

Diyarbakır İl Merkezinde Yaşayan Tüketicilerin Piyasadaki Balların Kalitesi Hakkındaki Düşünceleri ve Bal Tüketim Tercihlerini Etkileyen Faktörler

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ÖZ

Bu çalışma, Diyarbakır il merkezinde yaşayan tüketicilerin piyasada satılan balların kalitesi hakkındaki düşüncelerini belirlemek ve bal tüketim tercihlerini etkileyen faktörleri saptamak amacıyla yapılmıştır. Araştırma, 2022 yılında yürütülmüş ve bu amaçla Diyarbakır il merkezinde yaşayan tüketicilerle yapılan anketlerden sağlanan veriler kullanılmıştır. Verilerin toplanması amacıyla Diyarbakır ilini temsil edecek şekilde il merkezindeki 4 mahalle belirlenmiş ve toplam 281 adet anketin, 104'ü Bağlar, 92'si Kayapınar, 55'i Yenişehir ve 30'u Sur ilçelerinde yapılmıştır. Elde edilen sonuçlara göre, ankete katılan tüketicilerin %61.9'u bal tüketmenin sağlık açısından gerekli olduğunu bildirmişlerdir. Tüketicilerin %58.7'sinin piyasada satılan ticari ballarda tağşiş (katkılı) veya taklit (sahte) yapıldığına inandıkları belirlenmiştir. Tüketicilerin %47'si, piyasadaki ballarda ilaç ve antibiyotik katkısı olduğunu düşünmektedirler. Tüketiciler, bal satın alırken en fazla dikkat ettikleri hususun tanıdıkları bir satıcıdan almak olduğunu açıklamışlardır. Balın kalitesini anlamak için, tüketicilerin daha çok (%29.2) fiyatına dikkat ettikleri gözlenmiştir. Tüketicilerin %36.7'si petekli balı daha güvenilir bulduklarının söylemişlerdir. Sonuç olarak, bal tüketiminin artırılması için, bal tüketimi konusundaki tanıtımların artırılması, tüketicilerin ticari ballar hakkında bilgilendirilmesi, piyasadaki balların saf, şekersiz ve sertifikalı bal şeklinde sağlıklı ve gıda güvenliği açısından güvenilir ürünler olmasının sağlanması, piyasadaki sahte veya hileli ballar konusunda tüketicilerin yeterli düzeyde aydınlatılmasının zorunlu olduğu söylenilebilir.

Anahtar kelimeler: Diyarbakır, piyasa balı, bal kalitesi, bal tüketimi, tüketim tercihleri.

The Opinions of Diyarbakır Provincial Center Consumers on the Quality of Honey on the Market and the Factors Affecting Their Honey Consumption Preferences

ABSTRACT

This study was carried out to determine the thoughts of consumers living in Diyarbakır city center about the quality of honey sold in the market and to determine the factors affecting their honey consumption preferences. The research was carried out in 2022, and the main material of the study consisted of data obtained from face-to-face surveys with consumers living in Diyarbakır city center. In order to collect the data, 4 neighborhoods in the city center were determined to represent the province of Diyarbakır. A total of 281 surveys were conducted, 104 of them in Bağlar, 92 of them in Kayapınar, 55 of them in Yenişehir and 30 of them in Sur. According to the results, 61.9% of the consumers who participated in the survey reported that consuming honey is necessary for health. It has been determined that 58.7% of consumers believe that commercial honey sold in the market is adulterated (added) or imitated (fake). 47% of consumers think that the honey in the market contains drug and antibiotic additives. Consumers have stated that the most important point when purchasing honey is to buy it from a familiar seller. In order to understand the quality of honey, it has been observed that consumers pay more attention to its price (29.2%). Consumers said that they

found comb honey more reliable by 36.7%. As a result, in order to increase honey consumption, it is necessary to increase the promotion of honey consumption, to inform consumers about commercial honey, to ensure that the honey in the market is healthy and reliable in terms of food safety in the form of pure, sugar-free and certified honey, and consumers should be adequately informed about fake or fraudulent honeys in the market.

Key words: Diyarbakır, market honey, honey quality, honey consumption, consumption preference.

INTRODUCTION

Bee products obtained from an important breeding activity, apiculture, are valuable products for human healthy and balanced nutrition (Burucu and Gülse Bal, 2017). Some of the bee products are used as food, while some are used for different purposes in the apiculture sector (Korkmaz, 2013; Mutlu et al., 2017). Apiculture has become an economically valuable sector in recent years due to the ability to use some bee products in different fields. When it comes to bee products, honey, pollen, and beeswax are the first products that come to mind. However, besides these products, there are also important biologically significant products such as propolis, royal jelly, bee venom, bee bread, apilarnil, and hive air. However, when bee products are mentioned, honey is the first product that comes to mind, and it has been seen as the main purpose of production since ancient times. Honey has been recognized as an important foodstuff throughout history, cherished for its perceived naturalness, consumed with fondness, and also utilized for health preservation and therapeutic purposes. Due to its geographical location, rich flora, diverse vegetation types, and climatic characteristics, our country is one of the oldest and most widespread centers for apiculture and honey production in the world (Kekeçoğlu et al., 2007; Gürel, 2015). Türkiye ranks second in the world in terms of both production levels and the number of hives, with 95.386 enterprises and 8.984.676 hives. Approximately 114.886 tons of honey are produced annually in Türkiye, and most of this amount is consumed domestically. Türkiye's annual honey exports amount to 17.248 tons, of which 89.5% is in the form of liquid honey (TÜİK, 2023). However, the per capita annual honey consumption in our country is 1.3 kg, placing it eighth worldwide (FAO, 2022). Since our country has an important place in beekeeping, many studies are carried out on both production and honey consumption. A significant portion of research on consumer preferences for bee products has focused on honey (Merdan and Durmuş, 2018; Denizli Akdemir and Dağdemir, 2021). These studies have primarily concentrated on consumption quantity, consumer habits, consumer preferences, and consumer awareness (Kumova and Korkmaz, 1999; Kumova and Korkmaz, 2000; Paydaş and Semerci, 2001; Şahinler et al., 2004; Bölüktepe and Yılmaz, 2006; Kızılaslan and Kızılaslan, 2007; Saner et al., 2007; Sıralı and Çelik, 2007). The results of these studies have indicated that numerous factors influence honey consumption preferences, including attitudes, perceptions, decision-making abilities, beliefs, and values (Kavas, 1987; Denizli Akdemir and Dağdemir, 2021). Honey holds a significant place among natural foodstuffs in nutrition due to its nutritional components and flavor. The chemistry of honey primarily consists of carbohydrates, typically ranging from 95% to 99%. The most abundant sugars in honey are approximately 38.2% glucose and 31.3% fructose. Some adulteration practices and heat treatments during or after honey production disrupt the natural structure of honey and significantly reduce its nutritional value. Honey is one of the most adulterated (adulteration and imitation) foods. The primary reason for this is that honey is highly suitable for adulteration and imitation, and detecting and identifying adulteration in honey is very difficult. The crystallization of honey does not indicate whether it is fake or genuine. Some honeys crystallize very quickly, while others do not crystallize at all (Bhandari et al., 1999). Honeys generally crystallize at 14 °C. Therefore, it is more suitable to store processed honey at temperatures between 18-24°C and unprocessed honey at temperatures below 10°C. Comb honey crystallizes more slowly compared to liquid honey. One of the crucial parameters for assessing honey quality is HMF (hydroxymethylfurfural), a carcinogenic compound generated from the breakdown of sugars during the heating of honey. As per the regulations outlined in the Turkish Food Codex Honey Regulation, the HMF content in honey should not surpass 40 mg/kg (TGK, 2020). Regrettably, there remains an insufficient level of awareness and consciousness concerning this matter in the context of honey consumption. HMF formation occurs in liquid honey subjected to temperatures exceeding 60°C. Thus, when heating honey becomes necessary, it is imperative to ensure that the temperature does not exceed 55-60°C to mitigate the production of HMF. Natural honey is a food substance produced by bees using different pollen and nectar sources, without the addition of any sugar syrup or additives during or after production, not processed or subjected to heat treatment during storage, and maintaining its overall composition characteristics until consumption. Fake or adulterated honey is typically produced in two forms: adulterated honey and artificial honey. Adulterated honey contains chemically altered honey resulting from processes such as feeding bees with different sugar groups, adding syrup after production, mixing different types of honey, or adding water to honey with low

