PRODUCTION, CONSUMPTION AND FOREIGN TRADE OF HONEY IN POLAND IN THE YEARS 2004 TO 2015

Agnieszka Borowska

Department of Economics and Economic Policy Warsaw University of Life Sciences
Head of Department: dr hab. Alina Daniłowska, prof. SGGW

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A b s t r a c t. Changes in the beekeeping sector in Poland in the years 2004 to 2015 with particular focus on regional differences are discussed. The article inform about the production and specifics of sale, prices of honey in purchasing centers and on retail and wholesale markets is discussed. The foreign trade of honey in respect of its value and volume is reviewed, and honey consumption per household and per capita is characterized.

INTRODUCTION

Poland's accession to the EU in 2004 contributed to more dynamic development of the beekeeping sector. Because of opportunities of getting support under national beekeeping schemes [EC 2013a], integration of bee-keepers, as well as standing education of the latter, bee-keepers undertook formal and administrative steps in order to modernize and upgrade their apiaries, including the production of honey and other apiary products. China is the world's leader in honey production, it produces approx. 27% of the global volume, i.e. more than 450 Kt[1] in 2013. China is followed by the EU, which accounts for approx. 11-13% of the global honey output (more than 204-220 Kt in the period 2010-2013). The 2013 honey-producing leaders in the EU included Spain (30.6 Kt), Romania (26.6 Kt), Hungary (18.5 Kt), Germany (15.7 Kt) and Poland (15.4 Kt). Due to a growing role and position of Poland in honey production and trade in the EU, the article highlights changes which have been undergoing in the production, supply and international trade, as well as in honey prices (direct, wholesale and retail); the focus is also put on its distribution and household consumption in the period 2004-2015.

MATERIAL AND METHODS

The objective of this paper is to show changes in the honey market in Poland in the years 2004-2015, with particular account for the differences between the regions. The article

[1] Kt – thousand tonnes.

takes account of honey production and sales characteristics, wholesale, retail and buying-in prices; the author also elaborates on the international trade in honey – its value and volume, and describes its household and per capita consumption.The secondary sources of information, including the statistical yearbooks issued by the Central Statistical Office (CSO), the reports and studies of S. Pieniążek Research Institute of Pomology and Floriculture in Skierniewice Division of Apiculture in Puławy, the materials of the Polish Association of Beekeepers, and the INTRASTAT 2016, FAOSTAT 2016. The comparative and descriptive methods have been applied in the analysis of the research problem.

PRODUCTION OF HONEY IN POLAND IN THE YEARS 2010 TO 2015

According to FAOSTAT, in 2013 the world production of honey stood at close to 1 664 thousand tonnes with the increase of almost 1/3 over the two decades. 46% of production volume concentrated primarily in Asia where from 1990 the production grew by more than a half up to 737.5 Kt and especially in China where the production amounted to 466.3 thousand tonnes i.e. about 29% of the global production volume [Borowska 2011b]. The share of both continental Americas in the production of honey dropped (to about 20 %), the similar level of about 22 to 24% was maintained in Europe, while Ukraine (73 Kt) and Russia (68 Kt) together with production of 38.7% of the European honey (over 142 Kt) were the leaders (tab. 1.).

Table 1. Production of honey in the years 2003 to 2013

No.	Country	Production in year [thous. t]											2003-2013 [%]
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
World + (Total)		1328	1365	1418	1505	1462	1521	1510	1547	1573	1593	1664	123
1.	China, mainland	301	303	305	343	360	414	412	417	461	468	450	143
2.	Turkey	70	74	82	84	74	81	82	81	94	88	95	134
3.	Argentina	75	80	110	105	81	72	62	59	74	76	80	120
4.	Ukraine	54	58	71	76	68	75	74	71	40	70	74	168
5.	United States of America	82	83	73	70	67	74	66	80	67	67	68	87
6.	Russian Federation	48	53	52	56	54	57	54	52	60	65	68	138
7.	India	52	52	52	52	51	55	55	60	60	61	61	117
8.	Mexico	57	57	51	56	55	55	56	56	58	59	57	101
9.	Iran	15	29	35	36	47	41	46	47	48	48	44	243
10.	Ethiopia	38	41	36	51	42	42	42	54	40	46	13	66
24.	Poland	12	12	10	14	15	14	14	12	13	12	15	135

Source: FAOSTAT (03.03.2016).

