

RESEARCH ARTICLE

Differences between low-income and high-income buyers of organic milk and willingness to pay organic price premiums

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ABSTRACT

The demand for organic products has increased with the increase in individuals' education and income levels, their sensitivity to the quality of the products, and their willingness to pay higher prices for natural and quality products. Confidence in organic products, caring about the health effects of organic products, and the ease of accessing them are among the factors that increase their consumption. Organic products are also perceived as natural products in Turkey. The awareness of questioning the certificates and logos of purchased organic products has not yet been formed. Those who do not know the legislation, such as the organic logo requirement, perceive all kinds of natural products obtained from rural areas as organic. In this study, 477 questionnaires from households were obtained in Bursa, the 4th largest city in Turkey. The study aimed to reveal organic milk and dairy products (OMDP) consumption perceptions, consumption status, and reasons for preference by participants' income level. Consumers' awareness and perceptions of OMDP, their OMDP consumption status, and the relationship between OMDP consumption and income level. The study also inquired whether consumers would be willing to pay more for OMDP and whether this willingness to pay was affected by income levels. Middle-income consumers consumed the most organic milk—consumers with high income purchased OMDP the least. However, in case of increased product awareness, half of the high-income consumers were willing to pay 30% more for OMDP. This research is a reliable, empirical field study to reveal Turkish OMDP consumers' characteristics and contribute to the literature.

Keywords: Organic milk; Organic dairy products; Income effect; Consumer choice; Sustainable consumption

INTRODUCTION

In recent years, demand for organic food products has increased worldwide (Hurtado-Barroso et al., 2019). Developed and developing countries have turned to sustainable production systems to minimize the adverse consequences of climate change, malnutrition, obesity, shrinking agricultural lands, and Covid-19 pandemic (Wang et al., 2019; Scozzafava et al., 2020; Eynade et al., 2021). One of these sustainable production systems is organic production (Carfora et al., 2019). Organic production aims to protect human health and natural balance by focusing on the environment, ecological cycle, and biodiversity. Organic products are superior to traditional products because of their taste, freshness, and nutritional values. They are healthy and environmentally friendly (Udomkun et al., 2018; Petrescu et al., 2020).

The first organic production in Turkey started with the İzmir grape in 1984-1985. In the ongoing process with figs, apricots, and hazelnuts, products where Turkey is competitive in the world markets (Tirasci et al., 2020; Turan and Demircan, 2021). Many kinds of organic products are grown in this geography owing to its climate characteristics, fertile soils, and high biological diversity. Products must first be certified organic to be available for sale in the domestic and foreign markets.

Products not inspected during the production stages and certified are not considered organic. The primary purpose of this certification system is to convey to the consumer that the product is inspected and healthy (Turan and Demircan, 2021).

Compared to traditional production, it is easier in organic production to follow the production stages and know

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about the product. Verifying production steps creates a sense of consumer trust (Garcia and Teixeira, 2017; Carfora et al., 2019).

Organic farming is costly compared to traditional production systems. Inspection and certification of these products increase prices. Doorn and Verhoef (2015) found in their study that the biggest obstacle for consumers to buy organic food is the product's price. Relatively low production volume and high quality also make organic food expensive. Gerrard et al. (2013) expressed in their research that consumers are willing to pay more because they know that organic products' production and control process is costly. Similarly, Koze and Kircova (2020) further pointed out that price is the biggest obstacle to consumers' organic consumption. Even if they are curious and want to buy organic products, they cannot regularly buy due to budget constraints. The reason for obtaining contrasting results can be resulted from income differences between the consumer groups researched. Although low-income consumers want to consume organic products, they cannot regularly buy organic products.

