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## Organic production and evaluation of products from an animal perspective: The case of Osmaniye Province in Türkiye\*

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\*This study is summarized from Merve Bulanıklı's master's thesis.

**ABSTRACT:** The aim of this study is to determine organic production and evaluation of products from an animal perspective. The thesis study was carried out by using face-to-face survey method with a total of 419 individuals in the central district and Kadirli district of Osmaniye province. The 'Simple Random Probability Sampling Based on Main Population Ratios' method was used. The data collected from the questionnaires were identified using frequency and ratio distributions and analysed in the SPSS software. In the study, 96.7% of the participants stated that they had knowledge about organic farming, and 76.8% of them stated that they had previously heard about organic livestock. 91.6% of the participants reported that they consumed organic livestock products. While 36.5% of the participants stated that they learned about organic farming through communication tools such as television, the internet, etc., 58.7% stated that feeding is the key factor in organic livestock. While 43.7% of the participants stated that they consumed beef meat, 45.8% stated that they shopped in villages to meet their organic meat needs, since the organic products are healthier. 43.2% of the participants stated that they mostly consumed organic milk, they preferred extracted honey as organic honey, organic products were less likely to be sold in the market, organic products were environmentally friendly, and considered that organic products and those purchased from the village were healthier. The study revealed a significant correlation between the age groups of the participants and the animal products that prioritise organic consumption. The study revealed a statistical difference between the opinion of where to supply organic meat and age groups; between age groups and the preference of meat type; between age groups and milk and dairy products prioritised for organic consumption; between age groups and the opinion of whether the production method of animal foods affects consumption; between age groups and the opinion of how much do people trust organic products; between age groups and the opinion that organic products are more reliable; between age groups and the opinion that organic products protect nature; between age groups and the opinion that they should consume organic products. The study indicated a statistical difference between gender and the responses to the question of what the key factors in organic livestock; between gender and the responses to the question of whether the production method of animal foods affects consumption; and between gender and the responses to the question of how to understand whether milk is fatty or not.

**Keyword:** Questionnaire; Livestock; Organic feeding; Organic livestock; Organic farming; Osmaniye.

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## INTRODUCTION

Organic farming and livestock have recently become issues that have been carefully emphasised due to adverse effects of the problems in the implementation of the green revolution on living beings. Organic farming, in other words, ecological, sustainable, and natural agriculture, is a method that is based on the protection of the ecological order, maintains soil fertility, deals with the control of diseases and pests by natural means without the use of any chemicals, ensures productivity of plants and animals in nature based on their welfare, and discuss a sustainable production system model without disrupting the ecological order with the scarce resources we hold.

Organic farming is a sustainable agricultural production system approach that deals with the environment, humans, and the economy as a whole (Ak, 2004; Oral, 2020). Organic farming is analysed and carried out in two ways: plant and animal production. The outbreak of the COVID-19 pandemic across the world demonstrated the importance of the agricultural and livestock industries as much as the health sector (Lopez Ridaura et al., 2019; Abdelhedi & Zouari, 2020; Kogo et al., 2020). Organic farming is a method that avoids the application of pesticides and chemical fertilisers. While organic farming methods lead to the protection of soil and water resources and biodiversity, they play an active role in good human health. Organic livestock is a method implemented to protect the health and welfare of animals. This method avoids the use of synthetic substances, such as chemical drugs and hormones. Organic livestock breeding avoids the use of genetically modified organisms (GMOs) and aims to feed animals with natural fodder and allow them to roam freely. Organic farming and livestock are methods of agriculture and animal care and rearing that positively affect both the environment and human health. Unlike previous systems, organic products contain no chemical residues and are more nutritious, which are among the primary reasons why they are preferred. Oral et al., (2021) reported that developing industrial farming activities caused environmental, biological, chemical, and economic damage, diseases among people who lived in the environment increased due to such damages; they seriously destroyed nature, the use of hormones, hormone-like substances, and antibiotics in feed additives led to the transmission of these substances to humans through animals, and consequently, reduced human resistance against bacteria. The researchers reported

that organic livestock adhered to the principles of animal welfare, feeding, and rearing and Türkiye was a very favourable country for organic livestock. Ahmed & Khalaf (2024) reported that informing consumers about the value of organic products and supporting their production was vital for the growth of organic farming and the market for organic foods was expanding rapidly due to consumers' belief that organic food could be healthier than traditional food and has a superior nutritional profile. Amudha & Thaiyalnayaki (2024) suggested that marketers of organic foods should feature transparent and appropriate advertisements with the support of celebrities in order to motivate consumers to purchase organic foods. Researchers reported in their studies that there was a significant correlation between consumer involvement and their intention to purchase. While the researchers indicated that demographic variables were highly important, they also stated that producers should pay special attention to producing organic foods that would be more suitable and appropriate for consumers from a variety of demographic backgrounds in order to decide on the extent of consumer involvement in the purchase of organic products.

This study was carried out in order to determine organic production and evaluation of products from an animal perspective.