Table 2. Production of honey in Poland in the years 2004-2015

Province	Production in year												2004-2015 [%]
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015*	
Poland [t]	11 957	9 955	13 546	14 954	14 007	14 007	12 467	13 369	12 176	15 498	12 836	22 058	185
Total [%]	100%												
Lubelskie	15	16	16	15	5	11	11	11	10	14	12	14	172
Podkarpackie	11	7	11	7	6	11	5	8	9	11	7	12	206
Małopolskie	6	8	11	7	7	7	9	8	4	7	4	12	357
Warmińsko-mazurskie	12	12	8	13	13	10	12	10	12	10	12	10	161
Wielkopolskie	10	8	11	9	12	9	12	11	12	9	12	9	161
Mazowieckie	9	8	6	4	6	11	11	7	6	5	5	8	161
Zachodniopomorskie	3	3	2	3	6	5	5	4	5	4	5	6	371
Kujawsko-pomorskie	4	5	4	4	4	3	2	1	5	3	5	5	243
Dolnośląskie	9	10	8	9	11	10	9	10	9	8	9	5	105
Świętokrzyskie	1	4	3	4	4	2	2	4	2	5	4	4	485
Łódzkie	3	3	3	4	5	3	3	5	6	4	5	4	222
Lubuskie	6	6	5	4	5	5	4	6	4	6	4	3	99
Śląskie	4	4	3	3	3	4	4	4	4	3	4	3	135
Pomorskie	2	2	4	5	5	4	3	3	5	3	4	2	207
Opolskie	3	3	2	3	2	2	3	4	3	3	2	2	109
Podlaskie	2	2	2	4	4	4	4	3	4	3	5	2	179

Source: own calculations based on [CSO 2005-2015, 2009, p. 31; 2011-2015].

In 2013 the EU-27 countries delivered 188 thousand tonnes. Taking into consideration the 30 largest honey producers in the world, the leading China was followed by the beekeepers from Turkey (94 Kt), Argentina (80 Kt), USA (67 Kt), India (61 Kt), Mexico (57 Kt), Ethiopia (45 Kt), Brazil (35 Kt), Iran (44 Kt), and Poland, with the production of about 12-14 Kt, took 25 or 30th position (tab. 1.). In Poland honey was the main source of income for the beekeepers. Other bee products, such as the multiflower honey, bee venom, beeswax, propolis, pollen and bee bread was acquired in small amounts [Cichoń, Wilde 1996]. The year 2015 was favorable for the Polish beekeepers who harvested over 72% (i.e. 9.2 Kt) more honey than in the previous year with over 22 thousand tonne production. In terms of honey production years 2005, 2012 and 2014 of the last decade were unfavorable due to poor atmospheric conditions prevailing during the growth season and nectar and pollen harvest. The honey production in Poland was variable not only depending on the year but also was depended on province (tab. 2.).

Most honey was harvested by the beekeepers in the Lubelskie, Podkarpackie, Warmińsko-Mazurskie, Wielkopolskie and Dolnośląskie provinces, while the Podlaskie, Opolskie, Pomorskie and Śląskie provinces produced the smallest volumes of honey [Majewski 2010, Wilde 2016]. The good production results of the first four provinces only gave about 43 to 45% of the total volume of honey production in the country. Considering the period of 2014-2015, the production, despite annual fluctuations, increased in all regions. In the period of 2004-2015 the growth recorded in respective provinces amounted to about 5% in the Dolnośląskie province, more than 120% in the Łódzkie and

Table 3. Honey output per 1 colony in Poland in 2004-2015 by province

Province	Output per 1 colony in year [kg]											2004-2015
	2004	2005	2006	2007	2008	2009	2011	2012	2013	2014	2015	2003 = 100
Poland total	14.6	11.5	15.9	17.4	18.4	16.5	11.9	9.5	11.5	9.3	15.2	139
Małopolskie	10.0	10.3	21.8	15.9	15.8	13.7	10.2	4.2	9.5	4.7	20.3	497
Podkarpackie	18.6	9.7	19.0	17.2	11.8	20.9	10.0	9.2	13.5	6.5	19.7	322
Wielkopolskie	17.4	12.0	18.0	15.8	19.1	15.6	15.3	14.1	13.1	13.1	16.7	120
Kujawsko-pomorskie	11.9	12.9	12.9	17.2	15.8	12.8	3.0	8.9	8.1	10.0	16.6	315
Warmińsko-mazurskie	16.7	14	13.5	19.4	18.4	13.7	13.0	11.6	12.8	12.3	16.5	118
Lubelskie	16.1	11.5	18.0	18.6	23.7	14.5	11.7	7.8	13.2	8.7	16.4	191
Lubuskie	19.4	15.0	18.1	20.1	23.3	21.6	18.5	11.7	18.1	11.0	16.0	127
Mazowieckie	17.8	13.0	13.8	16.6	20.7	24.6	11.4	8.2	8.7	6.5	15.8	185
Zachodnio-pomorskie	10.2	7.5	9.6	14.6	23.7	21.1	9.0	8.7	8.3	7.6	15.4	234
Świętokrzyskie	3.5	8.0	10.0	13.8	16.4	8.5	10.3	4.4	12.5	9.4	12.6	419
Łódzkie	15.1	9.9	10.9	15.9	19.7	10.5	14.3	14.7	11.8	11.5	12.1	121
Opolskie	22.4	15.0	15.0	20.5	17.7	13.7	15.5	11.3	11.5	5.9	11.0	93
Podlaskie	11.1	11.8	12.3	15.8	17.1	15.0	14.4	15.1	15.4	17.4	10.2	109
Pomorskie	8.4	6.0	13.0	17.8	17.3	14.9	10.4	11.6	9.0	10.0	10.0	178
Dolnośląskie	13.6	12.7	17.5	20.0	22.2	20.1	15.5	11.2	11.8	11.7	9.9	86
Śląskie	18.2	13.5	16.5	15.2	17.1	20.2	10.9	6.9	6.7	6.9	9.7	77

Source: see tab. 2.