moisture content. Adulteration is mostly done by using sugar groups such as high fructose corn syrup, invert sugar, sucrose or glucose. During times when nectar is insufficient in the production season, beekeepers feed bees with various sugar groups to obtain more products. However, in such cases, since the sugar given to bees is converted into honey, the resulting honey is composed of sugar rather than nectar. Artificial honey, on the other hand, encompasses honey produced solely through chemical means from different sugar groups without any contribution from bees during production. In addition to the sucrose-glucose-fructose profile of honey, its color, taste, aroma, etc. It is imitated using non-bee-derived substances. Although it misleads the consumer and provides unfair profits, this type of honey can find buyers in the market due to its low prices (Tosun, 2004).

The aim of this study was to determine the perceptions of consumers living in the city center of Diyarbakır regarding the quality of honey available in the market, identify factors influencing honey consumption preferences, and raise awareness about honey consumption. Through this study, consumers' thoughts, demands, concerns, complaints, behaviors, and expectations regarding the quality of honey in the market will be revealed. These findings are very important as they may encourage producers to produce better quality honey (natural) in line with consumer expectations and lead to the supply of better quality honey to the market.

MATERIAL AND METHOD

The main data of the study consisted of data from face-to-face surveys conducted with consumers living in Diyarbakır city centre in 2022. Face-to-face surveys were conducted with consumers in 4 districts (Bağlar, Kayapınar, Yenişehir and Sur districts) in the provincial centre to represent Diyarbakır province. The number of interviews conducted with consumers was calculated using the following formula, taking into account the population of the respective neighbourhoods (Aksoy and Yavuz, 2012).

$$n = \frac{N * t^2 * p * q}{(d^2 * (N - 1) + t^2 * p * q)}$$

n: number of individuals to be included in the sample

N: number of individuals in the target group (1047286)

p: probability of the event being studied (0.50)

q: probability of occurrence of the observed event (0.50)

t: Standard value of the normal distribution (1.96)

d: sampling error (0.05).

Of the questionnaires, 104 were administered in Bağlar, 92 in Kayapınar, 55 in Yenişehir and 30 in Sur districts (Table 1). In the questionnaire forms, 36 questions were asked to the consumers. The questionnaire questions were prepared according to the aim of the study, which was to find out the consumers' opinions about the honey sold in the market, the factors influencing these opinions and their honey consumption preferences. The data obtained were analysed using statistical methods and the results were compared and interpreted with previous studies.

Table 1. Population, population ratio and number of surveys conducted in Diyarbakır's central districts.

Neighbourhood	Total population	Rate (%)	Number of surveys
Bağlar	386.578	36.9	104
Kayapınar	342.977	32.7	92
Yenişehir	204.284	19.5	55
Sur	113.447	10.9	30
Total	1.047.286	100.0	281

The data obtained from consumers through questionnaires were analysed using SPSS 22 software and descriptive statistics and frequency tables were determined. The chi-square test of independence was used to analyse whether there was a relationship and dependency between two variables.

RESULTS AND DISCUSSION

Socio-Demographic and Economic Characteristics of Surveyed Consumers

Among the consumers who participated in the survey, it was found that there was a higher proportion of males, with the participation rate being 54.1% for males and 45.9% for females. It was found that 31.3% of respondents were aged 31-40, 27.8% were aged 21-30, 20.6% were aged 41-50, 12.8% were aged 51-60 and 7.5% were aged 61-70. The participation rate of people under the age of forty was around 60%. It can therefore be said that the participation rate of young people is higher. In the study conducted by Saner et al. (2011), it

was found that the average age of individuals was 41. In the studies conducted by Denizli Akdemir (2019) and Denizli Akdemir and Dağdemir (2021), the average age of men and women was determined to be 41 and 37 respectively. In the studies conducted by Aydurmuş et al. (2022) and Yüzbaşıoğlu (2022), the mean age of the participants was 38 and 34 years, respectively. It was found that the results obtained were similar to the findings of previous studies. When analysing the educational level of the consumers, it was found that 28.5% of the consumers who participated in the survey were university graduates, 24.6% were high school graduates and 19.2% were secondary school graduates. In the study conducted by Kumova and Korkmaz (2000), it was reported that 38.88% of the individuals were high school graduates and 36.72% were high school graduates. In the study conducted by Denizli Akdemir (2019) and Denizli Akdemir and Dağdemir (2021), it was determined that 38% of the consumers were high school graduates and 33% were university graduates. Şahinler et al. (2021) explained that the educational level of the participants in their study was high (50% of them were university graduates). Aydurmuş et al (2022) reported that 64% of the consumers in their study were bachelor or postgraduate graduates. It has been observed that the results reported in previous studies regarding the level of education are similar to the results of this study. Of the consumers participating in the survey, 4.6% had 2, 16.7% had 3, 21.4% had 4, 23.8% had 5, 14.2% had 6 and 19.2% had It was determined that there were more than 6 members. It was found that 19.9% of the consumers surveyed were civil servants, 38.8% were self-employed, 21% were workers, 10.3% were retired and 10% were students. Marangoz and Tayçu Dolu (2019) determined in their study that the consumers are mostly in the professional groups such as civil servants, students and workers. In a study conducted by Denizli Akdemir and Dağdemir (2021), it was reported that 30.25% of consumers were housewives, 18.5% were civil servants and 17% were students. In another study conducted by Yüzbaşıoğlu (2022), it was found that consumers were mainly in the civil servant (33.09%) and self-employed (30.15%) groups. The distribution of the surveyed consumers according to occupational groups is partly similar to the results of previous studies. The net minimum wage for 2022 was announced to be 5500.35 ₺ (Anonymous, 2022). Accordingly, in terms of income groups, 19.6% of consumers were in the 2500-3500 ₺ group, 11% in the 3501-4500 ₺ group, 26.3% in the 4501-5500 ₺ group, 14.9% in the 5501-6500 ₺ group and 28.2% in the 6501 ₺ and above group. It was concluded that around 70% of consumers participating in the survey had incomes close to or above the minimum wage. In their study, Marangoz and Tayçu Dolu (2019) reported that the average monthly income of the consumers surveyed was 3037.74 ₺. In the study conducted by Denizli Akdemir (2019), the average monthly income of consumers was found to be 3915 ₺. In the study conducted by Aydurmuş et al. (2022), it was found that 83.7% of the individuals had a monthly income of 5500 ₺ and below. In his study, Yüzbaşıoğlu (2022) reported that the average monthly income of consumers was 2034.03 ₺. Taking into account the minimum wage, it can be said that the results regarding the income level of consumers are similar to the results of the studies conducted in previous years.

