

# COMPARATIVE STUDY OF THE BEEKEEPING SECTOR IN ROMANIA AND EUROPE

Lecturer PhD. Georgiana-Raluca L. DARU<sup>1</sup>, PhD. Student Florian MARIN<sup>2</sup>, PhD. Student Artur Lucian BR ILEANU<sup>3</sup>

## Abstract

*This study presents a comparative analysis of the beekeeping sector in Romania and Europe. The paper is structured in seven parts. The first 3 parts analyzes the competitiveness of the beekeeping sector at European level, analyzing the production and consumption of honey, and honey trade performance. The next 4 parts analyzes the competitiveness of the honey sector at national level, analyzing honey production, honey consumption, honey trade and a number of indicators which analyzes the competitiveness of honey trade in our country: the revealed comparative advantage, Grubel and Lloyd index, the exports and imports market share and net exports index. The paper ends with a set of conclusions drawn from the analysis.*

**Key words:** *beekeeping sector, trade, honey, market, consumption*

**JEL clasification:** Q11, Q17

## 1. INTRODUCTION

Honey is becoming increasingly popular with consumers for its nutritional benefits as well as many other functions. (Cosmina M. et al, 2016, p. 52) But, in the past decade has seen a multitude of dramatic reports on honeybee (*Apis mellifera*) declines that raised great public and societal concern. Indeed the value of honeybees for human society has been estimated to exceed 153 billion (Gallai, N. et al 2008, pp. 810–821). In this context, participation in international trade has become one of the most important factors in increasing the prosperity of countries. The EU is the second largest global producer of honey. However, it is not self-sufficient and is dependent on honey imports from other countries. (Ministry of Foreign Affairs, 2015) A global honey market with low honey prices in exporting countries may make it less attractive for professional beekeepers in importing countries to produce honey with their own colonies. (Moritz R. et al, 2016, pp. 44-50)

## 2. RESULTS AND DISCUSSIONS

### 2.1. HONEY PRODUCTION ON EUROPEAN LEVEL

The first part of the study examines the evolution of honey production in Europe. For the analysis were taken into consideration countries with high production of honey in Europe - Turkey, Ukraine, Russia, Spain, Hungary, Germany, Greece, France, Poland for a period of 5 years, between 2009-2013.

Analyzing the data presented in Table 1 it is observed that honey production had an oscillating evolution in European countries in the five years analyzed, with increasing and decreasing values from year to year. Yet even with this oscillating evolution, it can be

---

<sup>1</sup>Faculty of Agrifood and Environmental Economics, Bucharest University of Economic Studies, raluca.ladaru@eam.ase.ro

<sup>2</sup> Bucharest University of Economic Studies, marin.florian@bns.ro

<sup>3</sup> PhD Student, Bucharest University of Economic Studies, artur.braileanu@gmail.com

observed that the production value increased from 353877 tonnes to 372123 tonnes in the period 2009 - 2013, which means an increase of 5.16%.

Table 1 – Honey production on European level - tonnes -

	2009	2010	2011	2012	2013
<b>Europe</b>	353 877	348 603	374 300	347 926	372 123
<b>Turkey</b>	82003	81115	94245	89162	94694
<b>Ukraine</b>	74100	70873	70300	70134	73713
<b>Russia</b>	53598	51535	60010	64898	68446
<b>Spain</b>	32336	34550	34624	29735	30613
<b>Hungary</b>	22500	16500	24500	17500	18500
<b>Germany</b>	16460	23178	25831	15699	15700
<b>Greece</b>	16000	14300	14500	14800	15000
<b>France</b>	15527	13824	13788	11771	11414
<b>Poland</b>	14007	12467	13369	12176	15498
<b>EU</b>	204 725	204 391	221 445	190 632	203 840
<b>EU average</b>	7582,4	7570,0	8201,6	7060,4	7549,6

Source: faostat.org

According to the data, it can be seen that Turkey is the European country with the highest level of honey production, leading the ranking throughout the five years analyzed, followed at a big distance by Ukraine. A very interesting evolution is Russia, which since 2010 is in a continuous growth, approaching heavily to the second place of the top. At the bottom of the list was Spain and Hungary, with productions that do not exceed 35,000 tonnes (in the case of Spain) and 25,000 tonnes (in the case of Hungary).