61% Mazowieckie provinces, 271% in the Zachodniopomorskie and 173% Kujawsko-Pomorskie provinces, about 385% in the Świętokrzyskie province, up to more than 257% growth in the Małopolskie province (tab. 2.).

The average yield of honey from one bee colony in small-scale apiaries in Poland is about 20 kg of honey, while in large-scale apiaries up to 40 kg of product at an average can be harvested in favorable years. In the period of 2004 to 2015, i.e. from Poland's accession to the EU, in 10 provinces the highest average yield of honey from a hive was achieved in 2008; the country average was 18.4 kg. In 8 regions the results fell below that level, while the highest yields of honey from one bee colony of approx. 23 kg were achieved in the Lubelskie, Lubuskie and Zachodniopomorskie provinces. In the Warmińsko-Mazurskie, Kujawsko-Pomorskie, Opolskie, and Pomorskie provinces honey output higher than in 2008 was recorded in 2007, while in the Podkarpackie, Mazowieckie and Śląskie provinces better results from a colony were achieved in 2009 (tab. 3.). For example, in Sweden, the average productivity per bee-hive reaches the level of 51 kg, in Finland - 46 kg, in Hungary – approx. 38 kg, in Germany - 34 kg, and in Greece only 11 kg, while in Spain, the Czech Republic, Cyprus, Austria, France or Italy it does not exceed 19 kg [EC 2013b].

FOREIGN TRADE OF HONEY

In the EU the quality, purity, and safety of the beekeeping products are of great importance. These features of honey are subject to the supervision system, and the producers themselves strive to meet the widely popularized demands of implementation of the Good Production Practice and Good Hygienic Practice [*The honey and other bee products...* 2009]. The honey production is strongly correlated with weather conditions and available honey flows. In the periods of low production, it is advisable to supplement honey supplies with imports [Semkiw 2007]. In the foreign trade, honey is exported from countries with a lower level of economic development to countries with a higher level of life where products can be sold at a relatively higher price than on the domestic market [Borowska 2011a]. In the international trade honey goes mainly to the European market (over 53%) and mainly to the EU countries [Report from the Commission…2013]. USA and Japan were the biggest world importers of honey in the twenty-first century. Among the countries with the highest volume of imported honey, 16 belonged to the European Community, out of which Germany (approx. 100 Kt), United Kingdom, France (approx. 30 Kt), Belgium, Spain, Italy (over 16 Kt) were the leaders. In terms of quantity and value an upward trend of honey import and export was observed every year. On the average several hundred tonnes of honey were exported from Poland every year in the years 2004-2009, whereas in 2014 the export level exceeded 15.2 Kt. China with a volume of over 10.1 Kt was the main honey trade partner of Poland, however its share decreased from 51% in 2010 to about 45% in 2014. Until 2011 the EU countries jointly were on the second place in the honey trade (at about 3.6 Kt), while in 2012-13 the honey coming from Ukraine (about 7.9 Kt) constituting 30-39% of the honey imports took over their place. In the last five years Bulgaria (more than 1 Kt in 2014), Romania (262-430 t), Germany (500 t), Spain (130 t), France were important trading partners in imports from the EU. Until 2009, besides the latter three countries, also Italy (over 328 t) and the UK (approx. 400 t) belonged to that group. An increasingly important role

Table 4. Volume and value of export and import of honey in Poland in 2004-2015

Years	Export							Import						
	volume	value			price of 1 kg of honey			volume	value			price of honey per 1 kg		
	Kt	PLN mln	USD mln	Euro mln	PLN	USD	Euro	Kt	PLN mln	USD mln	Euro mln	PLN	USD	Euro
2004	0.62	7.36	1.98	1.59	11.9	3.2	2.6	3.58	19.20	5.38	4.29	5.4	1.5	1.2
2008	0.66	6.59	2.66	1.85	9.9	4.0	2.8	5.55	37.34	15.30	10.65	6.7	2.8	1.9
2009	1.30	13.17	4.22	3.05	10.1	3.2	2.3	7.34	62.80	20.67	14.70	8.6	2.8	2.0
2010	2.68	25.77	8.65	6.47	9.6	3.2	2.4	11.55	91.39	30.61	22.89	7.9	2.7	2.0
2011	4.63	46.31	15.39	11.16	10.0	3.3	2.4	13.71	115.29	38.39	27.87	8.4	2.8	2.0
2012	6.28	62.39	19.17	14.85	9.9	3.1	2.4	14.15	113.04	34.76	26.99	8.0	2.5	1.9
2013	11.21	112.43	35.86	26.86	10.0	3.2	2.4	19.97	149.83	47.80	35.79	7.5	2.4	1.8
2014	15.26	160.16	50.76	38.23	10.5	3.3	2.5	22.52	174.88	55.59	41.79	7.8	2.5	1.9
I-III Q 2015	7.02	80.39	21.71	19.17	11.5	3.1	2.7	13.79	123.23	33.07	29.55	8.9	2.4	2.1