Opinions of respondents on honey consumption

While 61.9% of the respondents answered "yes", 15.3% answered "not sure", 13.2% answered "don't know" and 9.6% answered "no" to the question "Is honey consumption necessary for a healthy diet? In a study conducted by Aydurmuş et al. (2022), the percentage of those who answered "yes" to the question "Is honey consumption necessary?" was 85.5% in Artvin, 90.4% in Bayburt, 88.7% in Giresun, 84.9% in Gümüşhane, 96.9% in Ordu, 98.0% in Rize, 91.2% in Samsun and 91.7% in Trabzon. When asked whether the consumption of other sweet foods (jam, marmalade, molasses, etc.) instead of honey would replace the consumption of honey, 39.9% of consumers answered 'no', 31.7% answered 'partly', 17.4% answered 'don't know' and 11% answered 'yes'. Looking at the proportional distribution of the foods that respondents prefer to consume more of at breakfast and the reasons for this preference, honey is preferred by 27.0%, jam by 22.1%, molasses by 22.4% and all together by 28.5%. When asked why they consume honey, 58.9% of respondents said it was 'healthy', 14.3% said it was 'tasty' and 12.5% said it was 'because I like it'. As a result, it can be said that consumers tend to consume honey more than other sweet foods and the most important reason for this is the belief that honey is healthy.

Opinions of respondents on honey sold on the market

When asked whether honey sold in the market is adulterated or not, 58.7% of consumers answered "definitely", 24.6% "probably", 8.5% "no" and 8.2% "don't know". A study conducted in Ordu reported that consumers have serious doubts about the purity of honey sold on the market and whether it contains additives (Sıralı and Çelik, 2007). When asked whether fraudulent and adulterated honeys cause serious problems for human health, 52% of the respondents answered "yes", 22.8% answered "maybe", 21.7% answered "don't know" and 3.6% answered "no". Of the consumers surveyed, 56.9% disagreed with the statement that honey on the market is healthy, 34% had no opinion and 8.9% agreed. In response to the question "What is

counterfeit honey?", 19.6% of the respondents answered "honey produced by bees but with syrup, molasses, etc. added to the hives", 20.6% answered "honey produced by humans but not by bees", 40.9% answered "both" and 18.9% answered "I have no information". Looking at the answers of the respondents regarding the belief that there are residues of drugs and antibiotics in the honey on the market, the rate of those who answered "yes, I believe" is 25.3%, the rate of those who answered "no, I do not believe" is 27.7% and the rate of those who answered "I have no information" is 47%. Do you think that producers give sucrose syrup, invert sugar syrup, starch-based syrup, cake, etc. to bees during the honey season? To this question 38.1% of people answered "yes", 35.2% "probably", 21% "don't know" and 5.7% "no".

Opinions of respondents on the purchase and consumption of honey

In response to the question "Do you feel uncomfortable about the presence of starch-based sugars, drug or antibiotic residues in honey?", 54.1% of respondents answered "yes, I am concerned", 17.4% answered "no, I am not concerned", 16% answered "don't know" and 12.5% answered "a little". In response to the question "What makes you most hesitant about the quality of honey when you buy it at the market?", 35.2% of consumers answered "the low price", 29.5% answered "the appearance of the honey", 24.6% answered "buying honey from an unknown seller" and 10.7% answered "the attitude and behaviour of the seller". When buying honey at the market, the most important criterion for consumers was "price of honey" with a rate of 29.2%, "familiarity of the seller" with a rate of 26.3%, "external appearance of honey" with a rate of 17.5%, "name of the producer company" with a rate of 16% and "trust in the seller" with a rate of 11%. In a study conducted by Kumova and Kormaz (1999), 94% of consumers trusted the quality of the honey they bought from the beekeeper. In a study conducted by Arvanitoyannis and Krystallis (2006), the most common reasons given by consumers for consuming honey were health benefits, taste, nutritional value, quality, positive effect on skin, anti-cancer effect and anti-aging effect. Sıralı and Çelik (2007) found that 75% of consumers trusted the beekeeper regarding the quality of liquid honey. Similarly, Baki et al. (2014) concluded that consumers prefer reliable sellers when buying bee products. Karahan and Özmen Özbakır (2020) reported that 57.8% of people who buy honey pay attention to the quality, 38.5% to the price, 2.2% to the fact that the honey is not mixed and 1.5% to the way it is sold. Aydurmuş et al. (2022) explained that consistency, brand and production date were effective in the selection of honey by individuals, respectively. In response to the question "Do you prefer local honey or honey produced or packaged in other provinces?", it was found that 49.5% of people said "it must be local", 33.1% said "it does not matter" and 17.4% said "I do not prefer packaged or bottled honey in the markets". A study found that 49.6% of consumers preferred to buy only branded honey, 42.9% preferred to buy both branded and unbranded honey, and 7.5% preferred to buy only unbranded local honey (Bölüktepe and Yılmaz, 2006). In the study conducted by Karadavut et al. (2014), it was reported that more than half of the consumers preferred the brand in honey consumption, while 38% did not prefer any brand. Sıralı (2015) reported that brand is important in honey consumption in Turkey and consumers prefer branded honey more. Aydurmuş et al. (2022), when the survey was conducted, it was determined that 82.3% preferred Eastern Black Sea Region honey, 9.4% preferred Northeastern Anatolia region honey, and 2.3% preferred Aegean Region honey. In the study, it was determined that 32.6% of the honey buyers preferred the honey of that region because they thought that the regional honey they purchased was of higher quality and safer. The numbers and rates of their views on some variables in terms of consumption, mass purchasing and consumption in the survey are given in Table 3. Regarding the additive or non-added status of karakovan honey offered in the market, 8.5% responded as "unadulterated", 30.7% as "added", 35.9% as "not sure" and 24.9% as "varies depending on the producer". The situation regarding whether expensive honey implies higher quality has been determined as follows: %17.8 of respondents believe "Yes, expensive honey is generally of higher quality," %56.6 believe "No, it doesn't provide any idea," and %25.6 stated "I am influenced to some extent." Regarding the belief in whether honey labeled as organic is truly organic, respondents provided the following responses: %34.5 said "I absolutely don't believe," %13.5 said "Yes, I believe," %23.8 said "I have no idea," and %28.1 said "I believe if I know the seller very well." On the matter of whether crystallized honey indicates poor quality or falsification, respondents' opinions were as follows: %31.7 said "Yes, crystallized honey is fraudulent," %27.4 said "No, high-quality honey can also crystallize," %27.1 said "I have no idea," and %13.9 said "I absolutely don't want my honey to crystallize." When purchasing honey from an unfamiliar seller, respondents indicated their primary concerns as follows: %17.4 said "price," %20.3 said "appearance," %17.1 said "odor," %29.5 said "I prefer comb honey over liquid honey," and %15.7 said "the trustworthiness of the seller." In response to the question of which honey is the most trustworthy among those available in the market, the percentages were as follows: %16 said "Karakovan honey," %36.7 said "Comb honey," %17.4 said "Liquid honey," and %29.9 said "I have no idea." According to Marangoz and Tayçu Dolu's (2019) study, it was reported that comb honey is the most trusted bee product. According to the survey, it has been determined that 12.5% of participating

