

# Factors Affecting Consumer Perception of Goat Milk and Dairy Products in Ankara Province

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## Abstract

The aim of this study is to determine the consumption of goat milk and dairy products according to the demographic characteristics of consumers residing in the urban areas of Ankara and to determine the factors affecting the buying and consuming behaviors of these products. Within the scope of the study, face-to-face questionnaires were conducted in supermarket chains with 269 consumers. The surveys were conducted in 9 districts of Ankara including Altındağ, Çankaya, Etimesgut, Gölbaşı, Keçiören, Mamak, Pursaklar, Sincan and Yenimahalle. The results of the research were analyzed with chi-square statistical method and cross table. Average monthly consumption of consumers was found to be 0.25 L for goat milk, 0.62 kg for goat cheese and 0.40 kg for goat ice cream. As a result of the chi-square analysis, the differences between consumption of goat cheese and ice cream with age distribution, consumption of goat milk and cheese with number of years in Ankara were found to be statistically significant. ( $P < 0.05$ ). It is thought that the results will contribute to the studies aimed at increasing the consumption of goat milk and dairy products in Türkiye.

## Introduction

Milk is obtained from many mammalian farm animals such as cows, buffaloes, sheep, goats and these are used at rural and industrial levels (Silanikove *et al.*, 2010). In recent years, there has been a steady increase in the production of milk and *cheese* from mammalian farm animals in the world, the EU and Turkey (Table 1 and Table 2) (Anonim 2022, Anonymous 2022).

As can be seen from Table 1, goat's milk was the type of milk whose production increased the most compared to cow and sheep's milk in the EU and Turkey in the period 2009-2019. This increase in goat milk production has reached a very important level, especially in Turkey (200.3%). Also, in the period 2009-2019, there were significant increases in goat cheese production in parallel with goat milk production in the world and the EU (24.83% and 10.92%, respectively) (Table 2). As to in Turkey, the period of 2013-2019,

there was a 39.82% decrease in the amount of cheese produced only from goat's milk, but there was an 11.84% increase in the amount of cheese produced mixed from goat, cow, sheep and buffalo milk (Table 3) (Anonim 2022). The following factors are shown as the reasons for the increase in goat milk and dairy products production in developed and developing countries: Increasing awareness of the positive effects of goat milk on human health, the abundance of product diversity and the economic importance of the goat milk sector at rural and industrial level etc. (Şentürlü and Arslanbaşı 2010; Savran *et al.*, 2011).

Goat's milk contains higher levels of protein than cow's milk and it is richer in some vitamins (vitamin A, Thiamine, Riboflavin, Niacin, B6) and minerals (Ca, P, Mg, Se, Cl, K) (Park *et al.*, 2007). The fact that its physicochemical properties are close to breast milk makes its use as baby food widespread and it is preferred in the nutrition of children, young and old

people (Ribeiro 2010, Gürsoy, 2015). Goat milk is recognized a food product that can be easily consumed by people with lactose intolerance due to its lower lactose content compared to cow's milk, and by patients who have digestive problems due to its high digestibility (Park et. al. 2007). Conjugated lineoic acids, which are mostly found in meat and dairy products of ruminant animals (they have anti-oxidant and anti-carcinogenic, immune system-enhancing, cholesterol-balancing, obesity-preventing effects) are found at about 0.65% in goat milk (Jahreis et. al. 1999; Ulus and Gücükoğlu 2017). Goat milk is also very suitable for the production of new foods obtained by adding products such as fruit, honey, chocolate etc., which are appropriate for the taste of consumers and it is seen as a very suitable milk for the production of functional foods containing components such as probiotics, prebiotics and vitamins (Ribeiro, 2010).

