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CONSUMPTION PATTERNS AND SENSORY PERCEPTION OF HONEY BY YOUNG SEGMENT IN SLOVAKIA

Ing. Peter Šedík
Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Department of Marketing and Trade, Slovakia
sedik.peter@gmail.com

Ing. Renáta Benda Prokeinová, PhD.
Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Department of Statistics and Operations Research, Slovakia
renata.prokeinova@gmail.com

prof. Dr. Ing. Elena Horská
Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Department of Marketing and Trade, Slovakia
elena.horska@gmail.com

Abstract:

The popularity of honey has been increasing worldwide mainly due to the increasing trend in healthy lifestyle. Many consumers search for functional food to bring added value to their health. Honey belongs to the category of products with rich nutrient content and possesses many health benefits. According to the Statistical Office of the Slovak Republic, the yearly consumption of honey per capita has significantly increased in Slovakia over the past ten years. While in 2006 the annual consumption was 0.6 kg, in 2016 it increased up to 1 kg per capita. Nevertheless, due to increasing demand in the honey market, many frauds and adulterations frequently occur. The purpose of the study was to identify consumer behaviour and consumers' perception of intrinsic attributes (sensory qualities) between domestic honey and imported honey in the absence of extrinsic attributes (price, country of origin, brand, label, producer) by pilot testing of blind sensory test. Primary data were obtained by questionnaire survey conducted in spring 2017 on a sample of 200 students (18 – 30 years) in Slovakia. Evaluation of sensory attributes was part of a questionnaire survey where respondent evaluated taste, aroma, colour and consistency of each sample on a 5-point scale and afterwards selected which sample they preferred more. Based on the results, the majority of young generation consume honey once per month or less in beverages in the morning and they prefer light, monofloral honey in liquid form mostly acacia or linden honey. Sensory evaluation revealed that domestic honey (sample A) obtained in average slightly better rating in terms of taste, aroma and consistency while the colour ratings were the same for both samples. Nevertheless, only 55 % chose domestic sample as a preferred one, which indicates that young generation is not able to distinguish domestic honey from a local beekeeper from imported honey based only on sensory evaluation. In conclusion, beekeepers should inform and educate consumers in order to promote the genuine taste and aroma of local honey.

Key words:

honey, consumer study, sensory evaluation, young generation, Slovak Republic

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1 Introduction

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 healthier food. Even many parents seek for natural products in order to ensure their children a healthy diet (Bodnar, Nagy and Makra, 2016). Honey is considered to be a natural source of energy, nutritive product rich in minerals, vitamins, flavonoids and antioxidants, alternative sweetener with health benefits and healing effects (Crittenden, 2011; Marghitas et al., 2010; Matsuda and Sabato, 2004; Pocol and Stan, 2015). The popularity of honey is driven by its multifunctionality involving healing effects, positive effects on immunity, natural character, nutritional aspects and compatibility with healthy eating habits (Roman, Popiela-Pleban, and Kozak, 2013b; Krystallis, Petrovici and Arvanitoyannis, 2007).

According to the Statistical Office of the Slovak Republic, the consumption patterns of honey in Slovakia are slowly changing. Since 2003 the annual consumption per capita has increased from 0.4 kg to 1 kg, which represents approximately 150 % increase. Nevertheless, the recent Slovak study identified low honey consumption among young consumers (Guziy, Šedík, and Horská, 2017). The same situation occurs in Poland (Pidek, 2001), Hungary (Vanyi, Csapo and Karpati, 2010), the Czech Republic (Šánová et al., 2015) and Romania (Pocol, 2011). In general, the frequency of honey consumption is influenced by tradition or habit (Roman et al. 2013a) and depends on consumers' perception. Usually honey is perceived as natural and local food produced by beekeepers (Pocol, and Bolboaca, 2013) and consumers buying motives are connected with product healthiness and safety (Pocol and Ilea, 2011). Another consumer study conducted in Poland showed that honey is consumed due to its taste, healing effects, culinary use and habits. Moreover, increasing the level of education in terms of nutritional knowledge intensifies honey consumption. Therefore, there is a need for nutritional education among consumers (Kowalczuk, Jeżewska-Zychowicz, and Trafiałek, 2017).