consumers prefer to buy honey solely from specialized honey shops, 58.7% prefer to order it from beekeepers in villages, 4.3% from supermarkets, 2.8% from mobile honey vendors, and 6.4% from online sources. The percentage of individuals who do not pay attention to the location when buying honey is found to be 15.3%. Kumova and Korkmaz (1999) reported that 49% of consumers meet their honey needs from beekeepers, while 45% obtain it from supermarkets. On the other hand, Şahinler et al. (2004) determined that 31.1% of consumers buy honey from supermarkets, 24.8% from beekeepers, 18.4% from sellers, and 9.7% from grocery stores and markets. In another study, it was reported that 70% of consumers purchase branded honey from supermarkets, while 66% purchase unbranded honey directly from producers (Bölüktepe and Yılmaz, 2006). Arvanitoyannis and Krystallis (2006) explained that consumers mainly buy honey directly from producers, occasionally from local stores, and supermarkets. Sıralı and Çelik (2007) reported that 72% of consumers obtain honey from beekeepers. In a study conducted in İzmir, it was found that 68.4% of consumers prefer to buy honey and other bee products from large supermarkets, 10.5% directly from producers, and 9.2% from supermarkets and producers (Saner et al., 2012). In a study conducted in Tokat province, it was determined that liquid honey is mostly purchased (63.9%) from beekeepers (Sayılı, 2013). Sıralı (2015) evaluated previous studies in Turkey and concluded that supermarkets, grocery stores, and beekeepers are the main sources of honey, with beekeepers having a significant influence on honey consumption in areas with a high number of them. According to a study by Aydurmuş et al. (2022), 67.4 % of consumers prefer to buy honey from beekeepers, while 24.3% prefer supermarkets. It was concluded that other sales points are rarely preferred when buying liquid honey. When looking at the ways individuals consume purchased honey, it has been determined that 23.5% consume it "for breakfast," 24.6% use it "as a dietary supplement for illnesses like flu and colds," 8.2% believe "in the healing properties of honey," and 43.8% choose "all of the above." In a study by Soylu and Silici (2018), it was found that consumers' reasons for consuming honey were 54.8% for its nutritious qualities, 19.3% for its health benefits, and 18.1% for its sweetness. In a study conducted by Denizli Akdemir and Dağdemir (2021), it was reported that 62.5% of consumers consume honey for health purposes, while 4.5% consume it for children's mental and physical development. In another study, it was found that 38% of consumers consume honey to boost their immune system, 32% for nutrition, 26% for protection against diseases, and 4% for its taste (Şahinler et al., 2021). The situation regarding whether individuals find the honey in the market tasty or not has been determined as follows: 23.8% answered "Yes, tasty," 26.7% answered "No, not tasty," 10.7% answered "Very tasty," and 38.8% answered "Slightly tasty." Regarding the belief in the quality of honey available in the market, the percentages of respondents who provided each answer are as follows: 26.7% said "I absolutely don't believe," 54.8% said "I might believe if experts provide explanations," and 18.5% said "I trust the statements made by the government." When asked why they consume unreliable honey from the market, individuals responded as follows: 20.3% said "I have no other option," 33.5% said "I obtain honey from a known producer instead of buying it from the market," 13.2% said "I am careful about consuming in small amounts," and 33.1% said "I prefer to buy honey in mandatory situations." Regarding the frequency of honey purchases, it was determined that 25.6% of respondents buy honey once a year, 25.3% buy it twice a year, 20.6% buy it more than twice a year, and 28.5% do not have a fixed number of honey purchases within a year. Arvanitoyannis and Krystallis (2006) reported that 42.7% of individuals consume honey at least once a month, 25.9% consume it at least once a week, 17.7% consume it less than once a month, and 11.4% consume it daily. In a study conducted in Çanakkale, it was found that 12% of consumers buy honey once a week, 45.1% once a month, 16% once every two months, 14.9% once every six months, 11.4% once a year, and 0.6% less frequently (Niyaz and Demirbaş, 2017). Soylu and Silici (2018) reported that 47.9% of individuals consume honey occasionally, 14.7% consume it once a week, 12.5% consume it daily, 12.1% do not consume it at all, 8.3% consume it every other day, and 4.5% consume it every fifteen days. Marangoz and Tayçu Dolu (2019) determined that the frequency of honey purchase every six months is 30.8% for comb honey and 34.7% for liquid honey. In another study, it was found that 58.3% of honey buyers purchase liquid honey once a year, 22% purchase it twice a year, and 11.6% purchase it every month (Aydurmuş et al., 2022). Individuals who purchase 1-5 kg of honey per year constitute 47.7%, those purchasing 6-10 kg constitute 26%, those purchasing 11-15 kg constitute 11.4%, those purchasing 16-20 kg constitute 9.3%, and those purchasing more than 20 kg constitute 5.7%. It's observed that nearly half of the consumers purchase 5 kg or less of honey annually. In some previous studies, the annual honey consumption average of consumers has been reported as more than 0.5 kg by Krystallis et al. (2007), ranging between 0.5-2.5 kg by Guziy et al. (2017), and below 5 kg by Denizli Akdemir (2019) in a study conducted in Erzurum. Aydurmuş et al. (2022) explained the annual consumption average of honey as 7.12 kg for comb honey, 8.6 kg for liquid honey, and 3.8 kg for Karakovan honey. Yüzbaşıoğlu (2022) determined the annual honey consumption quantity as 1.70 kg for liquid honey and 2.80 kg for comb honey. According to the survey, 16.4% of participating consumers purchase honey in the ratio of 75% liquid to 25% comb honey, 38.1% in the ratio of 50% liquid to 50% comb honey, 20.3% in the ratio of 75% comb

to 25% liquid honey, 11.4% in 100% comb honey, and 13.9% in 100% liquid honey. It has been observed that consumers mostly prefer both liquid and comb honey in equal proportions. In a study conducted in Istanbul by Paydaş and Semerci (2001), it was found that 85.3% of consumers purchase liquid flower honey. Şahinler et al. (2004) reported that 43.7% of consumers in Antakya consume liquid honey and 13.1% consume comb honey. In a study conducted in Ordu, Sıralı and Çelik (2007) found that 56% of consumers consume liquid flower honey. Saner et al. (2012) reported that 45.7% of consumers in Izmir consume only liquid flower honey, while in Tokat, it was reported that 86.7% of consumers consume liquid honey (Sayılı, 2013). Kabakçı and Dodoloğlu (2014) explained that consumers in Erzurum mostly prefer liquid honey (60.9%). Baki et al. (2014) reported that 24% of consumers in Izmir prefer comb honey. Sıralı (2015) concluded that consumers generally prefer liquid flower honey nationwide. In a study by Karahan and Özmen Özbakır (2020), 98.7% of individuals consume honey and other bee products, with 40.9% preferring a mixture of liquid and comb honey, 37.7% preferring only comb honey, and 20.8% preferring only liquid honey. In the study, the percentage of consumers purchasing honey during the periods of August-September, October-November, and December-January were determined as 13.5%, 28.5%, and 2.4%, respectively. The percentage of consumers purchasing honey during any period of the year was determined to be 35.6%. Aydurmuş et al. (2022) reported that honey is consumed most intensively during the winter months. Regarding storage, 18.1% of surveyed consumers store the purchased honey in the refrigerator, 16.4% in the pantry, 35.9% in the kitchen, and 11.7% in any other room.

