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Economic analysis of exporting Serbian honey

RESEARCH ARTICLE

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Abstract

Researching competitiveness of Serbia's honey sector represents an introduction into a complex issue of dynamic changes with complex heterogenic and long term socio-economic implications. Tracking changes of comparative advantages in export during Serbia's transition period and accession to the EU is significant for viewing the effects that trade liberalization and integration in international streams have on the sensitive honey sector. The research started from indicators of demand and level of foreign trade in the EU. Quantitative indicators of Serbia's honey export on European market were shown in order to confirm Serbia's potential and dominant presence. Research subject of this paper is the analysis of Serbia's comparative advantage in exporting honey and specialization in international trade with the EU. The Balassa index, Revealed comparative advantages index and Revealed symmetric comparative advantage index were used with the goal to measure the level of Serbia's comparative advantage, Grubel Lloyd Index and Trade Balance Index were used to measure the specialization level. Research results point to a positive comparative advantage value in exporting Serbia's honey to EU and inter-industry exchange character.

Keywords: honey, production and trade of honey, competitiveness, comparative advantage, specialization
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1. Introduction

Indicators of production, consumption and trade of honey have changed throughout history, production volume and consumption tendency have altered (Allsop, 1996). In today's time there is an increase in nurture of healthy life style, the share of population consuming honey has changed and production is increased. Honey is used in diets (Popkin and Gordon-Larsen, 2004), as a natural sweetener (Mizrahi and Lensky, 1997) in cosmetics (Nikitović *et al.,* 2000), as a remedy wounds (Cooper and Gray, 2012), burns and similar skin problems (Bardy *et al.*, 2008). The research of Mruk (1987) and Ćirić *et al.* (2015) have shown that health care and nurture of a healthy life style is a dominating factor in consumption of honey.

European consumers are interested in innovative food products or new tastes, especially if they are declared as a "healthy product". It's in this context that individual and industrial demand for honey grows. German consumers go a step further and show significant inclination to consuming organic honey, which is mainly imported and sold in specialty shops and all-organic shops, with willingness to pay up to 30% higher price (Centre for the promotion of imports from developing countries – CBI, 2015b).

Even though EU is the second largest global producer of honey, its production volume does not satisfy domestic needs and depends on import from other countries. In fact, around 40% of consumption needs in the EU are satisfied through the import of honey (CBI, 2015). There are expectations that honey import will significantly increase in the next five years in order to compensate the fall of European production (CBI, 2015) with a trend of importing from Central Europe, Eastern Europe and developing countries, such as Serbia.

Honey production in Serbia has sufficient volume to satisfy domestic need, thus leaving significant amounts for export. Export potential of Serbia's honey sector is in direct relation to production which is burdened by problems from the past. As a result of bad transition, beekeepers were unorganized and unprotected. Today, the significance of Serbia's honey sector and the need for its research in frames wider than national and analysis of its competitiveness is observed through the fact that participation of the honey sector in agricultural production and Serbia's export is increasing, that it's organic honey of high quality and geographical indication. For Serbia, a country with low market potential, knowledge of European market's demand is especially important. Researching comparative advantage in exporting honey, in the context of comparative advantage of exporting food from Serbia, points to problems and changes in production and positioning on European market. Serbia is still in the transition process and accession to the EU and it requires expert and financial support. Cooperation of all participants in the value chain is especially important: producers, buyers, distributers, exporters, foreign consumers and scientists. Considering favorable natural conditions for production of high quality honey, research of comparative advantage in export provides empirical data on a sector which is fitting for foreign investment capital, implementation of knowledge and experience. It is for this reason that research subject is analysis of comparative advantage in exporting honey and specialization in Serbia's trade with the EU. Finally, stated arguments talk about the need to manage comparative advantages in export, in order to intensify, modernize and use the potential of Serbia's honey sector and satisfy foreign demand.

The remainder of this paper is structured as follows: the following section provides literature review on production, consumption and trade of honey in Serbia and EU countries and empirical studies on the comparative advantage of exporting honey. The methods and data used in the research are then described, followed by a presentation and discussion of the results. The final section contains concluding remarks.

2. Literature review

Available studies research honey and beekeeping from different aspects. Authors see for the first time in production of honey, an increase employment with the development of social and rural entrepreneurship, promotion of the environment, and horizontal and vertical organizing as a precondition for appearance on the international market. Research results from authors from countries with a developed honey sector,

i.e. their conclusions represent a special contribution due to their sublimated advisory, coordinating and entrepreneurial recommendations. Previous research on production and consumption of honey in Serbia are lacking and a united conclusion of majority of authors is that beekeeping is a chance which is insufficiently used. Thus, conclusions of this study unify conclusions from similar researches and represent a connection of widely represented honey sector and comparative advantage in export. Authors' research contributes to the creation of a comprehensive image on competitiveness level of Serbia's honey sector, where the level of comparative advantages in export and development problems of the honey sector during the entire process are tracked, not just at the end of the EU accession process.

According to Grubić (2008 shows that Serbia, and especially the region of Vojvodina, has significant opportunities for success because its plains are rich in diverse flora i.e. honey plants. Considering the thesis that beekeeping is "a good job" Bekić *et al.* (2013) point out that an increase in production honey and bee products, innovations in production and supply with contemporary approach strategy and developed marketing orientation increases profitability of beekeeping production. In accordance with that, Marinković and Nedić (2010:5) show that "rearrangement of labor and reduction of the number of permanent workers, and by engaging temporary seasonal labor in accordance with the duration of the beekeeping season" will influence an increase in producer's profit. Dealing with the issue of honey production Pocol and Popa (2012) indicated that Romanian beekeepers are more interested in stationary, conventional production. The reasons are high transport costs and the risk of moving hives, very expensive periodic inspections of organic honey, bureaucracy and difficulty of selling. Authors concluded that "ecologic beekeeping is justified in terms of profitability only when it comes to high production" (Pocol and Popa, 2012:243). Matsop *et al.* (2011:3) point that "there is a significant difference in output and net benefit between traditional and semi-modern bee farms" and the authors "suggest that beekeepers should adopt the semi-modern (Kenyan) hives".

