

CONDITIONS OF HONEY CONSUMPTION IN SELECTED REGIONS OF POLAND

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ABSTRACT

Background. The nutritional value of honey is a factor that encourages the increase of its consumption. The aim of the study was to identify consumers' behaviours and preferences towards honey and their determinants.

Material and methods. Quantitative (PAPI method) survey was carried out in 2015 on a sample of 690 respondents from Mazowieckie, Podkarpackie and Zachodniopomorskie voivodeships. The data analyzed were: the frequency of and reasons for honey consumption, preferred buying locations, preferred types of honey, factors considered during purchase and different uses of honey.

Results. The study showed that Poles consume honey several times per month. The main incentives for honey consumption were: health benefits, a wide range of culinary uses, flavour and habits. It was established that Polish consumers buy honey mainly in apiaries and open-air markets. Primary factors considered during purchase were the type of honey (preferred types being lime, polyfloral and acacia), price and colour. Honey was chiefly used for consumption, most commonly as a sandwich spread and sweetener. Less popular applications included medical and cosmetic purposes. Some socio-demographic characteristics (gender, age, place of residence, income), self-assessment of nutritional knowledge and, to a lesser extent, education significantly differentiated consumer behaviours in the honey market.

Conclusions. The study has shown that Poles consume honey relatively seldom. For the increase of honey consumption nutritional education is needed. Further studies will allow a more detailed diagnosis, which is required for the development of effective information and marketing strategies.

Keywords: honey, consumer behaviour, preferences, Poland

INTRODUCTION

Natural honey has been used for consumption and medical purposes since ancient times (Bogdanov, 2012). However, over the centuries honey consumption declined, especially after the Industrial Revolution and the introduction of sugar cane (Pocol and Bolboacă, 2013). In some cultures honey has been treated as a symbol of prestige and wealth.

From the nutritional point of view, honey can be described as a high energy value product (320–330 kcal per 100 g). Honey comprises mainly simple

sugars (glucose and fructose), which determine its sensory and enhancing properties. Its characteristic flavour is also conditioned by organic acids (i.e. gluconic, malic and citric acid) and aromatic substances (i.e. essential oils, aliphatic alcohols, aldehydes and ketones, esters, and polyphenolic compounds) (Jaworska, 2014). The colour of honey is determined mainly by carotenoids, including β -caroten and xanthophyll (Kędzia and Hołderna-Kędzia, 2008). Among the proteins which are found in honey, enzymes play

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an important biological role, the most notable being invertase α -amylase and β -amylase (Lipiński, 2010). Honey is a source of such minerals as potassium, chlorine, phosphorus, magnesium, calcium, iron, manganese, and cobalt. Apart from minerals it contains trace amounts of vitamins, including vitamin B₁, B₂, B₆, B₁₂, folic acid, pantothenic acid and biotin (Ajibola et al., 2012; Whitney and Rolfes, 2008). Due to the presence of polyphenols, honey has antioxidant properties (Ghedolf et al., 2002; Schramm et al., 2003) making it a functional product (Viuda-Martos et al., 2008). It is worth noting that the chemical composition of honey significantly depends on its type: the raw material from which it is produced is vital in this matter (Bogdanov et al., 2008; Erejuwa et al., 2012).

The nutritional value of honey is a factor that encourages its increased consumption. The structure of agricultural holdings in Poland also seems to affect the production of honey in a positive way. Despite the stable honey supply, honey consumption in Poland is not high, and ranges from 0.65 kg/person/year (Pszczerlarstwo..., 2014) to 1.32 kg/person/year (Roman et al., 2013). Honey consumption in the US is estimated at 3 kg, in the EU at 0.9 kg/person/year. The highest consumption among the EU member is registered in Greece (3.5 kg), Austria (2.5 kg) and Germany (2 kg) (Sektor pszczelarski..., 2014).

In order to take effective action to stimulate the consumption of honey in Poland it is necessary to identify determinants of honey consumptions, which was the purpose of the study.