The Relationship between the Opinions of Individuals Surveyed According to the Districts They Live In and the Honey Sold in the Market

The relationships between the opinions of individuals surveyed regarding the honey sold in the market, based on the districts they live in, are presented in Table 2. The perception of adulteration in the honey sold in the market has shown statistically significant differences across districts ($\chi^2=19.240$ and $P<0.01$). There was found to be a significant relationship between individuals' beliefs about the presence of drug and antibiotic residues in the market honey and the districts they live in ($\chi^2=20.847$ and $P<0.001$). Opinions regarding the presence of drug and antibiotic residues in market honey vary depending on the district of residence, with a dependency coefficient of 27.2%. The relationship between the primary concern of consumers when purchasing honey from the market, namely its quality, and the district they live in was found to be significant ($\chi^2=23.599$ and $P<0.001$). The primary concern of consumers when purchasing honey from the market, namely its quality, varies depending on the district of residence, with a dependency coefficient of 29%. There was found to be a significant relationship between individuals' beliefs about whether honey labeled as organic in the market is truly organic and the districts they live in ($\chi^2=21.015$ and $P<0.01$). Consumers' beliefs about whether honey labeled as organic in the market is truly organic vary depending on the district of residence. The relationship between the primary consideration when purchasing honey from an unfamiliar seller and the district individuals live in was found to be significant ($\chi^2=29.855$ and $P<0.001$). The primary consideration when purchasing honey from an unfamiliar seller varies depending on the district of residence, with a dependency coefficient of 32.6%. The relationship between consumers' opinions on which honey among those available in the market is the most reliable and the district they live in was found to be significant ($\chi^2=25.712$ and $P<0.001$). In terms of this notion, opinions on which honey among those available in the market is the most reliable are dependent on the district of residence, with a dependency coefficient of 30.2%.

Relationship Between the Opinions of Individuals Surveyed by Age Groups Regarding Market Honey

The relationships between the opinions of individuals surveyed regarding market honey, categorized by age groups, are presented in Table 3. Significant associations were found between consumers' beliefs about the presence of medication and antibiotic residues in market honey and their age groups ($\chi^2=19.055$ and $P<0.01$). The opinions on the presence of medication and antibiotic residues in market honey were found to be dependent on age groups, with a dependency coefficient of 26%. Furthermore, a significant relationship was observed between the most prioritized factor when purchasing honey from the market and age groups ($\chi^2=30.406$ and $P<0.01$). Dependency on age groups was determined concerning this belief, with a dependency coefficient of 32.9%. It can be stated that consumers in the younger age group (below 30 years old) tend to believe more in the presence of medication and antibiotic residues in market honey and prioritize price criteria more when purchasing honey from the market compared to consumers in other age groups. In a study, it was reported that there was no statistically significant relationship between the sources of beekeeping products and the ages of consumers, but consumer characteristics such as age, education level, and income level were reported to influence honey consumption tendencies (Şahinler et al., 2004). Some studies have examined the relationships between honey preferences and consumer characteristics, identifying statistically significant relationships (Vanyi et al., 2011; Gyau et al., 2014; Guziy et al., 2017). In a study conducted by Marangoz and

Tayçu Dolu (2019), it was found that the level of knowledge about bee products varies statistically according to individuals' ages. Yüzbaşıoğlu (2022) concluded that an increase of one unit in individuals' ages would decrease honey preference by 0.8%.

Table 2. Relationships between consumers' opinions about honey on the market according to the districts they live in.

Opinions	Districts				
Presence of adulteration in honey sold in the market					
	Kayapınar	Bağlar	Yenişehir	Sur	Toplam
Yes, definitely	59	66	25	15	165
No	4	4	10	6	24
Probably	21	26	14	8	69
I don't know	8	6	6	3	23
Total	92	102	55	32	281
Chi-square (χ^2) value and P-value	19,240 ve 0,023**				
The belief that there are residues of medication and antibiotics in the honey on the market.					
Yes, I believe so.	24	34	9	4	71
No, I don't believe so.	17	28	25	8	78
I'm not sure.	51	40	21	20	132
Total	92	102	55	32	281
Chi-square (χ^2) value and P-value	20,847 ve 0,002***				
The most worrying thing about the quality of honey when buying honey from the market.					
Low price	39	42	10	8	99
Appearance of the honey	19	27	24	13	83
Seller's attitude and behavior	7	9	7	7	30
Buying honey from an unfamiliar seller	27	24	14	4	69
Total	92	102	55	32	281
Chi-square (χ^2) value and P-value	23,599 ve 0,005***				
Believing that honey sold as organic in the market is actually organic					
I don't believe so at all.	30	41	18	8	97
Yes, I believe so.	11	9	10	8	38
I don't have an opinion.	14	26	18	9	67
If I know the seller very well, I believe it.	37	26	9	7	79
Total	92	102	55	32	281
Chi-square (χ^2) value and P-value	21,015 ve 0,013**				
The most important thing to pay attention to when buying honey from an unfamiliar seller					
Price	12	27	8	2	49
Based on the appearance,	18	12	14	13	57
Based on the aroma,	15	16	13	4	48
I prefer comb honey over liquid honey.	27	28	17	11	83
Based on the trust the seller instills.	20	19	3	2	44
Total	92	102	55	32	281
Chi-square (χ^2) value and P-value	29,855 ve 0,003***				
The most reliable honey on the market					
Karakovan honey	22	9	10	4	45
Comb honey	30	35	25	13	103
Liquid honey	9	18	13	9	49
I don't have an opinion	31	40	7	6	84
Total	92	102	55	32	281
Chi-square (χ^2) value and P-value	25,712 ve 0,002***				

** : P<0.01, *** : P<0.001.

Table 3. Relationships between the opinions of the surveyed individuals about the honey sold in the market by age groups.

Opinion	Age groups					Toplam
	21-30	31-40	41-50	51-60	61-70	
Belief that there are drug and antibiotic residues in honey on the market						
Yes I believe	24	24	15	7	1	71
No I dont believe	25	17	12	12	12	78
I dont know	29	47	31	17	8	132
Total	78	88	58	36	21	281
Chi-square (χ^2) value and P-value	19,055 ve 0,015**					
The most important criterion when purchasing honey from the market						
The familiarity of the seller	18	25	16	8	7	74
The price of the honey	22	17	19	16	8	82
The appearance of the honey	17	12	15	3	2	49
The name of the producing company	15	16	4	8	2	45
The trust provided by the seller	6	18	4	1	2	31
Total	78	88	58	36	21	281
Chi-square (χ^2) value and P-value	30,406 ve 0,016**					

** : P<0.01, ***: P<0.001.

The Relationship between the Opinions of the Surveyed Individuals about the Honey Sold in the Market According to Their Gender

The relationship between the opinions of individuals surveyed based on their genders regarding the honey sold in the market is provided in Table 4. The relationship between the most important consideration when consumers purchase honey from the market and gender groups was found to be significant ($\chi^2=17.164$ and $P<0.001$). It was determined that gender significantly influences the most emphasized aspect when purchasing honey from the market, with a dependency coefficient of 24.7%. Male consumers were observed to place more importance on the price criterion when purchasing honey from the market compared to female consumers. Previous studies have examined the relationships between honey preferences and consumer characteristics, and statistically significant relationships have been identified (Gyau et al., 2014; Guziy et al., 2017). In a study conducted by Kabakçı and Dodoloğlu (2014), it was found that women prefer filtered honey at a higher rate compared to men. In the same study, it was reported that the relationship between gender and other criteria considered when purchasing honey, such as taste, smell, color, and the source of production, was insignificant, and among consumer preferences, the source of honey production was found to be more important compared to others. Marangoz and Tayçu Dolu (2019) concluded that the level of trust in purchasing bee products varied according to gender, with women having more trust in sellers compared to men. Yüzbaşıoğlu (2022) determined that the gender of individuals positively influences honey consumption, with men preferring to consume more honey than women.