The main reasons for consumers to prefer organic products are health (Dipeolu et al., 2009) and environmental concerns (Rana and Paul, 2017). It can also be seen as an emerging marketing trend where health benefits are considered before making a purchasing decision (Mtimet et al., 2020). It has been determined that individuals who consume organic milk, meat, fruit-vegetable, etc. pay more attention to their diets than individuals who do not consume organic products (Kesse-Guyot et al., 2013). Also, organic consumers' physical activity rate (Bradbury et al., 2014) is higher and smoking rate (Eisinger-Watzl et al., 2015) is lower (Zong et al., 2016) compared to consumers who prefer conventional products. Organic consumers are also sensitive to residues in food and animal welfare in organic farming (Mie et al., 2017). Torjusen et al. (2014) stated in their research that particularly pregnant women and women who had just given birth paid more attention to organic consumption.

The chemicals used in conventional production adversely affect human health (Bjorling-Poulsen et al., 2008). Problems have been identified in the central nervous systems of individuals exposed to these chemicals, especially at an early age and who are exposed for an extended period (Grandjean and Landrigan, 2014). The absence of synthetic and chemical use in organic production eliminates this drawback (Bellanger et al., 2015). It is vital that milk and dairy products do not contain chemicals.

The main objective of this study is to determine the effect of different income levels on the consumers' willingness to

pay (WTP) for organic milk and the relationship between willingness to pay and their perception and expectations of organic dairy products with an emphasis on milk. In recent years many studies has been done to determine the WTP of consumers for organic foods (Illichmann and Abdulai, 2013; Krystallis and Chryssohoidis, 2005) as well as milk (Yormirzoev et al., 2020; Akaichi et al., 2012; Huang and Lee, 2014). Also many of these studies researched the effect of income on willingness to pay for milk and organic products (Bahsi and Akca, 2019; Dimitri and Dettmann, 2012; Gundala and Singh, 2021).

CONSUMPTION OF MILK AND DAIRY PRODUCTS

Milk and dairy products are indispensable in human nutrition and development (Koyuncu et al., 2014). The lactose, vitamins, minerals, proteins, and micronutrients in their content are essential for the fundamental physiological development of individuals. In addition, milk is a source of calcium and phosphorus that supports bone development (Bezie, 2019). Milk is widely consumed all over the world. It is an element that has existed in the diet of people of all ages since ancient times and has contributed positively to nutrition (Evershed et al., 2008; Wijesinha-Bettoni and Burlingame, 2013; Chalupa-Krebzdak, 2018). Yibar and Kucuk (2019) stated that milk and dairy products are the basic foodstuffs that people of all ages should consume in a healthy and balanced diet.

Despite all these benefits of milk, some consumers choose not to consume milk willingly, and some unintentionally (Thorning et al., 2016). Lactose intolerance, milk protein allergy, vegan diet, paleo diet, and cultural reasons prevent some individuals from consuming milk (Carvalho et al., 2001). In this case, those individuals prefer plant-based milks. Fulgoni et al. (2011) determined that plant-based dairy products created a perception in consumers that they had the same nutritional values as those of animal origin. Especially for children and the elderly, the preference for plant-based dairy products instead of animal milk causes severe nutritional problems (Carvalho et al., 2001).

Besides the problems caused by not consuming milk, some health problems are also seen in the case of milk consumption. Especially unpacked (loose) milk that is not sold under hygienic conditions causes serious health issues. Coliform bacteria are frequently encountered in loose milk, which is also called street milk (Berhanu et al., 2021; Celik et al., 2021).

There are two main reasons why consumers prefer loose milk; The seller brings the product to the door, and loose milk is cheaper than packaged milk (Karakaya and Inci

2020). Costard et al. (2017) stated in their study that the disease risk rate of unpasteurized milk and dairy products was 800 times higher than that of pasteurized milk and dairy products. Before and after the pasteurization process, precautions are taken to eliminate the conditions that may cause disease. According to Tapki et al. (2021), 75.9% of primary school graduates consumes loose milk. Again, in the same study, examining unpacked milk consumption according to age groups disclosed that unpacked milk consumption was higher for each age group than other types of milk. Although it is known that many diseases can be caused by loose milk consumption in developing countries such as Turkey, people continue to consume loose milk due to economic reasons.

