

Interdisciplinary Approach Towards Consumer Acceptability of Flavoured Honey: Case of Young Generation in Slovakia

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Abstract

Flavoured honey is an increasingly popular product among consumers. Enriching honey with other healthy ingredients such as spices, herbs, dried fruits, pollen and propolis is a way to create new innovative products, with benefits for both, beekeepers and consumers. The purpose of the study was to test four types of flavoured honey among young consumers segment in Slovakia: honey with cacao, honey with cinnamon, honey with turmeric and honey with pollen, by using an interdisciplinary approach. The research combined sensory analysis, consumer research and laboratory tests methods aiming to find the consumer interest and acceptability of these products. Based on overall sensory analysis, honey with cacao and cinnamon obtained the best evaluations in terms of aroma, taste and colour, while honey with turmeric obtained the worst. Laboratory tests showed that all four types of flavoured honey have higher antioxidant activity than normal pure honey. Communicating these results to consumers partially influenced their preferences. The results of consumer research indicate that flavoured honey was perceived as innovative and natural product and the majority of respondents would buy it.

Keywords: enriched honey, sensory attributes, antioxidants, preferences, young segment

Introduction

The interdisciplinary research of innovative food products represents the starting point in promoting them on competitive markets. This approach will bring benefits, both for producers and consumers (Byrne *et al.* 2013). By combining sensory analysis, laboratory test and studies on consumer behavior, researchers can obtain interesting results: on the one hand they can define product characteristics, and on the other

hand, they can adapt the product to the consumers' demand (Yang and Lee, 2019). Sensory analysis and physicochemical analysis were both used by Mohan *et al.* (2020) to test the acceptability of functional Manuka Honey Yougurts, the authors suggesting the need for further studies based on consumer behaviour. Consumer acceptance was also mentioned by Maxim *et al.* (2019) as a successful factor for the marketing of functional foods. Szymandera-Buszkwa *et al.* (2020) stressed

the importance of consumers participations in the development of new product on the market, through sensory tests and consumers studies. According to Jaeger *et al.* (2017), developing new interdisciplinary methodological approaches and “capturing consumer responses in context” represent the future of sensory and consumer research.

The benefits of consuming flavoured honey

Honey is a unique product, due to the way it was created, through the interaction between plants and bees, but also due to its miraculous properties (García, 2018). It is a popular premium product, in high demand for consumers, due to both its pleasant taste and high nutritional value, as well as for its health benefits (Soares *et al.*, 2017). It is considered a functional food, mainly due to its antimicrobial and antioxidant properties. These properties are influenced by the botanical origin and the geographical area of its production (Luchese *et al.*, 2017; Soares *et al.*, 2017). Enriching raw honey with other healthy ingredients such as cocoa, ginger, nuts, cinnamon or other bee products (e.g. propolis, pollen) is a way to create added value to the product, but also a source of healthy food for consumers (Šedík *et al.*, 2019b). Products obtained from honey and other functional components such as pollen, propolis, royal jelly, cinnamon, nuts, ginger, turmeric, black cumin can have greater effects on human health compared to pure bee products (Muharemagić *et al.*, 2016). The benefits of creating functional foods obtained from honey and additives such as pollen, propolis, royal jelly and various products derived from fruits, vegetables, spices, herbs and berries are reflected in the entire beekeeping chain: the consumer will benefit from healthy products and the producer will therefore obtain a higher economic efficiency (Muharemagić *et al.*, 2016).

In recent years, flavoured honey has become increasingly present on the beekeeping market. A qualitative study conducted in 2017 by Oravec and Kovács (2019) shows that the most popular types of aromatic honey among Hungarian consumers are those enriched with “elderberry, lemon grass, chilli pepper, garlic, dill, cinnamon and mint”. Cacao-enriched honey was tested by Šedík *et al.* (2019a), both from a sensory point of view and in terms of perception of acquisition and consumption. The sensory attributes of honey with cacao were positively evaluated by

study participants, and consumers perceived it as a healthy alternative to chocolate (Šedík *et al.*, 2019a). Laboratory tests also showed that the antioxidant activity of cacao-enriched honey was higher than in the case of pure honey (Šedík *et al.*, 2019a). Another study conducted in Slovakia reveals consumers’ preference for honey with cinnamon and cacao (Šedík *et al.*, 2018).