## MATERIALS AND METHODS

In this study, official approval was obtained from the Scientific Research and Publication Ethics Committee of Institute of Science and Technology, Osmaniye Korkut Ata University within the framework of the decision dated 31.08.2022 and numbered 2022/7/11. The following formula was used to calculate the number of observations required for the application of the questionnaire (Akbulut et al., 2015; Yıldız et al., 2020).

$$n = \frac{pqz_{\alpha/2}^2}{e^2}$$

Where,  $z$  is the theoretical distribution value of the standard  $z$  distribution at the predicted error level  $\alpha/2$ ,  $\alpha$  is the error of the estimation, and  $f$  is the predicted difference between the sample rate and the population rate as  $(\hat{p} - P)$ . Also,  $p$ : indicates the occurrence rate of event A and  $q$ : indicates the non-occurrence rate of event A. Where  $p=0.50$ ,  $q=0.50$ ,  $z_{\alpha/2}^2 = 1.96$ . The maximum value of  $f$  is assumed to be 0.05. These values were found when they were substituted and calculated in the formula for calculating the sample size.

$$n = \frac{pqz_{\alpha/2}^2}{e^2} = \frac{0.50 * 0.50 * 1.96^2}{0.05^2} = 384$$

This calculated value represents the minimum number of questionnaires to be applied. However, given the possibility of inconsistent and invalid results of some questionnaires, more questionnaires were prepared and applied to 419 people. Using simple random sampling technique, 310 people from central city of Osmaniye province and 109 people from the district of Kadirli participated in the questionnaire.

The population of Osmaniye province—the subject of this study—was 557.666 in 2023. The population of Osmaniye comprised 280.450 men and 277.216 women. Given in percentage terms, 50.29% of the population were male and 49.71% were female. The province of Osmaniye comprised seven districts: Central, Bahçe, Düziçi, Hasanbeyli, Kadirli, Sumbas, and Toprakkale. The province had 14 municipalities (7 town municipalities + 7 district municipalities) and 160 villages. While the central district of Osmaniye province accounted for 50.22% of the total population, the population of Kadirli—the largest district—accounted for 22.87% of the total population.

The correlations between the questions and the variables were analysed by constructing cross tables. The findings obtained are presented in tables. A chi-square test ( $\chi^2$ ) was run to evaluate the significance of the correlations between the variables in the cross tables. The study accepted as statistically significant at a reliability of 95% or higher.

The Mann-Whitney U test was run to assess the participants' opinions about organic farming according to gender (Lehmann, 2006).

The Kruskal-Wallis test was run to evaluate the opinions about organic farming according to age groups. In terms of the hypotheses of the findings reached at the end of the application, since the data gathered using the SPSS 25 software were generally categoric and not normally distributed, non-parametric statistical techniques were used.

## RESULTS AND DISCUSSION

First, in this study, questionnaires based on the organic production and evaluation of products from an animal perspective in the central district of Osmaniye province and its district of Kadirli were applied, and individuals were asked about their preferences on this issue. When the profile of the individuals who were interviewed in the central district of Osmaniye

province and its district of Kadirli was analysed, 419 individuals were interviewed using the face-to-face survey method. Table 1 shows the demographic characteristics of the consumers.

Moreover, 60.8% of the participants were female and 39.1% were male. Examining the marital status of the individuals, it was identified that 64.2% of them were married and 35.7% were single. A related study showed that 64.1% of the consumers were female and 35.9% were male (Can, 2023), which is compatible with the finding of the present study.

When the age groups of the participants were analysed, it was observed that the rate of participants under the age of 20 was 6.0%, and the group between the ages of 20-29 years had the highest rate (33.4%). The rate of participants aged 30-39 years was 23.2%, the rate of participants aged 40-49 years was 15.7%, the rate of those aged 50-59 was 15.0%, and the rate of those aged 60 and over was 7.1%.

Considering the educational level of the participants, it was determined that 35.1% held a bachelor's degree, 25.3% held a high school degree, 12.7% held an associate's degree, 11.9% held a secondary school degree, 8.6% held a primary school degree, 3.3% held a master's degree, 1.7% were illiterate, and 0.2% held a doctorate degree. Examining the educational level of the participants, the highest rate of those who held a bachelor's degree indicated that the importance of conscious consumption in organic farming and livestock had been increasing. A related study examining consumers' perspectives on organic farming reported that the consumers mostly held high school and bachelor's degrees (Bahşi & Akça, 2019). When examining educational background of the questionnaire participants, İnci et al., (2017) responded that consumers who hold high school and bachelor's degrees had the highest rate, Ayaşan et al., (2022) responded that consumers who held bachelor's and doctorate degrees had the highest rate, and Taçyıldız & Son (2023) responded consumers who held bachelor's, master's/doctorate, high school and primary school degrees, respectively.