Due to increasing consumption, honey market in the European Union is flooded with cheap imported honey. Approximately 40 % of overall consumption in the EU is covered by import from third countries (European Commission, 2016). 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 in following form: blend of EC honeys, blend of non – EC honeys or blend of EU and non – EU honeys (Council Directive 2001/110/EC). Current legislation decreases traceability of honey, which creates opportunities for adulteration and frauds. Nowadays, honey is the third most adulterated food in the world market. Therefore, many consumers have started to focus on the country of origin which correlates with its quality (Phipps, 2017). The possible solution for decreasing frauds and increasing traceability could be reached by adding antioxidant analyses and colour characterisation. Both parameters are widely used in determining the profile of regional types of honey in many countries (Castiglioni et al., 2017; Bertoncelj et al., 2007; Zheng et al., 2016; Patrignani et al., 2015).

2 Objective and Methodology

The aim of the contribution was to identify consumers' perception of intrinsic attributes (sensory qualities) between domestic honey and imported honey in the absence of extrinsic attributes (price, country of origin, brand, label, producer).

Primary data were obtained by questionnaire survey with blind sensory testing on the sample of 200 respondents which evaluated two samples of polyfloral honey. First sample A was domestic honey from a local beekeeper and sample B was honey purchased from selected supermarket with country of origin labelled as a blend of EC and non – EC honey which ensured that sample contains imported honey. Research was conducted in spring 2017.

Respondents evaluated sensory attributes of both samples such as taste, aroma, colour and consistency using 5-point scale (very good, good, neutral, bad, very bad). After sensory evaluation each

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respondent had to indicate which sample they prefer (see Tab.1). Obtained data were processed, analysed and statistically tested in SAS Enterprise Guide 7.1.

Tab. 1 Blind sensory test

Sensory attributes	Sample A	Sample B
Taste		
Aroma		
Colour		
Consistency		

Source: own research 2017

Research sample

In regards to research sample, the targeted group was a young segment of honey consumers in a range of 18 to 30 years. The majority of sample were female students with an unfinished higher education, earning salary up to 100 € or between 101 – 300 € (see Tab.2).

Table 2 Research sample profile

Gender	
male	24.5%
female	75.5%
Age structure	
18 - 21 years	32.5%
22 - 25 years	66.0%
26 – 30 years	1.5%
Education	
secondary education	16.0%
unfinished higher education	84.0%
Income	
0 - 100 €	44.5%
101 - 300 €	42.5%
301 - 500 €	9.0%
more than 500 €	4.0%

Source: questionnaire survey – own research, 2017

Applied statistical tests:

- Chi – Square Test of Independence
- Cramer´s V Coefficient
- Mann – Whitney U Test

Formulated hypothesis

Hypothesis no. 1: We assume young consumers prefer both samples in equal proportion.
Hypothesis no. 2: We assume there exists significant differences in evaluation of sensory attributes between samples
Hypothesis no.3: We assume there exists dependence between sample preferences and respondent´s place of purchase