As with other animal food products, consumer perception and preference come first among the factors that determine the changes in the consumption of goat milk and dairy products. Consumer perception and preference are also controlled by different economic and socio-cultural factors. Numerous studies have been conducted in many countries around the world aimed at analyzing consumer perception and preference for

goat's milk and dairy products and the results were transferred to the relevant sectors (Ryffel *et al.*, 2008; Ozawa *et al.*, 2009; Santoso *et al.*, 2012; Costa *et al.* 2014; Machado *et al.* 2017; Idamokoro *et al.*, 2019). However, it cannot be said that the number of research and study carried out in this field in Turkey is at sufficient levels. Therefore, in this study; The perceptions of consumers living in the city center of Ankara to goat milk and dairy products and the factors affecting the consumption of these products were determined and it is aimed that these results will contribute to the studies that the Turkey goat milk sector and other relevant stakeholders will do to increase the consumption of goat milk and dairy products.

## Materials and Methods

### Materials

The material of the study was composed of consumer surveys conducted in small-scale (single-M) Migros stores and other grocery stores located in the central districts of Ankara province and data collected through these surveys. The data obtained with the questionnaire forms were used as primary data and the

**Table 1.** Milk production in the world, EU and Turkey (Anonim 2022, Anonymous 2022).

Years		2009	2019	Change (%)
Cattle milk (tonne)	World	589.981.608	708.264.265	20,5
	EU	133.343.620	152.581.300	14,43
	Turkey	11.583.313	20.782.374	79,42
Sheep milk (tonne)	World	9.408.987	10.617.961	12,85
	EU	2.781.296	2.969.138	6,75
	Turkey	734.219	1.521.455	107,22
Goat milk (tonne)	World	17.437.436	20.066.359	15,08
	EU	2.056.328	2.466.666	19,95
	Turkey	192.210	577.209	200,3

**Table 2.** Goat cheese production in the world and EU (Anonymous 2022).

Years	World	EU
2009	456.476	190.405
2010	437.011	184.963
2011	444.062	186.506
2012	539.214	176.712
2013	541.786	180.953
2014	539.123	184.072
2015	537.387	184.904
2016	545.310	188.303
2017	573.626	211.531
2018	583.476	225.208
2019	569.832	211.202
Change (%) 2009-2019	24.83	10.92

**Table 3.** Goat cheese production in Turkey (Anonim 2022).

Years	Produced only from goat's milk	Produced mixed from goat, cow, sheep, buffalo milk
2013	452	24.180
2014	651	48.549
2015	337	26.008
2016	1.249	18.530
2017	370	25.937
2018	902	29.705
2019	272	27.043
Change (%) 2013-2019	-39.82	11.84

data obtained from the relevant literature studies and field observations were used as secondary data.

### Methods

The proportional sample size formula given below was used to determine the number of consumers to be interviewed. As a result, the number of consumers to be surveyed was determined as 269 in 9 districts of Ankara, including Altindag, Çankaya, Etimesgut, Gölbaşı, Keçiören, Mamak, Pursaklar, Sincan and Yenimahalle (Aksoy 2012).

$$n = \frac{N_p(1-p)}{(N-1)\sigma_{p_x}^2 + p(1-p)}$$

n = Sample size,

N = Number of population in the region covered by the research,

$\sigma_{p_x}^2$  = Variance,

p ve q = Proportion of men and women (p+q=1 then 1-p=q)

The sample size was found 269 for N= 3706304 persons, 95% confidence interval and 5% margin of error. After determining the total number of samples, a proportional distribution was made according to the district populations in Ankara province and the number of surveys to be conducted in each district was determined. Surveys were conducted face to face with consumers. The data obtained from the questionnaires were analyzed using the SPSS package program. Chi-square test and crosstable were used by making use of the frequency distributions of the data (Düzgüneş, 1996):