Table 4. The relationship between the opinions of the surveyed individuals about the honey sold in the market according to their gender

Opinion	Gender		
	Male	Female	Total
The most important criterion when purchasing honey from the market			
The familiarity of the seller	36	38	74
The price of the honey	58	24	82
The appearance of the honey	22	27	49
The name of the producing company	17	28	45
The trust provided by the seller	19	12	31
Total	152	129	281
Chi-square (χ^2) value and P-value	17.164 ve 0,002***		

** : P<0.01, ***: P<0.001.

The Relationship between the Opinions of the Surveyed Individuals about the Honey Sold in the Market According to Their Professional Groups

The relationships between the opinions of individuals surveyed regarding the honey sold in the market based on their occupational groups are presented in Table 5. The relationship between consumers' opinions on whether there is adulteration in the honey in the market and their occupational groups was found to be significant ($\chi^2=24.243$ and $P<0.01$). It was determined that thoughts on the presence of adulteration in the honey in the market were dependent on occupational groups, with a dependency coefficient of 29.4%. The relationship between individuals' beliefs about the presence of pesticide and antibiotic residues in the honey when consumed and their occupational groups was significant ($\chi^2=28.282$ and $P<0.001$), with a dependency coefficient of 31.7%. The relationship between individuals' discomfort with the presence of starch-based sugar, drugs, or antibiotic residues in the honey when consumed and their occupational groups was also significant ($\chi^2=25.517$ and $P<0.01$), with the belief being dependent on occupational groups at a rate of 30.1%. The relationship between consumers' opinions on the most trusted honey among those available in the market and their occupational groups was found to be significant ($\chi^2=26.099$ and $P<0.001$). Consumers in the self-employed occupational group were found to have a higher belief in adulteration, presence of starch-based sugar, drugs, antibiotic residues, etc., in the honey sold in the market compared to other occupational groups, and they were more concerned about this issue. Additionally, it was observed that they considered comb honey to be safer compared to other types of honey. Various studies have reported statistically significant relationships between honey preferences and consumer characteristics (Gyau et al., 2014; Guziy et al., 2017).

Table 5. The relationship between the opinions of the surveyed individuals about the honey sold in the market according to their professional groups.

Opinion	professional groups					
	Officer	Self-employment	Employee	Retired	Student	Total
Whether or not there is fraud in honey sold in the market						
Yes definitely	40	70	31	11	13	165
No	2	7	9	5	1	24
Probably	9	22	17	9	12	69
I don't know	5	10	2	4	2	23
Total	56	109	59	29	28	281
Chi-square (χ^2) value and P-value			24,243 ve 0,019**			
Belief that there are drug and antibiotic residues in honey on the market						
Yes I believe	20	24	18	0	9	71
No I do not believe it	5	32	17	16	8	78
I don't know	31	53	24	13	11	132
Total	56	109	59	29	28	281
Chi-square (χ^2) value and P-value			28,282 ve 0,000***			
Feeling uncomfortable when consuming honey because it contains starch-based sugar, medication or antibiotic residue.						
Yes, I'm worried	34	62	28	13	15	152
No, I'm not worried	5	16	15	8	5	49
No idea	3	21	8	6	7	45
A little	14	10	8	2	1	35
Total	56	109	59	29	28	281
Chi-square (χ^2) value and P-value			25,517 ve 0,013**			
The most reliable honey on the market						
Karakovan honey	17	9	11	3	5	45
Comb honey	13	49	25	11	5	103
Liquid honey	6	19	10	7	7	49
I don't have an opinion	20	32	13	8	11	84
Total	56	109	59	29	28	281
Chi-square (χ^2) value and P-value			26,099 ve 0,010***			

** : $P<0.01$, *** : $P<0.001$.

The Relationship between the Opinions of the Surveyed Individuals about the Honey Sold in the Market by Income Group

The relationships between the opinions of the surveyed individuals about the honey sold in the market by income groups are given in Table 6. The relationship between income groups and the situation where people are most worried about the quality of honey when purchasing honey from the market is significant ($\chi^2=33.720$ and $P<0.01$), and it was determined that the concern in question is dependent on income groups (dependence coefficient 34.6%). The relationship between the most taken into consideration when buying honey from an unknown seller and the income groups was found to be significant ($\chi^2=24.604$ and $P<0.1$) and it was observed that this situation was dependent on the income groups. The relationship between the number of honey purchases in a year and income groups was also significant ($\chi^2=23.455$ and $P<0.05$) and the dependency coefficient was determined as 28.9%. It has been determined that consumers in the highest income group are more concerned about the low price of honey when purchasing honey from the market than individuals in other income groups, prefer comb honey instead of filtered honey, and purchase honey more than twice a year. In a study conducted by Şahinler et al. (2004), it was determined that individuals in the low-income group pay more attention to price, while individuals in the high-income group pay more attention to quality and nectar rate. In the studies conducted by Sıralı (2015) and Paydaş and Semerci, (2001), it was reported that there is a linear connection between the income level and the importance given to the brand, and that the degree of importance given to the brand decreases from the group with a high average income to the lower groups. In another study, it was reported that there was a negative relationship between individuals' income and honey consumption, and that a one-unit increase in individuals' income caused a four per thousand decrease in honey preference (Yüzbaşıoğlu, 2022).

Table 6. Relationships between the opinions of the surveyed individuals about the honey sold in the market according to their income groups.

Opinion	Income groups (₺)					ToTAL
	2500-3500	3501-4500	4501-5500	5501-6500	6501 and above	
The most worrying thing about the quality of honey when buying honey from the market is						
Low price	18	11	19	14	37	99
Appearance of honey	24	7	20	18	14	83
Attitude and behavior of the seller	6	7	12	2	3	30
Buying honey from a seller you don't know	7	6	23	8	25	69
Total	55	31	74	42	79	281
Chi-square (χ^2) value and P-value	33,720 ve 0,001***					
The most important thing to pay attention to when buying honey from an unknown seller is						
Price	10	5	11	8	15	49
Physical appearance	18	4	13	11	11	57
Smell	8	7	18	8	7	48
I prefer honeycomb honey instead of filtered honey.	13	10	23	12	25	83
Assurance given by the seller	6	5	9	3	21	44
Total	55	31	74	42	79	281
Chi-square (χ^2) value and P-value	24,604 ve 0,077*					
Number of honey purchases in a year						
Once	17	10	20	5	20	72
Twice	16	7	23	10	15	71
more than two	4	3	13	16	22	58
Not sure	18	11	18	11	22	80
Total	55	31	74	42	79	281
Chi-square (χ^2) value and P-value	23,455 ve 0,024**					

*: $P<0.5$, **: $P<0.01$, ***: $P<0.01$.

