

# Determination of Consumers' Consciousness Levels of Consumption of Bee Products

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## Article History

Received 18 April 2023

Accepted 07 June 2023

First Online 06 July 2023

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## Keywords

Survey

Bee

Bee products

Consumer

Level of consciousness

## Abstract

In this study, it was aimed to determine the honey consumption consciousness levels of consumers residing in Ordu province. For this purpose, a face-to-face survey was conducted with 387 people determined by simple random sampling. Determination of the honey consumption consciousness levels of consumers residing in Ordu province was carried out using a face-to-face questionnaire. 38% of the consumers were men and 62% were women, whereas 15% of the consumers were farmers, 15.2% were self-employed, 13.4% were workers, 39.3% were civil servants, 4.1% were retirees and 12.9% were tradesmen. In the study, 65.6% of the consumers stated that they had sufficient knowledge about honey, 26.1% did not, and 8.3% stated that they did not have any idea. Again, it has been determined that 59.2% of the consumers have sufficient knowledge about pollen, 32% did not and 8.8% have no idea about it. Similarly, 50.4% of the consumers stated that they knew about beeswax, 39.5% stated that they did not, and 10.1% stated that they did not have any idea. Moreover, 47.8% of the consumers stated that they knew about royal jelly, 39.8% did not, and 12.4% stated that they did not have any idea about it. Again, it was determined that 46% of the consumers did not know about bee venom, 34.9% knowledge and 19.1% had no idea about it. At the same time, 53% of the consumers stated that they knew about propolis, 33.6% did not, and 13.4% stated that they did not have any idea.

## Introduction

The beekeeping activity can be called the most dependent livestock activity due to the habits of honey bees and their collecting raw materials from nature. Although honey is the most well-known product of the beekeeping activity, there are also several bee products such as beeswax, pollen, royal jelly, and propolis. Although the name of honey products, which are very beneficial regarding human health, are well known, the benefits of honey products are not known well by consumers. It is determined that pollen strengthens the immune system, shows as an antibiotic effect against microorganisms causing severe diseases and has antibacterial and antiviral properties. Beeswax is mostly used to make honeycomb. It is also used in the cosmetic and pharmaceutical industry, dye and varnish production. Honey products, especially honey, are used in various areas from food to cosmetics industry, and in recent years they have been widely used in apitherapy (Baki et al., 2017). Though there are many studies concerning honey consumption in Turkey (Bölüktepe & Yılmaz, 2006; Bölüktepe & Yılmaz, 2008; Tunca et al.,

2015; Niyaz & Demirbaş, 2017), and in other countries (Arvanitoniannis & Krystallis, 2006; Pocol, 2011; Schifani et al., 2016), the number of studies that examine the honey consumption behaviours is limited. Honey is becoming an increasingly popular product among consumers. Honey is a product with very rich symbolism and it is present in all cultures, but its consumption is a variable category. It is, therefore, necessary to identify the wishes and expectations of consumers, which must correspond to the perception they have about this product (Haderbache & Mohammed, 2015).

Ordu province, located in the Eastern Black Sea Region, has recently attracted more and more people's attention with its natural beauties, vegetation, sea, mountains and beautiful plateaus. Beekeeping is widely practiced in Ordu, which is also the first in hazelnut production in Turkey. Bees provide people with products such as honey, beeswax, royal jelly, bee venom, pollen, and propolis, which are very valuable. At the same time, bees play an important role in maintaining the natural balance and in agricultural production with their contribution to pollination in

plants. For this reason, it has a very important role in maintaining the biological diversity of Turkey (Pirim et al., 2011; Sıralı, 2015; Sıralı, 2017).

Ordu province has a great economic potential in terms of beekeeping, and a significant part of the people, especially in the districts located at high altitudes, make their living from beekeeping (Sıralı, 2017). Beekeeping has become more profitable with the transition from traditional production methods to modern production methods in Ordu province and the transfer of bees to other regions. Beekeepers from Ordu, who make use of the flora in different regions of Turkey, make a significant contribution to the economy of the province with the honey and bee products they produce. For this reason, beekeeping has become the

most important agricultural sector after hazelnut cultivation in Ordu (Sıralı, 2015). In Table 1, the number of enterprises, the number of bee hives and honey production are given according to the districts in Ordu province (Anonymous, 2020). The objective of this research is to determine the consumption consciousness levels of consumers residing in Ordu province regarding honey bee products (beeswax, pollen, royal jelly and propolis). At the same time, these results will enable people working in this field to better understand the level of consciousness of consumers in terms of honey and its products, and will contribute to the development of some solution proposals for honey consumption.