Source: own calculation INTRASTAT 2016, www.stat.gov.pl (12.03.2016)

was played by the countries other than members of the European Community, namely Thailand (296 t) and Moldova (206 t). In the three quarters of 2015 greater than in the previous years inflow of honey from Argentina (97 t), Lithuania (77 t) and Cuba (54 t) was noted. Taking into account only the honey originating from the EU territory, in 2014 almost 48% was brought from Bulgaria, 22% from Germany, about 13% from Romania, 6% from Spain. Import from the UK and Italy that still three years ago accounted for, respectively, 11% and 9%, dropped to nearly 0.3-0.5%. In general, the price of honey imported to Poland was lower than exported. Still in 2004 the difference in favour of exports ranged from 113% if expressed in USD to 120% if expressed in PLN. To the year 2011 that difference decreased considerably to about 20% regardless of the currency, to raise to about 33% in the next three years. In the years 2004 to 2014 the dynamics of the import volume increased 2.5-fold, and almost 3-fold in value, while, respectively, about 6-fold and 5.3-fold dynamics of export was recorded. While on the average the prices of 1 kg of imported honey grew by approx. 50%, the prices in export dropped by 6% if expressed in the national currency, and grew by 17% if expressed in US dollars. In the years 2010 to 2015 the companies exporting honey charged 3.1 to 3.3 USD/kg, while the price of imported honey was around 2.4 to 2.8 USD/kg (tab. 4.).

Poland, with production of honey at about 12 Kt in 2014, exported more than 15.2 Kt (reexport) and imported 22.5 Kt worth, respectively, PLN 160 mln (equal to USD 50.7 mln) and PLN 174.8 mln (USD 55.6 mln). In 2009 the share of export in the domestic production of honey (honey export in relation to domestic production) was approximately 21.5 % with a tendency to grow to over 72 %. In 2014 an interesting phenomenon, not recorded so far, was observed, namely the export of honey (including the re-export) was by 19 % higher in quantity than the already extremely low domestic production of that year. In 2010-2014 and in the 3 quarters of 2015 Poland exported natural honey mainly, i.e. in 98%, to 23 EU countries, and the volume of exported honey increased almost five-fold to 15 Kt. Polish honey goes mainly to the markets of France, Germany, Denmark, Spain, and Italy, where the volume of exported honey was, respectively, 4.8, 3.7, 1.25, 1.17, and 1 Kt. Other export markets included also the United States (61 t in 2014), Saudi Arabia (24 t), China (24 t), Canada (13t), and small volumes of export to Iceland, Japan, Russia, Mongolia, the United Arab Emirates, and Australia. It is worth noting that the honey market, especially in the EU, is

Table 5. Volume of import and export of honey in Poland in 2010-2015*

Country	Volume in year					
	2010	2011	2012	2013	2014	2015 (I-III Q)
Import						
Total [t]	11 550.5	13 708.3	14 156.2	19 969.1	22 519.7	13 790.5
China [t]	5 930.5	6 840.1	6 882.2	8 922.8	10 143.0	5 980.4
EU-27 [t]	3 779.4	3 662.4	2 803.6	3 065.4	2 125.5	1 993.3
China [%]	51	50	49	45	45	43
Ukraine [%]	11	20	30	40	0	0
Argentina [%]	2	0	1	0	0	1
Thailand [%]	1	1	0	0	1	1
EU-27 [%]	33	27	20	15	9	14
Bulgaria [%]	9.4	6.7	7.7	6.7	4.5	5.0
Germany [%]	6	3	4	3	2	3
Romania [%]	4	3	3	2	1	4
Export						
Total [t]	2 684.2	4 638.1	6 280.2	11 206.3	15 260.9	7 016.5
EU-27 [t]	2 618.2	4 579.5	6 197.4	11 069	15 078.2	6 803.6
EU-27 [%]	98	99	99	99	99	97
Bulgaria [%]	11	3	4	16	1	2
France [%]	0	1	6	18	31	15
Germany [%]	40	55	55	38	24	27
Denmark [%]	18	17	12	11	8	5
Spain [%]	6	12	4	4	8	13
Italy [%]	0	0	2	2	7	12
Romania [%]	0	3	3	2	5	8
Austria [%]	9	4	9	4	3	1

* (1st to 3rd quarter).
Source: own calculations based on INTRASTAT 2016, www.gov.pl (12.03.2016).

increasingly demanding in terms of quality of product and attaches great importance to the compliance with the principles of world trade. However, given the scale of production, it is China (with about 1/3 of the world production) that dictates the terms of honey pricing by offering the relatively low wholesale prices on the market.