Numerous researchers have conducted studies on the properties of honey enriched with other bee products. Thus, Osés *et al.* (2016) showed that the antimicrobial properties are higher in the case of honey enriched with small amounts of propolis, than in the case of pure honey. Propolis honey is an excellent source of antioxidants, but the amount of propolis added also depends on the changes in the sensory characteristics of the new product and its acceptability by consumers (Habryka *et al.*, 2020). The antioxidant activity of aromatic honey with cloves and brahmi was studied by Gupta *et al.* (2019), demonstrating that the consumption of aromatic honey helps to strengthen the immune system. Džugan *et al.* (2017) analyzed the physicochemical properties and antioxidant activity of some varieties of raw honey compared to flavoured honey, confirming that the best antioxidant activity and the highest polyphenolic content is in creamed multifloral honey with the addition of dried herbs: lavender flowers (*Lavandula L.*), lemon balm leaves (*Melissa L.*), nettle leaves (*Urtica L.*), mint leaves (*Mentha L.*) and ginger root (*Zingiber Boehm.*). The results of the research conducted by Džugan *et al.* (2017) showed the importance of creating innovative bee products (e.g. herbal honey) for human health.

Comparative studies between the properties of raw acacia honey (*Robinia pseudoacacia*) and that enriched with *Rosa* spp. fruit were conducted by Serbian researchers, who identified significantly higher healing properties, as well as a higher phenolic and vitamin C content in the case of honey enriched with *Rosa* spp (Štajner *et al.*, 2014). Enriching multifloral honey with fresh or dried flowers of *Melilotus officinalis* and *Melilotus albus* can lead, in the opinion of Sowa *et al.* (2019), to obtaining products yielding a high therapeutic potential. In addition, Velciov *et al.* (2014) observed that honey fortified by oleaginous fruits has higher content of ascorbic acid.

Honey consumption among young generations

Honey consumption among young people is a topic of great interest in the area of scientific research. A study conducted in Poland, on a sample of 200 respondents aged between 20 and 25, shows that young consumers' preferences regarding honey consumption depend on family traditions, and the main criteria used by them in the purchase and consumption of honey include the price and sensory characteristics (Žak, 2017). The importance of flavor as a consumption criterion for young consumer segments was also demonstrated by Kowalczyk *et al.* (2017). According to the same authors, the consumption of honey among the younger generations should be constantly monitored, by conducting qualitative and quantitative studies, which should subsequently lead to the development of marketing strategies aimed at encouraging the consumption of honey by young people (Kowalczyk *et al.*, 2017).

Several studies on the consumption behavior of honey show that the frequency of consumption is lower among young consumers compared to older generations, emphasizing the need for better promotion of bee products among this age segment (Testa *et al.*, 2019; Pidek, 2001; Pocol and Bolboacă, 2013). Popescu and Guresoiaie (2019) observed that the 36-50 age group, followed by the 51-65 one are the most loyal consumers of honey, regardless of quantity. A possible explanation could be related to the awareness of mature and older people regarding the benefits of honey consumption, but also to the need of prevention or treatment for certain conditions. Ćirić and Ignjatijević (2017) found that there are significant differences between the amount of honey purchased, respectively the size of honey packages and age, as young consumers under 20 prefer packaging of less than 500 grams compared to other age groups, which prefer 1kg packages of honey.

The young generation represents the future of the beekeeping market, so this age segment should be an important target of the marketing strategies in the beekeeping sector (Zhang, 2018). Communication channels must also be adapted to the younger age segments, a fact confirmed by the study conducted by Demircan *et al.* (2017) which show that those who obtain information

about honey using the Internet are mainly young people with a high level of education.

