



Consumers Behavior Towards Bee Products Consumption in The Centre District of Kahramanmaraş Province

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ABSTRACT

The objective of this study is to determine the consumption behaviour and factors affecting the consumption of bee products of consumers in Kahramanmaraş. The main material of the study is the data obtained from surveys conducted with 270 consumers living in Kahramanmaraş city centre in 2018. Descriptive statistics, One-way ANOVA and t-test were used to analyse the data. According to the results, while 84.4% of the consumers consume honey, the percentage of the consumers consuming pollen and royal jelly are 7.8% and 1.5% respectively. Moreover, 28.5% of the consumers stated that they consume honey every day, whereas the share of the consumers consuming comb honey every day is 25.6%. In addition, most of the consumers prefer to buy honey from producers and markets. According to the results, factors affecting the amount of honey consumption are gender, income, the number of individuals in the family and the condition of having diabetes. On the other hand, marital status, age, and education level of consumers were not found to be important factors on the amount of honey consumption.

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Kahramanmaraş İli Merkez İlçede Yaşayan Tüketicilerin Arı Ürünleri Tüketim Davranışları

ÖZET

Bu çalışmanın amacı Kahramanmaraş ili Merkez ilçede yaşayan tüketicilerin arı ürünleri tüketim durumlarını ve tüketimlerinde etkili olan faktörleri belirlemektir. Araştırmanın ana materyalini 2018 yılında Kahramanmaraş kent merkezinde 270 tüketici ile görüşülen anketlerden elde edilen veriler oluşturmaktadır. Verilerin analizinde tanımlayıcı istatistikler, One-way ANOVA ve t testinden yararlanılmıştır. Araştırma sonuçlarına göre tüketicilerin %84.4'ünün bal, %7,78'inin polen, %1.5'inin arı sütü ve polen tükettikleri tespit edilmiştir. Üreticilerin %28.5'i süzme balı, %25.6'sı petek balı her gün tükettiklerini, arı ürünlerini satın alırken de öncelikli olarak direkt üretici ve marketleri tercih ettiklerini belirtmişlerdir. Sonuçlara göre, bal tüketim miktarını etkileyen faktörler, cinsiyet, gelir, ailedeki birey sayısı ve şeker hastası olma durumudur. Diğer yandan, medeni durum, yaş, eğitim ve çocuk sayılarının bal tüketim miktarında etkili olmadığı tespit edilmiştir.

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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 (Kekeçoğlu et al., 2007). 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. In Turkey, there are around

83210 beekeepers, and they produce 144471 tonnes of honey from 7991072 hives (TUIK, 2017a). 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. Bees consume an average of 10-25 kg of honey to produce 1 kg of beeswax. When it comes to Propolis, it is a sticky organic substance that has a significant anti-viral, the anti-bacterial and anti-fungal effect that bees collect from plant buds and sprouts (Central Beekeeping Association, 2017). 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 in called "treatment with honey bee products" (Baki et al., 2017).

Though there are many studies concerning honey consumption in Turkey (Boluktepe and Yılmaz, 2006; Boluktepe and Yılmaz, 2008; Tunca et al., 2015; Baki et al., 2017; Niyaz and Demirbaş, 2017), and in other countries (Arvanitoniannis and Krystallis, 2006; Pocol, 2011; Schifani et al., 2016), the number of studies that examine the honey consumption behaviour is limited. Boluktepe and Yılmaz (2006) found that 49.6% of Turkish consumers prefer only branded honey, while 42.9% consume prefer buying both branded and local unbranded honey. Moreover, it is determined that branded honey is purchased from general stores or supermarkets while unbranded honey is purchased from sellers in local bazaars or directly from producers. 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. The rate of the consumers who found the advertisements on television as convincing was determined as 5.9%. Consumers' levels of knowledge about propolis, pollen, bee venom and royal jelly were 28.2%, 22.9%, 56.8% and 23.3%, respectively. Niyaz and Demirbaş (2017) found that consumers consumed an average of 315.35 gr liquid honey and an average of 44.45 gr comb honey. Moreover, the least known bee product by consumers was bee venom, and consumers generally prefer to purchase honey from beekeepers and Beekeepers Association.

Schifani et al. (2016) and Nabwire et al. (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. Zavodna and Pospisi (2016) found that the main reason why Czechoslovakian consumers tend to buy bee products is the benefit of honey products for human health. Consumers generally prefer to buy bee products from directly beekeepers because they have high quality.

Kos Skubic et al. (2018) found that the price of products is the most important factor affecting a consumer's willingness to buy honey. Gyau et al. (2014) determined that education and age are significant factors affecting consumer decisions when purchasing honey in terms of consumer characteristics.