**Table 1.** Number of enterprises, total number of hives and honey production by districts in Ordu province

District Name	Number of enterprises	Number of hives	Honey production (Ton)
Altınordu	395	93060	2525
Ulubey	316	76147	2284
Gölköy	290	72600	2170
Gürgentepe	305	75000	2200
Perşembe	302	67200	1950
Ünye	210	44500	1424
Kabataş	143	40000	1250
Çatalpınar	190	33500	1300
Fatsa	152	32200	805
Çamaş	77	11992	358
Kumru	56	8870	265
Kabadüz	25	4750	140
Aybastı	30	4100	121
Gülyalı	26	2540	78
İkizce	35	2660	76
Mesudiye	32	1100	37
Korgan	14	1150	31
Akkuş	17	860	25
Çaybaşı	21	1129	18
<b>Total</b>	<b>2636</b>	<b>573358</b>	<b>17057</b>

## Materials and Methods

### Materials

In this study, face-to-face interviews were used as data collection methods and questionnaire forms were used as data collection tool. After the consumers were informed about the survey, it was ensured that the consumers answered the questions correctly.

### Method

The population of the study consisted of citizens residing in Altınordu district, which is the central district of Ordu province. The number of surveys was determined by using simple random sampling method. The equation given below was used to determine the number of surveys and a survey was conducted with a total of 387 people (Akbaş & Yıldız Tiryaki, 2007). Due to possible problems that may arise in the surveys, 10% more of the minimum sample size was surveyed. Thus, a total of 426 questionnaires were made. However, 39

surveys were excluded from the evaluation due to various lack of information and inconsistency issues, and 387 surveys were evaluated in the study.

$$n = (t^2 * p * q) / d^2$$

n: sample volume,

$t^2$  = Confidence coefficient (for 95% confidence, the coefficient was taken as 1.96),

p = Ratio value of the population (0.50),

q = 1 - P = 0.50,

$d^2$  = Accepted sampling is the margin of error.

### Statistical Evaluation

First of all, frequency analysis of the answers given by the respondents to all the questions in the questionnaires was performed, and the frequency values were calculated as numerical (n) and percentage

(%) all calculations were made using SPSS (2008) statistical package program.

## Results and Discussion

### Demographic Characteristics of Consumers

In the research, numerical (n) and percent (%) frequency values were obtained from the answers given

to the questions asked to determine the personal characteristics of the consumer participating in the survey study and the social-demographic and economic characteristics of the families. The frequency values obtained are given in Table 2.

In this study, 38% of the consumers participating in the survey were men and 62% were women. Also, of the

**Table 2.** Demographic Characteristics of Consumers

No	Demographic Characteristics	Options	Frequency	
			n	%
1	Profession of consumers	Farmer	58	15
		Self-employment	59	15.2
		Worker	52	13.4
		Civil servant	152	39.3
		Retired	16	4.1
		Tradesmen	50	12.9
2	Gender of consumers	Male	147	38
		Female	240	62
3	Monthly income of consumers (TL)	Below 2500	114	29.5
		2500-4000	71	18.3
		4001-6000	110	28.4
		6001-8000	79	20.4
		8001-10000	12	3.1
		10000 and above	1	0.3
4	Age of consumers (years)	30 years and less	91	23.5
		31-40 years	146	37.7
		41-50 years	93	24
		51 years and older	57	14.7
5	Education level of consumers	Illiterate	3	0.8
		Primary education	98	25.3
		High school	112	28.9
		University	174	45
6	Number of individuals in the household of consumers	Less than 4	187	48.3
		Between 4-6	167	43.2
		7 and above	33	8.5
7	Social security of consumers	None	47	12.1
		Green card	18	4.7
		Social Security Organization for Artisans and the Self-Employed	65	16.8
		Social security agency	257	66.4

participants, 15% are farmers, 15.2% are self-employees, 13.4% are workers, 39.3% are civil servants, 4.1% are retired and 12.9% are tradesmen were determined. The monthly income level of the participants is below 2500 Turkish Liras (TL) in 29.5%, between 2500-4000 TL in 18.3%, between 4001-6000 TL in 28.4%, between 6001-8000 TL in 20.4%, between 8001-10000 TL in 3.1%. On the other hand, 0.3% of them were found to be above 10000 TL. It was determined that 23.5% of the participants were under the age of 30, 37.7% were 31-40 years old, 24% were 41-50 years old, and 14.7% were 51 years old and over. When the educational status of the participants is examined; it was determined that 0.8% were illiterate, 25.3% were primary school graduates, 28.9% were high school graduates and 45% were university graduates. While the rate of consumers in the households of the survey participants is four or less is 48.3%, the rate of those between four and six is 43.2% and the rate of those with seven or more is 8.5. In terms of social security, it was determined that 4.7% of the participants had a green card, 16.8% had Social Security Organization for Artisans and the Self-Employed, 66.4% had Social Security Agency and 12.1% had no social security.