SALES AND PRICES OF HONEY

In 2002 in Poland 53% of honey was sold by the beekeepers directly to the consumers and only approximately 19% was sold on the wholesale market [Pidek 2003]. Yet in 2006 the such distribution channel accounted for 24% of, while in 2009 only 13% and regional differences among the beekeepers' preferences as to the form of sale could be clearly distinguished. In 2006 approximately 80% of honey was sold to the purchasing centers in two provinces: Warmińsko-Mazskie province and Zachodniopomorskie province, nearly 33.3% in the Kujawsko-Pomorskie and Lubelskie provinces, nearly 25% in the Pomorskie province, while only 1 to 5% in the Śląskie, Opolskie, Mazowieckie and Wielkopolskie provinces. In the years 2008-2010 direct sales was already the main channel of honey distribution in the country (65%), 10% of the remaining honey was directed to the retail trade (retail stores, health stores, pharmacies, and specialty stores (beekeeping products, healthy food), almost all the remaining honey was used by the packaging companies, and only 1% by the industry sector [*National Beekeeping 2007/2008-2009/2010…*, Borowska 2013]. Over the last 5 years the share of direct sales in the honey market already took 79% of the total production, 12% of the harvested honey were sent to the purchasing centers, 8.9% of produced honey were distributed by retail trade, and 0.1% of the country's production was used by the industry [*National Beekeeping Support Programme 2016/2017-2018/2019*]. In other EU countries, especially those previously belonging to EU–15 the sales pattern is similar. About 75% of honey is sold by the beekeepers in the apiaries, at homes or bazaars/marketplaces. For example in Greece and Germany, 70% of the honey production is sold by the beekeepers themselves directly to consumers while 30% is sold via the local retailers [EC 2013b]. In Poland certain pricing pattern can also be observed: the prices offered to the beekeepers by the purchasing centers are two to three times lower than the prices in the direct or retail sales. The bargaining power of purchase centers and sometimes small volumes of production the (as well as such specifics of the national beekeeping as the fragmentation of the beekeeping farms, no honey producers' group, prices imposed by the customers) put the beekeepers in disadvantageous position on the market. However, in spite of some unfavorable circumstances, especially the small beekeepers developed their primary sales channel in form of direct contacts with end customers and consider it to be a well-organized system. The average prices of natural honey in both direct and indirect (purchase centers or retail market) sales system varied in individual regions of the country. Assessment of the average retail price of honey in the years 2004-2014 indicated that (until 2009) the highest prices per 1 kg of honey were paid by the residents of the Świętokrzyskie, Mazowieckie, Zachodniopomorskie and Lubuskie provinces. Differences between the lowest and the highest average retail price paid for honey in particular provinces ranged from 17% in 2009 to 39% in 2011. The prices paid by the consumers from the Śląskie, Dolnośląskie, Wielkopolskie, Łódzkie and Lubelskie provinces were below the country's average price per 1kg (tab. 6.). Regardless of the region, the price of honey in the retail sales increased by 47% on the average with the greatest increase of more than 60%, in the

Table 6. Purchasing power of an average gross monthly salary by selected province in relation to price of honey in a given province in 2004-2014

Provinces	Purchasing power of an average gross monthly salary by province in relation to price of honey in a given province [kg]										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Poland Total	138	135	141	153	158	151	140	134	138	143	145
Dolnośląskie	138	138	148	165	172	158	157	143	150	158	167
Lubuskie	107	106	110	120	118	125	125	121	123	128	131
Mazowieckie	171	164	173	188	187	182	162	158	158	161	161
Śląskie	145	144	138	140	154	152	133	133	137	152	176
Świętokrzyskie	118	116	124	105	121	118	113	106	114	111	111

Source: own calculation based on [GUS 2004-2015, Baza Danych Lokalnych GUS (12.03.2016)].

Warmińsko - Mazurskie and Kujawsko – Pomorskie provinces. The price increase by more than 50% was recorded in 6 provinces, the lowest increase of 31% was observed in the Lubuskie province. In 2004-2008 the purchasing power of an average monthly gross salary per capita of residents of each provinces in relation to the retail price of honey in a given province increased in real terms by 14.5%, especially in the Zachodniopomorskie (approx. 31%) and Lubelskie (25%) provinces. However, in the following three years (until 2011) in the whole country scale the purchasing power dropped by 15%: from about 12% decrease in the Świętokrzyskie and Małopolskie provinces to 26% in the Podlaskie province. 3% growth of the purchasing power was recorded in the Opolskie and Lubuskie provinces. While the resident of the Mazowieckie or Dolnośląskie provinces could afford to purchase the largest volume of honey, the residents of Warmińsko-Mazurskie, Świętokrzyskie, and Lubuskie provinces were placed at the other end. Interestingly, in the country scale the beekeepers from the Warmińsko-Mazurskie region were leaders in the production of honey. The regional differences between the highest and lowest purchasing power of the average monthly gross salary per capita decreased from 83 kg in 2007 to about 51 kg in 2014.

In Poland, regardless of the form of sale (purchase center, direct sales, retail trade), the heather honey and the coniferous honeydew honey were the most expensive and the prices of rape honey and multiflower honey were the lowest. The prices of honey in direct sales were lower than the retail prices but higher than the prices offered to the beekeepers in the wholesale purchasing centers. Besides, the rarer specialties, such as the heather honey and the coniferous honeydew honey, on both the wholesale and retail market (in an apiary or retail store) are, respectively, three or two times more expensive (tab. 7.). In 2012-2015 the purchase centers and the direct sales market in Poland offered the lowest prices for the rape and multifloral honeys. The price offered by the purchase centers for 1 kg of those two honey species in 2012 to 2015 increased by about 25% to more than 11 PLN per 1 kg. The prices of acacia, lime and buckwheat honey species were similar. The prices of those honey species offered by the purchase centers increased from 2009 to 2015 by approx. 40%. The coniferous honeydew honey was by nearly 9 to10 PLN/kg more expensive than the species mentioned above. Among the honeydew honeys the deciduous honeydew honey was relatively cheaper (by 30-40%) than the honey from the coniferous honeydew.