Stemming from the literature study, the aim of this research was to test four types of honey among the young generations of consumers: honey with cacao, honey with cinnamon, honey with turmeric and honey with pollen. The testing of these aromatic honey varieties was carried out with the aim of introducing innovative products on the market, as their taste should arouse the interest for the consumption of these products among the young segments of consumers.

The research questions were:

RQ₁: What are the differences and similarities of sensory attributes among tested flavoured honeys?

RQ₂: What is the impact of information about antioxidant activity on respondent's preference for tested samples?

RQ₃: Does flavoured honey have higher antioxidant activity than normal pure honey?

Materials and methods

Consumer research

Research involved short questionnaire survey and consumer sensory analysis of 4 samples of flavoured honey: honey with cacao powder, honey with cinnamon, honey with turmeric and honey with pollen (Figure 1). Samples of flavoured honey were prepared in laboratory by mixing 130 grams of honey with 15 grams of selected ingredient. Research sample comprised 70 young honey consumers (57% females) from Slovakia with following demographic profile: university students between 20 – 24 years with monthly income up to 400 € and living either in rural (51%) or urban areas. Questionnaire survey was focused on general information on honey consumption, followed by sensory analyses where respondents evaluated not only basic sensory attributes (taste, aroma, colour and consistency) but also intensity of selected properties such as sweetness, honey taste, taste of ingrediency, sourness, bitterness and aroma. Evaluations were based on 7- point scale (1 = very bad/very low intensity; 7 = very good/very high intensity) Afterwards, respondents determined the preference order and continue to fill questions aimed on tested products. The last part of consumer research was linked with the results of antioxidant activity, where respondents were informed about laboratory results and again



Figure 1. Rapeseed (*Brassica napus*) honey of creamed consistency enriched by cacao powder, cinnamon, turmeric and bee pollen

were asked to determine the preference order of tested products.

Laboratory testing

Sample preparation and Chemicals

An amount of 1 g of sample was extracted with 20 ml of distilled water for 1 hour. After centrifugation at 4000 g (Rotofix 32 A, Hettich, Germany) for 10 min, the supernatant was used for measurement (antioxidant activity, polyphenols, flavonoids, phenolic acids). Extraction was carried out in triplicate. All chemicals were analytical grade and were purchased from Reachem (Slovakia) and Sigma Aldrich (USA).

Radical scavenging activity – DPPH method

Radical scavenging activity of extracts was measured using 2,2-diphenyl-1-picrylhydrazyl (DPPH) (Sánchez-Moreno *et al.*, 1998). The sample (0.4 ml) was mixed with 3.6 ml of DPPH solution (0.025 g DPPH in 100 ml methanol). Absorbance of the reaction mixture was determined using the spectrophotometer Jenway (6405 UV/Vis, England) at 515 nm. Trolox (6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid) (10–100 mg/L; $R_2=0.989$) was used as the standard and the results were expressed in mg/g Trolox equivalents.

Total polyphenol content

Total polyphenol content extracts was measured by the method of Singleton and Rossi, (1965) using Folin-Ciocalteu reagent and 0.1 ml of each sample was mixed with 0.1 ml of the Folin-Ciocalteu reagent, 1 ml of 20% (w/v) sodium carbonate, and 8.8 ml of distilled water. After 30 min. in darkness the absorbance at 700 nm was measured using

the spectrophotometer Jenway (6405 UV/Vis, England). Gallic acid (25–300 mg/L; $R_2=0.998$) was used as the standard and the results were expressed in mg/g gallic acid equivalents.

Total flavonoid content

Total flavonoids were determined using the modified method of Willett, (2002) and 0.5 ml of sample was mixed with 0.1 ml of 10% (w/v) ethanolic solution of aluminium chloride, 0.1 ml of 1 M potassium acetate and 4.3 ml of distilled water. After 30 min. in darkness the absorbance at 415 nm was measured using the spectrophotometer Jenway (6405 UV/Vis, England). Quercetin (0.5–20 mg/L; $R_2=0.989$) was used as the standard and the results were expressed in mg/g quercetin equivalents.