In a previous study conducted by Bölüktepe and Yılmaz (2006), 38.2% of the participants were high school graduates, 24.1% were university and college graduates, 35.1% were primary school graduates and 2.7% were literate. When the occupational distributions are analyzed, 34% of the participants are housewives, 19.3% are private sector employees, 15.1% are public employees, 14.1% are tradesmen, 3.7% are employers and 3.3% of them are farmers. Niyaz and Demirbaş

(2017) stated in their research that 52% of the consumers are female and 48% are male. In a similar study, 63.5% of the students participating in the study by Saral and Yavuz (2020) were women and 36.5% were men. Akdemir (2019) found that 44.25% of the participants were men, 55.75% were women, and Bölüktepe and Yılmaz (2008) determined that 54% of the participants were women and 46% were men. Kumova and Korkmaz (2000) stated that 38.88% of the surveyed the consumers' education levels were high school, 36.72% were high school, 16.67% were primary school, 7.48% were secondary school and 0.25% were only literate. Akdemir (2019) determined that 2.5% of the consumers do not have social security and 1% of the consumers who have social security have green card. Similarly, in the study conducted by Baki et al., (2017), it was determined that 97.5% of the consumers have social security. Again, in the study conducted by Karahan and Özbakır (2019), it was determined that 80.7% of the participants were male, 19.3% were female, and 36.1% of them were undergraduate considering their educational status. Gyau et al. (2014) determined that education and age are significant factors affecting consumer decisions when purchasing honey in terms of consumer characteristics.

#### Main Findings Regarding the Consumption Consciousness of Bee Products of Consumers

The frequency values obtained from the answers given to the questions about the consumption consciousness level of consumers and their families regarding bee products are given in Table 3.

**Table 3.** Statistical Values Regarding the Consumption Consciousness of Bee Products of Consumers

No	Questions	Options	Frequency	
			n	%
1	Do you know enough about honey?	No	101	26.1
		No idea	32	8.3
		Yes	254	65.6
2	Do you know enough about pollen?	No	124	32
		No idea	34	8.8
		Yes	229	59.2
3	Do you know enough about beeswax?	No	153	39.5
		No idea	39	10.1
		Yes	195	50.4
4	Do you know enough about royal jelly?	No	154	39.8
		No idea	48	12.4
		Yes	185	47.8
5	Do you know enough about bee venom?	No	178	46
		No idea	74	19.1
		Yes	135	34.9
6	Do you know enough about propolis?	No	130	33.6
		No idea	52	13.4
		Yes	205	53

It was determined that, 65.6% of the consumers stated that they knew about honey, 26.1% did not, and 8.3% of the consumers stated that they did not have any idea about honey. According to these findings, it can be said that the level of consciousness of the consumers is high. In the study conducted by Dağdemir and Akdemir (2021), it was found that 47.25% of the consumers had wrong information about unsweetened honey, 41.25% had no idea about it, and only 11.5% had correct information about unsweetened honey.

While 59.2% of the consumers stated that they knew about pollen, 32% did not, and 8.8% stated that they did not have any idea about it. Also, 50.4% of the consumers answered that they knew about beeswax, 39.5% answered that they did not, and 10.1% stated that they did not have any idea about it. Moreover, 47.8% of the consumers stated that they knew about royal jelly, 39.8% did not, and 12.4% had no idea about it. Again, while 34.9% stated that they had knowledge and 19.1% had no idea about it, 46% of the consumers stated that they did not know about bee venom. In the study, 53% of the consumers who participated in the survey stated that they knew about propolis, 33.6% knew and 13.4% had no idea. In the study conducted by Tunca (2015), 22% of the consumers stated that they had one way or another heard of propolis from bee products, while 78% stated that they had never heard of it. In a study by Dağdemir and Akdemir (2021), it was determined that the consumers did not know pollen, royal jelly, beeswax, bee venom and propolis at a rate of 46.75%, 67.50%, 69.75%, 87.00% and 81.30%, respectively. In the study conducted by Bölüktepe and Yılmaz (2008), the recognition levels of pollen, royal jelly, beeswax, bee venom and propolis were determined as 61.10%, 52.80%, 46.40%, 16.30% and 8.90%, respectively. In the study conducted by Niyaz and Demirtaş (2017), it was determined that consumers knew pollen, royal jelly, beeswax, propolis and bee venom at a rate of 69%, 50%, 58%, 21.70% and 27.40%, respectively. Consumers' levels of knowledge about propolis, pollen, bee venom and royal jelly were 28.2%, 22.9%, 56.8% and 23.3%, respectively (Tunca et al., 2015).