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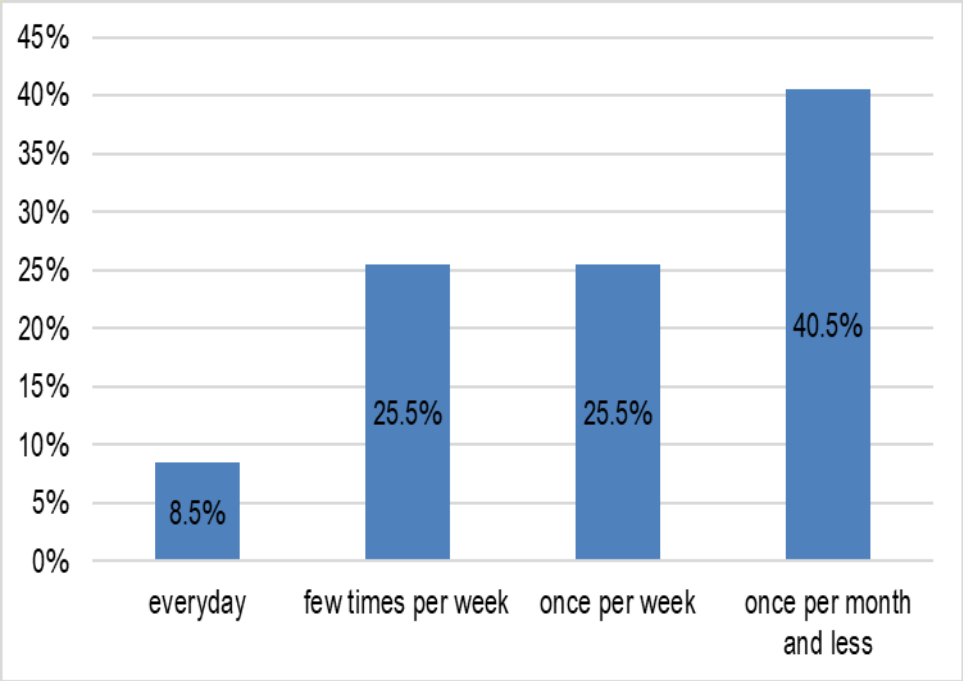
3 Paper results

The results of the questionnaire survey showed that young honey consumers tend to eat low quantities of honey. In general, the annual honey consumption is lower than 1 kg (45.5%) or from 2 to 5 kg (43%). Only 11.5 % of respondents consume more than 6 kg per year. According to Figure 1, the majority consume honey once per month or less. One fourth of respondents consume either once per week or few times per week. Everyday consumption was marked by only 8.5% of respondents. Data showed that young generation mostly eats honey in beverages in the morning or directly from the jar when they want to eat something sweet.

Figure 1: Consumption frequency of honey



Source: questionnaire survey – own research, 2017

Part of the survey was focused on consumer preferences regarding type, colour and consistency. According to Figure 2, the most preferred honey by young segment is monofloral honey with light colour. In regards to the consistency of honey, the liquid form is preferred the most. Creamed and crystallised honey is preferred by less than 10 % of respondents. On the honey market is recognised besides floral honey also honeydew honey which is produced by plant-sucking insects. This type of honey is unaware among 66.5% and only 15.5% have a positive attitude to it.