MATERIAL AND METHODS

Quantitative research (questionnaire survey) was carried out in 2015 on a sample of 690 respondents living in three voivodeships: Mazowieckie, located in central Poland (400 respondents), Podkarpackie, in the south of Poland (160), and Zachodniopomorskie in the north-west (130). These voivodeships were selected arbitrarily, due to their diverse geographical, economic and social characteristics. The number of respondents from each voivodeship was in proportion to their populations, with the total population of the selected voivodeships being 9.24 million, including: Mazowieckie – 2.36 million (58.0%), Podkarpackie – 1.74 million (18.8%), and Zachodniopomorskie – 2.14 million (23.2%). Quota sampling was used (taking into consideration gender and age). The study population profile is presented in Table 1.

The questionnaire contained five questions related to issues being examined and the respondent's characteristics. It was tested on a sample of 25 respondents.

Table 1. Characteristics of respondents

Specification	Number	Percentage
1	2	3
Total	690	100
Gender		
women	373	54.1
men	335	48.6
Age, years		
16–29	156	20.6
30–44	190	27.5
45–59	166	24.1
60–74	123	17.9
75 and over	55	7.9

Table 1 – cont.

	1	2	3
Place of residence			
rural areas		276	40.0
towns of up to 20,000		110	15.9
cities of 20,000–500,000		179	26.0
cities of >500,000		125	18.1
Education			
vocational and lower		200	29.0
secondary		350	50.7
higher		140	20.3
Income			
<1,500 PLN		241	34.9
1,500–2,000 PLN		311	45.1
>2,000 PLN		138	20.0
Self-assessment of nutritional knowledge			
low		135	19.6
average		273	39.6
high		282	40.8
Voivodeship			
Zachodniopomorskie		160	23.2
Mazowieckie		400	58.0
Podkarpackie		130	18.8

The questions included in the questionnaire related to the following issues:

- the frequency of consuming honey: expressed on a 5-point scale, ranging from 1 – “not at all”, 2 – “less than once per month”, 3 – “several times per month”, 4 – “several times per week”, to 5 – “daily or almost daily”
- the reasons for honey consumption: expressed on a 5-point scale, ranging from 1 – “insignificant”, 2 – “of little significance”, 3 – “moderately significant”, 4 – “significant”, to 5 – “very significant”
- the place of purchasing honey: respondents were asked to indicate up to 3 places
- the factors influencing honey consumption: expressed on a 5-point scale, ranging from 1 – “insignificant”, 2 – “of little significance”, 3 – “moderately significant”, 4 – “significant”, to 5 – “very significant”
- the preferences for honey: respondents were asked to indicate up to 3 most preferred types
- the forms of eating honey: the frequency of using various forms of eating honey was expressed on a 5-point scale, ranging from 1 – “I do not use it”, 2 – “I use it occasionally”, 3 – “I use it sometimes”, 4 – “I use it often”, to 5 – “I use it very often”.

STATISTICAL METHODS

An analysis of frequency and cross tables was run, and mean values and standard deviations were calculated. Differences between participant groups with respect to socio-demographic characteristics were evaluated by the Chi² independence test. To verify the relationship between variables, Spearman's rank correlation coefficient was applied. Statistical significance was considered when $p = 0.05$. All tests were conducted using SPSS 14 software.

RESULTS

Frequency of honey consumption

More than 2/5 of the respondents declared that they consume natural honey several times per month, and approximately 1/4 of population ate honey less

frequently than once per month. Only about 6% of the respondents consumed honey daily, and 4.1% did not consume it at all. The average frequency of eating natural honey was 2.95. It is the average frequency, explained under the Table 2. Significantly more women than men declared that they consume honey daily or almost daily. At the same time, significantly more men than women ate honey several times per month and less. The frequency of consuming honey correlated positively with self-assessment of nutritional knowledge, income, and education. A negative correlation was found regarding the place of residence (Table 2).