When the number of households was analysed, the highest rate appeared to be in families of four people with 26.7%, followed by families of three people with 21.5%. A related study reported that the number of households of four or more people had the highest rate, with 42.9%, which is compatible with the finding of the present study (Taçyıldız & Son, 2023). Can (2023) stated that 59.9% of the ques-

**Table 1.** Demographic characteristics of the consumers

Characteristics	Description	Number	Rate %
Gender	Female	255	60.8
	Male	164	39.1
Marital Status	Married	269	64.2
	Single	150	35.7
Age Groups	Under 20 years	25	6.0
	20-29 years	140	33.4
	30-39 years	97	23.2
	40-49 years	65	15.7
	50-59 years	62	15.0
	60 years and above	30	7.1
Educational Level	Primary School	36	8.6
	Secondary School	50	11.9
	High School	106	25.3
	Associate's Degree	53	12.7
	Bachelor's degree	147	35.1
	Master's Degree	14	3.3
	PhD	1	0.2
	Illiterate	7	1.7
	Student	5	1.2
	1	35	8.4
Number of households	2	78	18.6
	3	90	21.5
	4	112	26.7
	5	83	19.8
	6	15	3.6
	7	4	0.9
	8	2	0.5
	Under 10000 Turkish liras	208	49.6
Monthly income groups	10000-19999 Turkish liras	154	36.8
	20000-29999 Turkish liras	42	10.0
	30000-39999 Turkish liras	15	3.6

tionnaire participants had the number of households between four and six, while 38.3% had the number of households between one and three. When the average monthly family income of the individuals was analysed, it was found that approximately half (49.6%) of the families' income status was below 10,000 TL, the rate of those who earned between 10,000-19,999 was 36.8%; and the rate of individuals who earned between 30.000-39.999 TL was the lowest (3.6%).

The participants were asked whether or not they had previously heard of organic farming (Table 2),

and the majority of the participants (96.7%) had previously heard of organic farming. 76.8% of the participants had previously heard of organic livestock, 91.6% consumed organic animal products, 67.3% of them could easily understand whether organic milk was fatty or not, 92.4% of them responded "yes" to the question, "Does the production method of animal foods affect consumption?", and 56.3% of them responded "no" to the question, "Do you have information about the production conditions of the organic animal products you consume?". While Erbaşlar (2013) reported that 89% of the participants



**Table 2.** Opinions on organic farming and livestock

	Description	Number	Rate %
Have you previously heard about organic farming?	Yes	405	96.7
	No	14	3.3
Have you previously heard about organic livestock?	Yes	322	76.8
	No	97	23.2
Consuming organic animal products	Yes	384	91.6
	No	35	8.4
Can you understand whether organic milk is fatty or not?	Yes	282	67.3
	No	137	32.7
Does the production method of animal foods affect consumption?	Yes	387	92.4
	No	32	7.6
Do you have information about the production conditions of the organic animal products you consume?	Yes	183	43.7
	No	236	56.3

responded “yes” to the question “Would you feed your child with organic products?”, Azak (2018) stated that 83.4% of the participants knew about organic farming; another study (Bulanıklı et al., 2021), which asked why organic farming is necessary, reported that the majority of consumers (77.3%) considered it to be a conscious and correct production model and it was necessary to produce natural, sustainable, healthy, reliable and quality goods that are free from chemicals and hormones; 11.9% of them refused to respond to and 10.8% of them reported that this branch was difficult and expensive. Yormirzoev et al., (2021) reported that the rate of those who knew a little about organic farming ranked first at 37.5%, followed by those who did not know well informed with 20.2%, those who were never informed with 17.4%, those who stated that they knew nothing with 16.9%, and those who stated that they were well informed with 7.9%. Ayaşan et al., (2022) identified that 95.0% of the participants had knowledge about organic farming; whereas, 5.0% of them did not have knowledge about organic farming and 80.2% of them consumed organic products. Kadirhanoğulları et al., (2022) reported that 50.3% of the questionnaire participants had enough knowledge about organic foods.

Another question asked the participants their opinions about organic farming and its products in four options, and they were told that they could mark more than one response if they wished. 157 participants (37.5%) indicated that they viewed organic farming positively, supported and encouraged it, and stated that organic farming was sustainable, healthy, and reliable, and the products from organic farming were of high quality. Additionally, it was found that 11.9% of the participants considered organic farm-

ing and its production to be positive but the rate of those who considered organic farming insufficient and unsupported in Türkiye. Besides the agreement with the foregoing information, the rate of those who considered organic farming to be positive but difficult and expensive to combat was found to be 12.6%.

After the adoption of the organic farming and livestock concept, the consumption of organic animal products was evaluated, and the question was posed to consumers about how they learnt about organic farming products in order to recognise their levels of knowledge and awareness about organic farming, and when their responses were analysed, it was observed that the most common response was the communication tools such as TV, internet, etc., with 36.5%, followed by learning about it from friends and the circle with 16.5%; it was determined that the rate of those who marked the above 2 options together was 13.1%. It was also observed that 12.6% of the individuals who were interested in organic farming and who were engaged in organic farming stated that they learnt through their knowledge and experience. Seeking an answer to the question of where you follow the developments about organic products, Erbaşlar (2013) found that the media ranked first with 45%, 12% of them reported that they learnt these developments from magazines, 7% from books, while 35% stated that they did not follow the developments in organic products. Acıbuca et al., (2018) reported that the majority of consumers (73.1%) were informed by the Provincial/District Directorates of the Ministry of Agriculture and Forestry, 17.3% were informed upon recommendation, and 9.6% were informed through social media.

Unfortunately, the generation of information pollution, efforts of individuals to engage in organic farming by learning from the circle and social networks, and reading as well as the transmission of this information pollution to their friends and environment, have unfortunately led to the misunderstanding and misquotation of organic farming rather than its shortcomings. The fact that the rate of information obtained from scientific articles was as low as 4.3% is the clearest indicator of this. The low number of articles on organic farming and livestock in scientific journals and fewer people and departments studying this subject have led to a lack of information transfer to the other parties.