Table 7. Average price of selected varieties of honey in Poland in 2012-2015*

Years	Price of varieties of honey [PLN/kg]							
	multiflower	rape	acacia	lime	buckwheat	coniferous honeydew	deciduous honeydew	heather honey
Direct sales								
2012	21.8	20.5	25.2	26.3	27.1	36.7	29.2	39.0
2013	23.1	21.5	25.5	26.4	27.2	32.1	29.5	44.0
2014	23.5	21.8	25.8	26.4	26.0	34.6	28.7	46.9
2015	22.8	21.2	26.0	25.5	28.0	32.6	28.7	44.6
Sales to purchasing centers								
2012	9.5	9.0	16.0	15.0	15.0	22.0	15.0	29.0
2013	10.6	10.5	15.4	14.3	14.8	23.0	18.0	29.2
2014	11.0	11.0	15.8	15.8	15.8	26.5	15.0	34.2
2015	11.5	11.1	16.5	16.0	16.1	24.8	15.0	35.0
Retail sales								
2012	24.2	23.5	31.2	30.0	31.8	39.7	28.0	56.8
2013	24.2	22.5	30.0	30.7	31.1	42.7	34.1	55.8
2014	22.4	24.5	32.3	31.0	30.8	41.3	32.8	60.9
2015	23.2	22.7	31.3	29.4	30.3	42.7	30.6	69.8

* in November 2012, 2013, Oct/Nov 2014, Sep-Nov 2015.
Source: [IHAD 2013- 2015, Semkiw 2015].

In 2015 the heather honey was the most expensive honey for which the purchase centers paid an average price of PLN 35/kg, while the beekeepers obtained on the average about 1/3 higher price in direct sales. The respective price on the retail market was even PLN 69.8, i.e. over 23% higher, than even three years before. Over the four analyzed years the retail prices of the multifloral, rape, linden, and buckwheat honey fell by about 2 to 5%, while the price of the acacia honey remained unchanged, and the price of the honeydew honeys slightly grew by 8 to 9%. A beekeeper operating in the years 2009-2015 on the direct sales market could get for the lime honey from about 65 to 85% higher price than in the purchase centers. The respective figures were 95-130% for the multifloral and rape honeys, 65-93% for the buckwheat honey, 17-51% for the heather honey, 26-67% for the coniferous honeydew honey, and 60-95% for the deciduous honeydew honey. In the years 2014-2015 the heather honey with the average price of PLN 35/kg paid by the purchase centers was the most expensive. In 2015 the supply of the coniferous honeydew honey was greater than in the previous year which caused a reduction of wholesale prices by 6.5% to 24.8 PLN/ kg, and by 6% to 32.6 PLN/kg in the direct sales.

In 2009-2012 the prices of honey sold in bulk to the purchase centers increased by about 15%, the greatest price increase of 27% was recorded in the linden and buckwheat honey species, and the price of the most popular multifloral honey and rape honey grew by only 3%. The similar trend was observed in the direct sales – the average price increase was 30%, although the price growth of the multifloral and rape honeys was 24%, and 25% of the lime and buckwheat honeys. That trend was most evident in pricing of the honeydew honeys with increase by nearly 40%. In the 2012-2013 period the average prices of the acacia, lime and buckwheat honeys sold directly by the beekeepers remained at the same level (tab. 7.). Assessment of the differences between the lowest and the highest prices

Table 8. Volume and value of honey purchases and average price of 1 kg of honey in purchase centers in Poland in 2006-2014

Specification	Volume in year								
	unit	2006	2007	2008	2009	2010	2011	2013	2014
Total honey purchase	t	3 244.6	3 208.2	2 414.7	1 870.9	2 041.7	2 364.4	2 222.3	2 567.8
Share of purchase in honey production	%	24.0	21.5	17.2	13.4	16.4	17.7	14.3	20.0
Value of total purchase of honey	1 000 PLN	23 995.8	21 988.8	17 211.9	19 763.1	23 147.9	24 764.5	25 429.2	30 333.6
Average purchase price	PLN/kg	7.40	6.85	7.13	10.56	11.34	10.47	11.44	11.81

Źródło: own calculation based on [GUS 2005-2014].

obtainable in 2013 for a particular type of honey in direct sales indicated that the highest prices reached 114% for the multifloral and rape honeys, and 215% for the heather honey. The difference was definitely lower in the case of prices offered by the wholesale buyers and amounted to 25% for the coniferous honeydew honey, 33% for the heather, multifloral, and rape honeys, and up to about 64% for the lime and buckwheat honeys. In the retail sales lower deviation of prices of the heather, rape and deciduous honeydew honeys was observed. The prices of honey in direct sales (for instance in an apiary) were lower than the retail prices, however much higher than the wholesale prices offered in the purchase centers and, for that reason, most honey was sold outside that distribution channel. A beekeeping farm usually builds its reputation, brand, and market position for years attracting regular and loyal customers and therefore difficulties in selling its product are of not much concern to them.