Organic milk and dairy production differ from conventional production. In organic farming, the living conditions of animals are much better than the conventional ones (Gardebroek et al., 2010). In organic farming, animals roam freely and their needs such as nutrition, shelter, care and veterinary services are met without interfering with their natural habitat. Hormones, stimulants, and additives that accelerate animals' growth and increase their efficiency can be used in conventional production. However, these are strictly prohibited in organic production (Bayram et al., 2013; Celikyurek, 2017). For this and similar reasons, there are differences between organic and conventional milk in terms of nutritional value. Organic milk's protein level and some minerals may be lower than traditional milk. On the other hand, organic milk's fatty acid ratio (Mie et al., 2017) and pro vitamins are higher than conventional milk because animals are fed from green grasses and pastures (Selcuk and Muruz, 2018). Consequently, the demand for organic animal products obtained under these conditions is increasing day by day (Bayram, 2021). Britwum et al. (2021) stressed that the most fundamental factor affecting the preference for organic milk and dairy products (OMDP) was "not using growth hormone" in animals. This directly affects consumer preferences. Consumers, who care about environmental concerns as well as human health, also consider the welfare of living things. Therefore, raising animals in higher welfare conditions is a critical factor.

Although organic products differ significantly from natural products, consumers often have difficulty distinguishing them. Consumers who do not fully know what "organic" means perceive natural products sold in markets and rural areas as organic. Britwum et al. (2021) found that natural products with overlapping characteristics with organic products are often mixed up with each other.

Tomic Maksan et al. (2022) stressed that consumers prefer organic dairy products because they are healthy, have high nutritional value, and are reliable. The main factors affecting

consumers' organic product preferences are product knowledge, health benefits, price, income status, and past experiences (Victoris et al., 2016). The certification process is majorly affected by organic products' production costs (Eckhardt et al. 2010). The fact that there are not enough certification bodies in Turkey increases the cost of the process. The incentive to increase certification bodies will also have a positive impact on organic product prices (Boz and Kilic, 2021).

WILLINGNESS TO PAY FOR ORGANIC MILK AND DAIRY PRODUCTS

With food quality and safety being a vital preference factor, higher quality levels are offered to consumers at different price levels. Consumers demand food quality and safety due to increased benefit levels and reduced health risks. They are willing to pay a higher price for healthy–nutritive foods (Rodriguez et al, 2007).

When the literature on willingness to pay a quality premium (WTP) for organic milk is analyzed, it is striking that there are few studies on this subject in both international and national literature. Vandermerch and Mathijs (2004) investigated the opportunity to add value to milk in the domestic market in their study. The study aimed to reveal the amount consumers are willing to pay for milk certified with the local origin and to explain which socio-demographic and behavioral variables determine this amount. The study divided consumers into two groups: price shoppers and added-value seekers. The customers in the second group were willing to pay a price difference of €0.1. In general, dairy consumers agreed to pay a price difference of 10% to 20%.

Bernard and Mathios (2005) studied the milk market, the factors that affected consumer choice of organic products, and the implications for the development of niche markets. The authors aimed to determine how much consumers were WTP for these products. Further, the authors presumed that higher-income households would be more likely to purchase organic milk. The research highlighted that consumers were WTP more for organic milk compared to conventional milk. The premium consumers were WTP was higher for organic milk.

Smed (2006) analyzed consumer preferences for newly introduced "low fat" conventional and organic milk and its effects on the stagnant organic milk market. WTP increased between 7% and 12% in the first period, 11% and 21% in the second period, and 7% and 21% in the last period.

Rodriguez et al. (2007) calculated consumers' willingness to pay for organic products in Argentina by applying

Binominal Multiple Logistic Regression. The research has revealed that the quality-price WTP difference is observed in various values, ranging from 6% to 20%.

Studies on WTP for organic fruit and vegetable demand are rare in Turkey. More worryingly, In the Turkish literature, only two more WTP studies could be found in meat (Kadanali et al. 2010) and conventional milk (Topcu, 2019). There is no study estimating WTP for organic milk and dairy products in Turkey.