Motives of honey consumption

The most important reason for consuming honey among the respondents was its positive impact on health (mean 4.1). This reason strongly correlated with the frequency of consuming honey and the

Table 2. Frequency of consuming honey, according to the respondents' characteristics ($n = 690$), %

Specification	Daily or almost daily	Several times per week	Several times per month	Less than once per month	Not at all	Average*/SD
1	2	3	4	5	6	7
Total	5.9	18.3	43.2	29.5	4.1	2.95/0.36
Gender						
women	11.7***	19.6	39.6***	24.6***	4.5	3.09/0.76
men	1.6***	16.7	45.3***	33.9***	3.5	2.82/0.43
Age, years ($R^{**} = 0.346$)						
16–29	3.4***	12.1***	45.7	34.2***	4.6	2.76/0.49
30–44	6.1	22.3***	46.2	21.5***	3.9	3.05/0.78
45–59	5.9	17.4	43.2	29.7	3.8	2.92/0.67
60–74	6.2	21.3	35.6***	32.3	4.6	2.92/0.54
75 and over	6.3	20.2	38.2***	30.8	4.5	2.93/0.78
Place of residence ($R = -0.299$)						
rural	6.9***	22.1	45.3	22.9***	2.8***	3.07/0.57
town of up to 20,000	6.2	23.6***	46.1	20.5***	3.6	3.08/0.89
city of 20,000–500,000	5.8	17.8	38.2***	33.5	4.7	2.87/0.89
city of >500,000	5.4	17.1	37.4***	35.2***	4.9	2.83/1.02

Table 2 – cont.

	1	2	3	4	5	6	7
Education ($R = 0.187$)							
vocational and lower		6.0	17.5	43.5	26.3	6.7***	2.90/0.89
secondary		4.4***	19.6	38.2	34.3	3.5	2.87/0.76
higher		5.8	18.7	44.6	26.8	4.1	2.95/0.56
Income ($R = 0.248$)							
<1,500 PLN		3.2***	18.6	41.3	31	5.9	2.82/0.78
1,500–2,000 PLN		6.5	22.5	41.2	26.6	3.2	3.03/0.53
>2,000 PLN		6.8	26.5***	31.7	31.1	3.9	3.01/0.89
Self-assessment of nutritional knowledge ($R = 0.375$)							
low		5.6	12.4***	23.9***	48.9***	9.2***	2.56/0.56
average		4.6	19.5	40.1	30.4	5.4	2.89/0.91
high		6.8	24.5***	48.7	18.7***	1.3***	3.17/0.82

*On a 5-point scale: ranging from 1 – not at all to 5 – daily or almost daily.

**Spearman's rank correlation coefficient ($p < 0.05$).

***Statistically significant difference ($p < 0.05$).

self-assessment of nutritional knowledge. Its significance was rated higher by women (4.6), people from older age groups (aged 45–59 years – 4.3, aged 60–74 years – 4.4, aged 75 years and older – 4.4), and with average income (4.3). Using honey for culinary purposes was also rated highly (mean 3.9). Respondents' opinions were not differentiated by gender. Another important reason for consuming honey was its flavour (mean 3.8), which correlated with the frequency of its consumption ($R = 0.471$) and income ($R = 0.387$). Flavour was more important to men (4.2), respondents representing 16–30 (4.1) and 60–74 age group (4.0), and those with an education level lower than secondary (4.2). A correlation was found between the importance of habit (mean 3.5) and the frequency of honey consumption ($R = 0.432$). The greater significance of habit was registered among the elderly (aged 60–74 years – 4.2, older than 74 years – 4.3) and the respondents from rural areas (4.0). Peer and medical recommendations as reasons for honey consumption were of moderate or lower than moderate importance. Medical recommendations were more important for the elderly (aged 60–74 years – 3.2, aged 75 years and older

– 3.3) and those who declared a high level of nutritional knowledge (3.1). Recommendations from peers were more important for respondents aged 30–44 years (4.0). Fashion was the least important factor influencing honey consumption (mean 1.6) – the higher the nutritional knowledge, the lower the importance of fashion. Similarly, the reverse correlations occurred in the case of education and age. Socio-demographic features and frequency of honey consumption correlated with opinions about the importance of all reasons, but the correlations differed in strength and character (Table 3).