Cooperation of beekeepers with science and the real sector representatives (Tesser and Cavicchioli, 2014), development of social entrepreneurship (Pocol *et al.,* 2012a) and development of entrepreneurial behavior, regardless of age, gender or level of education would contribute to a decrease of total and especially rural unemployment (Pocol *et al.,* 2017; Popa *et al.*, 2011). In fact Pocol *et al.* (2012b) said that establishing social beekeeping enterprises as an innovative solution to social problems will contribute to preservation of local specificity, promotion of traditional agriculture and creation of local brands of products. Saha (2003:2) pointed out the existence of "a large unrealized honey production potential with multi-seasonal plants and/or crops" and she pointed out that beekeeping is a profitable venture which provides rural population with income and healthy food "without the need for compulsory land ownership or much capital investment". Promoting honey as a local product in rural areas can contribute to an increase in a producer's income, an increase in standard of living (Mickels, 2006), inclusion of all members of the community, development of teamwork (Qaiser *et al.*, 2013), prevention of migration to urban areas or other countries (Pocol and Ilea, 2011). According to Ahmad *et al.* (2017) beekeeping in rural areas represents an alternative in the way of life of small farmers, since it contributes to an increase in average income of households by 51.54% (in the case of Pakistan). If honey producers transfer to professional beekeeping (Pocol *et al.*, 2014) modernization of exploitation (Popa and Pocol, 2011) as well as regular education of beekeepers would influence an increase in productivity. It's up to the farmers to choose an adequate strategy in order to maintain a certain level of competitiveness and profitability. The SOSTARE model was developed by Paracchini *et al.* (2015) and it analyzed the technical efficiency of agricultural holdings, as well as their ecological and economical sustainability. From the aspect of our research it's important to point out a growing interest of farmers, other than clean production for: vacation, tourism and other uses for rural land, as well as beekeeping. Beekeeping contributed to a stop in loss of biodiversity and an improvement of the ecosystem, which is the basis of sustainable rural development.

Urbisci (2011:53) points out that managed bees contribute to the awareness of their importance for human life and the environment. The author points out that bees can be observed as an indicatory specie for assessing quality of the environment and concluded that the campaign for awareness should be led by "universities, or municipalities in partnership with relevant government departments specialized in agriculture and the

environment". Dirina and Bugina (2012:75) conclude that through promotion of api-tourism, it's possible to inform people on the significance of beekeeping. "To popularize it and make beekeeping business profitable, it is required to develop beekeeping techniques that are friendlier to the environment". Production and consumption of honey fulfills two needs (Pocol, 2012:132): food and health. Satisfying those needs should be done with fulfillment of "three essential elements of the triangle of sustainability, namely economic, social and environmental".

In the present due to a decrease in agricultural land (Pocol *et al.*, 2012b), when bees are dying out due to diseases and weaknesses, poisoning, pesticides, climate changes and presence of extreme temperatures, droughts and floods, transfer to organic production of honey secures the highest quality, absolute health safety with protection of the environment (Gibbs and Muirhead, 1998; Prodanović *et al.,* 2016; Simeunović, 2016). Data from 2015 point out that leading EU producers of organic honey are Romania with 33 thousand tons, Bulgaria with 2.16 tons and Spain with 912 tons (http://ec.europa.eu/eurostat). The suitable areas in Serbia for the production of organic honey are national parks, forests, hills and mountains with the presence of traditional agricultural production (Zarić *et al.*, 2014). Production of organic honey is at its beginning even though there were very favorable experiences recorded by beekeepers in the area of Župa Aleksandrovačka and Central Serbia (Bogdanov, 2010).

Research by Pocol *et al.* (2017) point out the significance of supplying honey with protected geographic origin. They also state that there are several European Countries where honey is protected by Protected Designation of Origin/Protected Geographical Indication status: Greece, Spain, France, Italy, Luxembourg, Malta, Poland, Portugal and Ukraine (Pocol *et al.* 2017:5). In Italy those are "Miele della Lunigiana", registered from 2004 (Commission Regulation, 2004), "Miele delle Dolomiti Bellunesi" registered from 2011 (Commission Implementing Regulation, 2011), and "Miele Varesino", registered in 2014 (Commission Implementing Regulation, 2014), In Romania, the Ministry of Agriculture and Rural Development encourages the Protected Designation of Origin/Protected Geographical Indication honey certification (Romanian Ministry of Agriculture and Rural Development, 2016). However Petković *et al.* (2012) concluded that producers and consumers in Serbia do not know the benefits of such production and that continued education is necessary. Limited financial funds and inadequate organizing of beekeepers caused little attention to promotion of the qualification structure – by hiring expert consultants, cooperating with veterinarians, professional management and supervision of production (Ignjatijević *et al.*, 2015). In spite of numerous problems in the beekeeping sector, "Fruška Gora linden honey" has received the label of geographic origin and "Vlasina honey" is in the process of certification, thanks to the support of EU funds and Switzerland government in the process of certification. Dugalić-Vrndić *et al.* (2011) have dealt with the problem of honey quality, i.e. authenticity and have indicated that producers must be protected from forgeries and in such way disloyal competition. From the consumer's point of view, Wu *et al.* (2015) indicate it is very important that there is a diversification of forgeries from real honey in sales. Bračić (2004) pointed out the assessment that only 50% of produced honey in Croatia is done regularly, while there is no such data for Serbia.

Even though beekeeping is an agricultural activity, it is important to observe its influence on the society. On the macro level beekeeping creates a competitive advantage through innovation and improvement of trade balance (Popesku, 2010a) and at a micro level it provides beekeepers a source of income (Pocol *et al.*, 2017).

Analysis by Ignjatievć and Milojević (2011) shows that Serbia achieved a surplus in export of agricultural and food products after 2005 and the export potential was confirmed by a study performed by Keca *et al.* (2012). High export and minimal import values contributed to Serbia's positive revealed comparative advantage (RCA) in export of agricultural and food products, industry produced sugar, molasses (Raičević *et al.,* 2012) and especially honey (Ignjatijević *et al.*, 2014). Ignjatijević and Cvijanović (2017) researched the honey sector and concluded that Serbia exports honey in EU countries (its export is dominant in Germany and Italy) and has a positive comparative advantage in exporting honey, measured by relative advantages of export, relative merits of import, relative trade advantage, revealed competitiveness (RC) and RCA indices. Pocol *et al.* (2017) give the confirmation of positive comparative advantage in exporting honey. Considering the

positive comparative advantage in exporting honey and medicinal herbs (Ignjatijević *et al.*, 2010; Ignjatijević and Cvijanović, 2017), it would be significant to link the production of honey and medicinal herbs in order to increase the quantity and assortment of honey in export.

3. Data

About 1,470.66 tons of honey are produced annually in the world (data from 2013; http://www.fao.org/faostat), dominated by the production of honey in Asia, Europe and America. Leading world producers in the analyzed period are China, Turkey, USA, Argentina and Ukraine. Production of honey varies from country to country, so as Mruk (1987) points out the average production in Poland amounted to 15-20 thousand tons, which with low level of consumption amounts to 7% of total consumption of honey in the EU, leaving significant amounts for export. Spain, Hungary, Romania and Germany have increased production thanks to favorable conditions and tradition, as it is pointed out by Pocol (2012). Favorable conditions have contributed to an increase in production of honey from 2005 to 2009 in Germany, Austria and Portugal as well (Pocol, 2012). During its accession process to the EU, Romania achieved market transformation, cooperative organizing, i.e. consolidation of beekeeping, which is followed by an increase in production of honey (Pocol and Árváné, 2012). Average European production from 2001 to 2013 was 197 thousand tons (Ignjatijević *et al*, 2015). Leading producers in 2013 were Spain with 31 thousand tons, Romania with 27 thousand tons, Hungary with 19 thousand tons, Germany with 16 thousand tons and Poland with 15 thousand tons (https://www.cbi.eu/market-information/honey-sweeteners/trade-statistics).