The literature review disclosed that there is not sufficient research on the factors affecting consumers' OMDP preferences and WTP for such products in the Marmara region and Turkey. Current research aims to fulfill this gap.

For this purpose, we aimed to determine consumers' awareness and perceptions of OMDP, their OMDP consumption status, and the relationship between OMDP consumption and income level. The study also examined whether consumers would be willing to pay more for organic products and whether this willingness to pay was affected by income levels.

The available research argues that several demographic factors affect the consumption of organic products. According to the study by Gumber and Rana (2019), participants' age, gender, income, education, and marital status affected their organic food product preferences. In contrast, Yin et al. (2016) stated that gender, marital status, number of children, and income level did not affect consumers' trust in organic milk. According to Muthukumaran et al. (2021) and Yildirim (2021), income status does not affect organic product consumption preferences. Etuah et al. (2021), Turan and Demircan (2021), and Ozdemir (2021), on the other hand, concluded that more organic products would be preferred if the income level increased. In the studies that were examined, contrasting results were obtained on the income effect. Therefore, the present research desired to determine the impact of income level on the consumption of OMDP.

METHODOLOGY

The research data were obtained with the structured questionnaire in February 2022 with the participation of 477 consumers residing in Bursa. The population of Bursa province was 3,147,818 in 2021 (TUIK, 2021). The participants in the study group were randomly selected, and the questionnaire forms were completed with face-to-face interviews after obtaining the participants' consent (Gurbuz and Kadagan, 2019). The following formula was used to obtain the sample size Yamane (1967) (Eq 1).

$$n = \frac{t^2 pq}{E^2} = \frac{(1.96)^2 [(0.50*0.50)]}{(0.05)^2} = 384 \quad (1)$$

According to the formula given above, 384 samples are sufficient for a population of 50,000 people. However, considering the possibility of missing and erroneous data, a questionnaire was administered to 477 people. Before forming the survey questions and the scales used in similar studies had been examined. The preliminary survey study was conducted with ten participants; some questions were revised and transformed into the final form. Survey questions aimed to determine the participants' general characteristics, perception of OMDP consumption, consumption levels, and reasons for choosing OMDP. Before the survey, the participants were not informed about the definitions of organic products and certification.

The central hypothesis aimed to reveal the relationship between income and organic milk consumption. It is helpful to give background information about the earnings in Turkey. The high ratio of those working at and around the minimum wage among the total number of employees makes the minimum wage much more critical for that country. Turkey is one of the countries where the minimum wage is the lowest when compared to the European Union (EU) countries. According to Eurofound (2021) data, the average rate of workers in EU member countries with a minimum wage was around 9%. In Turkey, on the other hand, the rate of workers that earn 10% more or less than the minimum wage was 57%. This means the rate of those who make around the minimum wage in Turkey is more than six times the EU average. The proportion of those who make a minimum wage is 3% in the Netherlands, Denmark, Belgium, and Sweden. It is 4% in Austria, Greece, and the Czech Republic, and 5% in Spain, Slovenia, Germany, and Finland. Among the EU countries, the three countries with the highest minimum wages are Romania with 21% and Hungary and Portugal with 20% (DİSK-AR, 2021). In our study, Turkey's minimum wage announced for January-July 2022 was taken as the basis for determining income groups. Thus, respondents that earn \$350 (minimum wage for January-July 2022) and less has been classified as the low-income group, \$351-700 was classified as the middle-income group and \$701 and above was classified as the high-income group. The statements in the questionnaire were prepared as a 4-point Likert Scale coded as "1: Strongly Agree, 2: Agree, 3: Disagree, 4: Strongly Disagree". The data obtained from the survey were analyzed using SPSS 25.0. The study tested the research questions using Frequency analysis, ANOVA analysis, and Correlation analysis. In the research, three subgroups were formed. These subgroups are (1) OMDP

consumption perception, (2) OMDP consumption status, and (3) reasons for OMDP preference.