Places where honey is purchased

Open-air markets (32.0%) and apiaries (27.4%) were indicated by the largest group of participants as places where they purchase honey. Both places were indicated by a significantly larger group of respondents aged 45–59 years (42.3% and 37.6%, respectively) and those aged 60–74 years (41.5% and 36.2%, respectively), as well as by people confident about their nutritional knowledge (40.3% and 37.1%, respectively). Local grocery stores are the locations where honey

Table 3. Reasons for consuming honey according to the frequency of consumption and socio-demographic characteristics of the respondents ($n = 656$)

Specification	Mean/SD*	Variables						
		1	2	3	4	5	6	7
		R^{**}	p^{***}			R		
Health benefits	4.1/0.2	0.461	+	0.354	0.112	0.165	0.259	0.413
Culinary uses	3.9/0.8	0.245	–	0.231	–0.245	–0.256	–0.103	0.276
Flavour	3.7/0.4	0.471	+	–0.218	0.112	–0.245	0.387	0.212
Habit/custom	3.5/0.5	0.432	–	0.456	–0.345	–0.112	0.098	0.093
Peer recommendations	3.2/1.0	0.093	+	–0.234	0.129	0.134	0.121	0.126
Medical recommendations	2.6/0.9	0.171	–	0.421	–0.118	0.111	–0.117	0.213
Fashion	1.6/1.1	0.059	+	–0.256	0.187	–0.221	0.175	–0.432

1 – frequency of honey consumption, 2 – gender, 3 – age, 4 – place of residence, 5 – education, 6 – income, 7 – self-assessment of nutritional knowledge.

*On a 5-point scale: ranging from 1 – insignificant to 5 – very significant.

**Spearman's rank correlation coefficient ($p < 0.05$).

***Statistically significant difference ($p < 0.05$).

was purchased by 21.4% of population. More men (31.7%) and elderly people (32.3%) bought honey in local grocery shops. Almost 20% of the population purchased honey in supermarkets, especially people aged 16–30 years (29.6%), those with a lower education level (27.6%) and a low self-assessment of nutritional knowledge (31.1%). Purchasing honey in health food stores was indicated by 18.6% of the respondents, mostly by women (29.6%), people with higher education (31.4%) and a higher income (35.1%), residents of large cities (32.5%), and those with a high level of nutritional knowledge (28.9%). Buying honey at roadside and picnic stalls was indicated by 16.2% of respondents. In this group there were significantly more men (25.3%), people aged 30–44 years (26.4%), those with secondary education (25.9%), residents of large cities (26.1%) and those with the highest income (25.7%). Over 1/5 of the respondents (20.4%) declared that they receive honey from family and friends. Such a source of honey was declared by significantly more respondents aged 30–44 (34.2%) and 60–74 years (31.2%), and participants representing urban areas (31%). Only 4.2% stated that they produce their own honey, all of whom live in countryside (10.5%).

Factors influencing honey consumption

The most important factor taken into account while purchasing honey was its type/flavour (mean 4.2). The importance of this factor was higher for men than for women (4.9 and 3.5, respectively). The higher the self-assessment of nutritional knowledge, the higher the importance of flavour as a purchasing factor, although this correlation was not strong ($R = 0.163$). Price and flavour were of equal importance (mean 4.2). A negative correlation between the importance of price and frequency of honey consumption was found ($R = -0.346$). Negative correlations were also found between the importance of price and income ($R = -0.267$), education level ($R = -0.234$) and self-assessment of nutritional knowledge ($R = -0.211$). This means that the higher the income, education or nutritional knowledge, the lower the importance attributed to price.

In comparison with flavor, colour was only slightly less important when selecting honey (mean 4.1). Its importance was correlated with self-assessment of nutritional knowledge ($R = 0.221$) and income ($R = 0.189$). The saccharification level in honey (mean 3.7) was also considered as significant by the participants.