The objective of the research is to analyse consumers' honey bee products (beeswax, pollen, royal jelly and propolis) consumption behaviours in Kahramanmaraş province of Turkey.

MATERIAL and METHODS

The main material of the study is the data obtained from face to face interviews with the consumers living in the central district of Kahramanmaraş province in January-March 2018. In the survey, the consumers were questioned open-ended questions, close-ended questions, and five-point Likert questions. The proportional sampling method was used to determine the sample size (n) (Newbold, 1995):

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

where σ_{p_x} is Variance of Ratio, N is population, p is the ratio (in order to reach the maximum sample volume, p = 0.5).

According to the Turkey Statistical Institution, the population of the central district of Kahramanmaraş province is 63.2487 people (TUIK, 2017b). In this context, the sample size was found to be 270 with a 90% confidence interval and a 5% error margin.

Descriptive statistics, One Way ANOVA and Independent Sample t-test were used to analyse the data.

RESULTS and DISCUSSION

Results show that 58.5% of consumers are male, the average age of consumers is 41.3 years, and average education of consumers is 8.7 years (Table 1). While 32.96% of consumers work in the private sector, 22.22% of them were self-employed.

Moreover, the majority of the consumers (84.07%) were born in Kahramanmaraş, an average number of individuals living in the household is 4.11 people, and the average number of children living in the household is 2.44.

However, the average number of people working from household is 1.43. The household average monthly income is 700.11 \$, and the monthly expenditure on food is 160.54\$. The share of honey expenditure on total food expenditure is around 3.3%.

Table 2 gives information about the preferences of consumers in honey consumption and the amount of honey consumed. The majority of respondents (84%) consume honey. While the percentage of the consumers consuming liquid honey was found 61.11%, the ratio of responders consuming comb honey was 53.33%.

Table 1. Socio-demographic characteristics of consumers

Demographic Characteristics	Number of people	Percentage (%)	Demographic Characteristics	Number of people	Percentage (%)
Age (year)			Income (\$)		
≤30	71	26.30	≤512	104	38.52
31-50	128	47.41	513-1026	125	46.30
≥51	71	26.30	≥1027	41	15.19
Total	270	100.00	Total	270	100.00
Gender			Marital status		
Female	112	41.48	Single	61	22.59
Male	158	58.52	Married	209	77.41
Total	270	100.00	Total	270	100.00
Number of people working in the household			Occupation		
≤1	171	63.33	Civil servant	23	8.52
2	76	28.15	Private sector	89	32.96
≥3	23	8.52	Retired	23	8.52
Total	270	100.00	Self-employment	60	22.22
Education level (year)			Housewife + non-working		
≤5	108	40.00	Farmers	18	6.67
6-8	43	15.93	Others	13	4.81
9-12	66	24.44	Total	270	100.00
≥13	53	19.63	Hometown		
Total	270	100.00	Kahramanmaras	227	84.07
Number of members in the household			Other		
≤3	97	35.93	Total	43	3.33
4-5	131	48.52		270	100.00
≥6	42	15.56			
Total	270	100.00			

Moreover, the rate of those consuming both liquid and comb honey was 30.40%. Similar to the results of the study, Sayılı (2013) found that 86.76% of the consumers consume liquid honey, and 74.63% of consumers consume comb honey in Tokat province.

It is found that the average amount of liquid honey consumed per year by responders is 499.19 gr year⁻¹, whereas the average amount of comb honey consumption is 432.99 gr year⁻¹.

The amount of the annual consumption of honey per person is 923.18 gr. In another study, Baki et al. (2017) found that annual per capita honey consumption is 1.55 kg, and approximately half of this honey consumption is composed of pine honey. On the other hand, Niyaz and Demirbaş (2017) found that consumers living in Canakkale province consume comb honey around 44.35 gr month⁻¹ and liquid honey about 315.35 gr month⁻¹. Schifani et al. (2016) found that the percentage of responders consuming honey rarely is around 29%, whereas the proportion of responders consuming honey every day is about 18%. In another study, Arvanitoyannis and Krystallis (2006) stated that although Romania is the third biggest honey suppliers in the world, the annual per capita honey consumption is between 100–150 gr. Furthermore, a similar result found in Bulgaria, the yearly per capita honey consumption is between 400-500 gr (Nikolov,

2005).

Consumers spend an average 42.08 \$ per year on liquid honey, while they spend an average 22.34 \$ on comb honey. The share of liquid and comb honey in annual food expenditure are 3.15% and 1.67%, respectively. The consumption of royal jelly and propolis, which are the other honey products of the consumers, is quite low. The average annual consumption of pollen, royal jelly, and the propolis are 34.74 gr year⁻¹, 12.37 gr year⁻¹ and 12.96 gr year⁻¹, respectively. In another study, Niyaz and Demirbaş (2017) found that the responders consume 14.87 gr pollen, 3.52 gr propolis, 0.98 gr royal jelly per month. In addition, the most commonly consumed bee product is honey, whereas the consumption frequency of other bee products was quite low.