Unfortunately, the concept of organic farming and livestock has not been appreciated well enough in Türkiye. The primary causes behind this included mistrust caused by such information pollution and sharp price fluctuations. Other ways of acquiring information included those who were informed by their spouses, friends, and relatives living in the village; those who were informed by family elders; and those who were trained in different courses and seminars. Also, there was a small rate of those who knew nothing about organic farming.

Considering the opinions on organic livestock (Table 3), almost half of the participants (49.4%) argued that organic livestock is a correct and conscious production model and it is necessary to produce natural, sustainable, healthy, reliable, and high-quality products away from chemicals. 27.5% of individuals considered that organic livestock should be further

improved and promoted. 21.7% of the participants reported that it was quite difficult to establish this farming system, but they were positive about it. On the other hand, a small rate (1.4%) stated that such a farming model was neither necessary nor that they considered it available. When the participants were asked with the question, “What is the key factor in organic livestock?” (Table 3), it was found that feeding, shelter, health, and comfort issues played an important role, and nutrition was the key factor (58.7%) among them. Health was also the second most effective factor (33.2%).

The participants were asked about the organic products they consume more (Table 4); 53.0% of them stated that they consumed meat and its products more, followed by milk and dairy products with 35.6%. The rate of those who consumed organic eggs was 8.6% and the rate of those who consumed organic honey was 2.8%. When participants were asked about the type of organic meat they consumed, 43.7% responded cattle, 21.2% goat, 19.8% sheep, and 9.8% chicken. Only a few of the participants stated that they ate no meat. When the participants were asked the question, “Where do you purchase organic meat?”, 45.8% of them stated that they purchased organic meat from villagers, 32.9% from butchers, and the rest from grocery stores, ranches, and local bazaars, respectively (Table 4). Nearly half of the questionnaire participants (42.2%) responded to the question, “Why do you purchase organic meat?” as “healthy,” while 29.8% responded “safe.” The rest of the participants stated that it was fresh

**Table 3.** Responses to the questions about organic livestock breeding

		Number	Rate %
Opinions on organic livestock	Should be further improved and promoted	115	27.5
	A correct and conscious production model is necessary to produce natural, sustainable, healthy, reliable and quality products that are free from chemicals and hormones.	207	49.4
	Unnecessary, I do not believe there is such a thing as organic livestock.	6	1.4
	It is hard to do, but I am positive about it.	91	21.7
	Feeding	246	58.7
What is the key factor in organic livestock?	Shelter	25	6.0
	Health	139	33.2
	Comfort	9	2.1

**Table 4.** Responses related to the consumption of organic meat

		Number	Rate %
Which type of meat do you consume?	Cattle	183	43.7
	Sheep	83	19.8
	Goat	89	21.2
	Chicken	41	9.8
	Fish	19	4.5
	I do not prefer	4	1.0
Where do you purchase organic meat?	Grocery stores	43	10.3
	Butchers	138	32.9
	Ranches	27	6.4
	Villagers	192	45.8
	Local bazaars	19	4.6
Products prioritised for organic consumption	Meat and its products	222	53.0
	Milk and dairy products	149	35.6
	Egg	36	8.6
	Honey	12	2.8
	Palatable	48	11.5
Why do you consume organic meat?	Healthy	177	42.2
	Reliable	125	29.8
	Fresh	62	14.8
	I do not prefer	7	1.7

and palatable, while a small number reported that they preferred no organic meat.

The most of the participants indicated that they consumed organic meat and its products occasionally (41.3%), which was higher than their daily, weekly, or monthly consumption. On the other hand, 2.9% stated that they never consumed organic meat and its products. While another study (Eti İçli et al., 2016) reported that 62.4% of the questionnaire participants purchased an organic food once a week, followed by those who purchased organic food several times a month (19.7%), once a month (9.0%), several times a week (7.3%), and once every few months (1.6%), respectively. Kadirhanoğulları et al., (2022) stated that most of the consumers who were asked about their frequency of purchasing organic food responded, 'a few times a week,' and another study reported that 42% of the students responded 'usually,' 28% responded 'occasionally,' and 25% responded 'always' to the question, 'How often do you purchase organic meat, vegetables, and dairy products? On the other hand, 5% responded that they did not purchase organic products (Güler et al., 2022).

The open-ended question, "What makes you con-

sume organic products?" elicited a wide range of responses from the participants. The most common responses to that question were as follows: healthy, affordable, reliable, and accessible. Erbaşlar (2013) suggested that consumers consider factors, such as freshness, affordability and health compliance, brand and expiry date, taste and flavour, packaging, and quality, respectively, when purchasing organic products. Güney & Giraldo (2019) reported that organic products were consumed due to their healthier nature, Güngör (2019) reported that factors such as health, environmental awareness, and flavour/taste were the three most important factors that influenced the purchase of organic products. Ayaşan et al., (2022) responded to that question that they were healthy, reliable, tested, produced with environmentally friendly methods, had taste quality and palate pleasure, and contributed to animal welfare. Taçyıldız & Son (2023), on the other hand, stated healthier organic farming products, the desire to protect nature for future generations, support for organic farming, and sustainability, etc. The participants responded to the question, "Why do you consume and prefer organic milk?" (Table 5) stated that it was healthy, reliable, fresh, and palatable, respectively,