$$\chi^2 = \sum_{i=1}^k \frac{(G_i - B_i)^2}{B_i}$$

$G_i$  = Observed frequency,

$B_i$  = Expected frequency

### Results and Discussion

#### Demographic characteristics of consumers and tendency in consumption of goat's milk and dairy products

The relationships between demographic characteristics and goat milk and dairy product consumption tendency of consumers in Ankara province based on chi-square test are given in Table 4. According to the results of this research, 48.7% of the consumers participating in the survey were men and 51.3% were women. Although the difference in terms of gender proportion was not statistically significant ( $P > 0.05$ ), proportion of women (54.5%) consuming goat milk and dairy products was higher than men (45.5%). Unlike the results of this study, McLean-Meyinsse and Cavalier (2004); in their survey conducted in the USA, they determined that male consumers consume more goat's milk than female consumers. Also Idamokoro *et al.* (2019) In their study conducted in smallholder's in the Republic of South Africa (GAC), they found that men farmers consume more goat's milk than women farmer. (62.3% and 37.6%, respectively).

According to the results of this research, the proportion of married and single consumers was 59.9% and 40.1%, respectively and the difference between both groups was not statistically significant ( $P > 0,05$ ). On the other hand, the consumption of goat milk and dairy products by married consumers (58.6%) was higher than single consumers (41.4%). Furthermore, during the survey, it was observed that pregnant women and families with children were more conscious about the consumption of goat milk and dairy products. In a similar study conducted in the GAC, it was revealed that married people consume more goat's milk than singles (Idamokoro *et al.*, 2019). According to these findings, it can be said that targeting women and married consumers in studies to increase the perception and preference of goat milk and dairy products can give more positive results.

In this study, 66.2% of the respondents were young and middle-aged people between the ages of 18-45. Goat milk and dairy products consumption has been occurred mostly between the ages of 25-35 (28.8%). As

a result of the statistical analyzes, no significant relationship was found between age distribution and consumption of goat milk and dairy products ( $P > 0.05$ ). Similarly, Savran *et al.* (2016) in the study they carried out in Çanakkale; they found the relationship between age distribution and consumption of goat milk and dairy products to be insignificant ( $P > 0.05$ ). However, in this study conducted in Ankara, when goat milk and dairy products were analyzed separately, it was determined that the difference between goat cheese and ice cream consumption and age distribution was significant ( $P < 0.05$ ). Unlike the findings of this study, Çebi *et al.* (2018); In their study in the province of Erzincan, they reported that the tendency to consume goat milk and dairy products is higher in consumers aged  $\geq 46$  years. According to these results; It can be suggested that identifying young and middle-aged consumers as the target audience will make a positive contribution, especially in studies aimed at increasing the consumption of goat cheese and ice cream.

According to the results of this research (Table 4), 7.1% of the respondents were primary school graduates, 4.1% secondary school, 30.5% high school, 8.6% associate degree, 49.7% undergraduate and graduate degrees. It was determined that 52.9% of the consumers who consumed goat milk and dairy products were undergraduate and graduate, and 27.2% were high school graduates. Additionally as the education level increases, the consumption of goat milk and dairy products increases. Similarly in a study conducted in Çanakkale, Istanbul and Ankara, it was determined that the consumption of goat milk and dairy products increased with the increase in education level (Savran *et al.*, 2011). Considering the findings of both studies, it can be accepted that focusing on consumers with a high level of education can have a positive effect in publication studies aiming to increase the level of perception and demand for goat milk and dairy products.

In this study, 53.5% of the families to which the consumers belonged consisted of 3-4, 37.9% of 1-2, 8.6% of  $>5$  individuals. The relationship between the number of individuals in families and consumption of goat milk and dairy products was not significant ( $P > 0.05$ ). However, it was determined that families consuming goat milk and dairy products mostly consisted of individuals (52.4%) of 3-4 people. Contrary findings of this study, Savran *et al.* (2011), Tumer *et al.* (2016) and Engindeniz *et al.* (2017) in their studies; they determined that large families ( $>4$ ) have higher consumption of goat milk and dairy products.