Frequency analysis (Manicandan, 2011; Carlson and Winquist, 2018) as a descriptive statistical method has been used to determine the demographic characteristics and the perception about organic dairy products of the participants by showing the number and percentage of the occurrences of the responses provided by the surveyed individuals. In this study ANOVA test (Snedecor, 1934) has been used to determine if the income levels of respondents have any effect on their consumption of organic milk. When there are three or more variables available in a model. ANOVA can be helpful for investigating whether the difference in means of variables are statistically significant or not. In essence they are similar to two sample t-test however results offer less type I errors (Scott and Mazhindu, 2005). The ANOVA results in the study showed that there were no statistically significant difference for WTP related to income no further analysis were considered. Also correlation analysis (Cohen et al., 2002) have been performed to see the relationship between consumers' willingness to pay for organic milk with different variables such as organic certification, organic logo knowledge, and label information desired by consumers. In order to show the relationship between two variables different statistical methods can be used. In this study Pearson's correlation analysis (Weinberg and Abramowitz, 2008) has been used. Pearson's correlation can be used when the variables involved are normally distributed and there is a linear relationship between the variables. Since the aim was to prove a directional relationship between the WTP of the consumers and the related variables and the data were assumed to be normally distributed Pearson's correlation was used.

FINDINGS AND DISCUSSION

Demographic characteristics of respondents, including gender, age, income, education, marital status, household size, education status and income level can be found in Table 1. Examination of the demographic characteristics of the participants revealed that the number of females (49.1%) and males (50.9%) were almost equal. Their marital status was primarily single (68.8%). The number of participants between the ages of 23-30 was 109, and the number of university graduates was 223. Income groups were close to each other in terms of participant numbers with middle income group being the highest at 35%, and households that were formed by 3-4 people was 52.6%.

Consumers' perceptions of organic milk and dairy products

One of the main problems is that consumers perceive natural milk and dairy products as organic (Schröck, 2012; Lindstrom, 2022). Consumers are not sufficiently aware of the differences between natural and organic products. Consumers are also confused about whether natural or organic products are more beneficial (Yiridoe et al., 2005). For this reason, organic product perceptions of individuals who stated that they consume OMDP were tried to be determined. The findings are summarized in Table 2.

It is seen that 277 individuals participating in the survey preferred to consume OMDP, while 272 preferred to consume natural milk and dairy products. It is possible to interpret that the number of consumers in both groups is close to each other, as consumers cannot distinguish between natural and organic and perceive both as the same. In addition, it is possible to interpret this finding as

Table 1: Characteristics of the participants

Gender	N	%	Marital Status	N	%
Women	234	49.1	Married	149	31.2
Men	243	50.9	Single	328	68.8
Age	N	%	Education	N	%
23-30	109	22.8	Literate	13	2.7
31-40	100	21.0	Primary School	77	16.1
41-50	93	19.5	Secondary School	49	10.3
51-60	89	18.7	High School	115	24.1
61 ≤	86	18.0	University	223	46.8
Income	N	%	Household size	N	%
Low	156	32.7	1-2	171	35.8
Medium	169	35.4	3-4	251	52.6
High	152	31.9	5 ≤	55	11.5
Belief in the nutrition value of organic milk			Organic product prices		
Nutritious	441	92.6	Expensive	337	71.6
Not nutritious	36	7.4	Normal-cheap	140	29.4
Total	477	100.0	Total	477	100.0

Table 2: Consumers' perceptions of organic milk and dairy products

	1		2		3		4		M	Sd
	N	%	N	%	N	%	N	%		
I prefer organic products in milk and dairy products	123	25.8	154	32.3	123	25.8	77	16.1	2.32	1.03
I prefer natural products in milk and dairy products	93	19.5	179	37.5	124	26.0	81	17.0	2.41	0.99
It is important for me to include more information about the nutritional values on the label.	69	14.5	128	26.8	205	43.0	75	15.7	2.60	0.92
It is important for me that the label tells more about the milk processing process.	71	14.9	149	31.2	181	37.9	76	15.9	2.55	0.93
I find organic milk prices affordable	31	6.5	109	22.9	159	33.3	178	37.3	3.01	0.93
It is important for me that the label gives more information about the farm/conditions in which the milk is produced.	68	14.3	137	28.7	192	40.3	80	16.8	2.60	0.93
I read the labels, and I inquire about the certificate of the organic product I purchase.	26	5.4	38	7.6	189	40.0	224	46.9	3.74	0.98