## 2. HONEY CONSUMPTION AT EUROPEAN LEVEL

Analyzing the data presented in Table 2 is seen that Germany is the European country with the highest consumption of honey. Even if in the period 2007-2009 the level of consumption has declined in Germany, it has kept the first position in the ranking, taking advantage of the lower values registered in other European countries. Noteworthy is the evolution of honey consumption in Ukraine, a country where the value recorded in the period 2007-2010 was relatively high, but recorded a sharp decline, less than half of 2011 level. At the other side, countries with the lowest consumption of honey were Romania and Switzerland.

Table 2. The honey consumption in the first 10 European countries - tonnes -

	2007	2008	2009	2010	2011
Germany	88572	80052	77014	92199	84246
Russia	54018	58385	55763	56800	65325
UK	36071	36289	36711	35733	39336
France	34869	37116	35238	35274	36874
Spain	29517	30313	31332	30506	36508
Ukraine	64187	71764	66768	65597	30439
Italy	18803	19683	21990	16990	18113
Greece	17009	17594	17470	15233	15716
Romania	10828	13523	9799	12086	15295
Switzerland	10393	9461	10143	10523	11513

Sursa: faostat.org

Regarding the consumption of honey per capita, Switzerland holds the first place in 2011 with a consumption of 1.5 kg / inhabitant / year, followed by Greece, Austria and Slovenia. Those are the only European states that during the analyzed period the consumption recorded higher levels than 1 kg / inhabitant / year. In contrast, European countries with the lowest consumption of honey per capita in 2011 are Albania and Bosnia Herzegovina. Regarding Romania, in 2011 consumption of honey per capita registered a very low value compared to other European countries, with a value of 0.6 kg / inhabitant / year.

### 3. HONEY TRADE AT EUROPEAN LEVEL

#### 3.1 Honey export

Data analysis at European level indicates an upward trend in honey export, which is favorable from economic point of view. If in the first year of analysis (2010) at European level was recorded an export of over 537 mil. USD, in 2014 the level of honey exports recorded 879 mil. USD, with a growth of 38.9%.

Table 3. Honey export - thousand USD -

	2010	2011	2012	2013	2014
<b>Total</b>	1488279	1700097	1769206	2070376	2293052
<b>Europe</b>	537793	593637	640444	799716	879184
<b>Germany</b>	109864	120716	127246	134316	150310
<b>Spain</b>	81717	79184	79843	91483	120428
<b>Hungary</b>	60774	60117	63501	90467	95791
<b>Ukraine</b>	19954	27821	31113	52972	93198
<b>Belgium</b>	48782	54621	54773	72888	73063
<b>Romania</b>	41953	41230	44593	54572	53919
<b>Italy</b>	31236	32639	38392	59117	46384

Source: intracen.org

In terms of Europe's position in global export, the export value recorded is 38.34% of the export value recorded worldwide. Regarding the main exporters of honey in Europe, Germany ranks first among exporters of honey in terms of value. In the year 2014 Germany exports reached over 150 million USD, followed by Spain, with a difference of about 30 million USD. At the opposite side are Romania and Italy with honey export values between 46 mil. to 54 mil. USD.

From a quantitative perspective, honey export from Europe is significant. If in terms of value, the honey exports from Europe is 38.34% of total exports worldwide, quantitatively is 31.09% of the total amount of honey exported worldwide. If in terms of value, Germany is the top exporter of honey, we can not say the same in exports from a quantitative perspective, ranking only the 3rd place. This indicates a higher competitiveness of beekeeping sector in Germany rather than other European countries analyzed. On the opposite, as in the case of export in terms of value, is Romania, with over 10 thousand tonnes of honey annually exported throughout the analyzed period, excepting 2011.

#### 3.2 Honey import

The honey import places Europe in the top importers globally, with a share of 48.5% of total honey importers. Europe registered an upward trend in the years 2010 - 2014 and the average imports of honey in the analyzed period is 999.6146 million USD.