Total phenolic acid content

Total phenolic acids content was determined using method of Farmakopea Polska, (1999). A 0.5 mL of sample extract was mixed with 0.5 mL of 0.5 M hydrochloric acid, 0.5 mL Arnova reagent (10% NaNO_2 + 10% Na_2MoO_4), 0.5 mL of 1 M sodium hydroxide (w/v) and 0.5 mL of water. Absorbance at 490 nm was measured using the spectrophotometer Jenway (6405 UV/Vis, England). Caffeic acid (1 – 200 mg/L, $R_2 = 0.999$) was used as a standard and the results were expressed in mg/g caffeic acid equivalents.

Statistical analysis

Descriptive statistics was applied in order to process and evaluate results obtained from questionnaire survey and sensory testing. Research questions were analysed by non-parametric statistical hypothesis tests such as Wilcoxon signed-rank

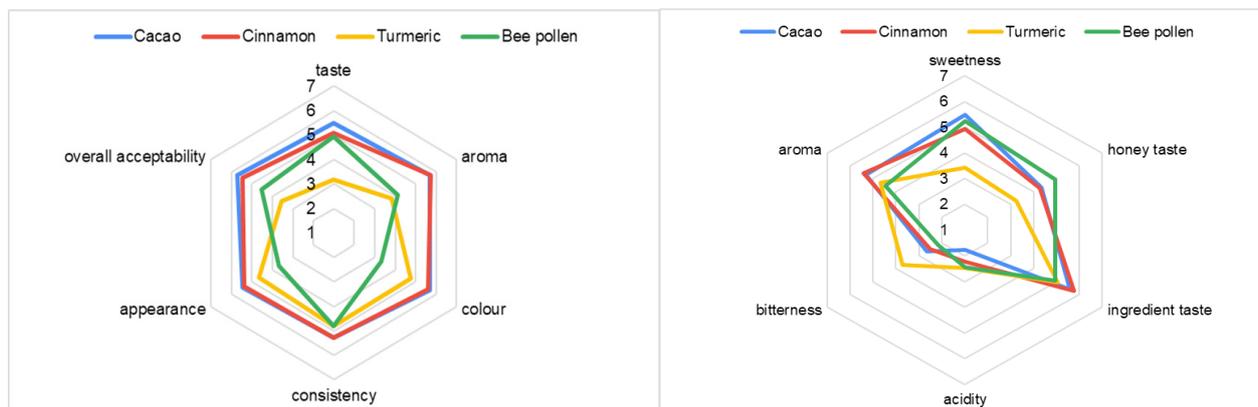


Figure 2. Results of sensory testing

Table 1. The results of Friedman and Nemenyi tests

Sample	Mean of ranks	Groups			
Pollen [colour]	3.286	A			
Turmeric [taste]	3.429	A			
Turmeric [aroma]	4.357	A			
Pollen [aroma]	5.014	A	B		
Turmeric [colour]	6.436	B C			
Pollen [taste]	6.821	B	C	D	
Cinnamon [taste]	7.107	C D			
Cacao [taste]	7.921	C D			
Cinnamon [colour]	8.193	C D			
Cacao [colour]	8.350	C D			
Cacao [aroma]	8.443	C D			
Cinnamon [aroma]	8.643	D			

Friedman's test p -value = < 0.0001

test, Friedman test, and Nemenyi test. Statistical analysis was performed in SPSS and Xlstat.

Laboratory experiments were carried out in triplicate and the results reported are the results of those replicate determinations with standard deviations. Correlation coefficients were calculated by CORR analysis ($p \leq 0.05$). The experimental data were subjected to analysis of variance (Duncan's test), at the confidence level of 0.05; correlation coefficients were calculated by CORR analysis using software SAS.