**Table 5.** Responses related to organic dairy products

		Number	Rate %
Why organic milk?	Reliable	102	24.3
	Palatable	43	10.3
	Healthy	172	41.1
	Fresh	94	22.4
	I do not prefer	8	1.9
	Cheese	148	35.3
Dairy products prioritized for organic consumption.	Milk	181	43.2
	Clotted cream	18	4.3
	Butter	28	6.7
	Yoghurt	44	10.5
	Villagers	210	50.1
	Ranches	21	5.0
Where the need for organic dairy products is supplied from	Acquaintances	99	23.6
	Local bazaars	37	8.9
	Grocery stores	52	12.4

while 1.9% stated that they did not consume organic milk and dairy products.

The participants responded to the question, “Which organic dairy products do you consume the most?” as milk, cheese, yoghurt, butter, and clotted cream, respectively. The participants mostly purchased organic dairy products from villagers, with 50.1%, while the rest of the participants stated that they purchased from acquaintances, grocery stores, local bazaars, and ranches. A study asked the question, “Where do you want to purchase organic products?” and 36% of the participants responded as district markets, 23% with supermarkets, 22% with greengrocers, and 19% with private outlets (Erbaşlar, 2013). Doğan & Kızıloğlu (2014) stated that the lack of organic milk production was due to the insufficient number of organic milk producers in the immediate vicinity; the long and expensive organic milk production process was an important barrier for producers who worked/would work in this field; and the demand for organic milk was less due to the high cost of organic milk. The study by Yazıcı (2016), in which 72% of the participants indicated that they preferred organic milk, reported that the reasons for non-preference of organic milk were that people did not prefer organic milk due to lack of information, believing that they were no different, they did not care; whereas, there were also people who did not prefer organic milk due to distrust in organic milk and the high cost of organic milk. Cin-

tra et al., (2018) reported that the protein content of organic milk was 3.39%, while the protein content of milk produced with conventional methods was 3.35%. Eleroğlu (2019) reported that the differences between regions were significant for eggs, milk, organic beverages, poultry meat, vegetables, and fruits consumed. Manuelian et al., (2022) reported that organic milk production doubled since 2008, and a comparison of both organic and conventional foods indicated that organic foods were both healthier and of better quality. Grodkowski et al., (2023) reported that milk extracted from cows conventionally grazed on pasture had similar characteristics and composition, while organic farms tended to have lower milk yields compared to conventional farms due to lower consumption of concentrate feed.

Nikonova & Nikonov (2021) reported that the rate of those who indicated that they would not purchase milk due to the rise in organic milk prices was 11%. Yormirzoev et al., (2021) found that there was no statistical difference between the participants’ preference for uncertified natural milk and certified organic milk; the frequency of purchasing/consuming organic milk ranked first with 44.2% for drinking several times a week, the frequency of drinking milk daily was 29.6%, and the frequency of drinking milk several times a month was 26.2%. Can (2023) found that the rate of those who strongly agreed that organic milk was an important food for human diet was 48.2%, the rate of those who strongly agreed

that it was necessary for people of all ages to drink milk was 45.1%, the rate of those who stated that organic milk was expensive was 44.5%, the rate of those who stated that organic milk was not sold everywhere was 41.1%, and the rate of those who stated that they would purchase more if the cost of organic milk was lower was 38.8%.

The participants indicated that they preferred to consume organic eggs as they are healthy, fresh, palatable, and reliable (Table 6). A related study reported that food safety, nutritional value, and health awareness were effective in consumers' intention to purchase organic eggs (Onurlubaş et al., 2020). Bardakçı (2021) reported that 31.60% of consumers ate organic eggs and chicken meat to protect their and their families' health. While the questionnaire participants stated that they could understand whether the egg was organic mostly by its colour, 25.5% stated that they could in no way understand it. A study conducted by Alkan & Derebaşı (2018) to determine the awareness of egg consumption in Ordu province showed that 76.23% of the questionnaire participants knew what the letters (S, M, L, XL) marked on the egg meant, while 90.44% of the participants knew what organic eggs meant. Another study stated that the consumption of free-range chicken eggs and organic eggs followed the consumers' preference for standard eggs in terms of consumption frequency (Güney & Sangün, 2019). Researchers also reported that higher educational level of individuals made them more likely to consume organic eggs.

Azak (2018) stated that although 68.18% of the participants claimed to understand the organic farming product from its logo, 22.73% of them had dif-

ficulty distinguishing it. Özer Canaslan & Yılmaz Uz (2019) found that the most consumed organic food among the participants was eggs. Ayaşan et al., (2020) reported that consumers checked the packaging, label, and logo when purchasing organic eggs; Bardakçı (2021) reported that 54.08% of consumers checked the code on organic eggs; 71.94% of consumers did not even know the code of organic eggs, and 41.84% of consumers checked the organic product logo when they were asked the question, how do you recognise organic eggs? Another study (Alkan & Berber, 2022) conducted to determine the egg consumption preferences of consumers in Bursa province reported that 18.3% of the questionnaire participants were aware of the organic egg system among the egg production systems, the organic system ranked second among all egg systems with 39.1%; 77.4% of them were aware of the eggs laid by hens raised in organic or free-range systems; and they were less informed about organic farming. The same researchers also indicated that the most important factors that affected egg prices from organic or free-range systems were high price (44.3%), low production (41.5%), and difficult production (14.1%). When they were asked why organic eggs, they said they were healthier. Avçılar et al., (2023) asked students about their preference for egg production systems and reported that 42.3% of them preferred village eggs, 35.7% preferred organic eggs, 15.3% preferred free-range systems, and 6.6% preferred cage systems. The researchers indicated that the preference for purchasing organic eggs was mostly purchasing directly from the farmers, followed by grocery stores, special shops, and bazaars, respectively.