Table 4. Factors influencing honey purchases according to the frequency of its consumption and socio-demographic characteristics of respondents ($n = 656$)

Specification	Mean/SD*	Variables						
		1	2	3	4	5	6	7
		R^{**}	p^{***}			R		
Type/flavour	4.2/0.3	0.056	+	0.075	0.032	0.087	0.089	0.163
Affordable price	4.2/0.2	-0.346	-	0.129	-0.149	-0.234	-0.267	-0.211
Colour	4.1/0.4	0.087	-	0.101	0.088	0.092	0.189	0.221
Saccharification	3.7/0.8	0.077	-	-0.051	0.011	0.068	0.094	0.182
Country of origin	3.7/0.8	0.069	-	0.245	0.095	0.256	0.094	0.321
Container size	3.3/1.0	0.045	-	0.065	0.026	0.037	-0.243	0.023
Brand/producer	2.6/1.0	0.067	-	-0.198	-0.099	0.134	0.099	0.069
Packaging material	2.5/0.9	0.061	-	0.021	-0.031	0.032	0.079	0.089
Packaging esthetics	3.2/0.9	0.053	+	-0.162	0.065	0.121	0.199	0.026
Advertising	1.5/0.5	0.067	-	-0.245	0.112	-0.342	0.078	-0.225
Display	1.5/0.5	0.041	-	-0.292	0.078	0.067	0.102	0.027

1 – frequency of honey consumption, 2 – gender, 3 – age, 4 – place of residence, 5 – education, 6 – income, 7 – self-assessment of nutritional knowledge.

*On a 5-point scale: ranging from 1 – insignificant to 5 – very significant.

**Spearman's rank correlation coefficient ($p < 0.05$).

***Statistically significant difference ($p < 0.05$).

The importance of this factor increased with a more positive self-assessment of nutritional knowledge ($R = 0.182$). The importance of the country of origin (mean 3.7) also increased with the self-assessment of nutritional knowledge ($R = 0.321$), education ($R = 0.256$) and age ($R = 0.245$), whilst the brand (mean 2.6) was particularly important to the youngest group of participants (3.6) ($R = -0.189$).

The importance of pack size (mean 3.3) correlated negatively with income ($R = -0.243$). Packaging material was considered less important (mean 2.5) than pack size. Moreover, the esthetic features of packaging (mean 3.2) were rated higher among women (mean 3.6), the youngest group ($R = -0.162$), and respondents with the highest income ($R = 0.199$). The least important factors were advertising and display. The importance of advertising when honey is chosen correlated negatively with the level of education ($R = -0.342$), age ($R = -0.245$) and self-assessment of

nutritional knowledge ($R = -0.225$). The importance of display correlated negatively with age ($R = -0.245$) (Table 4).

Preferences for honey

The most preferred honey types were polyfloral (66.7%) and lime-tree (60.9%). Both types were indicated by significantly more women (78.2%) and people aged 60–74 years (77.3%) and aged 75 years and older (78.5%). Acacia honey was selected by more than half of the respondents (53.5%). In this group there were significantly more women (62.3%), people aged 30–44 years (61.7%), those with higher education (65.6%) and those living in large cities (64.3%). Rapeseed honey was preferred by 30.6% of respondents, with a significant predominance among the elderly (aged 60–74 years – 41.2%; aged 75 years and older – 43.1%) and residents of rural areas (44.7%). Honeydew and buckwheat honey were selected by

27.4% and 25.9% of respondents, respectively. These were more preferred by men (37.4% and 36.9%, respectively), people with higher education (39.3%), and high income (36.7%) and respondents with a high level of knowledge about nutrition (41.2%). The least preferred was heather honey (9.4% of respondents). It was significantly more preferred among those with higher education (16.8%) and high income (19.7%).

Forms of honey consumption

Honey was primarily used as a sandwich spread (mean 4.2) and natural sweetener (mean 4.2). Both forms of honey use were positively correlated with the frequency of honey consumption ($R = 0.234$ and $R =$

0.267, respectively). Honey was used as a sandwich spread by more men (4.5) and younger consumers ($R = -0.212$), whereas as a sweetener it was consumed by more women (4.5), older consumers ($R = 0.241$) and respondents who rated their nutritional knowledge higher ($R = 0.234$).