Results and discussion

Consumer research identified low consumption of honey among university students. The majority of them (61.4%) consumes up to 1 kg per year. One quarter of respondents indicated 2 – 3

kg per year. Only 12% have annual consumption of honey higher than 3 kg. Regarding the consumption frequencies, 30% eat honey on regular basis, 40% few times per month and 30% consume honey only occasionally. This segment mostly uses honey as food (75%) followed by medical purpose (18%) and as cosmetics (6%). Regarding the healthy lifestyle the majority of respondents indicated doing sports and eating healthy food only sometimes. Even though majority of them are seeking healthy food products, 70% has never heard about flavoured honeys. Similar results were obtained by Šedík *et al.* (2019b) investigating consumption behaviour and perception of cacao-enriched honey among 292 consumers between 18 – 24 years.

Table 2. Effects of providing information about antioxidant activity (Wilcoxon signed-rank test)

Type	Antioxidant information	Mean	p-value
Cacao	not provided	1.8	0.384
	provided	1.73	
Cinnamon	not provided	2.04	0.029
	provided	1.89	
Turmeric	not provided	3.54	0.058
	provided	3.63	
Bee pollen	not provided	2.61	0.028
	provided	2.76	

Results of sensory testing showed that respondents perceived flavoured honeys differently (Figure 2). Based on overall acceptability respondents evaluated selected flavoured honeys in following order: cacao > cinnamon > bee pollen > turmeric. Cacao enriched honey, on average, obtained the best evaluation in terms of colour (5.7), taste (5.5), appearance (5.5) and together with cinnamon flavour also in case of aroma (5.7) and consistency (5.3). The worst evaluation, on average, was obtained by turmeric flavour in terms of taste (3.2) and aroma (3.8) and by bee pollen in terms of colour (3.3) and appearance (3.7). Regarding the intensity of selected product properties (sweetness, honey taste, ingredient taste, aroma, bitterness and acidity), the highest intensity of aroma (5.4) and taste of ingrediency (5.8) were obtained by cinnamon-enriched honey, while cacao-enriched honey, on average, was rated with highest sweetness (5.5). The highest intensity of acidity (2.5) and bitterness (3.7) was obtained by turmeric-enriched honey, while honey with bee pollen obtained highest intensity of honey taste (5.0).

Friedman test and post-hoc test called Nemenyi test were performed in order to test RQ₁. Based on these non-parametric tests, statistically significant differences in sensory evaluations among samples were confirmed (Table 1). Honey with cacao and cinnamon have similar evaluations in terms of aroma, taste and colour while evaluations of all three attributes are significantly different in comparison to aroma, colour and taste of honey with turmeric and to aroma and colour of bee pollen flavour.

Respondents were asked to indicate which sample of flavoured honey they do not like at all.

Results showed that 70% of respondents didn't like honey with turmeric flavour, 12% indicated bee pollen flavour and 10% liked all tested samples.

In terms of their purchasing behaviour towards flavoured honeys, the majority of them would buy these products (78.5%). They would prefer to purchase them directly from beekeepers (39%), followed by specialty shops (22%) or farmer's market (17%). The optimal price for flavoured honey was indicated from 2 to 4 €/250g regarding cacao, cinnamon and turmeric flavour, while in case of bee pollen the most respondents selected price higher than 4 euros. The main motives of purchase were taste (67.2%) and health aspect (30.9%). Approximately 58% of respondents thinks that flavoured honeys would be consumed by the whole family in a form of spread (39%) or directly by spoon (35%). The main reasons for not purchasing these products were the strong preferences for normal honey without any additional flavour. Nevertheless, flavoured honey were perceived by majority of respondents as innovative (88.6%) and natural (82.9%).

The last two questions of the questionnaire survey were related to RQ₂, which examined the impact of information about antioxidant activity and respondents' preference for tested samples of flavoured honey. Approximately 47% indicated that this information partially influenced their preferences. Moreover, by applying Wilcoxon signed-rank test (Table 2) we confirmed significant influence in terms of cinnamon (p-value = 0.029) and bee pollen (p-value = 0.028). Ratings of cinnamon improved in positive direction as it has the highest antioxidant activity among tested samples.