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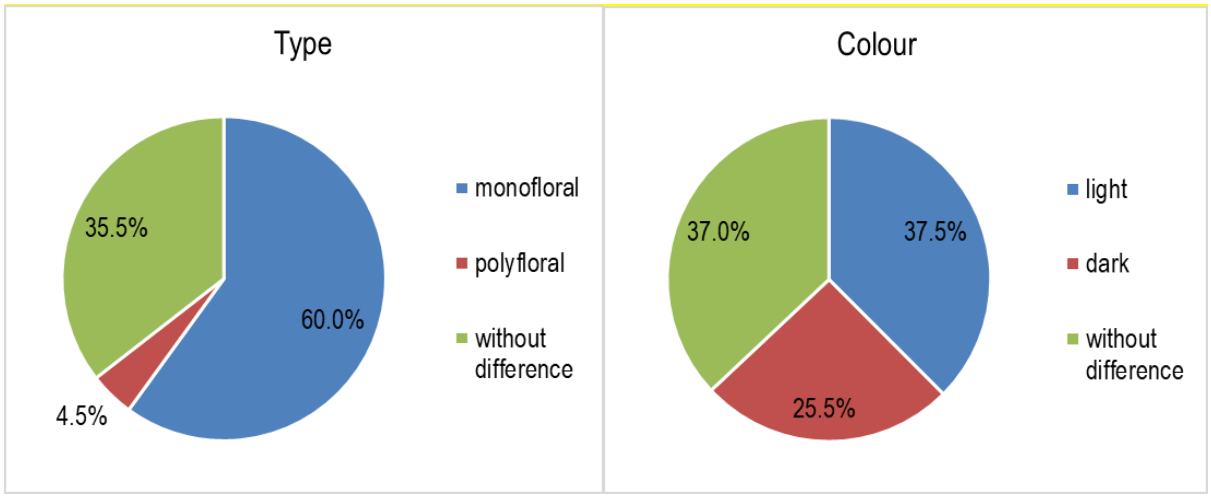
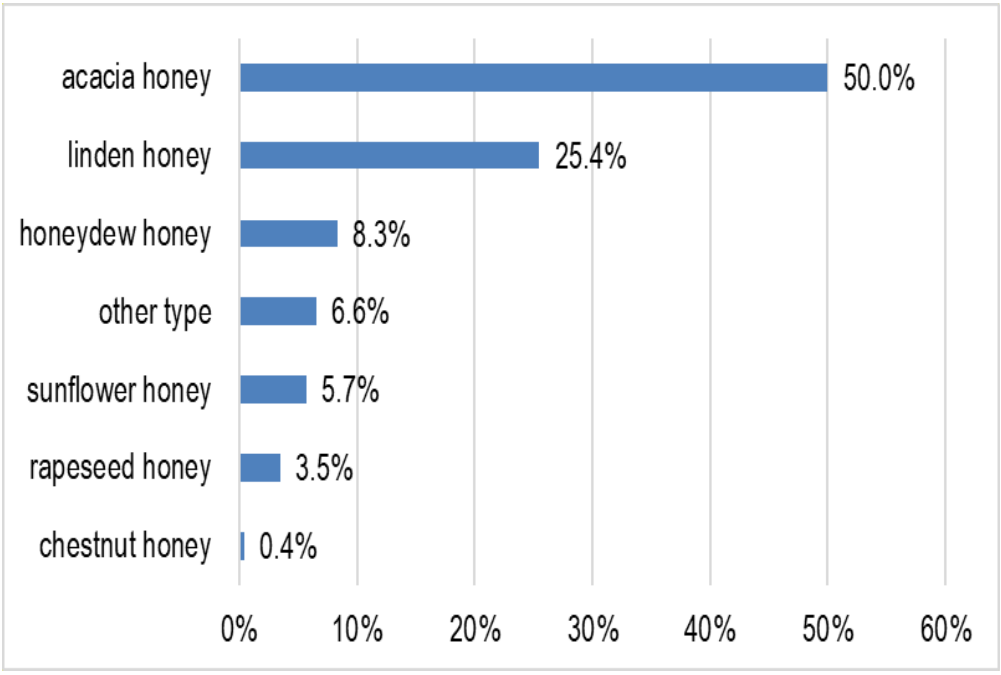
Figure 2 Honey preferences



Source: questionnaire survey – own research, 2017

According to monofloral honey (see Fig. 3), it could be stated that the most preferred type of monofloral honey is acacia (50%), followed by linden honey (25.4%). The majority of respondents prefer honey of Slovak origin and consider 5 – 6 € to be an optimal price per one kilogram. Furthermore, respondents evaluated the selected criteria considered during purchase using a 7-point scale (1 –the most important, 7 – the least important). The most important criteria at honey purchase was quality (mean 1.91), followed by taste (mean 2.43), consistency (4.15), price (mean 4.21), type (mean 4.25), country of origin (mean 4.38). The least important criteria was packaging (mean 6.67), mostly 1 kg glass jars. In regards to organic honey, around 60 % of respondents have heard about organic honey.