According to the findings of Pocol and Árváné (2012) Hungary is the fourth country in production of honey in the EU. The production of honey in Croatia has greatly increased in recent years thanks to organizational modernization, as it is pointed out by Svečnjak *et al.* (2008) with 314 thousand registered beekeeping cooperatives in 2007. On the other hand, consumption of honey in Croatia is at a low level with 0.4 kg per capita a year, making room for export (Svečnjak *et al.,* 2008).

Research by Ignjatijević *et al.* (2015) pointed out that Serbia produced an average of approximately 4,200 tons of honey annually from 2001 to 2013 with an average number of 305 thousand beehives and average yield of 12 kg per hive. The next two years were highly productive for Serbia which further increased production and yield per hive.

Indicators of foreign trade in honey are: from 2001 to 2014 leading exporting countries were: Germany, Spain, Belgium, Hungary and Romania and leading importing countries were: Germany, Great Britain, France, Belgium and Italy. In 2015 Serbia's honey export has amounted to 9.670 million tons, of which most was exported in EU countries, i.e. Italy and Germany. Germany is the biggest importer of honey in the EU with the share of 26% or 83 thousand tons in 2014. Other main honey importers in the EU are Great Britain (12% of total import), France (11% of total important), Belgium (9% of total import) and Spain (8% of total import). Honey importers in these countries process and sell it domestically and abroad.

European countries were directed at importing honey from Argentina until 2010. After the abovementioned period, the leading supplier of the EU is China. Chinese honey was cheaper because of low margins, usage of dumping prices (Strayer *et al.*, 2014) and low wages to the workforce (CBI, 2015). In Schneider's (2012) opinion, in order to avoid anti-dumping customs Chinese producers have transshipped honey in order to "conceal the true country of origin", a process named "honey laundering" (Strayer *et al.*, 2014). Due to distrust in its quality (mainly due to residue) they turned to import from Ukraine, Balkan countries and their own production through support programs (for example EU allocated €216 million for the development of national apiculture programs from 2017 to 2019 (European Commission, https://ec.europa.eu/agriculture/honey/programmes).

4. Methods

Competitiveness is the basis for success on the domestic and especially on international market. Competitiveness received a significant role in contemporary researches (Ilić *et al.,* 2016). Comparative advantage is a concept that resulted from the existence of a large number of countries which actively participated in international trade, but do not have absolute comparative advantage in production, and such comparative advantage does not imply simultaneous existence of competitive advantage. The concept of competitiveness has changed from the concept of price competitiveness – based on price analysis, production costs, exchange rate, across competitiveness that recognizes non-price factors. Honey sector's competitiveness in Serbia has been analyzed in the study by Ignjatijević *et al.* (2015). Even though price and non-price factors are significant, some are hard to quantify. Due to the impossibility of quantifying all factors, we selected the indices of comparative advantage. We focused our research on comparative advantage in exporting honey from Serbia to the EU market. The basis is international trade balance, so we observed production potential and indicators of international trade of honey on the EU market. With the aim of measuring Serbia's comparative advantage in exporting honey we used the Balassa index (B), revealed comparative advantage index (RCA), Revealed Symmetric Comparative Advantage (RSCA), and the level of specialization measured by Grubel Lloyd's index (GL) and Trade Balance Index (TBI).

B index was used in order to measure the level of comparative advantage in exporting honey from Serbia and the EU countries. The original index of revealed comparative advantage was first published by Balassa (1965):

$$B = \frac{Xij / Xit}{Xnj / Xnt} \tag{1}$$

Where X represents the export value, *i* indicate the country, *j* symbolizes the product (honey), *t* stands for all products and *n* for a group of countries or all countries. The Balassa index (B-index) is especially criticized because it is known to neglect different effects of agricultural policies and asymmetric values (Dalum *et al.*, 1998:102).

It is because of this criticism of the Balassa index that the RCSA index was applied in the paper, developed by Dalum *et al.* (1998). This transformed index is written in the following form:

$$\text{RSCA} = \frac{(\text{B} - 1)}{(\text{B} + 1)} \tag{2}$$

The RSCA index has a value between -1 and 1, with values between 0 and 1 indicating a comparative export advantage and the values between -1 and 0 a comparative export disadvantage.

The model that unifies exports and imports and seeks to unify the aforementioned shortcomings of the Balassa index by using an algorithm, is represented in following researches by Buturac (2008, 2009) and Ignjatijević *et al.* (2015). RCA leans on the Balassa index, and the formula for calculating competitive advantage is (Balassa, 1965):

$$RCA = \ln\left[\frac{X_i}{M_i}\right] \times \left(\frac{\sum_{i=1}^{n} X_i}{\sum_{i=1}^{n} M_i}\right) \times 100 \tag{3}$$

Symbol explanations:

- RCA = revealed comparative advantage;
- X_i (export of product) = honey i of country j in year t;
- M_i (import of product) = honey i of country j in year t;
- $\sum_{i=1}^{n} X_i$ = total export of all sectors of the country j, or world, in the year t;
- $\sum_{i=1}^{n} M$ = total import of all sectors of the country j, or world, in the year t.

In the previously listed formula, X represents the export value, whereas M is the import value. Index *i* symbolizes the product – the honey of selected economy. Positive value of the RCA index shows the comparative advantage and the bigger the value of RCA, the bigger the revealed comparative advantage of a certain products is.

TBI is employed to analyze whether a country has specialized in export (as net-exporter) or in import (as net-importer) for a specific product (honey). Trade Balance index published by Lafay (1992):

$$\text{TBI} = \frac{(\text{Xij} - \text{Mij})}{(\text{Xij} + \text{Mij})} \quad (4)$$

TBI index normalize the trade balance (export – import) of a certain product (honey) in a certain country (i) with respect to the amount of total trade (export + import) of that product in that country. It ranges from –1 to +1, when the index is positive the country (i) is a net exporter of product j (honey) otherwise is a net importer (Widodo, 2009:68).

For the analysis of the specialization level in intra-industry exchange (export and import) we used the GL. International trade exchange between two countries can be inter-industry (export or import) and intra-industry (Mihajlović *et al.,* 2017). Higher index value points out to a higher specialization level in intra-industry exchange, and a lower value of GL index shows that the international trade exchange is far closer to the inter-industry exchange. In this research the GL index shows the exchange character of Serbian honey sector with the EU countries as a group. Results should show how much Serbian honey sector is open to the EU market, i.e. is there import and export at the same time (propulsive sector – intra-industry exchange) or if trade is one sided (only import or only export – inter-industry exchange character). Serbian Republic Bureau of Statistics (http://www.stat.gov.rs), UN Comtrade and The International Trade Centre (ITC) do not have information on exports of different kinds of honey (acacia, linden, citrus, eucalyptus, chestnut, sunflower...) for Serbia. Grubel Lloyd's index is calculating in the formula (Grubel and Lloyd, 1975):

$$GL_i^t = \left(\sum_{i=1}^{n}\left(X_i^t + M_i^t\right) - \sum_{i=1}^{n}\left|X_i^t - M_i^t\right|\right) / \sum_{i=1}^{n}\left(X_i^t + M_i^t\right) \quad (5)$$

GL_i^t is the Grubel Lloyd's index. X_i^t is product export – honey, and M_i^t is import value. The index ranges from 0 to 1.