**Table 6.** Responses related to the consumption of organic egg

		Number	Rate %
Why do you prefer organic eggs?	Reliable	63	15.0
	Palatable	68	16.2
	Healthy	150	35.8
	Fresh	124	29.7
	I do not prefer	14	3.3
	Number	52	12.4
How do you understand if an egg is organic?	Colour	189	45.1
	Size	39	9.3
	Package	32	7.7
	I cannot understand	107	25.5

Table 7 shows the findings on organic honey consumption. Regarding the consumption of organic honey, the participants stated that the primary reasons for consuming it were its health benefits, followed by its reliability, palatability, and freshness, respectively. On the other hand, 6.2% stated that they did not consume organic honey (Table 7). Findings of the study showed that the participants were most likely to consume extracted honey, but they also consumed honeycomb, flower honey, and pine honey.

Most of the participants responded to the question “What are the most common problems you come across with the honey you consume?” as the crystallisation (sugaring) of honey. While Gomes et al. (2011) reported that organic honey production adopted an ecologically based system that promoted using good farming practices to maintain agro-ecosystem balance and diversity, sustainable use of natural resources, environmental quality, animal welfare, and human health, Estevinho et al., (2012) stated that the quality, integrity, sanitation, and nutritional value of honey today were drawing international attention due to the rise in the content of chemicals in this matrix. Wongsiri et al., (2012) stated that organic honey was purely natural, without any pesticides, antibiotics, or other contaminants, and real organic honey was extracted from apiaries located in remote areas of Thailand, and the consumers would pay

more for organic honey; Eleroğlu (2019), who found no difference in organic honey consumption across regions, also reported that consumer preferences made no difference.

The most common organic products in the markets were milk and dairy products (46.1%), followed by eggs, meat, and their products and honey (Table 8). The majority (62.5%) of the questionnaire participants paid attention to the brand of the food in the animal products they consumed organically, while 28.9% of them partially paid attention to it. A study on this subject (Eleroğlu, 2019) found that the brand was paid attention to when purchasing organic products, and such a difference was statistically significant. While 39.4% of the participants were observed to purchase organic animal foods regularly every month, there were also those who purchased them regularly and once a week, and 19.6% stated that they did not purchase them due to their high costs. A related study found that 47% of the students who participated in the questionnaire consumed organic products at least once a week, 38% consumed organic products at least once a month, and 14% consumed organic products at least once a year (Erbaşlar, 2013). When the participants were asked how often they consume organic products, 29.8% of them responded that they did not consume organic products, while 26.3% responded very rarely, 16.0% once a week, 6.3% frequently, 3.8% very frequently,

**Table 7.** Responses related to the consumption of organic honey

		Number	Rate %
Reasons to consume organic honey	Reliable	100	23.9
	Palatable	69	16.5
	Healthy	166	39.6
	Fresh	58	13.8
	I do not prefer	26	6.2
	Flower honey	72	17.2
What kind of honey do you purchase?	Pine honey	61	14.6
	Extracted honey	186	44.4
	Honeycomb honey	87	20.8
	Other honeys	3	0.7
	I do not consume	10	2.3
What are the most common problems you come across with the honey you consume?	The sour taste of honey	41	9.8
	Crystallisation (sugaring) of honey	302	72.1
	Discoloration of honey	76	18.1

**Table 8.** Opinions on organic animal food

		Number	Rate %
The most common organic products in grocery stores	Meat and its products	95	22.7
	Milk and dairy products	193	46.1
	Egg	109	26.0
	Honey	22	5.2
Do you pay attention to the brand of food?	Yes	262	62.5
	No	36	8.6
	Partially	121	28.9
	I always purchase organic products.	83	19.8
Frequency of purchasing organic animal foods	I pay attention that it is organic once a week.	89	21.2
	I would like to use organic products every month.	165	39.4
	I cannot buy organic because it is expensive.	82	19.6

and 8.8% every day (Ayaşan et al., 2022). Taçyıldız & Son (2023), on the other hand, indicated that the rate of those who purchased organic products 1-2 times a week ranked first with 37.5%, followed by those who purchased organic products 2-3 times a month (21.7%).

The participants in the thesis study indicated that the market chances of organic animal products were low and they could not easily find them everywhere, while 20.7% of them stated that it was difficult to procure them at present, but they believed that they would be easily procured in the future (Table 9).