CONCLUSION AND RECOMMENDATIONS

This study examines the preferences, concerns, thoughts, and behaviors of consumers living in the central district of Diyarbakır regarding the purchase and consumption of commercially available honey, as well as the relationships between these and certain socio-economic characteristics of consumers. The influential perceptions affecting consumers' honey preferences and the factors contributing to these perceptions are addressed, and the findings are evaluated. The study also identifies the misconceptions that limit honey consumption in Türkiye and suggests measures to eliminate these negative perceptions. The findings are deemed highly significant for both consumers and honey producers. Additionally, the study emphasizes the need for honey producers to understand consumer expectations and for consumers to be informed about the true value of commercial honey, suggesting comprehensive promotional efforts to highlight honey's increasing economic value over time. In this study, it was determined that the participation rate in the survey was higher among males compared to females, and approximately 60% of the participants were under the age of 40. It was observed that among the surveyed consumers, there was a high proportion of university graduates and self-employed individuals. The average number of members in the families of the surveyed consumers was close to the Turkish average, with approximately 70% having incomes close to or above the minimum wage. The majority of surveyed consumers held positive views on the necessity of consuming honey for healthy nutrition, tended to consume honey more than other sweet foods (such as jam, molasses, marmalade, etc.), and believed that the main reason for consuming honey was its health benefits. Many consumers disagreed with statements claiming that commercial honeys in the market are healthy, believing instead that there is adulteration (adulteration and counterfeiting) in the honey sold in the market, which could pose serious health risks. A significant portion of consumers expressed concerns that if the price of honey is low when purchasing it from the market, it may not be natural, and may contain additives such as sugar, syrup, drugs, or antibiotic residues. When purchasing honey from the market, consumers ranked the criteria they most valued and emphasized proportionally as follows: price of honey, familiarity with the seller, appearance of honey, name of the producing company, and trust provided by the seller. Nearly half of the consumers (49.5%) preferred to purchase local honey when buying honey. Consumers generally preferred filtered and comb honey in similar proportions, and it was found that nearly half of the consumers purchased 5 kg or less of honey per year. It was determined that younger consumers tended to believe more in the presence of drugs and antibiotic residues in commercial honey compared to consumers in other age groups, and placed more importance on price when purchasing honey from the market. Male consumers were observed to place more importance on price when purchasing honey from the market compared to female consumers. Consumers in the self-employed occupational group were found to believe more in adulteration and the presence of drugs and antibiotic residues in the honey sold in the market compared to other occupational groups. They also expressed higher levels of discomfort regarding the presence of sugar, syrup, and starch-based sugar in honey when consuming it, and considered comb honey to be safer compared to other types of honey. Consumers in the highest income group were found to be more concerned about the quality of honey when purchasing it from the market compared to individuals in other income groups. Based on the results obtained, some opinions and suggestions are provided below:


- Due to the significant influence of the plant flora of the region where honey is obtained, the quality of honey produced in Türkiye varies considerably depending on the regions.
- According to the Turkish Food Codex Honey Regulation, no substance, including food additives, can be added to honey. Honey must be free from organic and/or inorganic substances not naturally found in its composition.
- However, honey, being subject to limited and nature-dependent production, as well as high demand both domestically and internationally, is currently among the most adulterated (counterfeit and adulterated) foods.
- Since almost the entire dry matter of honey consists of sugars, it is highly susceptible to adulteration. Whether honey is adulterated or not is crucial both for health reasons and commercial purposes. Preventing adulteration is of great importance for protecting consumer health and preventing unfair competition.
- Compared to other agricultural foods, honey is generally produced and marketed under less regulated conditions, leading to higher food safety concerns. It is not possible to determine whether honey is adulterated from its appearance, smell, or taste. The most accurate method is to analyze the composition of honey. Nowadays, with advancing technology, all characteristics of honey can be thoroughly analyzed.
- Despite being one of the leading countries in honey production, Türkiye faces significant quality issues in its honey products. Therefore, problems often arise in honey exports to foreign countries.
- In addition to pure honey, there is a considerable amount of counterfeit and adulterated honey in the market. Effective control of honey using appropriate methods is necessary to limit this fraud and reduce associated risks.

- Relevant authorities should ensure the production of honey is healthier and safer by conducting regular inspections of beekeepers and considering practices to eliminate consumer doubts.
- Consumer awareness of healthy nutrition plays a significant role, and as consumers' income levels increase, there is a tendency to consume higher quality and healthier honey. To address the generally negative perception consumers have towards commercially available honey, a trust environment must be established between honey producers and consumers.
- Ensuring traceability throughout the production and marketing stages of honey, along with regular and effective inspection mechanisms, is essential to remove low-quality honey from the market.
- Consumers are advised to prefer products from beekeepers approved and registered by the Ministry of Agriculture and Forestry when purchasing honey.
- Compliance with legal regulations in honey production and marketing largely depends on a thorough understanding of professional organization and ethical principles within the industry.

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REFERENCES

- Aksoy, A., Yavuz, F., 2012. Çiftçilerin küçükbaş hayvan yetiştiriciliğini bırakma nedenlerinin analizi: Doğu Anadolu Bölgesi örneği. *Anadolu Tarım Bilim. Derg.*, 27(2):76-79.
- Anonim, 2020. Temmuz 2022 tarihli ve 31388 Mükerrer sayılı Resmi Gazete.
- Anonymous, 2022. T.C. Çalışma ve Sosyal Güvenlik Bakanlığı, 2022 Yılı İçin Yeni Asgari Ücret 5 Bin 500 TL Olarak Belirlendi. (<https://www.csgb.gov.tr>).
- Arvanitoyannis, I., Krystallis A. 2006. An empirical examination of the determinants of honey consumption in Romania. *International Journal of Food Science and Technology*, 41: 1164–1176.
- Aydurmuş, İ., Türkmen, Özen, İ., Karataş, Ü., 2022. Bal Tüketim ve Bilinç Düzeyinin Araştırılması. *Kadirli Uygulamalı Bilimler Fakültesi Dergisi Cilt 2, Sayı 2*, 181-196.
- Baki, F., Saner, G., ve Güler, D. 2014. İzmir ilinde tüketicilerin arı ürünlerine yönelik tercihler ve tüketim durumu. 4. Uluslararası Muğla Arıcılık Ve Çam Balı Kongresi, Muğla, s. 5-9.
- Baki, F., Saner, G., Adanacioğlu, H., ve Güler, D. 2017. Türkiye’de süzme çam balına yönelik tüketici tercihlerinin Konjoint analizi: İzmir ili örneği. *Balkan and Near Eastern Journal of Social Sciences*, 3:(2), p. 50-57.
- Bhandari, B., D’Arcy, B. ve Kelly, C. 1999. Rheology and crystallization kinetics of honey: present status. *International Journal of Food Properties*, 2(3), 217-226. <https://doi.org/10.1080/10942919909524606>.
- Bölüktepe, F. E., ve Yılmaz, S. 2006. Tüketicilerin bal satın alma davranış ve alışkanlıklarını etkileme sürecinde markanın önemini belirlemeye yönelik bir araştırma. *Uludağ Arıcılık Dergisi*, 6(4): 135-142.
- Burucu, V., Gülse Bal, H.S. 2017. Türkiye’de arıcılığın mevcut durumu ve bal üretim öngörüsü. *Tarım Ekonomisi Derg.*, Cilt: 3 Sayı: 1, 28-37.
- Denizli, Akdemir, G. 2019. Erzurum ilindeki tüketicilerin bal tüketim tercihlerinin incelenmesi. *Atatürk Üniversitesi Fen Bilimleri Enstitüsü, Tarım Ekonomisi ABD, Yüksek Lisans Tezi*.
- Denizli, Akdemir, G., ve Dağdemir, V. 2021. Erzurum ilindeki tüketicilerin bal tüketim tercihlerinin incelenmesi. *İğdir Üniversitesi Fen Bilimleri Dergisi*, 11(4): 3172-3183.