5. Results

The value of honey exported from the EU countries is significantly increasing, and it grew with the average rate of 11.84% a year from 2001 to 2015. Main destinations for exporting EU honey are other EU markets, which can mostly be found in Western Europe. More precisely, the most important destination for exporting is Germany with the rate of 8.83% growth rate of exports and 7.42% growth rate of imports. The second most important country for imports in 2015 was Great Britain, and then France, Belgium and Italy. There is an interesting trend of gradual shift in exports towards Eastern Europe. In fact, there was a significant increase in exports from Romania, Hungary, Bulgaria and Poland between 2001 and 2015. The research results of imports from the EU indicate that there is an annual increase with the average rate of 10.12%. According to the value of achieved import from the EU countries, Germany takes the first place, while there is a significant increase in the rate of imports in Poland in the analyzed period (Table 1).

Comparative overview of imports and exports points to an annual growth rate of exports for 11.68% and imports for 11.36% in the period from 2001 to 2015, which indicates that there is a tendency of growth in total exchange of honey in the world (Table 1). It is significant to point out that there was a significantly larger increase of average annual exports than imports in the analyzed period, which points to the choice of European countries to meet their high demand by their own production. It should be added that the increase of organic honey production is the evidence of promotion of general level of competitiveness in beekeeping. Germany is the leading country in the value of exports in the entire period. There is a positive

Table 1. List of top 10 EU exporters for 0409 honey product 2001-2015 in 000 $ (adapted from ITC database).

List of EU exporters for 0409 honey product 2001-2015 (thousand $)						
Exporters	**2001**	**Average 2001-2005**	**Average 2006-2010**	**Average 2011-2015**	**2015**	**Growth rate (%)**
World	457,816	740,431	1,151,973	2,049,361	2,349,498	11.68
European Union (EU 28)	132,388	236,675	405,338	663,521	695,058	11.84
Germany	40,494	69,546	100,463	136,242	139,402	8.83
Spain	15,281	30,616	56,214	94,489	101,505	13.52
Belgium	10,327	11,503	28,357	66,919	83,402	14.92
Hungary	19,255	40,255	63,058	77,089	79,292	10.11
Romania	8,339	16,243	29,121	48,199	46,045	12.20
Italy	7,902	10,323	19,353	44,067	43,800	12.23
Bulgaria	3,544	9,579	16,444	36,636	37,452	16.84
Poland	547	1,133	3,791	31,128	32,484	29.17
France	7,802	12,210	25,285	30,171	32,245	10.14
United Kingdom	1,804	4,096	10,205	19,210	19,287	16.92
List of EU importers for 0409 honey product 2001-2015 (thousand $)						
Importers	**2001**	**Average 2001-2005**	**Average 2006-2010**	**Average 2011-2015**	**2015**	**Growth rate (%)**
World	471,381	772,968	1,158,593	2,028,538	2,313,635	11.36
European Union (EU 28)	261,506	437,086	654,945	996,966	1,079,029	10.12
Germany	112,286	182,816	228,168	308,081	317,294	7.42
United Kingdom	36,516	60,867	98,134	126,650	129,654	9.05
France	22,563	40,854	78,084	119,625	127,306	12.36
Belgium	15,036	18,949	35,819	68,941	90,648	12.83
Italy	15,115	30,815	40,719	72,998	84,534	12.30
Spain	15,719	23,085	33,646	55,765	72,746	10.94
Poland	2,807	5,178	16,765	45,342	48,733	20.39
Netherlands	8,035	18,413	28,482	44,655	42,562	11.91
Austria	6,917	11,283	17,938	31,519	29,421	10.34
Denmark	7,255	10,613	13,787	18,437	21,988	7.92

balance of international trade of honey on a global level, while there is a deficit on the level of EU28. The biggest deficit is present in Germany, Great Britain, France and Italy. List of top 10 EU exporters of honey is present in Table 1.

The average value of exported honey from Serbia globally from 2006 to 2015 was $6,590 thousand. The export into Germany dominates with the average value of 2,397 thousand $. Italy takes the second place with the average value of Serbian export of $1,403 thousand (Table 2). The average exporting quantity of honey globally from Serbia, from 2006 to 2015 was 1,531 thousand tons. The main exports destination is Germany with the average amount of 560 thousand tons annually. Italy is in the second place with the average exporting amount of 335 thousand tons. Serbian honey export into EU countries is visible in Table 2.

Structure of exported Serbian honey into the EU is similar to total quantities since the most significant importing countries are Germany and Italy. Value analysis of exported honey shows that approximately 74% of that value is exported into the EU countries. It can also be concluded that the second five-year period of exports is more significant on entire EU level as well than the period from 2006 to 2010. The research results of the annual increase in exported amounts show a significant decrease on the EU market, i.e. Italy, Germany and Austria.

Table 2. Serbian honey export in period 2001-2015 and price of exported honey (adapted from ITC database).

Importers	Average 2006-2010	Average 2011-2015	2015	Average 2006-2015
Export in 1000 $				
World	20,926	10,254	9,670	6,590
European Union (EU 28)	2,355	6,887	5,929	4,873
Italy	400	2,205	2,764	1,403
Germany	1,158	3,388	2,028	2,397
Austria	457	507	471	493
Spain		292	454	292
Hungary	387	279	122	333
Export in 1000 tons				
World	803	2,258	2,045	1,531
European Union (EU 28)	657	1,552	1,288	1,154
Italy	134	496	576	335
Germany	297	770	424	560
Austria	115	121	112	119
Spain		75	129	75
Hungary	126	61	23	93
Exported unit value, US dollar/ton				
World	3,458	4,587	4,729	4,023
European Union (EU 28)	3,211	4,495	4,603	3,924
Italy	2,903	4,398	4,799	3,734
Germany	3,405	4,455	4,783	3,988
Austria	4,080	4,629	4,205	4,472
Spain		4,855	3,519	4,855
Hungary	3,130	4,643	5,304	3,887

As an expression of value, the price of honey is tied to the quality of honey on one side, and the production costs on the other. Considering different levels of export prices among the EU countries, the logical question would be how much is it reflected on the difference in quality (if it exists at all), level of demand, income level, margins, competition or consumer preferences. Since honey goes through strict control when it's imported in the EU countries, and it must possess regulated certificates, low price level of Serbian honey is related to consumer preferences, strong competition on the market, i.e. entrance strategy on certain markets. For example, Italian honey consumers show no interest in trying international honey, including Serbian. They use different kinds of honey, other than Acadian, flower and linden; they use citrus, chestnut, eucalyptus and sunflower honey. Serbia produces and exports only certain kinds of honey, such as Acadian, linden, flower and sunflower. Italian consumers favorite domestic beekeepers, which also influences the price of Serbian honey on such markets. The situation is similar to German market with the presence of strong competition. Another important factor is the distribution chain and margins of participants in the supply chain. It is within that context that there is a growth in demand for sweeteners in individual and industrial production. Packaging has a significant role when price of the product is determined, no matter the size or the appearance of the product. Innovative packaging of honey (as a squeeze bottle), also influenced an increase in demand and price (CBI; https://www.cbi.eu/market-information/honey-sweeteners/trends).