The percentage of responders consuming liquid honey several times a week is around 29, while whereas 22.22% of the consumers stated that they did not consume liquid honey in Table 3. Moreover, while the percentage of responders consuming comb honey every day is 25.56%, the percentage of those who consume comb honey a few times in a week is 20%, and the rate of those who do not consume comb honey is 46.67%. In addition, the proportion of responders consuming pollen every day is only 0.74%. Niyaz and Demirbaş (2017) found that 34% of consumers always consumed

honey, while the majority of the consumers never consumed other bee products. 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).

Table 2. Consumers honey consumption decision and amount of consumption

	Consumption (%)		Amount of consumption			Expenditure (\$ year ⁻¹)
	Consume	Not consume	Household gr year ⁻¹	Std Dev.	Per person gr year ⁻¹	
Liquid honey	61.11	38.89	2051.67	2761.991	499.19	42.08
Combhoney	53.33	46.67	1742.59	2520.725	423.99	22.34
Total honeyconsumption	84.44	15.56	3794.26	3706.52	923.18	64.43
Pollen	7.78	92.22	34.74	194.699	8.45	0.71
Royaljelly	1.48	98.52	12.37	183.417	3.01	19.03
Propolis	1.48	98.52	12.96	183.366	3.15	2.49

Table 3. The frequency of consumption of bee products

	Liquid honey		Comb honey		Pollen		Royal jelly		Propolis	
	Number of people	Ratio (%)	Number of people	Ratio (%)	Number of people	Ratio (%)	Number of people	Ratio (%)	Number of people	Ratio (%)
Don't consume	105	38.89	126	46.67	249	92.22	266	98.52	266	98.52
Every day	77	28.52	69	25.56	2	0.74	0	0.00	0	0.00
Several times a week	60	22.22	54	20.00	5	1.85	1	0.37	1	0.37
Once a week	9	3.33	9	3.33	2	0.74	1	0.37	1	0.37
Several times a month	10	3.70	5	1.85	5	1.85	1	0.37	1	0.37
Rarely	9	3.33	7	2.59	7	2.59	1	0.37	1	0.37
Total	270	100.00	270	100.00	270	100.00	270	100.00	270	100.00

Consumers generally prefer to buy honey products from the beekeepers (Table 4). While the majority of consumer (50.91%) buy the honey directly from the producer, the percentage of the consumers who buy honey from the supermarket is 46.67%. The rest of responders (2.42%) buy honey from the specialised honey shops.

As for comb honey, the percentage of responders buying comb honey from the producer is 61.81%, while the percentage of responders buying comb honey from the supermarket is 5.55%. Niyaz and Demirbaş (2017) found that producer and the Bee Growers Association are the most common channel preferred by consumers to buy honey. Bölüktepe and Yılmaz (2006) found that branded honey is mostly bought from markets and supermarkets, while unbranded honey is mostly bought from local suppliers and producers.

According to the survey conducted in the province of Tokat, 63.98% of responders consuming liquid honey and 71.92% of responders consuming comb honey prefer to buy honey from beekeepers. The proportion of consumers buying pollen, royal jelly and propolis from the sales centre is 9.52%, 25%, and 50%, respectively.

Schifani et al. (2016) stated that consumers tend to buy local honey instead of buying honey produced in another country. The main reason for this is that consumers believe that purchasing honey of local origin have a positive effect on the economy of rural, which means it helps to increase sustainable entrepreneurship.

When it comes to preferred package type by consumers, 79.4% of respondents buying liquid honey prefer a glass jar, and 81.97% of responders buying comb honey prefer the wooden box. Moreover, the majority of responders (76.22%) buying pollen prefers a glass jar and all consumers buying royal jelly prefer a glass jar (Table 5).

Gürer and Akyol (2018) found that glass jars (64.3%) are the most preferred by consumers, while plastic packages are the least preferred (2.4%) by consumers in the purchase of honey in Niğde province.

The socio-demographic characteristics of the consumers were analysed by using One Way ANOVA and Independent Samples T-test (Table 6). According to the results of the T-test, it is found that there is a statistically significant difference between the gender

($p < 0,10$), the condition of having diabetes ($p < 0,05$) and the amount of honey consumption. It is found that male consume honey more than female. On the other hand, Bianca (2011) found that the frequency of honey consumption among woman living in Romania is

higher than that of man. When it comes to diabetes, consumers having diabetes consume less honey than consumers not having diabetes. On the other hand, Arani et al. (2018) stated that probiotic honey has a beneficial effect on people who have diabetes.