Strongly agree, 2 Agree, 3 Disagree, 4 Strongly disagree. M=Mean, Sd: Standard Deviation

consumers who prefer natural products are more likely to select organic products.

A hefty 41.3% of the participants stated that it was vital for them to include more information on the label about nutritional values. About half of the participants (46.1%) said that it was essential for them that the label provides more information about the milk processing process. Further, 43% of the participants agreed with the statement that it was essential to know more about the farm/conditions where milk was produced. A vast majority of (86,9%) participants disagreed with the statement, "I inquire about the certificate of the organic product I purchased." Although a promising 58.1% of the participants consumed organic products, only 46.1% thought that information about the milk production process and 43% about the farm/conditions where milk was produced was important. The rate of those who questioned the organic produce certificate of the produce they buy was 13%. One of the critical findings of the research is that consumers are unaware of organic certificates and do not question organic certifications. This finding is frequently emphasized and confirmed by existing studies.

In their study, Varoglu and Turhan (2016) stated that consumers did not know the definition of organic production and defined the products they produce at home as organic. Varoglu and Turhan (2016) pointed out in their study that consumers cannot define organic production and consider their homemade products organic. A comparable finding was obtained by Turan and Demircan (2021). Nearly three-quarters of consumers (73.18%) described organic products as natural. Further, Bahsi, and Akca (2019) aimed to determine consumers' perspectives on organic agricultural products. The authors emphasized that their respondents also confused natural products with organic products.

This study and existing research showed that the certificates that legitimize the organic nature of the products are not

known to the consumers. The habit of inquiring about the certificates is not formed. The end user does not know that organic logos are required for genuine organic products. As a result, the perception has been formed that what is produced naturally is an organic product. Individuals participating in the current study also believed that the natural products they bought were organic.

It is apparent that consumers cannot describe and distinguish organic products (Daugbjerg, 2014; Roh et al., 2022). At this point, consumers should be educated and informed about the deterioration of environmental conditions and the gradual decrease of natural resources. Studies show that consumers with higher education levels are more sensitive to environmental problems and are more likely to prefer organic products.

In addition to the work of universities and research institutions and the promising practices of policymakers, awareness-raising campaigns should be organized in the mainstream and social media, taking into account consumers' intensive use of those media. These campaigns will help consumers to distinguish between organic and natural products. The most important and legally approved way for consumers to differentiate between natural and organic products is the organic logo on the packaging of food products.

Sahin and Yercan (2022) found that 97.8% of the participants knew the definition of organic, and 97.7% defined it correctly. When the status of questioning the certificates of the products is examined, it is seen that the consumers have incomplete information. Although consumers knew the definition of organic products, they did not care about the certificate status. In the present study, it was found that the certificate that forms the basis of the organic products was not questioned. Raising awareness of consumers about certificate inquiry will be beneficial in increasing the demand for organic products. According to

the research of de Magistris and Gracia (2012), Grashuis (2021), and Wong and Tzeng (2021), the use of organic logos on products increases consumers' awareness of organic products.

Effect of income on organic milk consumption

The study's main hypotheses were to examine the organic milk consumption of the participating individuals in terms of their income and to determine whether there is a statistical difference according to income groups.

The authors had predicted that due to the high price of OMDP, the highest consumption would be realized by the highest income group. On the other hand, analysis has shown that middle-income individuals consumed organic milk most. Surprisingly, there was almost no difference between the organic milk consumption of the participants in the lowest income group and the organic milk consumption of consumers in the highest income group. In other words, there was no noticeable difference in organic milk consumption between all three groups.