While analyzing the price on certain markets, we also can observe average import prices in the analyzed years. The average import price for Germany in 2014 and 2015 was 3.868$/t and 3.733$/t, Italy, 4.306$/t and 3.590$/t and Austria 4.358$/t and 3.995$/t (ITC). The average price of honey on the global level is 4,023 dollars. It is interesting that the highest exporting price of Serbian honey is achieved in following countries:

Bahrain, Jordan, UEA, Turkey, Great Britain and Belgium. The price achieved in Germany and Italy is significantly below the average and half bellow the price received when exporting to distant countries (ITC).

When analyzing the price while exporting in the EU countries it can be concluded that the prices achieved globally are as average in the same year, and the actual variations are very small. The value of exported honey for the same year was at the same level as when exporting in the EU, world and leading exporting countries.

Comparative advantage of exporting honey from Serbia and the level of specialization in international trade were measured by using the B index, RCA, RSCA, and the level of specialization measured by GL and TBI. Analysis of competitiveness index points to high value of uncovered comparative advantage of exports (B) whose average value in the analyzed period is 5.28. The value of expressed comparative advantage (RCA) is positive and averages at 2.75, which indicates the presence of stable positive value of exports in relation to imports. The value of RSCA varies from 0.09-0.89 with an average value of 0.58. The research results show that Serbia has a comparative export advantage in the period from 2006-2015. Indicators of Serbian exported honey are available in Table 3.

Specialization analyses in the international trade of honey points to the high level of inter-industry trade, which corresponds to asymmetrical trade where exports dominate. The average value of GL index is 0.034 and is in direct correlation with high revealed comparative advantage of (B) export. The research results of Serbia's specialization in exporting honey by using the TBI index show that Serbia was a net exporter in the analyzed period. The value of the TBI index ranges from 0.91 to 1, and the mean value is 0.97 which confirms the conclusion that Serbia had positive comparative advantage in exports, industry exchange character, i.e. Serbia is a net exporter of honey. Correlation of RCA, RSCA and B index is available in Table 4.

Revealed comparative advantage (Balassa – B), RSCA and derived comparative advantage (logarithmically processed RCA) are put in relation for the needs of a more detailed analysis of comparative advantage. Research results show that there is high, statistically important correlation between RSCA and Balassa (B), which can be expected. Since exporting values from both indices are put in relation, i.e. the influence of imports is excluded; the increase in Balassa (B) index will lead to the increase of RSCA. There is a statistical significance of correlation in the sample between RCA and RSCA. The research points that the correlations measured by Pearson's coefficient only have two pairs, while the Spearman's correlation only has three paired statistically significant relations.

Table 3. Indicators of Serbian exported honey (adapted from ITC database).[1]

Year	B	RSCA	RCA	GL	TBI
2006	1.20	0.09	1.52	0.09	0.91
2007	2.13	0.36	1.57	0.07	0.93
2008	2.38	0.41	2.21	0.02	0.98
2009	3.79	0.58	2.08	0.04	0.96
2010	7.78	0.77	2.26	0.04	0.96
2011	4.62	0.64	2.51	0.03	0.97
2012	11.93	0.85	4.31	0.00	1.00
2013	9.25	0.80	2.93	0.03	0.97
2014	4.74	0.65	4.87	0.00	1.00
2015	5.01	0.67	3.22	0.02	0.98
Minimum	1.20	0.09	1.52	0.00	0.91
Maximum	11.93	0.85	4.87	0.09	1.00
Mean	5.28	0.58	2.75	0.034	0.97

[1] B = Balassa index; RSCA = revealed symmetric comparative advantage; RCA = revealed comparative advantage index; GL = Grubel Lloyd's index; TBI = trade balance index.

Table 4 Correlation of RCA, RSCA and B index (Pearson and Spearman's Correlations) (adapted from ITC database).[1]

		Pearson Correlation			Spearman's Correlation		
		RCA	**RSCA**	**Balassa (B)**	**RCA**	**RSCA**	**Balassa (B)**
RCA	Correlation	1	0.637*	1.000	1.000	0.794**	0.794**
	Sig. (2-tailed)		0.047			0.006	0.006
	N	10	10	10	10	10	10
RSCA	Correlation	0.637*	1	0.794**	0.794**	1.000	1.000**
	Sig. (2-tailed)	0.047		0.006	0.006		
	N	10	10	10	10	10	10
Balassa (B)	Correlation	0.589	0.868**	1	0.794**	1.000**	1.000
	Sig. (2-tailed)	0.073	0.001		0.006		
	N	10	10	10	10	10	10

[1] RCA = revealed comparative advantage index; RSCA = revealed symmetric comparative advantage; * and ** = correlation is significant at the 0.05 and 0.01 level, respectively.

6. Discussion

Previous production and trade researches of agricultural and food products in Serbia have shown that it has a positive comparative advantage and that inter-industry trade is dominant (Ignjatijević and Milojević, 2011) in export of agricultural and food products, industry produced sugar, molasses (Raičević *et al.*, 2012) and especially honey (Ignjatijević *et al.*, 2014; Pocol *et al.*, 2017) which is confirmed by our researches.

As have Ignjatijević *et al.* (2015) previously pointed put, positive value of the RCA index, according to theory points to the presence of positive comparative advantage in exports. The conducted research points to an increase in comparative advantage of exports which is in correlation with the intra-industry exchange character, in accordance with conclusions of earlier researches by Ignjatijević *et al.* (2015). Within the analyzed period, positive comparative advantage is the result of existence of positive net export value (export-import). In fact, the value of exports is greater than the value of imports, which influenced a positive RCA. The conducted analysis of export and import value points to insignificant value of imported honey. The demand for honey in the domestic market is satisfied by domestic production, while the demand for import is insignificant. On the other side, growth in exports points to the existence of increased demand on the international market. Since domestic production of honey is faced with numerous problems, which have a negative influence on the level of price competitiveness on the international market, it can be concluded that high quality of honey is a crucial demand factor for international buyers.

The results of analysis of specialization in international trade of honey by using the GL index point to a high level of intra-industry trade, i.e. shows that Serbia is a dominant exporter of honey which is in accordance with the conclusions by Ignjatijević *et al.* (2015). The average value of the GL index is 0.034 and is in a direct correlation with high discovered comparative advantage (B) in exports. This was concluded by Ignjatijević *et al.* (2014) in previous researches. In the analyzed period, Serbia was a net exporter which is pointed out by the value of the TBI index (mid value is 0.97), confirming the conclusion that it had positive comparative advantage in exports, intra-industry exchange character, i.e. Serbia was a net exporter of honey.

