

SENSORY EXAMINATION OF HONEY AND THE EFFECT OF SENSORY CHARACTERISTICS ON PURCHASE DECISIONS

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ABSTRACT

Aside from honey's sweet and distinctive flavor, it can provide various human health benefits, which makes its market value favorable compared to those of other sweeteners. In the study, the purchase decision making process is examined through sensory experiments. The results are based on sensory analysis of 600 adult consumers, which show that, consumers' demand for honey varies significantly according to the flavor, aroma, color, texture and price. The geographic location of the honey's production and the product packaging are key factors for some consumer segments. Sensory differentiation and the evaluation of honey quality are different in the analyzed consumer segments, which are described in the study.

Keywords: honey, sensory examination, purchase decision, quality, consumer behavior

1. INTRODUCTION

The popularity of honey has been increasing worldwide mainly due to the increasing trend of healthy lifestyle, eating functional food, and local food consumption. In recent years, food market has been influenced by growing consumer interest in healthy lifestyle including healthy eating habits. Consumers are more concerned about their health and prefer to purchase natural and healthy food [1]. According to the Hungarian Central Statistical Office the consumption patterns of honey in Hungary are slowly changing. Since 2010 the annual consumption per capita has increased from 300 grams to almost 800 grams by 2018, which represents approximately a 170 percent increase in the mentioned period [2].

Due to increasing consumption, honey market in the European Union and in Hungary is flooded with cheap imported honey. Approximately 40 % of overall consumption in the EU is covered by import from third countries. The European Union is the world's second biggest producer of honey after China. Every year, about 600,000 beekeepers and 17 million beehives produce about 250,000 tonnes of honey. However, the production does not cover the demand: about 200,000 tonnes of honey were imported into the EU in 2016, mainly from China, which accounts for about 40% of EU imports [3]. Compared to their competitors elsewhere, EU beekeepers face relatively high production costs and the limited EU exports are priced higher than imports into the EU [4]. In general, imported honey does not have precise country of origin due to legislation, which maintains labelling rules which allows producers to indicate the honey origin [5]. There are significant differences in quality between honey products, and consumers find difficult to differentiate the honey products [6]. In the study the different honey characteristics are examined in three consumer segments.

2. MATERIALS AND METHODS

The aim of the research was to identify consumers' perception of intrinsic attributes (sensory qualities) between different types of domestic honey in the absence of extrinsic attributes (price, country of origin, brand, label, and producer). Primary data were obtained by experiment with blind sensory testing on the sample of 600 respondents which evaluated 11 different types of local honey.

The sensory examination lasted from the beginning of September to the end of December 2015 in four locations: in Budapest, Gödöllő, Szigetszentmiklós and Kerepes. During the examination we applied simple random sampling technique. The participants of the sensory examination were asked to taste 11

varieties of honey from the 2015 Kincses-Billege Beekeeping production. The tested samples were: acacia, mixed flower, silkworm, linden, chestnut, linden-chestnut, forest, pine, sunflower, rape-fruit and hawthorn honey.

After tasting all the different honey samples, the respondents selected the most preferred sample and which sensory characteristics were indicated their decision: taste, color, scent or texture and there was the price as other option. Consumers could choose all four properties, and they had to mark at least one of the characteristics.

The demographic character and other characteristics asked in the survey were gender, age, professional competence, and price sensitivity. Price sensitivity is indicated on a scale of 1 to 5. On the basis of professional competence, the respondents were divided into three groups: average consumers, demanding consumers and expert consumers. On the basis of professional competence, the respondents classified themselves into the certain category. An average consumer was defined as a consumer, who buys honey in case of illness, but at least every year once. Demanding consumer, who consumes several types of honey regularly throughout the year. Experts were defined as consumers, who consume several types of honey regularly throughout the year and has a knowledge on different honey types and is able to recognize the taste differences between the types of the honey.

Demographic characteristics asked during the study were sex, age, expertise in honey and price sensitivity. On the basis of expertise in honey, we divided the respondents into three groups: average consumers, demanding consumers and experts. An average consumer buys honey at the time of illness, but at least once every year. The demanding consumer consumes several types of honey regularly throughout the year. Price sensitivity is indicated on a scale of 1 to 5.

In the sample 57.2% of the respondents were women and 42.8% were men. According to the data of the Population Census 2011 of the Hungarian Central Statistical Office [8], the proportion of women in Central Hungary was 53.2%, while that of men was 46.8%, which in our sample was 3.94% in favor of men. The respondents were classified into 7 age groups with the differences from the representative ratio included in Table 1.