Table 3 presents the ANOVA analysis undertaken. The result obtained is $p=0.615$ $p>0.050$. This result suggests that organic milk consumption status did not differ statistically and significantly by income status. It can be concluded that this insignificance is due to the closeness in consumption levels of all three groups, as stated above. Contrary to the present study, Koyuncu et al. (2014), in their research in which they questioned the organic milk consumption habits of young people, found that 76% of the young people whose income was below the poverty level did not consume organic milk.

It was stated earlier that low-income participants consumed organic milk a fraction more than high-income groups, and there was no significant gap between researched income levels. For example, Bahsi and Akca's (2019) findings showed that 62% of low-income consumers purchased organic products. This figure is relatively higher than the current findings.

According to Dimitri and Dettmann's (2012) research, low-income consumers were less likely to buy organic milk, middle-income consumers had indifferent (neither

high nor low) organic milk purchases, and high-income consumers were more likely to buy organic milk. Gundala and Singh (2021) stated that individuals with high-income levels have easier access to organic products than those with low income. However, in this research, high or low income does not affect the consumption of OMDP. This is because low and middle-income individuals thought that they consumed natural products organically. Even if high-income individuals consume organic products, there was no difference in the research.

Low-income individuals find the organic product prices too high, while organic product prices are ideal for high-income individuals. Curl et al. (2013) stated that high-income individuals would continue to consume the product even if the prices of organic products increased. In their study, Doorn and Verhoef (2015) determined that consumers accepted high payments only for yogurt among organic food products. The production of OMDP was directly related to consumer demand.

The effect of income level on consumers' willingness to pay for organic milk and dairy products

This section has examined consumers' willingness to pay (WTP) more for OMDP by their income groups. Table 4 presents the findings. Winter and Davis (2006) suggested that consumers pay 10-40% more for organic milk than conventional milk. The study found that 104 participants agreed to pay a maximum price of 5% for OMDP. Forty-nine (47%) of these individuals were in the low-income group. Middle-income individuals accepted a price increase of up to 10% and high-income individuals by 30%. It is expected that individuals in the low-income group would accept a rise of 5% and 10%. However, it is a remarkable finding that one in three consumers in the low-income group said they agreed to pay 20% more. Although the middle-income group generally accepted an increase of 10%, more than one-third agreed to pay 20%, and one quarter agreed to pay 30% more. Half of the consumers in the high-income group stated that they could pay 30% more. It may be possible to say that participants who consumed less organic milk than the middle-income group, almost as much as the low-income group, were ready to

Table 3: Organic milk consumption by income groups

Income group	Do you consume organic milk?				F	Sig.
	Yes	%	No	%		
Low	77	49.4	79	50.6	156	0,486 0,615
Medium	84	49.7	85	50.3	169	
High	68	44.7	84	55.3	152	
Total	229	48.0	248	52.0	477	

Table 4: Consumers' willingness to pay for organic milk and dairy products by income groups

WTP	%5		%10		%20		%30		Total
	N	%	N	%	N	%	N	%	
Income Groups									
Low	49	47	32	27	43	33	32	26	156
Middle	33	32	59	49	47	37	30	24	169
High	22	21	29	24	39	30	62	50	152
Total	104	100	120	100	129	100	124	100	477

Table 5: Correlation analysis of selected variables

	Willingness to pay	Certificate Inquiry status	Information on the milk processing process on the label	Information on the farm/ conditions in which the milk was produced on the label
Willingness to pay				
R	1	-.140**	-.168**	-.143**
<i>p</i>		.002	.000	.002
N	477	477	477	477
Certificate Inquiry status				
R	-.140**	1	.045	.001
<i>p</i>	.002		.331	.990
N				
Information on the milk processing process on the label				
R	-.168**	.045	1	.749**
<i>p</i>	.000	.331		.000
N	477	477	477	477
Information on the farm/conditions in which the milk was produced on the label				
R	-.143**	.001	.749**	1
<i>p</i>	.002	.990	.000	
N	477	477	477	477

**p*<0,05 ** *p*<0,001

pay more, resulting from social desirability bias. Consumers in the high-income group often use higher-quality and branded products. Some of them purchase directly from the producer. Thus, the high-income group might have thought that they consumed natural and high-quality products and were also organic.