In this research, the period of time that consumers lived in Ankara was also examined. It was determined that 66.9% of the consumers lived in Ankara province for more than 20 years and 69.1% of these are consumed goat milk and dairy products. When goat milk and dairy products were analyzed separately, the differences between goat milk and cheese consumption and the period of time to lived in Ankara were found to

be significant ( $P < 0.05$ ). Consequently, as the number of years lived in this province increases, the consumption of these two products also increases.

#### **Factors affecting consumers' behavior towards consuming/purchasing goat milk and its products**

In Table 5, there are findings towards the purchasing behavior of consumers consuming goat milk and dairy products in Ankara province. According to these results;

While the proportion of consumers consuming at least one of the goat milk and dairy products is 71%, the proportion of those who do not consume is 29%. The most intensely consumed product types by consumers consuming goat milk and dairy products are respectively; cheese (52.8%), ice cream (43.5%), milk (29.7%), yogurt (15.2%), butter (5.6%), kefir and ayran (4.5%). As can be seen, the most preferred products are goat cheese and goat ice cream, respectively. Although goat ice cream is mostly consumed only in summer (82.1%), it is the second most consumed product. The rest of the respondents (17.9%) reported that they all the year round consumed goat ice cream 1-3 times a week (6%), once a month (5.1%), once every 15 days (3.4%), every day (1.7%) and only once (1.7%) respectively. In a similar study conducted on students studying at Çukurova University, it was determined that ice cream (18.6%) and cheese (15.3%) were consumed at the highest level among goat milk products too (Durmuş *et al.*, 2019).

In this study, the amount of monthly per capita goat milk consumption of consumers was calculated as 0.25 L on average. In a similar study conducted in the provinces of Çanakkale, Istanbul and Ankara, amount of the average monthly consumption of goat's milk by family members was found to be 0.35 L (Savran *et al.*, 2011). Respondents reported that they consume goat milk as 53.8% pasteurized, 33.8% raw and 12.4% UHT, respectively. Similar to these findings, conducted in Brazil by Dos Santos Sauzo *et al.* (2019) in their studies it was determined that consumers mostly buy goat milk as pasteurized (31.3%) and raw (31.3%).

In this research, the goat milk packaging preferences of the consumers are respectively; glass bottle (75%), UHT cardboard box (12.5%), plastic bottle (10%), loose milk (1.25%) and pasteurized cardboard box (1.25%) were determined. This is in line with the findings of Engindeniz *et al.* (2017) who reported that the highest proportion of goat milk packaging preference (61.5%) was glass bottle. Also in Güney and Sangün (2019); In their study they conducted in Adana and Mersin, they determined that the tendency of consumers to consume goat milk in glass bottles was higher.

In this study, consumers reported that they consumed goat's milk because they liked the taste the most (32.5%). This in order; high nutritional value (16.3%), health benefit (13.7%), curiosity (12.5%), baby and child nutrition benefit (12.5%), habit (11.25%) and self-production (1.25%) followed the causes. Similarly;

**Table 4.** Demographic characteristics of consumers and consumption trends of goat milk and dairy products.

Factor	Group	Consuming		Not consuming		Total	
		Number	Proportion	Number	Proportion	Number	Proportion
Gender	Male	87	45.5	44	56.4	131	48.7
	Female	104	54.5	34	43.6	138	51.3
	Total	191	100	78	100	269	100
Marital status	Married	112	58.6	49	62.8	161	59.9
	Single	79	41.4	29	37.2	108	40.1
	Total	191	100	78	100	269	100
Age*(years)	18-24 between	30	15.7	16	20.5	46	17.1
	25-35 between	55	28.8	28	36	83	30.9
	36-45 between	40	20.9	9	11.5	49	18.2
	46-55 between	40	20.9	10	12.8	50	18.6
	>55	26	13.7	15	19.2	41	15.2
	Total	191	100	78	100	269	100
Education level	Primary school	12	6.3	7	9	19	7.1
	Secondary school	8	4.2	3	3.8	11	4.1
	High school	52	27.2	30	38.5	82	30.5
	Associate degree	18	9.4	5	6.4	23	8.6
	Undergraduate and graduate	101	52.9	33	42.3	134	49.7
	Total	191	100	78	100	269	100
Household size	1-2 people	73	38.2	29	37.2	102	37.9
	3-4 people	100	52.4	44	56.4	144	53.5
	5+ people	18	9.4	5	6.4	23	8.6
	Total	191	100	78	100	269	100
Number of years lived*	1-7 years	31	16.2	10	12.8	41	15.3
	8-20 years	28	14.7	20	25.7	48	17.8
	>20 years	132	69.1	48	61.5	180	66.9
	Total	191	100	78	100	269	100