Table 1: Ratio of population in Central Hungary region in reality and in the sample

Age groups	Ratio of population	
	in reality	in the sample
0 – 18	14.08%	1.00%
19 – 25	11.64%	8.83%
26 – 35	15.47%	14.33%
36 – 50	22.03%	34.17%
51 – 62	17.16%	28.50%
63 – 75	12.24%	9.50%
75 and over	7.39%	3.67%
Total	100.00%	100.00%

Source: HCSO and own survey

Respondents were classified into three categories according to their expertise in honey: average consumer, demanding consumer and expert consumer. The majority of the respondents had an average level of expertise, 281 fell under the category of average consumer. 278 were demanding consumers, they had more expertise than average consumers, but they were not professional of honey. An additional 41 people participated in the research, who were experts on the topic.

On the basis of price sensitivity, the participants in the research were divided into three groups: 30.5% were highly price sensitive, 13.5% were price sensitive, 24.7% were classified as neutral, 11.3% was less price sensitive, while 20% was not price sensitive on their own.

The study was conducted in four locations: Budapest, Gödöllő, Szigetszentmiklós and Kerepes, the respondents were all residents of Central Hungary region: 405 people in Budapest, 66 in Gödöllő, 107 in Szigetszentmiklós and 22 in Kerepes.

3. RESULTS AND DISCUSSION

In the study the taste, color, scent and texture were examined in the three consumer segments as evaluation characteristics. We examined the consumer decision making process on 11 different taste sample.

3.1. Evaluation of honey characteristics

Based on the results of the chi-square test ($p = 0.20$), with the significant level of 0.05, there is no significant difference between the groups of consumers in judging the importance of the taste. (Figure 1) More than 85% of the average consumer, the demanding consumer and the expert groups consider the taste to be an important sensory aspect. The experts almost all agreed that the flavor is the most significant sensory characteristic of honey, but they also marked a higher proportion of other characteristics than the groups of average and demanding consumers, which can be associated with their high sensory skills.

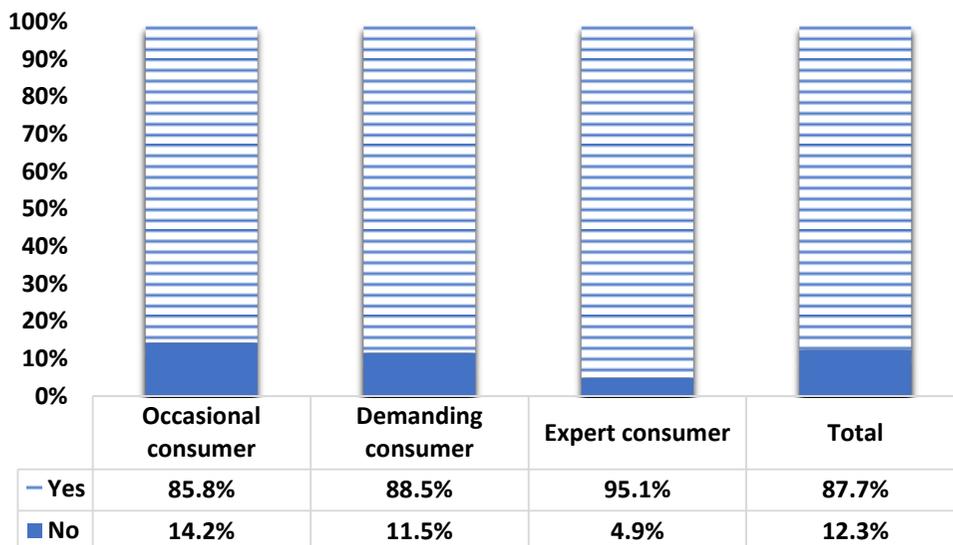


Figure 1: Taste evaluation of different consumer segments

Based on the result of the chi-square test ($p < 0.01$) at a 0.05 significance level, there is a significant difference between consumer groups in assessing the importance of color. More of the demanding consumers consider the color important than in the group of average consumers, but the majority of average and demanding consumers do not consider the color very important while the majority of experts consider the color of honey to be particularly important (Figure 2). This can be paralleled with the expertise of the consumers. The more the consumer understands the product, the more aspects he takes into account when deciding on it. After the taste the color proved to be the second most important characteristic.