Table 4. Honey import

- thousand USD -

	2010	2011	2012	2013	2014
<b>Total</b>	1495798	1697404	1723178	2006958	2270860
<b>Europe</b>	878392	962439	912613	1075361	1169268
<b>Germany</b>	289073	277955	279468	322004	316172
<b>France</b>	95540	107695	92810	113220	153619
<b>UK</b>	114862	136819	107575	126422	132780
<b>Italy</b>	53363	57967	56116	75188	91182
<b>Belgium</b>	50846	56770	55841	68048	77641
<b>Spain</b>	38042	43559	48292	53047	61181
<b>Holland</b>	33053	52203	44855	53750	58525

Source: intracen.org

From the point of view of the main importers of honey in Europe, Germany ranks first in top of European importers, with a value of over 279 mil. USD

Analyzing the quantitative import, we see that Germany is in the same leading position, in 2013 registering the peak of imported quantity of honey. The quantitative share of imports in total imports of honey in Europe (48.45%) is approximately equal to the percentage of honey imports in value (45.50%). The countries with the lowest levels of imports of honey are Spain and Poland.

### 3.3 Trade balance

Table 5. Trade balance at European level

- tonnes -

	2010	2011	2012	2013	2014
<b>Total</b>	-7519	2693	46028	63418	22192
<b>Europe</b>	-340599	-368802	-272169	-275645	-290084
<b>Hungary</b>	59867	59702	61977	90204	93549
<b>Ukraine</b>	19662	27805	30877	52883	92951
<b>Spain</b>	43675	35625	31551	38436	59247
<b>Romania</b>	39570	37574	39449	49026	45617
<b>Bulgaria</b>	29292	25793	30161	41831	39077
<b>Republic of Moldavia</b>	1543	1230	2308	3073	9555
<b>Serbia</b>	7379	5046	12899	14641	8680

Source: intracen.org

At European level it can be seen that throughout the analyzed period, the imports were higher than exports, which led to obtaining a negative trade balance. It can be observed, however, that all countries analyzed have achieved positive trade balance, which transforms European states with a lot of tradition in honey production (such as Hungary, Ukraine) in net exporters of honey.

In terms of value, the trade balance in Europe, is also negative for the entire analyzed period.

## 4. HONEY PRODUCTION IN ROMANIA

Further in the study is analyzed the honey market in Romania, considering the production of honey, honey consumption, import and export of honey, all analyzed both as national and regional region. Regarding the production of honey, it can be seen that although

in the period 2010-2013 was recorded a slight increase, it reached in 2014 a fall of over 8000 tonnes. Analyzed from a regional perspective, it can be seen that the first position among honey producers is owned by South West Oltenia, closely followed by the North East Region. At the opposite pole lies Bucharest-Ilfov region. It is noted however that the evolution of honey production is fluctuating, following an upward trend in the period 2010 - 2011, followed by a decrease in 2012 and strong growth in 2013, both national and regional level. Also, it is observed that in the year 2014 the production of honey recorded the lowest values in the entire analyzed period, both national and regional level.

Table 6. Honey production in Romania - tonnes -

	2010	2011	2012	2013	2014
<b>North-West</b>	2771	3159	2910	3117	2291
<b>Center</b>	2891	3466	3354	3958	2533
<b>North-East</b>	3894	3692	3368	3433	2711
<b>South-East</b>	2650	2728	2922	3130	2246
<b>South-Muntenia</b>	3592	3318	3395	4152	2688
<b>Bucharest-Ilfov</b>	225	215	219	379	171
<b>South-West</b>	3409	4037	3797	4491	2718
<b>West</b>	2790	3512	3097	4018	2682
<b>Total</b>	22222	24127	23062	26678	18040

Source: INSSE

## 5. HONEY CONSUMPTION IN ROMANIA

Regarding the honey consumption in Romania, it can be observed an increasing level from 2010 to 2014. At national level, the significant increase is observed in 2010-2012, while in the following period, until 2014 there is a constant evolution.

Table 7. Honey consumption in Romania - kg/inhabitant/year -

	2010	2011	2012	2013	2014
<b>Total</b>	8,16	8,4	8,76	8,76	8,76
<b>Macroregion 1 (West and North West)</b>	10,2	10,08	10,68	10,32	10,68
<b>Macroregion 2 (South East and North East)</b>	6,72	6,48	7,8	7,92	7,8
<b>Macroregion 3 (BI and South Muntenia)</b>	7,8	8,16	7,68	8,16	8,16
<b>Macroregion 4 (South West and North West)</b>	8,64	8,88	9,24	8,76	8,88

Source: INSSE

The analysis at regional level indicates that the highest consumption of honey is registered in macroregion 1 (West and North West), which consumes 1.92 kg / inhabitant /year, more than the national average. At the opposite pole is macroregion 2 (South-East and North-East) where honey consumption recorded the lowest value, but the strongest growth from year to year.