Yormirzoev et al. (2020) also has investigated consumers' WTP for organic compared to natural milk in Russia. Their research showed that 77,3% of consumers were WTP for organic milk. 30.3% were WTP 5%, 27,4% were WTP 10% more, 22.6% were WTP 20% more finally 19.7% were WTP 30% more. In the current study however, 21.8% of consumers WTP 5% more, 25.2% were WTP 10% more, 27% were WTP 20% more and finally 26% were WTP 30% more. Although the figures are similar in both studies, it is noteworthy that the current study has a high rate (30%) of WTP. Contrary to the current study, the acceptance rate in Yormirzoev et al. (2020) decreases as the price increases.

Relationship between willingness to pay, organic logo knowledge, and label information

We performed a correlation analysis to reveal the relationship between willingness to pay for OMDP, organic certification, thus organic logo knowledge, and label information desired by consumers. The results of the correlation analysis are presented in Table 5. In the table, only the statements with a significant relationship are included. There was a statistically significant and negative relationship between the request for payment and the certificate inquiry, information on the milk processing process on the label, and information on the farm/

conditions in which the milk was produced. Participants did not question the certificate of the OMDP they consumed and did not care about the information on the milk processing process or farm/conditions on the label. This shows that consumers preferred loose milk instead of labeled and packaged milk. In Sahin and Yercan's (2022) research, where the authors inquired about organic product awareness among consumers in the organic product market, 52.4% of the participants consumed OMDP, and 47.6% did not. Only 27.5% of those who consumed OMDP stated that the products had a certificate/logo of the certification body. Studies on this subject showed that consumers did not read the information on the labels and could not describe organic products. Consumers did not know enough about hygiene problems in loose milk and the label information required for OMDP.

CONCLUSIONS

This research investigated the relationship between consumers' awareness and perceptions of OMDP, their OMDP consumption status, and the relationship between OMDP consumption and income level. The study also examined whether consumers would be willing to pay more for organic products and whether this willingness to pay was affected by income levels.

The results confirmed that while almost half (48%) of the consumers who participated in the survey consumed OMDP, it was also observed that the participants were unaware of the organic certification requirement. The results again emphasized that consumers do not distinguish

between organic and natural products; they see both as the same. Participants in our study were grouped as low, middle, and high income. The study had anticipated that consumers' OMDP consumption would differ by income group. However, the opposite result was obtained. The OMDP consumption did not differ according to income levels. The research also showed that, in contrast to available research, consumers with high income purchased OMDP the least. However, in case of increased product awareness, half of the high-income consumers were willing to pay 30% more for OMDP.

Government supports are available to increase organic production. However, considering the country's population, the amounts of these supports and organic production are insufficient. Support for organic production should be increased. In addition, support and facilities should be provided for the processing and marketing of these products. Campaigns should be organized in the mainstream media to distinguish organic products and the benefits of organic consumption. Public advertisements should be placed on mass and social media. The certification requirement must be emphasized in these public sports.

Although the research was conducted in a socio-economically developed region of Turkey, it will help to compare and interpret the results for consumers in different geographies but with similar socioeconomic characteristics in future studies. Despite the rapid development, the organic food market has not yet reached the desired volume in Turkey. This research can be replicated with a larger sample in markets where the organic market is better developed. This research focused on milk and dairy products. Conducting similar studies for other organic food products will play an essential role in increasing the production and consumption of organic products.

Authors' contributions

Ozlem Turan; Conceptualization, data collection and analysis, methodology & writing

Ozgecan Kadagan; Conceptualization, data collection and analysis, methodology & writing.

Ismail Bulent Gurbuz; Conceptualization, review & editing.

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