Figure 3 Preferences for monofloral honey



Source: questionnaire survey – own research, 2017

In the blind sensory test, respondents evaluated taste, aroma, colour and consistency of both samples using a 5-point scale (1 – very good, 2 – good, 3 – neutral, 4 – bad, 5 – very bad). Based on

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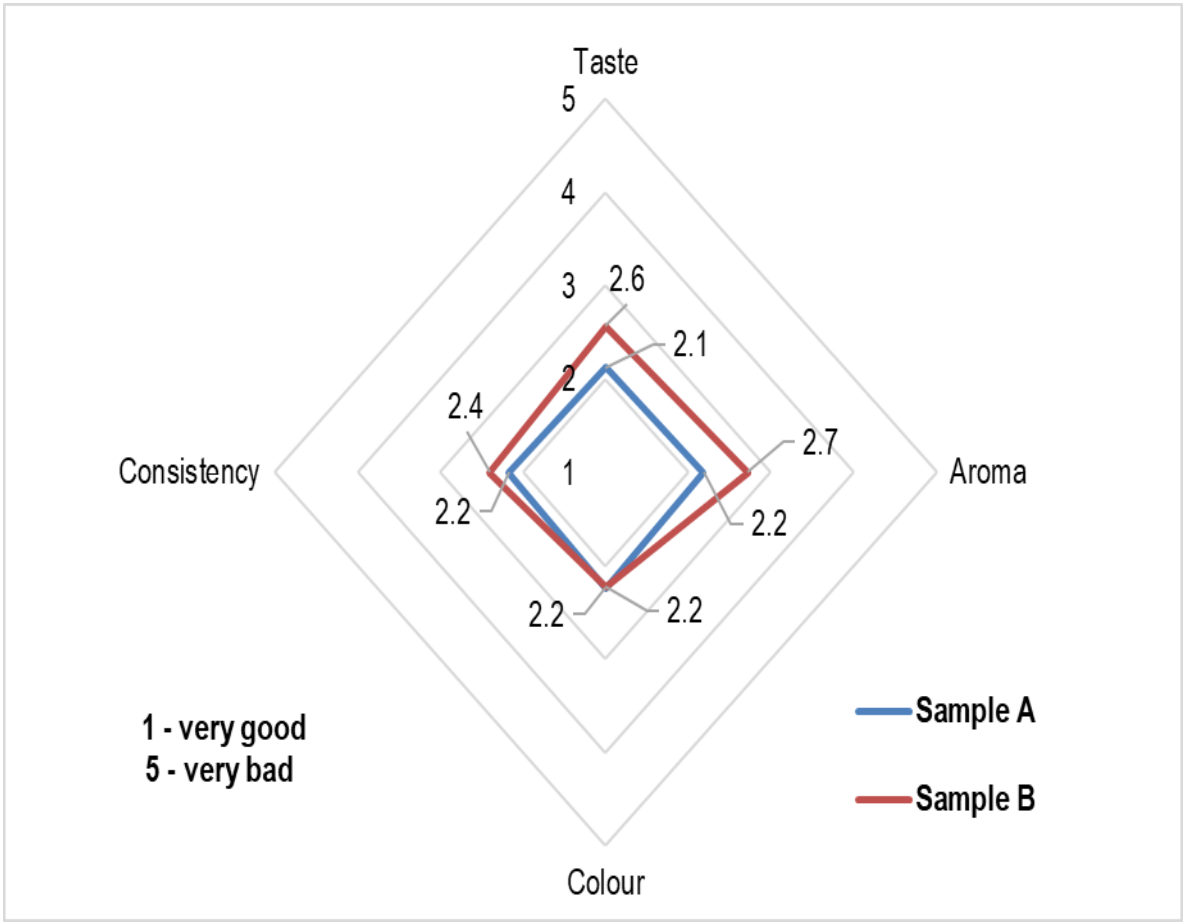
the results (see Fig. 4), better evaluation was obtained by sample A in terms of taste (mean 2.1) and aroma (2.2). Interesting results are in case of aroma where the majority of respondents rated aroma A either very good or good. Only a half of respondents liked the aroma of sample B. According to Mann – Whitney test at the level of significance (α = 0.05) in both taste (p-value = 0.0048) and aroma (p-value = 0.0001) were proven statistically significant differences between samples.