Research shows that EU countries, especially Germany and Italy represent target markets for Serbian honey, which is in accordance with earlier conclusions made by Ignjatijević and Cvijanović (2017). Germany and Italy are also leading countries in value and amount of imported honey from Serbia, while the price of honey is at the level exported in other EU countries, which is in accordance with conclusions made by Pocol *et al.* (2017), Ignjatijević *et al.* (2015) and Ignjatijević and Cvijanović (2017). However the price of exported honey in EU countries doesn't correspond to its high quality. Organic honey and honey with geographical

indications should be sold at a much higher price, especially if the willingness to pay more is known for certain countries (CBI, 2015b). A logical question is why this isn't the case and how should this being overcome? Firstly, Serbia doesn't have records on export of different kinds of honey. Then, producers aren't organized as enterprises and don't pay sufficient attention and means to promotion of products, research of consumer preferences, which is pointed out in earlier studies (Ignjatijević *et al.,* 2015). Since trade companies deal with export, it's significant to point out that purchase prices are low and intermediaries obtain significant profit. Low purchase prices on the domestic market aren't stimulating a significant increase in production and introduction of innovations. The existing situation should be overcome by more profitable production and modernization in an organizational sense. The solution is certainly also the development of innovative packaging and honey products, which would be in accordance with specific consumer preferences (CBI, 2017).

Beekeeping should be performed by beekeepers in rural areas, since over 85% of Serbia is rural ground, which is in accordance with the conclusions made by Zarić *et al.* (2014) and Ignjatijević and Cvijanović (2017). Development of beekeeping is in direct correlation with development of rural areas, and their bases are sustainable development and protection of the environment, which is pointed out by Urbisci (2011) and Dirina and Bugina (2012). It's up to the farmers to choose a business strategy. From the researchers' aspect it's important to point to an increasing interest of consumers for agriculture such as clean production, vacation, tourism, education and other uses of rural grounds, such as beekeeping. Technical efficiency of agricultural holdings (authors point out beekeeping on farms) would contribute to an increase in the economic situation of farmers and their ecological performances, making a basis of sustainable rural development, as pointed out by Paracchini *et al.* (2015).

Improving life in rural areas implies engaging and empowering sensitive groups, especially young people, as pointed out by Saha (2003), Ahmad *et al.* (2017), Qaiser *et al.* (2013) and Pocol and Ilea (2011). Considering that agriculture is the leading economic activity in Serbia's rural areas, then commitment to beekeeping is at the same time commitment to a healthy environment. Development of beekeeping, especially organic beekeeping will additionally influence advancement of the environment and greater added value to products. Development of local products would complete the offer of export of Serbian honey. The government has a significant role in promoting beekeeping. Strategic documents and action plans are the key for defining short-term and long-term measures to encourage development. Considering the significance of beekeeping in agriculture, development of rural areas, protection of the environment, international trade, and the government designates cash assets from its budget. State institutions, Autonomous province Vojvodina's institutions, regional agencies and city administrations institutionally encourage development of beekeeping through subventions and financing projects. International financial assets are also significant sources of development. In the context of international relations, Serbia's accession process to the EU would significantly promote business in the honey sector by harmonizing legislations, and make it more profitable just like it did it for Romania (Pocol and Árváné, 2012).

7. Conclusions

Promoting competitiveness of beekeeping starts from determined comparative advantage of exports, and it is supposed to contribute to larger yields per hive, greater quality and wider use. When the increase of yield and quality are in question, firstly it is necessary to ponder and then promote educational, age and sex structure of producers. Data on the economic strength of producers are significant in that for the support measures to adjust to the developing groups. The strategy of promoting beekeeping should encourage socially endangered groups in less developed areas to deal with beekeeping. When they talk about the possibility of expanding beekeeping, they mainly think about integral development of tourism and beekeeping, the food industry and beekeeping, pharmacy and beekeeping. Previous studies of developing beekeeping in Serbia have not covered these areas of beekeeping production, even though multidisciplinary approach would significantly promote demand, and with it the supply. Connecting the aforementioned sectors and all factors of value chain with promoting production of honey with marked geographic original would stimulate export and finally foreign exchange inflow. Concept of promoting competitiveness in beekeeping should finally be directed

at organic production that would secure sustainable production which would contribute to improvement of the environment.

Research has shown that there is an increase in honey consumption in EU countries in recent years. Changes in consumer preferences have contributed to increased consumption – greater health concerns and nurturing a healthy life style. In this process education and propaganda on usefulness of consuming honey as well as struggle against forgeries have played a significant role. Balance deficit in EU countries is compensated through import. Germany, Britain, France and Italy are dominant importers. Beekeeping is a growing profession in Serbia, i.e. beekeeping represents a lucrative hobby on one side and a chance for a carrier on the other. Honey consumption in Serbia is stagnating while its production is growing. This tendency had a positive influence on foreign trade i.e. it resulted in an increase of export. Research results show that Serbia exports a significant amount of honey on the EU market. Export prices show significant oscillations depending on the market, but also quality, certificates, protected geographic origin, etc. The exchange is characterized with inter-industry character, i.e. the GL index points to a significant participation of exports in relation to imports. The TBI index, whose value confirms that Serbia is a net exporter, is in accordance with that. A set of comparative advantage indices of export shows that Serbia has high positive comparative advantage in export of honey on the EU market, which is in correlation with inter-industry exchange character.

Even though there are high positive values in the analyzed period, the comparative advantage analysis is "ex post" and it does not give the possibility of predicting the future. The conducted analysis provides an indirect conclusion on the state and problems of beekeeping and the influence of beekeeping on comparative advantages in export. The basic problem of beekeepers is direct appearance on foreign markets, which should be solved through creation of profitable associations and cooperatives. Primary responsibility for promotion of beekeeping belongs to its producers. The country's role is significant and its support measures for the development of agriculture have recognized beekeeping as an area with potential for development.

The conducting analysis also does not examine the influence of factors of beekeeping production on export and the influence of problems with which beekeepers encounter on the level of comparative advantage of exports. The result, in fact, only gives an indirect conclusion on the state and problems of the beekeeping sector. The basic problem, which needs to be solved in the future, is the creation of profitable organizations or cooperatives. Such organizations would provide beekeepers a direct access to the international market. The responsibility of promoting beekeeping is primarily the duty of producers, although the role of the state is very significant. The measures of state support for development of agriculture have recognized beekeeping as an area with a developmental potential.

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References

Ahmad, T., G.M. Shah, F. Ahmad, U. Partap and S. Ahmad. 2017. Impact of apiculture on the household income of rural poor in mountains of Chitral District in Pakistan. *Journal of Social Sciences* 6(3): 518-531.

Allsop, K.A. and J. B. Miller. 1996. Honey revisited: a reappraisal of honey in pre-industrial diets. *British Journal of Nutrition* 75: 513-520.