Antioxidant activity

Antioxidant activity determined with DPPH method in observed honey ranged from 0.33 to 6.64 mg TEAC/g (Table 3). Control sample generally exhibited the lowest antioxidant activity, while in enriched honey samples activity increased, the best results being obtained in the cinnamon sample. Nowadays, there is a trend to enrich honey with medicinal herbs, spices, bee products, fruits as well as coffee and cacao beans. In our study we tested rapeseed honey enriched with turmeric, bee pollen, cinnamon and cacao powder. Results showed that antioxidant activity of flavoured honey was several times higher in comparison to pure rapeseed honey as a control sample. Obtained results provide us a positive answer for RQ₃, thus it can be concluded that flavoured honeys have higher antioxidant activity than normal pure honey. Similar results were published Wilczyńska *et al.* (2017) who tested biological activity of honey enriched with cinnamon, cardamom and ginger. The best results were determined in variant with cinnamon – the more cinnamon was added, the greater the phenolics content and radical scavenging activity was reached. Ginger acted similar to cinnamon, although its influence on the total polyphenol and DPPH values was lower. Džugan *et al.* (2017) tested honey enriched with dried medicinal herbs and determined significantly higher antioxidant activity in this honey in comparison to pure multifloral honey. Juszczak *et al.* (2015) determined significantly higher antioxidant activity in honey enriched with propolis, bee pollen and royal jelly in comparison to pure multifloral honey. Higher antioxidant activity of enriched honey can be also explained due to synergism between the antioxidants of honey and medicinal herbs or spices. The combined mixture of honey and mint (*Mentha spicata*) produced synergistic antioxidant activity in DPPH, ABTS and reducing power assays in study of Li *et al.* (2011). According to Nguyen *et al.* (2019) the antioxidant activity of honey has been reported to be a synergistic effect of mainly phenolic compounds along with other constituents in honey composition. Considerable antioxidant values are well documented for a broad range of honey types from different botanical and geographical origins. This statement was further supported by the fact that the antioxidant activity

of honey is highly correlated to its phenolic content and color intensity. Statistically ($p < 0.05$) significant regression coefficient was observed in our study between the amount of total polyphenols and antioxidant activity determined by DPPH method ($r = 0.975$) and between the amount of total phenolic acids and antioxidant activity determined by DPPH method ($r = 0.978$).

Total polyphenol, flavonoid and phenol acid content

The content of total polyphenol, flavonoid and phenolic acid content was several times higher in enriched honeys with compare to control sample (Table 3). Total polyphenol content ranged from 23.8 to 226.11 mg GAE/g with the best results in sample with cinnamon. Cinnamon bark is rich in antioxidants, especially polyphenol groups. Wijewardhana *et al.* (2019) determined in cinnamon bark the strong total antioxidant capacity and DPPH radical scavenging activity as well, yielding 149.15 ± 1.73 mg/ GAE and IC₅₀ value of 0.009 ± 0.76 respectively. High total polyphenols was also determined in our study in honey with cacao powder. Polyphenols, especially catechin and epicatechin are major components in cacao products, which are known for antioxidant properties. The high polyphenol content of cacao, combined with its wide presence in many food products, makes it particularly interesting from a nutritional and health point of view (Urbańska and Kowalska, 2019).