\*  $P < 0.05$ 

Savran *et al.* (2011) and Güney and Sangün (2019), in their studies, determined that the main reason for goat milk consumption is its taste. Equally, in a study conducted by Kamarubahrin (2019) on Muslim consumers in the city center of Indonesia; determined that the taste was more effective on goat milk consumption. On the other hand, Ozawa *et al.* (2009) traditional causes/habit (> 70%), Güney and Ocak (2013) found that the health benefit (47.96%) and Engindeniz *et al.* (2017) determined that the nutritional value (48.42%) had a higher effect on goat milk consumption.

According to the findings of this research, consumers do not consume goat milk mostly (60.3%) due to lack of habits. This in order; dislike of smell (12.2%), dislike of taste (9.52%), inability to find it in bazaar and markets (8.47%), height of price (6.88%) and other (2.63%) factors (lack of knowledge, allergic reactions, etc.) follows the causes. Similarly, Savran *et al.* (2011), Güney and Ocak (2013), Ocak and Önder (2014), Engindeniz *et al.* (2017) and dos Santos Souza *et*

*al.* (2019) in their studies; they determined that the most important reason for not consuming goat's milk is the lack of habit.

In this study, the amount of monthly per capita consumption of goat cheese by consumers was calculated as 0.62 kg. This finding, Tümer *et al.* (2016) in Kahramanmaraş, it was similar to the result determined in the study (0.64 kg per month). Respondents mostly consume goat cheese as traditional cheese made from cow + sheep + goat milk (38.1%), traditional cheese made from only goat milk (23.2%), and artisan cheese only goat milk (20.4%) respectively. The remaining 16.2% prefer to consume goat cheese made from sheep + goat's milk as traditional or artisan cheese. The proportion of consumption of artisan cheese made from cow+sheep+goat milk is 2.1%. These finding is similar to the results of some studies. Savran *et al.* (2011) in their study conducted in Istanbul, Ankara and Çanakkale provinces, the consumption proportions of cheese made from cow + sheep + goat milk and goat milk only were 29% and 3%, respectively and Engindeniz