Another evaluated sensory attributes were colour and consistency. A better rating of consistency was obtained by sample A (mean 2.2) where 63,5 % marked it as either very good or good while sample B (mean 2.4) was evaluated as bad or very bad by 21 %. In case of colour, both samples reached the same points in average (mean 2.2). However, colour of sample B reached slightly higher percentage regarding the evaluation very good. Based on Mann – Whitney test at the level of significance (α = 0.05) in both colour (p-value = 0.9291) and consistency (p-value = 0.0637) were not proven any statistically significant differences between samples.

Figure 4: Blind sensory evaluation of two honey samples



Source: blind sensory test – own research, 2017

Furthermore, respondents indicated which sample they prefer more. Results showed (Fig.5) no major differences between the choice of preferred sample among respondents. Domestic honey from a local beekeeper was slightly more preferred than the imported one. Based on the results, young consumers are not able to distinguish domestic honey from imported only according to sensory attributes.

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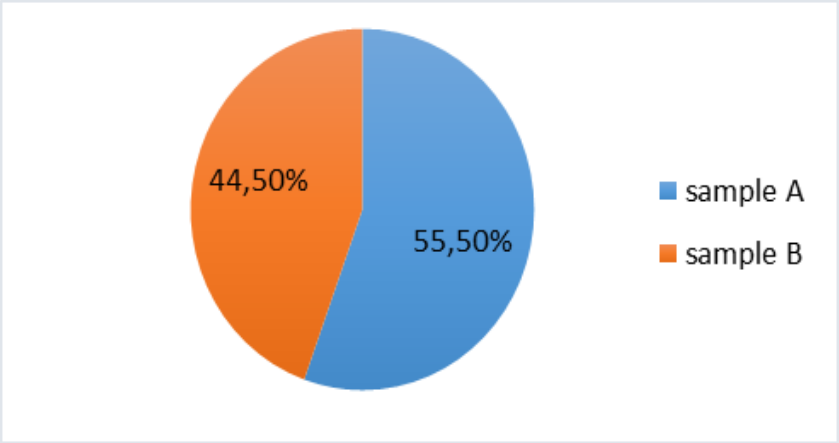
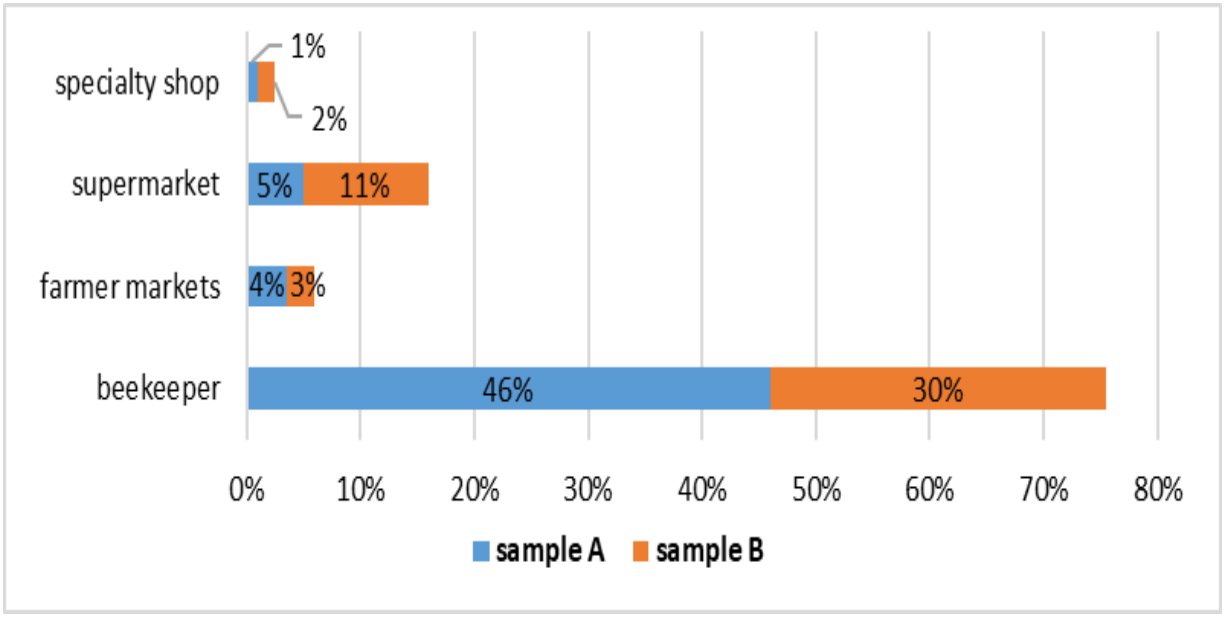
Figure 5: Sample preferences