Table 4. Bee products purchased places (%)

	Liquid honey	Comb honey	Pollen
Direct producer	50.91	61.81	61.90
Specialised honey shops	2.42	5.55	9.52
Market-supermarket	46.67	33.33	38.10
Grocer, bazaar and others	5.02	0,76	0.00

Table 5. A preferred package type of bee products (%)

	Liquid honey	Comb honey	Pollen
Plastic box	15.15	17.36	14.27
Glass jar	79.40	0.00	76.22
Tin box	5.45	2.78	4.76
Wooden box	2.42	81.97	0.00
Bag / Paper	0.61	0.71	4.76

According to the result of F test, it is found that there are two statistically significant variables ($p \leq 0,10$) which are the number of individuals in the family ($p < 0,05$) and income ($p \leq 0,10$). In this context, it was determined that the amount of honey consumption increase when income and the number of individuals in the family increase. Erdogan (2013) found that there is a statistically significant difference between income and honey consumption among staff working at Afyon Kocatepe University. There is a positive relationship between income and the amount of honey consumption, which means the amount of honey consumption increased when the income of consumers increased. Tunca et al. (2015) carried out research in various provinces of Turkey and found that there is a statistically significant difference between income and the consumption of honey. According to Schifani et al. (2016), income is a significant factor affecting consumer consumption behaviour in local honey, and it is supported by Bianca (2011). He stated that people having low income consume less honey than people having a high income. Furthermore, Roman et al. (2013) found that there is a positive correlation between the level of income and the amount of honey consumption among consumers living in Poland. As for household size, Ismaiel et al., (2014) found that there is a negative correlation between household size and the amount of honey consumption, which means per capita honey consumption decreases when the household size increases. On the other hand, marital status, age, education and the number of children in the household do not have an impact on honey consumption.

CONCLUSION

The objective of this study is to analyse the consumers' honey bee products consumption decision in Kahramanmaraş province of Turkey. According to the results, the most commonly consumed honey bee products is honey. The other honey bee products such as propolis, pollen and royal jelly are not consumed very much because of insufficient knowledge about these products. In particular, the consumption of propolis and royal jelly, which have a significant contribution to the immune system, can be increased through public and consumer awareness.

The honey that people consume to heal is unfortunately produced under the counter, and it has been sold on the market. Fake honey is produced in various ways, such as by feeding honey bees with sugar syrups instead of nectar or secretion then producing honey from these syrups or directly adding sugar syrups to honey. (Mutlu et al., 2017). This kind of fake honey affects people health adversely. It is difficult to figure out the difference between fake and real honey for the consumers. Therefore, consumers should be raised awareness about between fake and real honey by the Ministry of Agriculture and Forestry and the Turkish Association of Beekeepers. In addition, a public service announcement should publish to enable consumers to distinguish fake honey and to consume real honey.

Consumers do not prefer purchasing honey bee products over the internet as fake honey is sold to consumers especially via internet and telephone. The rate of consumers buying from the bee products sales centre is also very low. Research results show that honey producers and sellers can further increase their income from honey sales if they benefit from market segmentation according to consumer preferences.

Table 6. Socio-demographic characteristics of consumers affecting honey consumption

	N	Mean	Std. Error	Test- value (p-value)
Gender				
Female	112	3335.27	301.263	-1.787 (0.075)
Male	158	4119.62	319.168	
Marital status				
Single	61	3367.21	500.397	-0.985 (0.327)
Married	209	3918.90	252.188	
Age				
0-30	71	3470.42	447.296	0.455 (0.635)
31-50	128	3826.95	335.279	
51 and above	71	4059.15	416.291	
Education (year)				
0-5	108	3461.11	356.920	0.623 (0.601)
6-8	43	3779.07	526.239	
9-12	66	3971.97	432.438	
≥13	53	4264.15	569.960	
Household income				
≤512 \$	104	2995.19	276.802	7.796 (0.010)
513-1026 \$	125	3859.60	334.373	
≥1027 \$	41	5621.95	756.263	
Household size				
1-3	97	3006.19	301.684	3.866 (0.022)
4-5	131	4100.00	349.824	
≥6	42	4660.71	619.082	
The number of children				
0-1	79	3236.71	356.619	1.575 (0.209)
2-3	131	3883.21	326.513	
≥4	60	4334.17	545.465	
Total	270	3794.26	225.571	
The condition of having diabetes				
No	243	3980.86	242.709	6.280 (0.013)
Yes	27	2114.81	457.370	
Total	270	3794.26	225.571	

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