**Table 5.** Behaviors towards consumption of goat milk and dairy products.

<b>Goat Milk and It's Products Consumption</b>	<b>Number</b>	<b>Proportion</b>	<b>Goat Milk Consumption Type</b>	<b>Number</b>	<b>Proportion</b>
Consume	191	71	Pasturized	43	53.8
Not consume	78	29	Raw	27	33.8
<b>Products</b>			UHT	10	12.4
Goat Cheese	142	52.8	<b>Reasons for Consuming Goat Milk</b>		
Goat Ice cream	117	43.5	Liking the taste	26	32.5
Goat Milk	80	29.7	High nutritional value	13	16.3
Goat Yogurt	41	15.2	Health reasons	11	13.7
Goat Butter	15	5.6	Curiosity	10	12.5
Others (Kefir and buttermilk)	12	4.5	Benefit in infant and child nutrition	10	12.5
			Consumption habit	9	11.25
<b>Goat Cheese Consumption Type</b>			Other	1	1.25
Cow+ Sheep+ Goat traditional	54	38.1	<b>Reasons for Not Consuming Goat Milk</b>		
Traditional made from goat's milk	33	23.2	Lack of habit	114	60.3
Artisan made from goat's milk	29	20.4	Dislike of the smell	23	12.2
Sheep+Goat traditional	23	16.2	Not liking the taste	18	9.52
Others (Cow+Sheep+ Goat artisan)	3	2.1	Not available in the market	16	8.47
<b>Goat milk packaging Preference</b>			High price	13	6.88
Glass bottle	60	75	Others	5	2.63
UHT cardboard box	10	12.5	<b>Reasons for Consuming Goat Cheese</b>		
Plastic bottle	8	10	Consumption habit	64	45.1
Pasteurized cardboard	1	1.25	Liking the taste	45	31.7
Loose	1	1.25	Curious about the taste	20	14
			Self-produced	13	9.2
<b>Goat Ice Cream Consumption Preference</b>			<b>Reasons for Not Consuming Goat Cheese</b>		
Packaged	55	47	Lack of habit	84	66.1
Cardboard box	42	35.9	Dislike of taste and smell	21	12.6
Bowl (in cafe and restaurant)	16	13.7	Not available in the market	12	9.5
Cone (Street seller)	4	3.4	High price	10	7.9
<b>Goat Ice cream Consumption Frequency</b>			Others	5	3.9
Only summer time	96	82.1	<b>Reasons for Consuming Goat Ice Cream</b>		
1-3 times a week	7	6.0	Liking the taste	98	83.8
Once a month	6	5.1	Health reasons	11	9.4
Every 15 days	4	3.4	Curious about the taste	8	6.8
Every day	2	1.7	<b>Reasons for Not Consuming Goat Ice Cream</b>		
Only once	2	1.7	Lack of habit	102	67.1
			Dislike of taste and smell	17	11.3



**Table 5.** Behaviors towards consumption of goat milk and dairy products (cont.)

Monthly Consumption Amount		Not available in the market	16	10.5
Goat milk	0.25 L	High price	6	3.9
Goat cheese	0.62 kg	Others	7	4.6
Goat ice cream	0.40 kg	Allergic reaction	4	2.6
Place of Purchase			Number	Proportion
Supermarket			117	61.3
Sending family or relative			22	11.5
Dairy market			22	11.5
Market			17	8.9
Neighbor			8	4.2
Village			3	1.6
Own production			2	1
Total			191	100
Information Resources			Number	Proportion
Family			65	34
Tags on Market Shelves			49	25.8
Advertisements in TV			35	18.3
Occupation			21	11
Friend			19	9.9
Other			2	1
Total			191	100

*et al.* (2017) found this rate to be 61.4% and 41% in the study they conducted in Balıkesir, İzmir and Çanakkale.

According to the findings of this research the reasons for the consumption of goat cheese are having a habit (45.1%), liking the taste (31.7%), curiosity (14%) and producing it by oneself (9.2%) respectively and the reasons for not consuming goat cheese are respectively lack of habit (66.1%), dislike of its taste and smell (12.6%), not being able to find it in markets and bazaar (9.5%), high price (7.9%) and other (3.9%) reasons (lack of knowledge about its benefits, allergic reactions, etc.) are shown. Contrary to these findings, Ryfell *et al.* (2008) in their study in Switzerland determined that consumers consume goat cheese mostly because they like the taste (50%).

In this study, the amount of average consumption of goat ice cream by consumers was determined as 0.40 kg / month / person. A study conducted in Izmir, Çanakkale and Balıkesir provinces by Engindeniz *et al.* (2015) considering that the annual average consumption of goat ice cream is 0.65 kg, it can be said that the amount of goat ice cream determined in this research is quite high. In a study conducted in Izmir, Çanakkale and Balıkesir provinces by Engindeniz *et al.* (2015) considering that the annual average consumption of goat ice cream is 0.65 kg, it can be said that the amount of goat ice cream determined in this research is quite high. An important finding obtained from this research is that consumers consume goat ice creams containing cow-goat milk at a high proportion