## 6. HONEY TRADE IN ROMANIA

### 6.1 Honey export

Analyzing the data presented in Table 11 it can be seen that Romania has a fluctuating evolution of exports in 2010-2014, taking into account increases and decreases recorded from year to year.

Table 8 Honey export in Romania - tonnes -

	2010	2011	2012	2013	2014
<b>Total</b>	11017	9899	11460	12649	11116
<b>Germany</b>	6069	5402	5417	6754	5642
<b>Italy</b>	1183	1112	1440	1674	2019
<b>France</b>	121	404	704	998	1006
<b>Austria</b>	769	530	731	692	485
<b>UK</b>	1826	826	811	680	449
<b>Poland</b>	273	455	445	473	330
<b>Spain</b>	110	261	709	398	306
<b>Japan</b>	61	356	449	239	278
<b>Luxembourg</b>	78	0	0	0	238
<b>Israel</b>	9	95	197	149	161

Source: intracen.org

Regarding the destination of the exported honey, is seen that more than half of the exported honey from Romania goes to Germany. In 2014, Germany imported 5642 tonnes of honey from Romania, which represents 50.75% of the total honey exported by Romania. On 2nd and 3rd places in terms of our country's importers are Italy and France. On the opposite side are countries like the UK, which reduced the import from over 1800 tons of honey in 2010 to only 449 tonnes in 2014, or Luxembourg which hasn't imported honey at all from Romania in 2011 - 2013.

### 6.2 Honey import

Regarding imports, Romania is quite a small purchaser of honey from abroad and prefers domestic products. If in 2010 China was by far the biggest exporter of Romania, in the following period, this advantage was taken by Poland.

Table 9. Honey import in Romania - tonnes -

	2010	2011	2012	2013	2014
<b>Total</b>	880	1067	1712	2967	2577
<b>Poland</b>	0	121	197	302	785

<b>China</b>	467	244	568	325	548
<b>Republic of Moldavia</b>	0	0	0	138	379
<b>Spain</b>	4	26	150	1	195
<b>UK</b>	20	60	1	2	163

Source: intracen.org

### 6.3 Trade balance

Table 10. Trade balance for honey - tonnes -

	2010	2011	2012	2013	2014
<b>Romania</b>	10137	8832	9748	9682	8539

Source: intracen.org

Analyzing the data presented in Table 13 it is observed that Romania, throughout the period under review shows a positive trade balance for honey. It is also seen a fluctuating evolution, with decreases in values recorded in 2011 and 2014 (when was registered the lowest trade balance of trade with honey). From 2010 to 2014 the trade balance registered a decrease of 15.76%.

## 7. INDICATORS FOR ASSESSING THE PERFORMANCE OF EXTERNAL TRADE WITH HONEY

To evaluate the performance of external trade with honey, further in the study were calculated a set of indicators, such as: revealed comparative advantage, Grubel and Lloyd index, exports and imports market share and net exports index.

### *Revealed Comparative Advantage (RCA<sub>ij</sub>)*

Revealed comparative advantage index is used to assess countries' competitiveness in external trade and determine the comparative advantage of a given product.

Table 11 Revealed comparative advantage (RCA<sub>ij</sub>) for honey

	2010	2011	2012	2013	2014
<b>Romania</b>	2,754293	2,424877	2,094607	1,558805	1,570296

Source: own calculation based on Intracen.org statistics

Analyzing the data presented, it is observed that Romania has a high comparative advantage of trade with honey in total external trade of food products in the entire analyzed period, although the index register downward values in 2010 - 2013.

### *Grübel and Lloyd index*

This index can calculate the concentration of a country for import or export on certain categories of products

Table 12 Grübel and Lloyd index for honey

S	2010	2011	2012	2013	2014
<b>Romania</b>	0,989568723	0,991117557	0,990589843	0,99175725	0,993116618

Source: own calculation based on Intracen.org statistics

Analyzing the data presented, it can be seen that in Romania there is a balance in terms of imports and exports of honey during the entire period analyzed.