- FAO, 2022. Food and Agriculture Organization of the United Nations, FAO <http://www.fao.org/faostat/en/#data>. (Erişim tarihi: 02.03.2023).
- Guziy, S., Šedík, P., Horská, E. 2017. Comparative study of honey consumption in Slovakia and Russia. *Potravin. Slovak J. Food Sci.*, 11, 472–479.
- Gürel, F. 2025. Balda taklit ve tağşiş. *Arıcılık Araştırma Dergisi*. 7 :(13), 2-5. ISSN 2146 -2720.
- Gyau, A., Akalakou, C., Degrande, A., Biloso, A. 2014. Determinants of consumer preferences for honey in the democratic Republic of Congo. *Journal of Food Products Marketing*, 20(5), 476e490. <http://dx.doi.org/10.1080/10454446.2013.807405>.
- Kabakcı, D., ve Dodoloğlu, A. 2014. Türkiye'nin bal tüketim alışkanlıkları: Erzurum örneği. 4. Uluslararası Muğla Arıcılık ve Çam Balı Kongresi (5-9 Kasım) Bildirileri. Ölüdeniz, Muğla. s. 433-435.
- Karadavut, U., Tunca, İ., R., Taşkın, A., Büyük, M. ve Çimrin, T. 2014. Kırşehir ili arı ürünleri kullanımı ve tüketimi üzerine farkındalık çalışması. 4. Uluslararası Muğla Arıcılık ve Çam Balı Kongresi, ss. 446- 447.
- Karahan, Ş., ve Özmen, Özbakır, G. 2020. Güneydoğu Anadolu'da arıcılık faaliyetlerinin ve bal tüketim alışkanlıklarının belirlenmesi. *Türk Tarım ve Doğa Bilimleri Dergisi*, 7(4): 1148–1158.
- Kavas, A. 1987. Gıda seçimi ve tüketimi: Davranışsal Yaklaşım. *Gıda Sanayi*, 1(2): 18-22.
- Kekeçoğlu M, Gürcan E, Soysal M 2007. Türkiye arı yetiştiriciliğinin bal üretimi bakımından durumu. *Tekirdağ Ziraat Fakültesi Dergisi*, 4(2), 227 - 236.
- Kızılaslan, H., and Kızılaslan, N. 2007. Factors affecting honey production in apiculture in Turkey. *Journal of Applied Sciences Research*, 3(10): 983-987.
- Korkmaz, (2013). Arıcılığımızın temel sorunu: Arıcı. *Samsun İli Arı Yetiştiricileri Birliği. Petek Dergisi*. 9:(18-19).
- Krystallis, A., Petrovici, D. and Arvanitoyannis, I. 2007. From commodities to the consumption of quality foods in Eastern European context. *Journal of East-West Business*, 12, 5-37.
- Kumova, U., ve Korkmaz, A. 1999. Çukurova bölgesi koşullarında yetiştirilen arı otu bitkisinin bal arıları için önemi. *TİGEM*, 12(68): 28-31.
- Kumova, U., ve Korkmaz, A. 2000. Arı ürünleri tüketim davranışları üzerine bir araştırma. Türkiye'de Arıcılık Sorunları ve I. Ulusal Arıcılık Sempozyumu (28-30 Eylül 1999), Erzincan, s. 129-142.
- Marangoz, M. ve Tayçu Dolu, Z. 2019. Tüketicilerin arı ürünlerine ilişkin bilgi ve güven düzeyleri ile satın alma davranışlarının araştırılması. *Uludağ Arıcılık Dergisi*, 19(2): 110-125.
- Merdan, K., ve Durmuş, İ. 2018. Bayburt ölçeğinin arı ürünleri tüketim tercihlerini etkileyen faktörler üzerine bir değerlendirme. *Social Sciences Studies Journal*, 4(16): 1101-1112.
- Mutlu, C., Erbaş, M., Arslan Tontul, S., 2017. Bal ve diğer arı ürünlerinin bazı özellikleri ve insan sağlığı üzerine etkileri. *Akademik Gıda*. 15(1):75-83
- Niyaz, O. C., Demirbaş, N. 2017. Arı ürünleri tüketicilerinin genel özellikleri ve tüketim tercihleri: Çanakkale ili örneği. *Tarım Ekonomisi Dergisi*, 23(2): 255-262.
- Paydaş, M., ve Semerci, A. 2001. İstanbul'da süzme bal tüketim eğilimleri. *Teknik Arıcılık*. 73(1): 8-15.
- Saner, G., Yercan, M., Engindeniz, S., Karaturhan, B., ve Cukur. F. 2007. Alternative marketing strategies for honey and other bee products in Turkey. *Journal of Agricultural and Food Information* 8(4): 65–74. doi:10.1080/10496500802083690.
- Saner, G., Yücel, B., Yercan, M., Karaturhan, B., Engindeniz, S., Çukur, F. ve Kösoğlu, M. 2011. Organik ve konvansiyonel bal üretiminin teknik ve ekonomik yönden geliştirilmesi ve alternatif pazar olanaklarının saptanması üzerine bir araştırma: İzmir ili Kemalpaşa ilçesi örneği. *TEPGE (Tarımsal Ekonomi ve Politika Geliştirme Enstitüsü) Yayın No:195, Ankara*, s. 173.
- Saner, G., Engindeniz, S., Yercan, M., Çukur, F., Karaturhan B., Yücel, B., ve Köseoğlu, M. 2012. İzmir ili kentsel alanında tüketicilerin bal satın alma tercihleri ve tüketim düzeyleri. 3. Uluslararası Muğla Arıcılık ve Çam Balı Kongresi (01-04 Kasım 2012) Bildirileri Kitabı. Marmaris-Muğla, s. 215-223.

- Sayılı, M. 2013. Tokat ilinde tüketicilerin arı ürünleri tüketim durumları ve alışkanlıkları. *Uludağ Arıcılık Dergisi*, 13(1): 16-22.
- Sıralı, R., ve Çelik, Y. 2007. Ordu ili kentsel alandaki tüketicilerin süzme bal tüketim alışkanlıkları. *Hasad Gıda*. 23(270): 30-37.
- Sıralı, R. 2015. Süzme bal satın alma sürecinde tüketici tercihlerini etkileyen faktörler. *Ordu'da gıda güvenliği. Ordu Gıda ve Hay. Müd. Yay.*, 9: (25),45-49.
- Soylu, M., ve Silici, S. 2018. Üniversite öğrencilerinin bal tüketim tercihleri. *International Journal of Human Sciences*, 15(1): 386-398.
- Tosun, M., 2004. Balda yapılan hileleri belirleme yöntemlerinin uygunluğunun araştırılması. Atatürk Üniv. Fen Bilim. Enst. Gıda Müh. ABD. Doktora Tezi.
- Şahinler, N., Şahinler, S., Gül, A., ve Görgülü, O. 2004. Arı ürünleri tüketici özelliklerinin belirlenmesi üzerine bir çalışma. 4. Ulusal Zootekni Bilim Kongresi (1-3 Eylül). Isparta, s. 53-57.
- Şahinler, N., Çetinkaya, S., ve Toy N. Ö. 2021. Uşak ilinde arı ürünlerinin tüketim durumları. *Mustafa Kemal Üniversitesi Tarım Bilimleri Dergisi*, 26(1): 155-162.
- TGK, 2020. Türk Gıda Kodeksi Bal Tebliği. (Tebliğ No: 2020/7, 22 Nisan 2020 tarih ve 31107 sayılı Resmî Gazete.
- TÜİK, 2023. Türkiye İstatistik Kurumu veri portalı. <https://data.tuik.gov.tr/> (Erişim tarihi: 02.02.2024)
- Vanyi, A. G., Csapo, Z., Karpati. L. 2011. Evaluation of consumers' honey purchase habits in Hungary. *Journal of Food Products Marketing* 17(2–3): 227–240. doi:10.1080/10454446.2011.548293.
- Yüzbaşıoğlu, R. 2022. Bireylerin bal tüketimi ve yöresel ürün olan Zara balı tercih nedenleri (Sivas ili merkez ilçe örneği). *Tekirdağ Ziraat Fakültesi Dergisi*, 19(1): 16-27.