In Poland there were dozens of companies engaged in the purchase, packaging and wholesale of honey including, among others, the beekeeping cooperatives and highly specialized companies – the beekeeping farms. Their position on the market is important, particularly in view of their cooperation with the retail chains reporting a growing demand for large batches of standardized goods and in consideration of the foreign trade. The long-term cooperation with individual beekeepers and members of the professional beekeeping organizations allowed to develop solutions that in 2014 covered about 20% of honey purchased in the purchasing center, compared with nearly 13.4% in 2009, of more than PLN 30.3 million value. The comparison of the average purchase price of honey in Poland in the years 2009-2014 shows 11.8% price growth in relation to 37% increase of purchase volume and 53% increase of purchase value. Yet in 2006 the scale of purchases by purchasing centers accounted for 34% of honey produced in the season, i.e. more than 3,244.6 t. In 2014 the average purchase price of honey was PLN 11.81 per kg and was similar to the price level of 2004. The lowest price level of PLN 6.85/kg was recorded in 2007. The comparison of trends in the retail prices over the recent ten years showed the general increase of over 47% and 23% growth in the purchasing centers (tab. 8.).

Analyzing the costs of honey production in the Polish beekeeping industry in the years 2010 to 2015 in terms of both, the fixed costs (not depending on the production volume) which included, among others, the depreciation of hives, equipment, buildings – workshops, bee yard rents, interests on credits, and the variable costs (depending on the production volume) which included such costs as the expenditures on sugar, foundations, bee queens, medicines, labour, electricity, transportation, packaging materials, showed that the overall input costs in the commercial apiaries carrying out intensive production were higher than the respective costs in the low-scale apiaries, however the cost of production of one kilogram was lower because a bee colony in a commercial beekeeping farm produced, on the average, twice as much honey. The above specificity was confirmed by data provided by the Institute of Horticulture Department of Apiculture in Puławy according to which in 2015 the costs (fixed and variable) of production of honey by one hive amounted to about PLN 318 in the commercial (migratory) apiaries, while the respective costs in the amateur (stationary) apiaries were by about 21% lower and amounted to PLN 250 (60 €). The costs of keeping a commercial apiary compared with the respective costs borne by an amateur apiary per one hive were higher in relation to the weight unit (1 kg of honey). Considering that the production costs in an amateur apiary was PLN 13 per 1 kg of honey and the respective costs in a commercial apiary were more than 30% lower and amounted to PLN 9 per 1 kg, the commercial apiaries were more profitable. In the years 2010 to 2015 the fixed costs in the amateur apiaries were equal to about 15-17% of the total costs, while the respective costs borne by the commercial apiaries reached 20-22%. Comparing the variable costs in both types of apiaries, the labour costs were the highest (approximately 43-51% of the variable costs in the amateur apiaries and within 29-34% in the commercial apiaries). The extra costs of winter feeding in the amateur apiaries, and the costs of transport in the commercial apiaries were the most important components of that cost category. According to the estimates of Semkiw, in 2012 the direct sale of honey from a small-scale apiary at an average price of about PLN 24/kg allowed to achieve a positive net income at the production level of 12 kg of honey one colony [Semkiw 2012]. In the case of large-scale apiaries the production of 27 kg of honey per one colony allowed to achieve the positive net income if the honey was sold to the purchasing centers, while in the case of direct sales at an apiary the positive net income was achieved at the production level of 15 kg per one colony.

CONSUMPTION OF HONEY IN POLAND AGAINST OTHER COUNTRIES

The average level of consumption of honey per capita per annum in the world is about 0.3 kg, while in the EU countries it is around twice as high (about 0.6-0.7 kg) [http://ec.europa.eu/agriculture/statistics/agricultural/2011/pdf/d21-4-421_en.pdf, dated 12.03.2016]. It is estimated that the residents of EU-27 consume about 20-25% of the world consumption of honey. The level of honey consumption in Poland of about 300-430 grams per capita is relatively small if compared with the EU leaders (although the balance estimates at the level of about 0.5 kg per person are mentioned in the literature). Similar honey consumption is noted in Estonia, Hungary, Latvia, Lithuania, Italy, the UK and the Netherlands, while in Denmark, Germany, Greece, Sweden, and Austria, it is about 1 to 1.6 kg per person. The smallest amounts of honey, at the level of 100-200 g per year, are consumed by the residents of Austria, Sweden, Finland, and Ireland, while in Ukraine, which is the main trade partner of Poland in honey imports, the demand for honey per statistical resident is almost 1 kg. In Turkey the honey consumption per capita is less than 0.9 kg, a little less consumption of 0.85 kg is recorded in Canada, while in the US the annual consumption of only 0.5 kg per capita is noted. Certain pattern is observed in countries with the world's highest production of honey, namely, on the average, people eat the smallest quantities of honey there, as for instance in China, Brazil, and India where the average annual consumption of honey is only 0.1 kg per person. For many years the consumption of honey in Poland has been rather stable, although its level depends on several factors that include: economic factors (income level of consumers, production and supply volumes, volume of imports and exports) as well as social factors – tastes, traditions, habits, age, etc. Consumption of honey was declared by nearly 95% of the Polish households. Honey is most often consumed by older people (pensioners, although the disability pensioners consume about 25-30% less honey than the retirement pensioners) or families with children. The benefits of honey are also valued in the households of self-employed persons and white-collar employees (tab. 9.). On the average, the lowest honey consumption is recorded in the households of farmers, however farmers, who use sugar for, among other things, processing seasonal fruit (such as preserves, jams, compotes, juices, etc.) or baking cakes and other confectionery products, consume twice as much sugar as other socio-economic types of population. So far, the relatively lower income of Polish consumers in comparison with the residents of, for instance, Germany, Great Britain or France, and the high share of expenditures on food in the structure of total household expenditures (around 25%), as well as the high price of honey in the opinion of buyers, inhibit the growth of the demand for honey. While the honey consumption per capita is low, the demand for honey in the cosmetics, pharmaceutical, and food processing industries steadily grows.