***The exports market share with honey (E<sub>h</sub>)***

The exports market share indicates the percentage held by a country's total exports worldwide, for a given product category.

Table 13. Exports market share with honey in Romania

<b>2010</b>	2,333254972
<b>2011</b>	2,010496257
<b>2012</b>	2,244554605
<b>2013</b>	2,142097491
<b>2014</b>	1,776587277

Source: own calculation based on Intracen.org statistics

Analyzing the data in the table, it is found that Romania has an exports market share of over 2% worldwide during the whole period analyzed, the highest share being recorded in 2010 and the lowest in 2014.

***The imports market share with honey (I<sub>h</sub>)***

The imports market share indicates the percentage held by a country's total imports worldwide, for a given product category.

Table 14 *Imports market share with honey in Romania*

<b>2010</b>	<b>0,176135272</b>
<b>2011</b>	0,212568856
<b>2012</b>	0,325888532
<b>2013</b>	0,50795053
<b>2014</b>	0,41914025

Source: own calculation based on Intracen.org statistics

Analyzing the data presented, it is observed that Romania has a market share of imports between 0.17 and 0.5%, with the lowest value in 2010 and the highest one in 2013.

***Net exports index (N<sub>h</sub>)***

This index ranges between -1 (when the country develops only import activities) and 1 (when the country develops only export activity).

Table. 15. *Net exports index with honey in Romania*

<b>2010</b>	<b>0,001045595</b>
<b>2011</b>	0,000836187
<b>2012</b>	0,000496852
<b>2013</b>	0,000257983
<b>2014</b>	0,000298088

Source: own calculation based on Intracen.org statistics

It can be observed that the net exports index was positive throughout the period analyzed, which means that the level of exports surpassed imports in each of the 5 years. The highest value of this index was registered in 2010 and the lowest in 2013.

## **CONCLUSIONS**

Following the completion of this study it can be concluded that Romania is a major player on the European market of honey, being one of the top producers and exporters of honey at European level, among Germany, France, Hungary, Turkey etc.

The main conclusions of the study are:

- At European level, both the production and consumption of honey recorded oscillating values and it was recorded a negative trade balance in every year of the analyzed period; however, the countries with a lot of tradition in the production of honey are net exporters in Europe and worldwide;
- In Romania, both nationally and regionally the evolution of honey production was fluctuating, following an upward trend in the period 2010 - 2011, a decrease in 2012 and a strong growth in 2013. Also, it is observed that in the year 2014 was recorded the lowest values in the entire analyzed period, both nationally and regionally;
- Regarding honey consumption in Romania is shown an increasing trend between 2010 – 2014. At national level, the significant increase is observed in the period 2010-2012, and in the next period until 2014 is observed a constant evolution;
- Romania, throughout the period under review shows a positive trade balance for honey. It is also seen a fluctuating evolution, with decreases in values recorded in 2011 and 2014 (when was registered the lowest trade balance with honey);
- Regarding the performance of external trade with honey, it is concluded that Romania has a high comparative advantage on trade with honey in total trade of agri-food products, throughout the period analyzed. It is also shown a balance in terms of the level of imports and exports and a positive net exports index for the entire period analyzed.

## **REFERENCES**

- Cosmina M., Gallenti G., Marangon F., Troiano S., 2016, Attitudes towards honey among Italian consumers: A choice experiment approach, *Appetite* 99, pp.52-58
- Gallai N., Salles J.M., Settele J., Vaissière B.E., 2008, Economic valuation of the vulnerability of world agriculture confronted with pollinator decline, *Ecol. Econ.* 68 (3), pp. 810–821
- Moritz R., Erler S., 2016, Lost colonies found in a data mine: Global honey trade but not pests or pesticides as a major cause of regional honeybee colony declines, *Agriculture, Ecosystems & Environment*, Volume 216, pp. 44-50
- Ministry of Foreign Affairs, CBI Trade Statistics: Honey in Europe, 2015, <https://www.cbi.eu/sites/default/files/trade-statistics-europe-honey-2015.pdf>