Honey added to milk (mean 4.0) was more common among older consumers ($R = 0.345$) and respondents from small towns and rural areas ($R = -0.229$). Honey was also used for making cakes and desserts (mean 3.6), mostly by women (4.1), while it was eaten with a teaspoon (mean 3.5) by more men (4.01). Consumption of honey diluted in boiled water (mean 3.3) was more common among older people ($R = 0.268$)

Table 5. Forms of eating honey according to the frequency of consumption and socio-demographic characteristics of respondents ($n = 656$)

Specification	Mean/SD*	Variables						
		1	2	3	4	5	6	7
		R^{**}	p^{***}			R		
Sandwich spread	4.2/0.4	0.234	+	-0.212	0.086	0.021	-0.043	0.024
Sweetener	4.2/0.6	0.267	+	0.241	0.049	0.026	0.042	0.234
Added to milk	4.0/0.9	0.076	-	0.345	-0.229	-0.056	-0.061	0.089
Added to cakes and desserts	3.6/1.0	0.068	+	-0.075	-0.118	-0.043	-0.067	0.095
Eaten with a teaspoon	3.5/0.4	0.089	+	-0.159	-0.093	0.012	-0.016	0.137
With boiled water	3.3/0.5	0.098	-	0.268	-0.032	-0.017	-0.039	0.246
Added to cereal	3.2/0.9	0.046	+	0.058	0.262	-0.028	0.079	0.065
Added to meat dishes	2.1/1.0	0.045	-	-0.067	-0.223	0.029	-0.025	0.032
Added to alcohols	2.1/0.9	0.065	+	0.048	-0.113	-0.134	0.345	0.043
Internal use medicines	2.1/0.9	0.023	-	0.261	-0.256	-0.219	-0.076	0.098
External application (hair/skin)	1.9/0.8	0.047	+	0.079	-0.049	-0.087	-0.266	0.091
Added to jams	1.5/0.6	0.068	-	-0.087	-0.063	0.041	0.032	0.115
Added to vegetable dishes	1.1/0.6	0.080	-	0.020	0.035	0.059	0.054	0.031
Added to fish dishes	1.0/0.4	0.068	-	0.034	-0.107	0.069	0.051	0.087

1 – frequency of honey consumption, 2 – gender, 3 – age, 4 – place of residence, 5 – education, 6 – income, 7 – self-assessment of nutritional knowledge.

*On a 5-point scale: ranging from 1 – insignificant to 5 – very significant.

**Spearman's rank correlation coefficient ($p < 0.05$).

***Statistically significant difference ($p < 0.05$).

and those with a higher level of nutritional knowledge ($R = 0.246$). Adding honey to breakfast cereal (mean 3.2) was more characteristic for women (4.0) and respondents from urban areas ($R = 0.262$). A rare use concerned the addition of honey to meat dishes (mean 2.1), alcohol (mean 2.1), vegetable or fish dishes and jams (1.1; 1.0 and 1.8, respectively). Honey was added to meat dishes mostly by residents of rural areas, whereas it was added to alcohol mostly by men (3.0) and respondents with the highest income ($R = 0.345$).

As for the non-culinary uses of honey, preparing medicines for internal use (2.1) was more common than for external application (1.9). Applications for internal use were more popular among older people ($R = 0.261$), residents of small towns and rural areas ($R = -0.256$) and respondents with secondary or lower education ($R = -0.219$). Applying honey to skin and hair was more common for women (2.6) and respondents with a low income ($R = -0.266$).

DISCUSSION

The results of the study show that respondents consumed honey several times a month on average. Women consumed honey more frequently, which might be related to the higher level of health and nutrition awareness among them (Jeżewska-Zychowicz et al., 2009; Kozirok et al., 2012). The other studies conducted among Polish consumers (Pindek, 2001; Wilczyńska, 2011) also showed that honey consumption is more popular among women. The same difference in terms of gender was obtained in a study carried out in Romania (Pocol and Árváné Ványi, 2012). The frequency of consuming honey increased with income and nutritional knowledge, which was also stated by Roman et al. (2013). Respondents from the youngest group and those from urban areas consumed honey less frequently.

The main reasons for consuming honey were its nutritional value and health properties. Such reasons were also demonstrated in studies in Germany (Bardy et al., 2008), Poland (Przybyłowski et al., 2011; Wilczyńska, 2011) and Romania (Pocol and Bolboacă, 2013). These results confirm opinions about the growing nutritional awareness among the consumers (Johnston et al., 2005). Also important for honey consumption were flavour, especially for the younger

consumers, and habit, especially for older respondents. The habit of consuming honey among the elderly may stem from using honey as a substitute for sugar, which was rationed in Poland in the 1980s. Another factor important for consumers was honey's natural origins, which was also found in a study in Spain (Sanzo et al., 2003) and Romania (Lubieniechi, 2002; Pocol and Árváné Ványi, 2012).