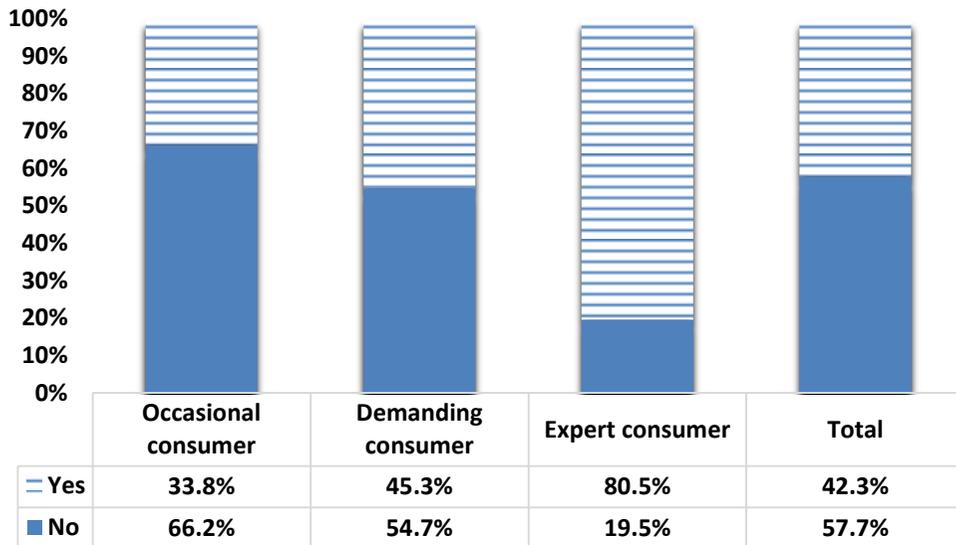


Figure 2: Color evaluation of different consumer segments

Based on the result of the chi-square test ($p < 0.01$) at a 0.05 significance level, there is a significant difference between consumer groups in assessing the importance of scent. 12.8% of average consumers, 18.0% of demanding consumers, and 51.2% of experts chose the scent as an important sensory characteristic, as shown in Figure 2.

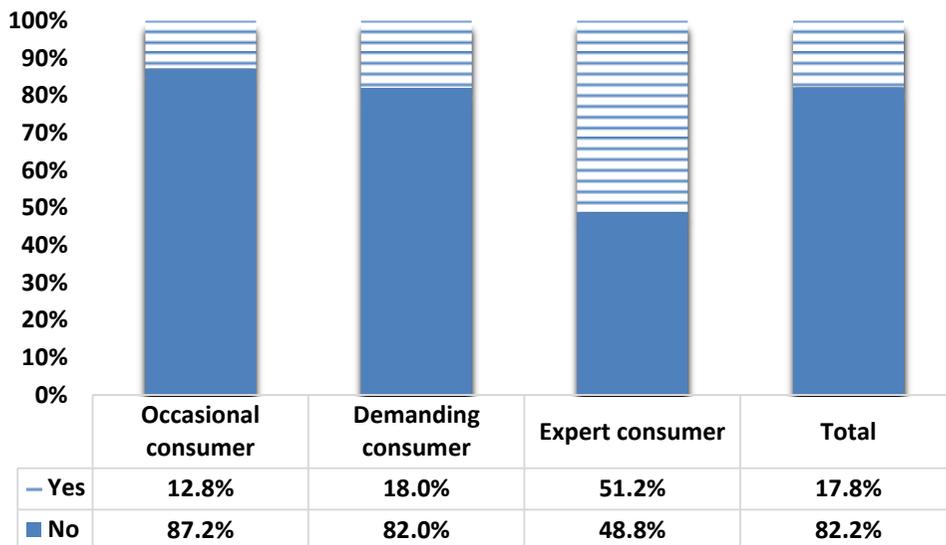


Figure 3: Scent evaluation of different consumer segments

The high proportion of the expert consumer group can also be explained by expertise, as is the case with other sensory characteristics. In terms of scent, it is important to mention that this was the least important aspect of sensory characteristics.

The result of the chi-square test ($p < 0.01$) at the 0.05 significance level shows a significant difference between the groups of consumers regarding the importance of the texture. A small part of occasional and demanding consumers consider the texture to be an important sensory characteristic while the majority of experts does so (see Figure 3). The majority of the respondents considered texture to be the third most important feature after color.