While the participants reported that they highly trusted organic products (39.1%), the rate of those who stated that they trusted them a little was 29.8%, and the rate of those who stated that they were indecisive was 22.4%. Those who stated that they distrusted organic products accounted for 8.6% of all participants. The questionnaire study conducted by Erbaşlar (2013) indicated that the rate of those who responded yes to that question ranked first at 49%; 42% responded partially, and 9% responded no, and it explained that a significant portion of consumers still held serious doubts about organic products. Our

**Table 9.** Market availability of organic animal products

		Number	Rate %
Market availability of organic animal products	Market chances are low; it is not available everywhere.	237	56.6
	Market chances are high; I can find it easily.	43	10.3
	It is on par with other products, I can access it.	52	12.4
	It is difficult to access now, but I expect it to be more easily available in the future.	87	20.7
How much do you trust organic products?	I highly trust	164	39.1
	I trust less	125	29.8
	Undecided	94	22.4
	I do not trust	36	8.6

questionnaire participants responded to the question, “Why don’t you trust organic products?” that there may be adulteration and fraud, they did not know the source, there was a lack of inspection and analysis, and they could not be sure whether they were fresh, etc.

This thesis study, in which the participants stressed that the prices of organic products were very high, showed that the rate of those who strongly agreed that organic products protected nature more was very high (68.5%), while 4.3% of the participants strongly disagreed that organic products protected nature more (68.5%). While the rate of those who agreed and strongly agreed that “Organic products are easy to procure” was 19.6%, the rate of those who strongly disagreed was 32.7%.

The Mann-Whitney U test was run to assess the participants’ opinions about organic farming according to gender (Table 10). When Table 10 was analysed, a statistical difference was found between the variable of “What is the key factor in organic livestock?” the variable of “Can you understand whether organic milk is fatty or not?” and the variable of “Does the production method of animal foods affect consumption?” and gender.

A related study found no statistical difference between gender and the “preference to purchase organic food” of the questionnaire participants (Eti İçli et al., 2016). Sarica et al., (2023) stated that there was a statistical difference between gender and the consumption of organic foods by the questionnaire participants.

The Kruskal-Wallis test was run to evaluate their opinions on organic farming according to age groups (Table 11).

According to this test result, a statistical difference was found between the age groups and the variable of the type of meat; the variable of where to purchase organic meat; the variable of dairy products prioritised for organic consumption; the variable of the number of individuals prioritising organic product consumption; the variable “does the production method of animal foods affect consumption?”; the variable “How much do you trust organic products?”; the variable “Organic products are more reliable”; the variable “Organic farming and livestock breeding have high prices”; the variable “Organic farming products protect nature”; the variable “organic livestock protects the health of living organisms”; the variable “organic products are healthier”; the

variable “organic products are easy to procure”; the variable “products from the villagers are organic”; the variable “I know about organic farming”; the variable “I should consume organic products”. A related study reported no statistical difference between age and the “preference to purchase organic food” of the questionnaire participants (Eti İçli et al., 2016). Another study (Can, 2023) investigated the factors that affected the consumption of organic milk according to age groups and reported that health, environmental conditions, taste, appearance and availability made a statistical difference, whereas the price variable made no statistical difference according to age groups.

When the Chi-square Test was analysed according to age groups, it was determined that there was a significant correlation between the livestock products prioritised for organic consumption and the age groups of the participants; between the opinions on “which type of organic meat do you prefer to consume” and the age groups of the participants; between the opinions about the frequency of consumption of organic meat and products and the age groups of the participants, and between the opinions on “What are the organic milk and dairy products you prioritise to consume?” and the age groups of the participants. A related study (Can, 2023) indicated that milk and dairy products were evaluated differently among age groups and reported that the most consumed products in primary school age were butter at 89.28%, fatty milk at 85.71%, cheese at 75%, and yoghurt at 71.42%, while butter was the most consumed product in secondary and high schools (57.98%), and the most consumed products in university age were yoghurt at 57.23%, fatty milk at 51.57%, and cheese at 47.29%.

The present study showed a correlation between the opinions on “What is your priority for organic honey consumption?” and the age groups of the participants; between the opinions on “What are the most common problems you come across with the honey you consume?” and the age groups of the participants; between the opinions on “organic products were more reliable” and the age groups of the participants; between the opinions on “organic farming products protect nature” and the age groups of the participants; between the opinions on “organic livestock protects the health of living organisms” and the age groups of the participants; and between the opinions on “I should consume organic products” and the age groups of the participants.