#### **Main Findings Regarding Honey Consumption Consciousness of Consumers**

The frequency values (n and %) obtained from the answers given to the questions asked to determine the honey consumption consciousness of the consumers and their families participating in the research are given in Table 4.

According to our findings, 97.4% of the consumers participating in the survey stated that they consume honey, while 2.6% do not. It was determined that 0.8% of the consumers who do not consume honey, do not trust the produced bee products, 0.5% find honey expensive and 0.3% have diabetes. On the other hand, 50.9% of the consumers who consume honey stated that they consumed honey for health, and 41.9% stated that they consumed honey as a food source.

When consumers were asked which type of honey they prefer, 68.2% of the consumers stated that they preferred liquid honey while 31.8% preferred comb honey. In this study, 16% of the consumers stated that they consume honey comb because it is more nutritious, 17.8% of them prefer to consume honey comb because it is more difficult to cheat and 21.4% of them like to consume honey comb. In addition, 44.7% of them stated that they did not have any idea about honey comb. In the study conducted by Dağdemir and Akdemir (2021), it was determined that 54.75% of the consumers prefer comb honey, and the most important reason for this is that it is more beneficial and healthy (37.90%).

Likewise, 60.5% of the consumers stated that they prefer liquid honey because it is easier to consume, 14.2% of the consumers stated as it looks cleaner and 12.7% of the consumers prefer it because it is easier to store. On the other hand, 12.7% of the the consumers stated that they did not have any idea about filtered honey. Akdemir and Dağdemir (2021) stated in their study that consumers prefer filtered honey at a rate of 84.50%, and the most important reason for this is that it is easy to consume (43.79%). In the study conducted by Niyaz and Demirbaş (2017), it was determined that filtered honey is more preferred than honey comb honey. Similarly in another study, Sayılı (2013) stated that 86.76% of the consumers in the province of Tokat preferred to consume filtered honey.

When the consumers were asked about their honey preferences according to the source, it was determined that 62.8% of the consumers preferred flower honey. In a previous study, Coşkun (2019) found that the consumers mostly preferred flower honey (67.9%), while Baki et al. (2017) stated that 31% of the consumers consumed flower honey. To the question of how much honey is consumed per week in your household, 66.4% of the consumers stated that they consume 0.5 kg of honey on average. In a similar study, Coşkun (2019) found that 34% of the consumers consume an average of 0-2 kg of honey per year. Tunca et al. (2015) carried out research in 11 provinces in Turkey. They found that the percentage of consumers consuming 0-500 grams of honey per month is around 40%. In addition, 51.2% of consumers buy honey from beekeepers whom they generally know, and 41% of consumers buy honey from market and bazaar. Klickovic et al. (2017) found that 47% of consumers consume honey several times a week. On the other hand, the percentage of respondents who consume honey very rarely is 12%. In another study, the frequency of honey consumption was asked to young people, the percentage of respondents who consume honey every day is around 11%, while the percentage of responders who consume honey occasionally is about 55% (Zak, 2017).

Moreover, 15.8% of the consumers participating in the research stated that they do beekeeping. It was determined that 9.6% of beekeeping consumers attended courses related to beekeeping.