Source: blind sensory test – own research, 2017

In a context of preferred sample was formulated hypothesis, which assumes there exists dependence between sample preference and respondents' place of honey purchase. Chi – Square Test of Independence was applied at the significance level (α = 0.05) and the dependence was confirmed (p- value = 0.0190). According to Cramer´s V Coefficient the strength of dependence is weak (0.2230).

Figure 6: Sample preferences according to place of honey purchase



Source: questionnaire survey and blind sensory test, 2017

Based on the results (see Fig.6), respondents who purchase honey directly from beekeepers more prefer domestic honey (sample A) and vice-versa, respondents who purchase honey from supermarkets more prefer imported honey (sample B).

4 Discussion

Product quality is commonly determined according to its properties and qualities based on sensory analyses evaluating taste, aroma, colour and consistency as well as physicochemical properties. Several authors conducted a sensory evaluation in various countries involving Denmark

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(Stolzenbach, Byrne and Bredie, 2011), Finland (Kortesniemi et al. 2018), Italy (Esti et al., 1997), Spain (González-Viñas, Moya, Cabezudo, 2003; González Lorente, De Lorenzo Carretero and Pérez Martin, 2008), India (Anupama, Bhat and Sapna, 2003) and the Arab Gulf region (Kaakeh and Gadelhak, 2005), who analysed taste, colour and texture of various samples of honey. In general, consumer research comprising sensory analyses is concentrating on product quality and its perception by consumers.

Sensory analysis in consumer research is widely used in sensory marketing (Berčík and Paluchová, 2017). Consumers are testing food products according to sensory attributes as taste, aroma, colour and consistency and based on their own perception they rate each of them. For evaluation a 5-point hedonic scale (1– extremely unpleasant, 2– unpleasant, 3 – neither like nor dislike, 4 – like, 5 –like very much) is commonly used (Pocol, Stan and Teselios, 2015). The main role of sensory marketing is to influence consumer perception, opinion and decisions through human senses, such as taste, smell, touch and sight. Generally, this type of marketing is connected with consumers' expectations and loyalty which is influenced by consumers 'experiences (Géci, Rybanská and Nagyová, 2017).

5 Conclusion

In conclusion, young consumers in Slovakia tend to consume up to 1 kg or from 2 to 5 kg per year. Honey is mostly consumed once a month or less in beverages in the morning or directly from the jar. The segment prefers light monofloral honey such as acacia and linden honey in a liquid form. During purchase the most important criteria are the quality and the taste.

Young generation of honey consumers is not able to perceive differences in preference between the examined samples based on intrinsic attributes (sensory evaluation) without extrinsic attributes (price, country of origin, brand and producer). Nevertheless, respondents who purchase honey directly from a beekeeper more preferred sample A (domestic honey) and sample B (imported honey) was preferred more by those who purchase honey from the supermarket.

Sensory evaluation revealed significant differences in taste and aroma between samples. Domestic honey – sample A obtained slightly better evaluation in taste than imported honey – sample B. In case of aroma, a majority of respondents rated sample A as very good and good. Insignificant differences were obtained in colour and consistency, even though intensive colour of imported honey was rated better than domestic honey.

In the quality evaluation of honey according to sensory attributes, consumers should consider aroma as the most important factor during their decision – making process due to the fact that imported honey, which are mostly being adulterated have a less intensive aroma or do not have aroma at all.

Beekeepers should focus more on consumer education by providing transparent information about the quality and sensory attributes of honey. Moreover, they should provide honey degustation in order to show and promote the genuine taste and smell of local domestic honey.

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