**Table 10.** Non-parametric statistical tests by gender

Variables	Mann - Whitney U	Z	p
The key factor in organic livestock	18473	-2.524	0.012
Products prioritised for organic consumption	20874.5	-0.265	0.791
Priority for organic meat consumption	20416	-0.649	0.516
Consuming organic animal products	20447	-1.200	0.230
Which type of meat do you consume?	20176	-0.855	0.393
A place to purchase organic meat	19094	-1.821	0.069
Frequency of consumption	19773.5	-1.205	0.228
Dairy products prioritised for organic consumption.	20772.5	-0.344	0.731
A place to purchase organic dairy products	20332	-0.736	0.462
How to understand whether milk is fatty or not	19019.5	-2.159	0.031
Priority for organic egg consumption	21086	-0.067	0.946
Priority for organic dairy products	20631	-0.460	0.646
How do you understand if an egg is organic?	21118.5	-0.040	0.968
Priority for organic honey consumption	20874.5	-0.249	0.804
What kind of honey do you purchase?	20703	-0.400	0.689
The most common problem you come across with the honey you consume	21084.5	-0.084	0.933
The most common organic products in grocery stores	19570	-1.398	0.162
Paying attention to the brand of food	19534	-1.560	0.119
Frequency of purchasing organic animal foods	19580.5	-1.358	0.175
Does the production method of animal foods affect consumption	19356	-3.142	0.002
Market availability of organic animal products	20538	-0.571	0.568
How much do you trust organic products?	19432.5	-1.495	0.135
Organic products are more reliable.	19917	-1.128	0.259
Organic farming and animal products have high prices.	20829.5	-0.320	0.749
Organic farming products protect nature.	20785.5	-0.377	0.706
Organic livestock protects the health of living beings.	20215	-0.983	0.325
Organic products are healthier.	20692.5	-0.469	0.639
Organic products are easy to procure	20374.5	-0.670	0.503
Products from the villagers are organic.	20684.5	-0.408	0.683
I promote the consumption of organic products.	19980.5	-1.215	0.224
Organic farming and livestock are widespread.	20669	-0.418	0.676
I have enough knowledge about organic farming.	19969.5	-1.011	0.312
I should consume organic products.	20343.5	-0.823	0.411
Knowledge about production conditions	19890.5	-1.215	0.224

## CONCLUSION AND RECOMMENDATIONS

The COVID pandemic and the earthquake that struck 11 provinces in recent years and its consequences required more attention to health. Organic farming

is an environmentally friendly method that prohibits the application of chemicals harmful to human health. This study was carried out to determine organic production and the evaluation of products from an animal products and it was found that the

**Table 11.** Results of Kruskal-Wallis' test according to age

Variables	Kruskal-Wallis H	sd	p
Consuming organic animal products	6.497	5	0.261
The key factor in organic livestock	10.240	5	0.069
Products prioritised for organic consumption	10.687	5	0.058
Priority for organic meat consumption	6.305	5	0.278
Which type of meat do you consume?	14.207	5	0.014
A place to purchase organic meat	30.810	5	0.000
Frequency of consumption	5.816	5	0.325
Priority for organic dairy products	7.567	5	0.182
Dairy products prioritised for organic consumption.	28.702	5	0.000
A place to purchase organic dairy products	3.848	5	0.572
How to understand whether milk is fatty or not?	4.607	5	0.466
Priority for organic egg consumption	1.385	5	0.926
How do you understand if an egg is organic?	1.536	5	0.909
Priority for organic honey consumption	8.424	5	0.134
What kind of honey do you purchase?	8.760	5	0.119
The most common problem you come across with the honey you consume	7.364	5	0.195
Number of individuals who prioritise consumption of organic products	33.951	5	0.000
The most common organic products in grocery stores	6.854	5	0.232
Paying attention to the brand of food	8.949	5	0.111
Frequency of purchasing organic animal foods	6.277	5	0.280
Does the production method of animal foods affect consumption?	21.536	5	0.001
Market availability of organic animal products	10.091	5	0.073
How much do you trust organic products?	24.363	5	0.000
Organic products are more reliable.	28.123	5	0.000
Organic farming and livestock products have high prices.	32.726	5	0.000
Organic farming products protect nature.	46.123	5	0.000
Organic livestock protects the health of living beings.	44.891	5	0.000
Organic products are healthier.	44.412	5	0.000
Organic products are easy to procure	13.093	5	0.023
Products from the villagers are organic.	25.743	5	0.000
I promote the consumption of organic products.	42.807	5	0.000
Organic farming and livestock are widespread.	4.614	5	0.465
I have enough knowledge about organic farming.	28.467	5	0.000
I should consume organic products.	44.333	5	0.000
Knowledge about production conditions	5.705	5	0.336

majority of the questionnaire participants previously knew about organic farming and organic livestock; the production method of animal foods affected consumption; little was known about the produc-

tion conditions of organic animal foods consumed; organic farming should be promoted, most of the information on organic farming was learnt from communication means, such as internet, television,

social networks; organic livestock was a correct and conscious production model; health and nutrition were the two key factors in organic livestock; most of the organic meat was purchased from villagers and butchers; meat and its products and milk and dairy products were prioritised; and the priority in organic meat consumption was to be healthy and reliable; organic meat and its products were consumed occasionally rather than continuously; the priority in the consumption of organic milk and dairy products was to be healthy, reliable and fresh; milk and cheese ranked the first 2 among organic dairy products; the priority in the consumption of organic eggs was to be healthy and fresh; the priority in the consumption of organic honey was to be healthy and reliable; milk and dairy products, eggs, meat and meat products were mostly available in the markets; the brand of the organic food purchased was paid attention to; the high prices of organic animal foods lowered the purchase of organic products; the market availability

of organic animal products was insufficient; they were not available everywhere; people were confused about their trust in organic products; organic products were more reliable; and organic products were healthier.

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## AUTHORS' CONTRIBUTIONS

MB and TA conceived the study design, data acquisition, analysis, and performed the experiments. TA proofread the manuscript.

## CONFLICT OF INTEREST DECLARATION

The authors declare that they have no conflict of interest.

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