Polish consumers preferred to purchase honey mainly in open-air markets and apiaries. Similar behaviours were found among consumers in Romania (Pocol and Bolboacă, 2013) and Australia, who claimed that honey bought in supermarkets was of inferior quality.

The main factor considered while purchasing honey was the type, which determines flavour. The most preferred types in Poland were polyfloral, lime and acacia honey. Similar preferences were found in earlier studies in Poland (Giemza, 2004), as well as in Romania (Pocol and Bolboacă, 2013) and Hungary (Árváné et al., 2011). Apart from flavour, colour was also very important for participants of the study. In Poland the most preferred honey was dark-gold, as in Ireland (Murphy et al., 2000).

The price of honey was declared to be of great importance when purchasing, although the importance of price was negatively related to education, income and self-assessed nutritional knowledge. A study on consumers' preferences in Ireland also found that the price of honey is the most important factor when a decision to purchase is made. According to Murphy et al. (2000), consistency, packaging, brand and colour are also important for consumers. Among the Hungarian population it was found that the most important determinants of honey purchase were: quality of product, price, producer and quality of the packaging (Árváné et al., 2011). However, in the omanian population, the importance of price was mostly stressed by the consumers with the lowest incomes (Pocol and Bolboacă, 2013).

Polish consumers ate honey primarily in the form of a sandwich spread and sweetener, which may be due to the fact that honey is considered a more healthy alternative to sugar. Honey was also added to cakes and desserts, breakfast cereal, and eaten with a teaspoon. When analyzing honey consumption among western Australians, Batt and Liu (2012) found that honey is

chiefly used as a sandwich spread and sweetener for breakfast cereal and oatmeal. In comparison to food applications, honey was used less frequently by Polish consumers for medical or cosmetic purposes. Nevertheless, the study shows that preferences regarding uses of honey differed depending on the respondents' socio-demographic characteristics.

The weakness of this study is the analysis of self-reported data, while its strength is a large population representative of 3 voivodships. The findings are a good source of knowledge for honey producers about the determinants of honey consumptions. Nevertheless, the determinants of honey consumption in Poland still require further analysis, because of the intense changes in the food market, and the growing role of consumers, their expectations and preferences.

CONCLUSIONS

The study shows that Poles consume honey relatively seldom. The main reasons for consuming honey were its positive impact on health, wide range of culinary uses, flavour and habits. It was found that Poles purchase honey most often in apiaries and open-air markets. When buying, they primarily pay attention to the type of honey (preferred types are lime-tree, polyfloral and acacia), its price and colour. Honey is used mainly for culinary purposes, usually as a sandwich spread or sweetener. Less popular uses include medical and cosmetic purposes. Some socio-demographic characteristics (gender, age, place of residence, income), self-assessment of nutritional knowledge and, to a lesser extent, education significantly differentiated consumer behaviours in the honey market, which suggest that for the intensification of honey consumption, nutritional education is needed.

The study findings offer an initial diagnosis in the field of consumer behaviour and determinants of honey consumption in Poland, and can be helpful in developing marketing strategies for honey producers.

Consumer behaviours should be systematically monitored in order to identify the trends of changes in honey consumption and their determinants. A particularly advisable course of action, would be to investigate further the consumption of honey among young consumers through qualitative and quantitative surveys. The results would allow informative programs and

marketing strategies to be developed which encourage honey consumption among this group. Because price is an important factor limiting honey consumption, conducting a study employing the WTP (willingness to pay) method would enable researchers to identify the features conditioning the product's utility and choosing a marketing strategy in order to reduce consumers' price sensitivity (Grunert et al., 2009; Kimura et al., 2008; Sanjuán-López et al., 2011; van Doorn et al., 2011). Other recommended and desirable actions include a detailed study on the medical and cosmetic uses of honey, and consumer behaviours regarding other apiculture products.

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