	Chi-Square Value x2 23.80				Probability 0.002			

According to the Chi-square analysis results, no significant difference was found between income levels and the sufficiency of monthly olive oil consumption ($p > 0.05$) (Table 10). Although the majority of consumers across all income groups reported sufficient olive oil consumption, the data in the table indicate that the proportion of consumers who found olive oil

consumption insufficient relative to sunflower oil consumption was higher both overall and across income groups. This situation may stem from higher olive oil prices relative to sunflower oil. Furthermore, the fact that 41% of consumers prefer homemade olive oil may indicate that they meet their essential food needs by seeking lower-cost products.

Table 10. Sufficiency of consumers' olive oil consumption according to income group.

	Income Groups							
	Low		Medium		High		General	
	F	%	F	%	F	%	F	%
Quite Insufficient	5	12.2	2	2.8	1	1.8	8	4.8
Insufficient	3	7.3	8	11.3	10	17.9	21	12.5
Neutral (Neither/Nor)	5	12.2	12	16.9	4	7.1	21	12.5
Sufficient	20	48.8	38	53.5	34	60.7	92	54.8
Extremely Sufficient	8	19.5	11	15.5	7	12.5	26	15.5
Total	41	100.0	71	100.0	56	100.0	168	100.0
Chi-square Analysis Results	Chi-square Value x2 12.41					Probability 0.134		

Changes in consumers' monthly oil consumption after increases in sunflower oil and olive oil prices were scaled using 3 options (1; Increased, 2; Unchanged, 3; Decreased), (Table 11). When the effects of price increases on consumption were examined, it was determined that the tendency for a decrease in olive oil consumption (24.5%) was more pronounced compared to sunflower oil (20.2%). However, the fact that approximately 70% of consumers in both oil groups did not change their consumption quantity reflects the essential food nature of the products and their resistance to price increases.

According to the Chi-square analysis results, no significant difference was found between income

groups and monthly sunflower oil consumption after price increases ($p > 0.05$) (Table 12). When the data in the table were examined, 23.1% and 25.3% of low and middle-income consumer groups, respectively, stated that their sunflower oil consumption decreased after price increases. In comparison, this rate was 10.6% in the high-income group

Table 11. Changes in consumers' oil consumption after price increases

	Sunflower	Olive oil
Increased %	6.5	6.5
Unchanged %	73.3	69.0
Decreased %	20.2	24.5
Mean	2.14	2.18
Standard deviation	2.18	0.52

Table 12. Germination rate and germination time of bottle tree seeds at the end of the germination test.

			Income Groups			
			Low	Medium	High	Total
Sunflower Oil Consumption Groups	Increased	F	6	6	3	15
		%	6.6	8.0	4.5	100.0
	Unchanged	F	64	50	56	170
		%	70.3	66.7	84.8	100.0
	Decreased	F	21	19	7	47
		%	23.1	25.3	10.6	100.0
Total		F	91	75	66	232
		%	100.0	100.0	100.0	100.0
Chi-square Analysis Results			Chi-square Value χ^2		Probability	
			6.76		0.149	

According to the Chi-square analysis results, a significant difference was found at the 5% level ($p < 0.05$) between consumers' education levels and monthly sunflower oil consumption after price increases (Table 13). The proportion of those who stated that sunflower oil consumption decreased after

price increases was 31.7% for those with a middle school education level or below, while this rate was 13.4% for those with a bachelor's degree. In contrast, the proportion of those who reported increased sunflower oil consumption after price increases was higher among highly educated consumers (8.9%) than among others.

Table 13. Sunflower oil consumption after price increases according to education level

		Sunflower Oil Consumption Groups			
		Increased	Unchanged	Decreased	Total
Middle school and below	F	2	41	20	63
	%	3.2	65.1	31.7	100.0
High school and associate degree	F	3	42	12	57
	%	5.3	73.7	21.1	100.0
University	F	10	87	15	112
	%	8.9	77.7	13.4	100.0
Total	F	15	170	47	232
	%	6.5	73.3	20.3	100.0
Chi-square Analysis Results		Chi-square Value χ^2		Probability	
		9.84		0.043	

4. Conclusion

The study results indicate that a large proportion of consumers in the urban area of Tokat province consume sunflower oil (85.6%), and the most significant factor influencing this preference was price (68.1%). In contrast, the remaining portion consumes olive oil (62.0%), and health perception (83.3%) and taste (66.7%) were found to be more influential factors in its consumption. Furthermore, while supermarkets were identified as the main point of purchase for vegetable oils, a significant portion of consumers also obtain olive oil directly from producers.