(43.5%). This is due to the fact that ice creams made from 100% goat milk are generally not available in supermarkets, markets, cafes and restaurants in Ankara province. It was determined that the consumers' goat ice cream consumption style was packaged package (47%), cardboard box (35.9%), ice cream bowl in cafe and restaurant (13.7%) and cone (3,4%). When the researches on this subject were examined, no study was found on the consumption style of goat ice cream. Studies on ice cream consumption style have generally focused on cow's milk; Çelik *et al.* (2005), Akbay and Tiryaki (2007), Sütütemiz *et al.* (2009), Onurlubaş and Yılmaz (2013) determined that consumers mostly prefer to consume packaged milk.

In this study, consumers reported that they consumed goat ice cream because they liked the taste the most (83.8%). This in order; health benefit (9.4%) and curiosity (6.8%) were followed. Consumers stated that they liked the ice cream produced from cow + goat milk more than the ice cream produced from cow's milk. Similar to this finding, Akın and Konar (2001) and Pandya and Ghodke (2007); In their study, it was determined that the ice creams produced from goat milk were more preferable than those produced from cow's milk. The reasons why consumers do not consume goat ice cream are respectively; lack of habit (67.1%), dislike of taste and smell (11.3%), not being able to find it in markets and bazaars (10.5%), high price (3.9%), lack of knowledge about its benefits, (3.9%), allergic reaction (2.6%) and prejudice (0.7%). No other

study could be found that could compare these results.

According to the findings of this research, a significant portion (61.3%) of consumers consuming goat milk and dairy products buy these products from supermarkets and it's followed by dairy market (11.5%), relative (11.5%), market (8.9%), neighbor (4.2%) and village (1.6%). 1% of consumers produce these products themselves.

In this study, consumers who consume goat milk and products stated that they reach information about these products through family (34%), tag on market shelves (25.8%), advertisements in TV (18.3%) occupation (11%), friends (9.9%) and other (social media devices, personal investigation) (1%), respectively. At the same time all consumers who responded advertisement reported that they saw only ice cream among goat products in advertisements on TV. Similarly, Güney and Ocak (2013) in their study in Adana reported that consumers have the most information about goat milk and dairy products through television (34.8%).

### Conclusion and Recommendations

According to the results of this research;

1- It was determined that consumers who prefer goat milk and dairy products in Ankara province are usually women (51.3%), married (59.9%), 25-35 years old (28.8%), at least bachelor's degree (52.9%), living in a family of 4 (52.4%) and individuals who have been residing in Ankara for many years (66.9%). Also, as the level of education increases, the consumption of goat milk and dairy products also increases. When these results are taken into consideration, the selection of consumers with these characteristics as the target audience in studies aimed at increasing consumer perception and preference for goat milk and dairy products will have a positive effect.

2- Cheese and ice cream are consumed the most among goat milk and dairy products in Ankara (0.62 kg/month, 0.40 kg/month, respectively). It can be said that these products are more odorless than other goat milk products has a positive effect on consumer perception and preference.

3-In the province of Ankara, consumers reported that they were influenced by television advertisements for the consumption of goat milk and dairy products only for ice cream. Therefore, it can be expected that the promotion of goat milk and dairy products in social media, especially on television, will have a positive effect on increasing consumption. In addition, it can be argued that the sale of goat ice cream in Ankara Atatürk Forest Farm during certain periods facilitates the supply of this product and allows it to be consumed more than other goat milk products.

4-In the province of Ankara, it was stated that the taste and aroma of goat milk and ice cream were mostly liked by consumers as the reason for consuming it. Considering the misperception that these products

smell at the beginning of the factors that negatively affect the consumption of goat's milk and meat in Turkey, this result is very important. For this reason, it is necessary to more detailed investigate the effect of this feature on consumer perception in the consumption of goat milk and dairy products throughout the country, especially in big cities, and to transfer the results to the relevant sectors.