Balassa, B. 1965. Trade liberalization and revealed comparative advantage. the Manchester school, John Wiley & Sons Ltd and The University of Manchester, UK, 33: 99-123.

Bardy, J., N. Slevin, K.L. Mais and A. Molassiotis. 2008. A systematic review of honey uses and its potential value within oncology care. *Journal of Clinical Nursing* 17(19): 2604-2623.

Bekić, B., M. Jeločnik and J. Subić. 2013. Honey and honey products. *Works with XXVI consulting agronomists, veterinarians, technologists and economists* 18: 3-4.

Bogdanov, S. 2010. Apimondia first world conference in organic beekeeping. In: *Abstract book of Apimondia First World Conference on Organic Beekeeping*. Apimondia, Sunny Beach, Bulgaria, pp. 6-10.

Bračić, I. 2004. *Poduzetništvo u pčelarstvu.* A report prepared for the Days of honey in Zagreb, Hrvatski pčelarski savez, Zagreb, Croatia, 12-14 November 2004. Available at: http://www.pcela.hr/forum/viewtopic.php?f=3&t=19.

Buturac, G. 2008. Komparativne prednosti i izvozna konkurentnost hrvatske prerađivačke industrije. *Ekonomska istraživanja* 21(2): 47-59.

Buturac, G. 2009. Regionalne sličnosti i razlike strukture međunarodne trgovine u Hrvatskoj. *Zbornik Ekonomskog fakulteta u Zagrebu* 7(1): 1-16.

Centre for the Promotion of Imports from developing countries (CBI). 2015a. CBI trends– honey in Europe. Available at: https://www.cbi.eu/market-information/honey-sweeteners/trends.

Centre for the Promotion of Imports from developing countries (CBI). 2015b. CBI product factsheet: organic honey in Germany. Available online: https://www.cbi.eu/market-information/honey-sweeteners/trade-statistics.

Centre for the Promotion of Imports from developing countries (CBI). 2017. Which trends offer opportunities on the European honey market? Available online: https://www.cbi.eu/market-information/honey-sweeteners/trends.

Ćirić, M., S. Ignjatijević and D. Cvijanović. 2015. Research of honey consumers behavior in Province of Vojvodina. *Economics of Agriculture* 62(3): 627-644.

Commission Implementing Decision. 2016. 2016/1102 of 5 July 2016 approving the national programmes to improve the production and marketing of apiculture products submitted by the Member States under Regulation (EU) No 1308/2013 of the European Parliament and of the Council (notified under document C (2016) 4133). *Official Journal of the European Union L* 182: 55.

Commission Regulation. 2004. No. 1845/2004 of 22 October 2004 supplementing the Annex to Regulation (EC) No. 2400/96 on the entry of certain names in the 'Register of protected designations of origin and protected geographical indications' (Tergeste, Lucca, Miele della Lunigiana and Άγιος Ματθαίος Κέρκυρας (Agios Mathaios Kerkyras)). *Official Journal of the European Union L* 322: 14-15.

Cooper, R. and D. Gray. 2012. Is manuka honey a credible alternative to silver in wound care? *Wounds UK* 8: 54-64.

Dalum, B., K. Laursen and G. Villumsen. 1998. Structural change in OECD export specialisation patterns: despecialisation and 'stickiness'. *International Review of Applied Economics* 12(3): 423-443.

Dirina, I. and V. Bugina. 2012. Development assessment of the beekeeping industry in Latvia. *Economic Science for Rural Development* 29: 69-76.

Dugalić Vrndić, N., J. Kečkeš and M. Mladenović. 2011. The authenticity of honey in relation to quality parameters. *Biotechnology in Animal Husbandry* 27(4):1771-1778.

European Commission (EC). 2011. Commission Implementing Regulation (EU) No 241/2011 of 11 March 2011 entering a name in the register of protected designations of origin and protected geographical indications (Miele delle Dolomiti Bellunesi (PDO)). *Official Journal of the European Union L* 66: 15-16.

European Commission (EC). 2014. Commission Implementing Regulation (EU) No 328/2014 of 26 March 2014 entering a name in the register of protected designations of origin and protected geographical indications (Miele Varesino (PDO)). *Official Journal of the European Union L* 98: 9.

Gibbs, D. and I. Muirhead. 1998. The economic value and environmental impact of the Australian beekeeping industry. Available at: https://www.honeybee.com.au/Library/gibsmuir.html.

Grubel, H. and P. Lloyd. 1975. *Intra-industry trade: the theory and measurement of international trade in differentiated products*. Wiley, New York, NY, USA.

Grubić, R. 2008. Pčelarstvo u Zrenjaninu. *Rad muzeja Vojvodine* 50: 273-283.

Ignjatijević, S., M. Čavlin and D. Đorđević. 2014. Measurement of comparative advantages of processed food sector of Serbia in the increasing the export. *Economics of Agriculture* 61(3): 127-138.

Ignjatijević, S., M. Ćirić and M. Čavlin. 2015. Analysis of honey production in Serbia aimed at improving the international competitiveness. *Custos e agronegocio on line* 11(2): 194-213.

Ignjatijević, S. and D. Cvijanović. 2017. Exploring the global competitiveness of agri-food sectors and Serbia's dominant presence: emerging research and opportunities (advances in business strategy and competitive advantage); IGI Global, Hershey, PA, USA.

Ignjatijević, S. and I. Milojević. 2011. Komparativna prednost izvoza poljoprivrednih proizvoda i hrane Srbije i zemalja dunavske regije. *Economics of Agriculture* 58(1): 103-111.

Ignjatijević, S., I. Milojević and D. Božić. 2010. Economic aspects of Serbian comparative advantages in exports of vegetable matter. *Economics of Agriculture* 2: 161-165.

Ilić, B., N. Praća and I. Kolarski. 2016. Savremeni ekonomsko-politički aspekti novog svetskog poretka. *Oditor* 2(3):49-62.

International Trade Centre (ITC). Database available at: www.intracen.org.

Keča, L., M. Marčeta and M. Bogojević. 2012. Commercialisation of non-wood forest products on the territory of AP Vojvodina. *Bulletin of the Faculty of Forestry* 105: 99-116.

Lafay, G. 1992. The measurement of revealed comparative advantages in international trade modelling. Springer, New York, USA, pp. 209-234.

Marinković, S. and N. Nedić. 2010. Analysis of production and competitiveness on small beekeeping farms in selected districts of Serbia. Applied Studies in Agribusiness and Commerce, Agroinform Publishing House, Budapest, Hungary, pp. 1-5.

Matsop Tsafack, A.S., G. Muluh Achu, F. Kamajou, V. Ingram and M. Vabi Boboh. 2011. Etude comparative de la rentabilité de deux types d'apiculture au nord ouest Cameroun. *Tropicultura*. 29: 3-7.

Mickels, G. 2006. Small-scale woodland-based enterprises with outstanding economic potential: the case of honey. Center for International Forestry Research (CIFOR), Bogor, Indonesia.