Total flavonoid content ranged from 0.15 to 9.31 mg QE/g (Tab. 3) with the best results in honey with bee pollen. Bee pollen consists of flower pollen mixed with bee digestive enzymes and preserved with some honey and nectar. It contains high antioxidant activity due to the presence of polyphenols and flavonoids. In bee pollen the total flavonoid content, both free flavonoids and glycoside-bound forms, varies between 0.25% and 1.4% (Rzapecka-Stojko *et al.* 2015). Bogdanov, (2004) gives a range of 0.04%–3% (40–3000 mg/100 g) as the norm. The high total flavonoids were also observed in honey with cacao powder. The health-promoting properties of cacao are attributed to their phenolic compounds, mainly flavonoids. Generally, cacao contains significant amount of procyanidin monomers, namely catechin, epicatechin and dimer to tetradecamer. These procyanidins showed potent antioxidant capacity in vitro and in vivo (Maleyki

Table 3. The antioxidant activity, total polyphenol, flavonoid and phenolic acid content in analyzed samples

Parameter	Control	HT	HP	HCI	HCa
DPPH [mg TEAC/g]	0.33±0.05e	1.81±0.01d	2.17±0.01c	6.64±0.01a	4.77±0.06b
TPC [mg GAE/g]	23.8±0.15e	40.58±0.47d	94.8±0.31c	225.74±0.39a	185.13±0.47b
TFC [mg QE/g]	0.15±0.06e	2.86±0.34c	9.31±0.03a	2.08±0.1d	4.17±0.3b
TPAC [mg CAE/g]	0.28±0.01c	0.94±0.04c	1.23±0.03c	12.08±0.51a	8.33±0.28b

DPPH – radical scavenging activity; TEAC – trolox equivalent antioxidant capacity; GAE – gallic acid equivalent; QE – quercetin equivalent; CAE – caffeic acid equivalent; mean (n=3) ± standard deviation; HT – honey with turmeric; HP – honey with bee pollen; HCI – honey with cinnamon; HCa – honey with cacao

and Ismail, 2011), so we can expect that these compounds can increase health benefits of honey enriched with cacao.

Total phenolic acid content ranged from 0.28 to 12.08 mg CAE/g with the best results in honey with cinnamon and cacao powder. According to Cheung *et al.* (2019) gallic acid is the most dominant phenolic acid in honey, followed by protocatechualdehyde, p-hydroxybenzoic acid. The phenolic acids profile of honey samples is greatly influenced by geographical location and floral sources. Cinnamon bark is rich in gallic acid, protocatechuic acid, p-hydroxybenzoic acid, p-hydroxybenzaldehyde, vanillic acid, caffeic acid, p-coumaric acid and ferulic acid (Muchuweti *et al.* 2007). Cacao powder is rich in caffeic, ferulic, gallic and p-coumaric acid (Belščak *et al.* 2009).

According to these findings, addition of cinnamon and cacao powder to honey can enrich this product for these special bioactive compounds with many health benefits (antioxidant, anti-inflammatory, anticancer etc.). Moreover, Šedík *et al.* (2020) assume that highlighting the nutritive properties may influence buying behaviour of consumers as well as the overall honey consumption.

Conclusion

Interdisciplinary research showed that flavoured honey has significant potential on food market. The majority of respondents perceive tested samples as innovative, natural and would purchase them due to their taste and health aspect. Sensory analysis identified differences in evaluation of sensory attributes among samples.

The best rating regarding taste and aroma were obtained by honey with cacao and cinnamon. The worst evaluation was indicated in case of honey with turmeric. Laboratory analysis revealed that all samples are rich in antioxidants which were even higher than in comparison to normal honey. Moreover, provided information about the results of antioxidant activity influenced respondent's preferences for tested samples, particularly in case of honey with cinnamon and bee pollen. Based on overall results, it can be concluded that flavoured honey represents a healthy food product with attractive sensory attributes and nutritional properties even for young segment of consumer with low honey consumption.

The study has practical implications for the entire beekeeping chain. For honey producers, the research results show the importance of diversifying honey-based products, of creating innovative products and of testing them. This should be done by using different methods, starting with laboratory tests and continuing with sensory analysis and consumer research. All these steps are necessary before launching the new products on the market. Young consumers should be encouraged to consume honey-based products, to test new products and new flavors. Flavoured honey provides a good opportunity for attracting the attention of young consumers towards honey.

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