5-The main reason for consumption of goat cheese in Ankara is that there is a consumption habit against this product. The fact that only goat's milk-containing and goat-milk mixed cheeses are easier to find in supermarkets and markets than goat's milk and ice cream has a positive effect on this situation.

6-It was determined that the most common reason for not consuming goat's milk, cheese and ice cream in Ankara province was the lack of habit. Inadequate availability in markets and bazaars and the high prices are other important reasons for not consuming.

7-In Ankara province, there is a perception among consumers that consuming ice cream in winter will cause health problems (sore throat, etc.). Informing and raising awareness of consumers in the written and visual media will be effective in changing this misperception and popularizing the consumption of 4-season ice cream in Turkey.

8-A significant portion of consumers (61.3%) in Ankara province buy goat milk and dairy products from supermarkets. Therefore, taking into account that the habit of goat milk and dairy products will develop over time, the availability of these products in certain quantities in the markets will positively affect the increase in the habit and consumption. Indeed, Dellal *et al.* (2013) in a study on the analysis of sheep and goat meat consumption perception; A significant portion of consumers (17%) reported that they do not know the kid meat because it is not available in the markets, but they can consume it if it is available in the markets. In addition, the sale of goat products such as yoghurt, butter and kefir, which are rarely found in the markets in Ankara, will make a significant contribution to their preference by consumers.

9-The vast majority of consumers (75%) in Ankara province prefer to consume goat's milk in glass bottles. This finding is an indication that consumers act consciously about their packaging preference. Besides that, selling goat's milk in glass bottles will have a positive effect on the increase in the consumption of this product.

10-According to the oral interviews in Ankara province it was determined that some consumers prefer goat's milk in the feeding of babies and children who are allergic to cow's milk due to the doctor's advice and some consumers used goat milk formulas as supplementary food for their babies. Accordingly, it can be argued that raising consumers' awareness of these characteristics of goat milk will lead to an increase in goat milk consumption.



11-Although consumers in Ankara mostly consume goat cheese in the form of traditional made from cow + sheep + goat milk, they generally do not know what type and structure of goat cheese they buy. They also reported that the labels on the product are too small. For this reason, the fact that the goat cheese labels on the shelves are large enough to be read and they provide sufficient information about the structure of the product will contribute to ensuring food safety and increasing consumption of these products.

12-One of the factors affecting consumers' not consuming goat's milk, cheese and ice cream in Ankara is the high prices of these products (respectively; 6.88%, 7.9%, 3.9%). Therefore, studies to ensure that the prices of these products are at a level that can compete with cow's milk will have a positive effect on the increase in their consumption.

13-A significant portion of the consumers (11.5%) in Ankara province stated that they did not buy goat milk and its products, but were provided by their families living in their hometowns. According to this result, it can be suggested that regional/geographical origins and habits are also effective in the consumption of goat milk products. The relationship between the consumption of goat milk and dairy products in Turkey and the regional origins of consumers and the transfer of the obtained results to the relevant sector will contribute positively to the increase in the consumption of these products.

14-According to the findings of this research carried out in Ankara; It can be said that different strategies should be developed for the promotion and marketing of goat milk and dairy products. For this, the creation of markets toward for niche products obtained from goat's milk taking into account regional consumption habits, will positively affect consumer preference and perception, and increase the consumption of these products. In addition, more effective use of instruments such as television, social media, and workshops in order to raise awareness of consumers about the benefits of goat milk and dairy products and their different uses (cosmetics, cleaning, etc.) will also contribute positively to the consumption of these products.

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### Author Contributions

All authors contributed equally to the study.

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### Ethical Statement

According to the articles of your journal as "Scientific Research Publication Policy"; We declare that our research, the information of which is given above, is among the studies that do not require ethical committee approval, since it was produced from a graduate study published before 2020.

### Conflict of interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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