Given that Tokat province accounts for approximately 3.75% of Turkey's oilseed sunflower production, the findings of this study are important for understanding the relationship between regional production potential

and consumer preferences. The results indicate that sunflower oil holds a dominant position in household consumption in the region; this situation may be related to the province's production structure and the accessibility of sunflower oil in the local market. A dynamic interaction between traditional consumption habits, economic constraints, and local production capacity shapes vegetable oil consumption in Tokat's urban area. Therefore, regional development policies and marketing strategies need to consider the different meanings consumers attribute to vegetable oils, particularly regarding price and health perceptions.

Based on the research findings, various recommendations can be offered. Strengthening policies that support low-income households' access to basic food products can help maintain adequate consumption levels. Furthermore, food safety

inspections in local markets should be intensified to prevent potential health risks associated with products sold directly by producers. For producers, diversifying packaging options and emphasizing product quality, naturalness, and regional production characteristics can help increase competitiveness in the vegetable oil

market. Overall, these findings can contribute to a better understanding of consumer behavior in regional vegetable oil markets and provide useful information for policymakers and producers in developing strategies for the vegetable oil sector.

Table 14. Consumers' levels of agreement with selected statements regarding vegetable oil preferences

	Likert Scales (%)					Mean	SD
	1	2	3	4	5		
Higher-priced oil has superior quality	23.2	33.2	19.6	21.0	3.0	2.47	1.148
Extremely well-established oil brands are inherently of superior quality	7.7	36.2	25.5	26.2	4.4	2.83	1.043
Less recognized oil brands in the market exhibit relatively lower quality	10.0	29.5	25.8	26.6	8.1	2.93	1.133
The lightness of its aroma is an important factor in my oil selection	3.7	7.0	15.9	56.5	17.0	3.76	0.942
From a health perspective, oils obtained in glass bottles are superior	4.8	9.2	10.7	48.0	27.3	3.84	1.076
When procuring oil, I meticulously pay attention to the presence of the Turkish Standards Institution guarantee	8.9	13.7	17.7	40.2	19.6	3.48	1.204
Products containing gifts or part of a promotional campaign represent high-quality products	27.3	45.0	21.8	5.5	0.4	2.07	0.862
Products sold in glass bottles exhibit superior quality compared to those distributed in PET bottles	5.5	14.8	19.9	38.0	21.8	3.56	1.146
All oils available in the market are natural and do not contain synthetic additives	53.9	28.8	12.9	3.7	0.7	1.69	0.887
Oils produced by established, leading brands stand out for their superior quality and natural reliability	17.0	20.3	26.2	30.6	5.9	2.88	1.190
Corporate advertising campaigns influence my selection preference regarding oil brands	26.6	35.1	19.6	15.1	3.7	2.34	1.134
I predominantly prefer lower-priced oils	24.7	37.3	19.6	12.2	6.3	2.38	1.164
The light color of the oil indicates that it is more easily digestible and conducive to health	13.7	29.5	29.9	21.8	5.2	2.75	1.100
Olive oil is clearly more beneficial for health compared to other vegetable oils	3.3	3.7	6.3	33.6	53.1	4.28	1.011

*Percentage % and 5-point Likert average. SD: Standard deviation.

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Authorship contribution statement

A.E.: Planning, Conceptualization, Software, Investigation, Data curation, Writing – original draft.

G.E.: Planning, Conceptualization, Methodology, Software, Editing

Conflict of interest

The authors declare no conflicts of interest.

Ethical Statement

Ethical approval for this study was obtained from the Tokat Gaziosmanpaşa University Social and Human Sciences Research Ethics Committee (Decision No: 01-17, Date: 04/04/2023).

References

- Ağır, M., Boran, C., Özden, F., & Artukoğlu, M. (2018). A study on consumer preferences in olive oil: The case of Dikili district of Izmir province. *Ege Journal of Agricultural Research*, 55(4), 81–90. (in Turkish with English abstract) <https://doi.org/10.20289/zfdergi.399277>
- Akçay, Y., & Vatansever, Ö. (2013). A research on red meat consumption: The case of urban area of Kocaeli province.