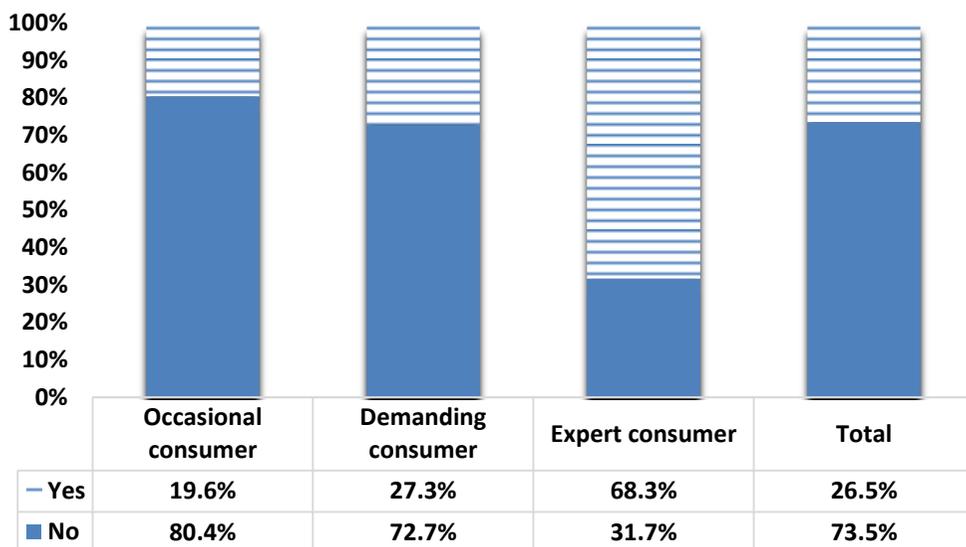


Figure 4: Texture evaluation of different consumer segments

In the case of all three groups, the taste was the most important sensory aspect, followed by color, then texture and scent. A total of 87.7% of the respondents chose the taste as important sensory characteristics, 42.3% of the respondents considered the color, 26.5% considered the texture while only 17.8% considered the scent important. There is a significant difference in the perception of consumer groups in terms of color, scent and texture, as shown in Figure 1-4. When evaluating honey, consumers take into consideration more and more sensory aspects with increasing expertise. For occasional consumers, it was only the taste that prevailed, while a higher percentage of demanding consumers took more considerations into account when choosing. For the experts, all four attributes were significantly more important in making the decision than in the other two groups.

3.2. Evaluation of honey varieties

Based on the result of the chi-square test ($p = 0.83$), at a significant level of 0.05, there is no significant difference between the consumer groups in evaluating the honey varieties. The distribution of consumer groups by honey variety is presented in figure 5, which illustrates that there is no significant difference between consumer groups regarding the preferences on varieties.