Such a situation makes honey a product that is seen on the consumers' tables every day, although its curative and preventive qualities are still appreciated. Honey is consumed at least once a week in every fourth household and 7% of Poles declare eating honey every day or almost every day. Honey is preferred for breakfast and during periods of reduced immunity [*Life*... 2009]. The varieties of cheaper honey, such as multifloral or rape honey, dominate in the consumption structure. Due to the nature of the market (supply and demand characteristics, price of product) the heather honey or coniferous honeydew honey are not as popular as those mentioned first. The households with higher income, in particular the households of the self-employed, senior executives, managers, and administration staff can afford to purchase the relatively more expensive varieties of honey. However, in the case of persons who consider taste, nutritional, and health values of honey important for their nutrition scheme price plays rather a minor role in the purchase decisions. Due to the

Table 9. Average annual consumption of sugar, jam, honey, chocolate and confectionery in households in Poland by socio-economic groups in 2006-2014

Years	Households, of which:								
	grand total	employee			farmers	of the self-employed	retirees and pensioners		
		total	in manual labour positions	nonmanual labour positions			total	of retirees	of pensioners
	of which jam, honey [kg per capita]								
2014	3.84	3.84	3.12	4.32	3.60	4.20	4.44	4.56	3.72
2013	4.08	3.96	3.36	4.68	3.24	4.44	4.44	4.68	3.48
2012	1.80	1.80	1.32	2.04	1.32	1.92	2.40	2.40	2.04
2011	1.92	1.68	1.56	2.04	1.32	1.92	2.52	2.52	2.04
2007	1.68	1.56	1.44	1.92	1.32	1.80	2.28	2.28	1.80
2006	1.80	1.56	1.44	1.92	1.20	1.80	2.28	2.52	1.92

Source: own calculation based on [CSO 2006-2014].

regional specificity, the regions with large wooded areas and such trees as acacia (Dolny Śląsk, Mazowsze), lime (Warmia i Mazury, Lubelskie), or moors (Zachodniopomorskie, Dolny Śląsk), coniferous forests (south of Poland – i.e. Podkarpacie, Małopolska), the high quality honey species characteristic for a respective region, inclusive of the regional honeys with EU certification, for example PDO or PGI, and those registered in the National List of Traditional Products, are especially popular among the residents.

SUMMARY

Basing on changes of the beekeeping sector in Poland in the years 2010-2015 the following conclusions can be drawn:

1. Honey is the main source of income for the beekeepers in Poland, other bee products are produced in small amounts. The production of honey in the analyzed period ranged from 12 to14 thousand tonnes, except for the year 2015, very favorable for honey production, when more than 22 thousand T was produced, placing the country among the top 30 manufacturers in the world .
2. In the years 2010-2015 the volume and value of exports of Polish honey to the European countries and its imports – mainly from China and the EU grew.
3. Almost 79% of honey is sold directly to the consumer. About 12% of the raw material is sold in the purchasing centres, nearly 9% in retail trade, the remaining percentage goes to the industry.
4. Regardless of the form of sale, the heather and honeydew honey from coniferous honeydew are the most expensive in Poland while prices of the rape and multifloral honey are the lowest.
5. The average consumption of honey per person still remains at a stable though low level of 0.5 to 1 kg per annum. The cheaper varieties and those harvested annually (eg.: the multifloral and rape honeys) dominate in the structure of honey consumption, while the seasonally variable honey species (depending on flows) such as the heather and honeydew honey (eg. of coniferous honeydew) are increasingly popular.

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Agnieszka Borowska

PRODUKCJA, KONSUMPCJA I HANDEL ZAGRANICZNY MIODEM W POLSCE W LATACH 2004-2015

Streszczenie

W artykule opisano zmiany w polskim pszczelarstwie w latach 2004-2015 z uwzględnieniem regionalnego zróżnicowania. Przedstawiono produkcję miodu, specyfikę sprzedaży, ceny miodów odmianowych w sprzedaży bezpośredniej i pośredniej – w skupie hurtowym i sprzedaży detalicznej. Ponadto scharakteryzowano handel zagraniczny w ujęciu wartościowym i ilościowym oraz konsumpcję miodu na osobę i w gospodarstwach domowych.

Correspondence address:
Dr Agnieszka Borowska
Warsaw University of Life Sciences, Faculty of Economic Sciences
Department of Economics and Economic Policy
Nowoursynowska St. 166, 02-787 Warsaw, Poland
e-mail: agnieszka_borowska@sggw.pl