- Journal of Institute of Social Sciences of Çankırı Karatekin University, 4(1), 43–60. (in Turkish with English abstract)
<https://izlik.org/IA27JA58BS>
- Anonymous, (2020). Republic of Türkiye Ministry of Agriculture and Forestry. Vegetable oils: Strategic products report. Strategy Development Department.
- Anonymous, (2022). Turkish Statistical Institute. Population statistics. <http://www.tuik.gov.tr/>
- Anonymous, (2024). Turkish Statistical Institute. Crop production statistics: Oilseed (sunflower) production and area data. Turkish Statistical Institute (MEDAS). [Accessed on 05 February 2026].
- Avcı, P. (2021). Determination of vegetable oil consumption preferences in Konya province (Master's Thesis). Isparta University of Applied Sciences.
- Avcı, P., & Gül, M. (2021). Analysis of factors affecting margarine consumption of consumers in Konya city center. Mustafa Kemal University Journal of Agricultural Sciences, 26(3), 506–515. (in Turkish with English abstract)
<https://doi.org/10.37908/mkutbd.868186>
- Brazdova, Z. (1994). Nutritional behavior: Principles and theory. Hygienia, 39, 120–128.
- Çiçek, A., & Erkan, O. (1996). Research and sampling methods in agricultural economics (Publication No. 12/6). Gaziosmanpaşa University Faculty of Agriculture Publications. (in Turkish)
- Durmaz, Y., & Bahar (Oruç), R. (2011). An empirical study on the examination of the effect of sociological factors on consumers' purchasing behavior. Journal of Electronic Social Sciences, 10(37), 60–77. (in Turkish with English abstract)
<https://izlik.org/IA93DM99JT>
- Gujarati, N. D. (2001). Essentials of Econometrics. McGraw Hill, New York.
- Gündüz, O. (2021). Why is sunflower oil price increasing in Turkey: Short and long-term dynamic analysis. Gaziosmanpaşa Journal of Scientific Research, 10(1), 30–48. (in Turkish with English abstract)
<https://izlik.org/IA92KM64UY>
- Gündüz, O., & Esengün, K. (2010). A study on vegetable oil consumption of families. KMU Journal of Social and Economic Research, 2010(2), 67–72. (in Turkish with English abstract)
<https://izlik.org/IA92MF76PJ>
- Irmak, S., & Ercan, U. (2017). Determination of factors affecting vegetable oil consumption using data mining methods. Kafkas University Journal of Economics and Administrative Sciences Faculty, 8(15), 57–79. (in Turkish with English abstract)
<https://izlik.org/IA53HN23JB>
- Karabaş, S., & Gürler, A. Z. (2012). Estimation of factors affecting consumer behavior in organic product preference using logit regression analysis. Journal of Adıyaman University Social Sciences Institute, 10, 129–156. (in Turkish with English abstract)
<https://doi.org/10.14520/adyusbd.272>
- Karakaş, G. (2020). Determination of factors affecting sunflower oil consumption: The case of Çorum province. KSÜ Journal of Agriculture and Nature, 23(5), 1301–1307. (in Turkish with English abstract)
<https://doi.org/10.18016/ksutarimdogavi.648490>
- Kaya, A., Acıbuca, V., & Ateş, M. (2023). Factors affecting individuals' vegetable and animal fat consumption in Hatay province. Mustafa Kemal University Journal of Agricultural Sciences, 28(3), 658–666. (in Turkish with English abstract)
<https://doi.org/10.37908/mkutbd.1344092>
- Kolsaracı, Ö., Kaya, K. D., Göksoy, A. T., Arıoğlu, H., Kulan, E. G., & Day, S. (2015). New quests in oilseed production. In Agricultural Engineering VIII. Technical Congress Proceedings Book-1 (pp. 401–425). TMMOB Chamber of Agricultural Engineers. (in Turkish)
- Küçükkömürler, S., & Uluksar, F. Ö. (2018). The use of olive oil in Turkish culinary culture: The Muğla case. Journal of Tourism and Gastronomy Studies, 6(2), 194–212. (in Turkish with English abstract)
- Onat, B., Arıoğlu, H., Güllüoğlu, L., Kurt, C., & Bakal, H. (2017). An overview of oilseed and crude oil production in the world and Turkey. KSÜ Journal of Natural Sciences, 20(Special Issue), 149–153. (in Turkish with English abstract)
<https://doi.org/10.18016/ksudobil.349197>
- Oruç, E., Gözener, B., & Kaplan, E. (2023). Determination of liquid oil consumption behaviors (Samsun province example). In H. G. Doğan, & M. Kan (Eds.), *Agricultural economics studies in the second century of the Republic* (pp. 167–182). Iksad Publishing House. (in Turkish)
- Öztekin, E. Ö. (2006). Consumer Trends and Customer Satisfaction Analysis in Vegetable Oil Products in Tekirdağ Province (master's Thesis), Trakya University, Institute of Science.
- Tapkı, N., Demirtaş, B., & Dağıstan, E. (2020). Determination of factors affecting olive oil purchasing preferences of consumers in Hatay city center. Turkish Journal of Agriculture and Natural Sciences, 7(2), 331–341. (in Turkish with English abstract)
<https://doi.org/10.30910/turkijans.725784>
- Urak, F., Bilgiç, A., & Dağdemir, V. (2018). Determination of factors affecting household expenditure on milk, dairy products, and edible oils in Turkey. KSÜ Journal of Agriculture and Nature, 21, 177–189. (in Turkish with English abstract)
<https://doi.org/10.18016/ksutarimdogavi.472701>