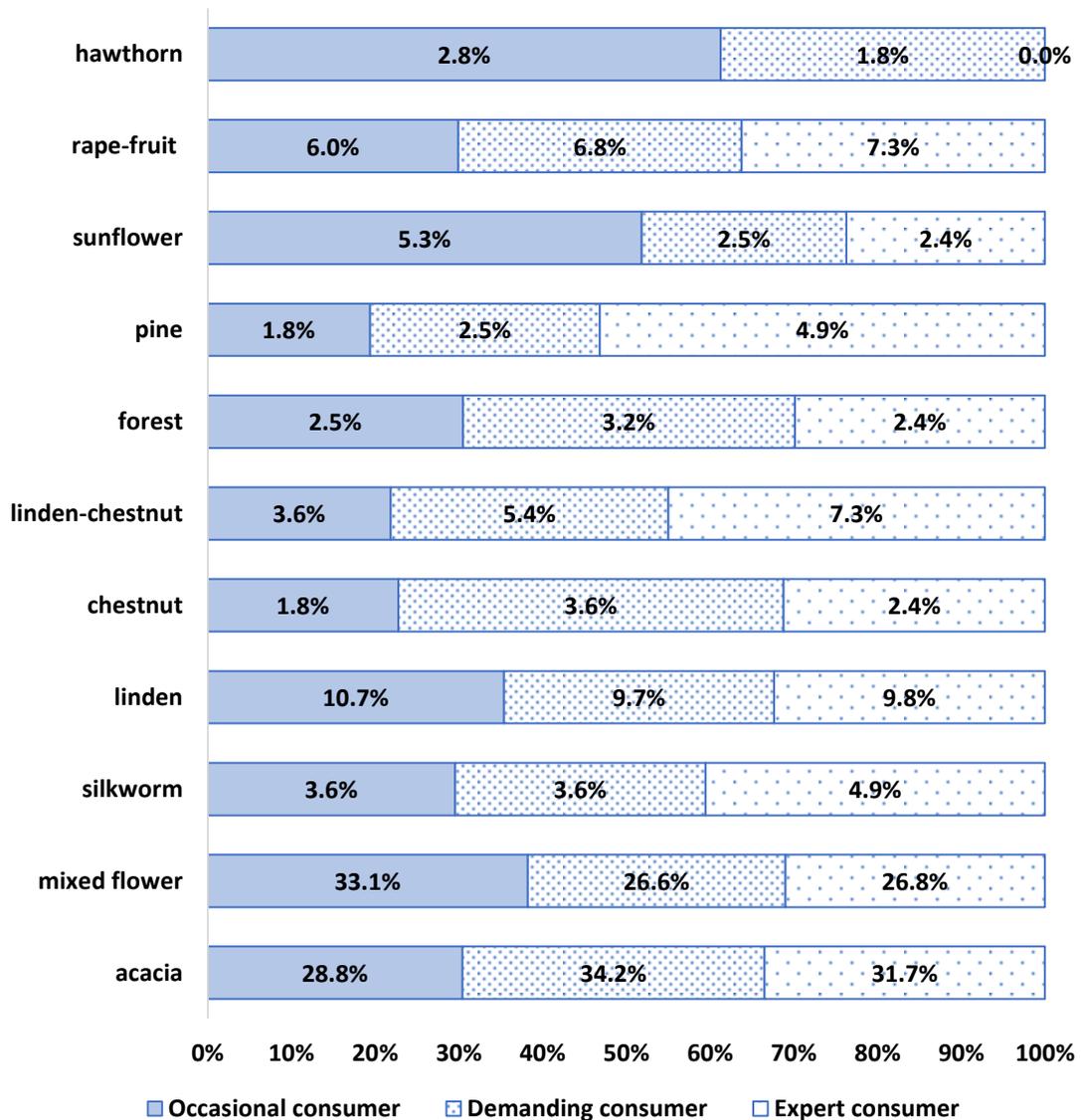


Figure 5: Evaluation of honey varieties in different consumer segments

Distribution of the popularity of honey varieties by all consumers is as follows: Acacia was the most popular with 31.5%, followed by mixed flower with 29.7% and linden by 10.2%. 6.5% of the respondents favored rapeseed, 4.7% of them linden-chestnut, 3.8% of them sunflower, and 3.7% of them silkworm honey. Less than 3% of the respondents preferred chestnuts, pine and hawthorn honey, see Figure 6.

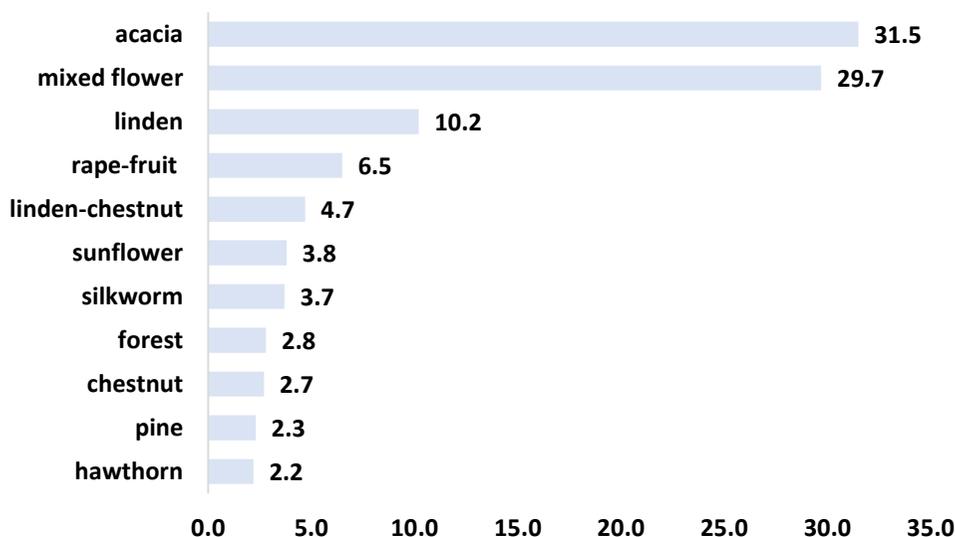


Figure 6: Distribution of the popularity of honey varieties by all consumers

Based on the results of the chi-square tests on sex, with 0.05 significance level, there was no significant difference between the perception of the sensory properties of the sexes and the honey varieties. For both sexes, taste is the most important sensory characteristic.

4. CONCLUSIONS

In conclusion, consumers in Hungary increased their consumption from 300 grams to almost 800 grams by 2018. We examined the differences in consumer preferences on honey taste, color, scent and texture. The consumers prefer the taste of monofloral honey acacia, the second most preferred taste is the mixed floral honey. After the third taste, which is linden the following tasted are less preferred, under the 5 percent of the consumers would buy those honey. There are significant differences between consumer segments in preferring honey tastes. The most important criteria in purchase is taste. Color, scent and texture is significantly more important to the expert consumers, who eat more varieties of honey regularly. The results of the study shows that, there are some highly preferred taste of honey which are preferred in all segments of customers.

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