**Table 4.** Statistical Values on Honey Consumption Consciousness of Consumers

No	Questions	Options	Frequency	
			n	%
1	Do you consume honey?	No	10	2.6
		Yes	377	97.4
2	If your answer is no, why?	Expensive	2	0.5
		I don't trust	3	0.8
		I am diabetic	1	0.3
		Others	4	1
		Non-responders	377	97.4
3	If your answer is yes, for what purpose do you consume honey?	As a source of nutrients	162	41.9
		For my health	197	50.9
		Others	18	4.7
		Non-responders	10	2.6
4	What kind of honey do you prefer?	Comb honey	123	31.8
		Liquid honey	264	68.2
5	What are the factors affecting your choice of comb honey?	Because it is more nutritious	62	16
		Because cheating is more difficult to confuse	69	17.8
		I like to consume comb honey	83	21.4
		I have no idea	173	44.7
6	What are the factors affecting your choice of liquid honey?	It looks cleaner	55	14.2
		Easier to consume	234	60.5
		Easier to store	49	12.7
		No idea	49	12.7
7	Which honey do you prefer according to its source?	Flower honey	243	62.8
		Glandular honey	5	1.3
		Chestnut honey	139	35.9
8	How much honey is consumed per week in your household (kg)?	0.5	257	66.4
		0.5-1.0	90	23.3
		1.0- 2.0	28	7.2
		2 and above	12	3.1
9	Do you do beekeeping?	No	328	84.8
		Yes	59	15.2
10	If yes, have you attended a training/course on beekeeping?	I did not participate	22	5.7
		I did participate	37	9.6
		Non-responders	328	84.8
11	If your answer is yes, for what purpose do you do beekeeping?	As a hobby	17	4.4
		Commercially	20	5.2
		For family need	22	5.7
		Non-responders	328	84.8
12	What is your opinion about crystallized honey?	Due to the natural structure of honey	182	47
		Honey is not pure	70	18.1
		Honey is spoiled	6	1.6
		I have no idea	129	33.3

In the research, 5.7% of beekeeping consumers stated that they do beekeeping for the needs of the family, 5.2% are beekeeping for commercial purposes and 4.4% of them are beekeeping as a hobby. At the same time, when consumers were asked about their opinions about crystallized honey, 47% of the consumers stated that it is due to honeys natural structure, 18.1% of the consumers stated that honey is not pure and 1.6% of the consumers stated that honey is spoiled. On the other hand, 33.3% of the consumers answered that they do not have any idea about crystallized honey. According to the result obtained from the study, it can be said that consumers are generally conscious about this issue. In the study conducted by Coşkun (2019), when consumers were asked about their opinions about crystallized honey; 52.52% of the consumers stated that honey originates from its natural structure, 19.45% of the consumers stated that honey is not pure and 8.96% of the consumers stated that honey is spoiled. However, 19.07% of them stated that they had no idea about frozen honey. In the study conducted by Aytop et al., (2019), it was determined that 84.4% of the consumers consume honey. In a similar study, Onuç (2020) determined that honey is mostly consumed for nutritional purposes at breakfast. Kos Skubic et al. (2018) found that the price of products is the most important factor affecting a consumer's willingness to buy honey. Schifani et al. (2016) and Nabwire (2016) stated that consumers prefer buying local honey and are willing to pay more to local honey products. In addition, according to Batt and Liu (2012), brand reputation, the origin and the price of honey products are the most important factors affecting consumers' attitudes towards buying honey.

## Conclusion

It is known that approximately 40% of the protein that needs to be consumed in order to a person to have a sufficient and balanced diet should be met by proteins of animal origin. Proteins of animal origin contain essential amino acids required for human health in a sufficient and balanced manner. Malnutrition has negative effects on people's health all over the world. For this reason, safe food production and balanced nutrition will be the most important health factor in the future as in the past and today. Honey is one of the most important protein sources of animal origin.

As in the whole world, the demand for organic agricultural products in Turkey is increasing gradually depending on the income level. One of these products is honey. In this study, it was tried to determine what the consumers thought about organic honey and it was determined that 86.6% of the consumers paid attention to the organic honey. These findings show that the consciousness level of consumers is quite high on this issue. For this reason, it is necessary to increase the production of organic honey in order to meet these demands of consumers. In the current study, 88.6% of

the consumers stated that they do not trust the honey purchased from the internet. Again, 71.6% of the consumers stated that they obtain honey directly from the honey producer and this is safer. It has also been determined that 84% of the consumers pay attention to the expiration date of honey when purchasing honey from the markets, and it has been understood that the level of consciousness of the consumers is high. The publications containing confusing, incorrect and incomplete information about bee products in the visual and written media affect people negatively about honey consumption. For this reason, the information to be given about bee products in the written or visual media should be given by people and institutions who are experts in their field, and the consciousness level of the consumers should be increased.

## Ethical Statement

There are no ethical issues with the publication of this article.

## Conflict of Interest

The authors declare that there is no conflict of interest.

## Funding Information

This research; has not received any funding grants from public, commercial or non-profit organisations.

## Author Contributions

Author 1: Investigation, Writing

Author 2: Investigation, Writing – Review & Editing, Supervision

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