Mihajlović, M., N. Imamović and N. Dragović. 2017. Uloga i značaj antimonopolske politike u savremenim uslovima poslovanja. *Oditor* 3(2): 100-106.

Mizrahi, A. and Y. Lensky. 1997. Bee products: properties, applications and apitherapy. Plenum Press, New York, NY, USA, pp. 83-87.

Mruk, H. 1987. Rynek miodu w Polsce. Instytut Rynku Wewnętrznego i Konsumpcji. Monografie i Syntezy, Warszawa, Poland, p. 47.

Nikitović D., M. Savić, N. Radičević and S. Jocić. 2000. Macro-and microelements of a product based on honey and common centaury. *Journal of Agricultural* Sciences 45(1): 43-47.

Paracchini, M.L., C. Bulgheroni, G. Borreani, E. Tabacco, A. Banterle, D. Bertoni, G. Rossi, G. Parolo, R. Origgi and C. De Paola. 2015. A diagnostic system to assess sustainability at a farm level: the SOSTARE model. *Agricultural Systems*: 133: 35-53.

Petković D., V. Zarić, N. Nedić, D. Beatović, S. Jelačić, Đ. Moravčević and A. Deljanin. 2012. Attitudes of Vlasina honey producers towards geographical indications. In: *Proceedings of 6th Central European Congress on Food*. CE Food Congress, Institute of Food Technology, Novi Sad, Serbia.

Pocol, C.B. 2012. Consumer preferences for deferent honey varieties in the North West Region of Romania. *Lucrari Stiintifice serie Agronomie 55*(2):263-266.

Pocol, C.B. and V.G. Árváné. 2012. A comparison between Hungarian and Romanian honey consumption. *Buletin Bulletin of University of Agricultural Sciences and Veterinary Medicine, Horticulture* 69(2): 244-252.

Pocol, C.B., A. Bârsan and A.A. Popa. 2012a. A model of social entrepreneurship developed in Barcău Valley, Sălaj County. *Analele Universităţii din Oradea* 11(1): 183-190.

Pocol, C.B., S. Ignjatijević and D. Cavicchioli. 2017. Production and Trade of Honey in Selected European Countries: Serbia, Romania and Italy. In: *Honey Analysis*, InTech, Rijeka, Croatia, pp. 1-20. Available at: http://tinyurl.com/y9nqh8d3.

Pocol, C.B. and M. Ilea. 2011. The development of local products in Romania: a case study of honey. *Agricultural Management/Lucrari Stiintifice Seria I, Management Agricol* 13(2).

Pocol, C.B., L.A. Marghitas and A.A. Popa 2012b. Evaluation of sustainability of the beekeeping sector in the North West Region of Romania. *Journal of Food Agriculture and Environment 10:* 1132-1138.

Pocol, C.B., C. Moldovan-Teselios and F.H. Arion. 2014. Beekeepers' association: motivations and expectations. *Bulletin of University of Agricultural Sciences and Veterinary Medicine, Horticulture* 1(1): 141-147.

Pocol, C.B. and A.A. Popa. 2012. Types of beekeeping practiced in the North West region of Romania – Advantages and disadvantages. *Bulletin of the University of Agricultural Sciences & Veterinary Medicine Cluj-Napoca, Horticulture 69*(2).

Popa, A.A., L.A. Mărghitaş and C.B. Pocol. 2011. Economic and socio-demographic factors that influence beekeepers' entrepreneurial behavior. *Agronomy Series of Scientific Research/Lucrari Stiintifice Seria Agronomie* 54(2).

Popa, A.A. and C.B. Pocol. 2011. A complex model of factors that influence entrepreneurship in the beekeeping sector. *Bulletin of University of Agricultural Sciences and Veterinary Medicine*, *Horticulture* 68(2).

Popescu, A. 2010a. Study on the economic efficiency of Romania's honey foreign trade. Scientific Papers: Series D. *Animal Science* 53:176-182.

Popkin, B.M. and P. Gordon-Larsen. 2004. The nutrition transition: worldwide obesity dynamics and their determinants. *International journal of Obesity* 28: 2-9.

Prodanović, R., J. Bošković and S. Ignjatijević. 2016. Organic honey production in function of enviromental protection. *Ecologica* 82(23): 315-321.

Qaiser, T., M. Ali, S. Taj and N. Akmal. 2013. Impact assessment of beekeeping in sustainable rural livelihood. Journal of Social Sciences, 2(2): 82-90.

Raičević, V., S. Ignjatijević and J. Matijašević. 2012. Economic and legal determinants of export competitiveness of the food industry of Serbia. *Industrija* 40(1): 201-226.

Romanian Ministry of Agriculture and Rural Development. 2016. Direcţia Generală De Industrie Alimentară, Recunoa Şterea Calităţii Mierii Române Şti La Nivel European, 1-13. Available at: http://tinyurl.com/yanjjfzb.

Saha, J. C. 2003. Beekeeping for rural development. its potentiality and beekeeping against poverty-Bangladesh perspective. In: *The 38th Apimondia Congress. Ljubljana, Slovenia 24-29*. Available at: http://www.apimondia.com/apiacta/slovenia/en/saha.pdf.

Schneider, A. 2012. Asian honey, banned in Europe, is flooding U.S. grocery store shelves. Available at: http://www.foodsafetynews.com/2011/08/honey-laundering.

Simeunović, T. 2016. Menadžerski aspekti međuzavisnosti zaštite životne sredine i budžeta, Oditor 2(1): 25-30.

Strayer, S. E., K. Everstine and S. Kennedy. 2014. Economically motivated adulteration of honey: quality control vulnerabilities in the international honey market. *Food Protection Trends* 34(1): 8-14.

Svečnjak, L., G. Hegić, J. Kezić, M. Dražić and D. Bubalo. 2008. Stanje pčelarstva u Republici Hrvatskoj, *Journal of Central European Agriculture* 9(3): 475-482.

Tesser, F. and D. Cavicchioli. 2014. *Economic aspects of beekeeping and honey productions in Italy and in Lombardy region, Seminarion sugli insetti utili – sala dei Cavalieri, Castelo Visconteo di Sant`Angelo Lodigiano / Venerdi 16 Ottobre 2014*. Museo Lombardi di Storia dell`Agricoltura, Sant`Angelo Lodigiano, Italy, pp. 41-52.

Urbisci, L. 2011. The economic effects of size and enterprise diversity on apiary profits in Canada. University of Guelph, Guelph, ON, Canada.

Widodo, T. 2009. Comparative Advantage: Theory, empirical measures and case studies. *Review of Economic and Business Studies (REBS)* 4: 57-82.

Wu, S., J.R. Fooks, K.D. Messer and D. Delaney. 2015. Consumer demand for local honey. *Applied Economics* 47(41): 4377-4394.

Zarić, V., Z. Vasiljević, N. Nedić and D. Petković. 2014. *The marketing strategies of Serbian honey producers. Agroinform Publishing House,* Budapest, Hungary, pp. 27-31.