

ANALYSIS OF ROMANIA FRUIT AND VEGETABLE SECTOR COMPARED TO OTHER E.U. COUNTRIES DURING THE PERIOD 2007-2018

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Abstract

The fruit-vegetable sector is of major importance in Europe's economy, but is under-exploited, representing only 18% of total agricultural production. Although the beneficial effects of consuming vegetables and fruits are permanently promoted, it is still below the WHO recommended level of 400 grams daily for one person. In Romania things are no different, even if there is an extraordinary potential and a vast supply of fresh vegetables and fruits. On the one hand, the consumer is overwhelmed by the high purchase prices, on the other hand the producers have given up investing to create a competitive market to European standards, discouraged by the massive imports. To create a clearer picture of this sector, in this paper we set out to study the surfaces and productions of vegetables and fruits, the import and export and consumption of these products, in Romania compared to other countries of the European Union between 2007 and 2018.

Key words: vegetables, fruits, consumption, production, surfaces

INTRODUCTION

In the EU countries, an important role is played by the fruit and vegetable sector, especially in the Mediterranean region and a few countries in Eastern and Northern Europe.

The EU population growth requires a better and high quality supply of fruit and vegetables [3].

The most commonly marketed horticultural products on EU farms are apples and tomatoes. Most farms are small in size and have a high labor force, thus earning average incomes [8].

Despite favorable pedoclimatic conditions for the production of vegetables and fruits, agriculture in Romania does not align with the demands characteristic of the market economy.

From the existing statistical data and analyzes from numerous studies, it follows that in this sector, farms with areas of up to 3 ha predominate and over 90% of them are managed by persons, who apply a poor organization of production, the low degree of technology and marketing of products at the farm gate [4].

Romania has a wide range of vegetables and fruits, from domestic and imported products,

but consumption still remains below the values recommended by nutritionists.

In order to consolidate the position of this sector in the economy, the operators as well as to increase the consumption of vegetables and fruits, the EU offers to each country a set of support measures ("De minimis aid for the application of the program to support garlic production", "Support scheme for tomato product support program in protected areas").

MATERIALS AND METHODS

In the paper we used the following indicators: arithmetic mean, standard deviation, coefficient of variation. The formulas used to calculate these indicators are presented below [2].

For the arithmetic mean: $\bar{x} = \frac{\sum xi}{n}$;

where: X = moving arithmetic mean; xi = the values of the productions / areas over a number of years (i); n = number of years considered.

For the annual growth rate [1]:

$$r_{2007-2018} = \sqrt[n]{\prod (p1/p0)} - 1$$

where: r 2007-2018 = the annual rhythm;
 $\prod p_1/p_0$ = chained growth indicators.

For standard deviation: $\hat{\sigma} = \sqrt{\frac{\sum(\bar{x}-x_i)^2}{n-1}}$;

where: $\hat{\sigma}$ = standard deviation; x_i = the values of the productions / areas over a number of years (i); n = number of years considered.

For the coefficient of variation: $C = \frac{\hat{\sigma}}{\bar{X}} \times 100$,

where: C = coefficient of variation (expressed as a percentage)

The coefficient of variation can be: between 0-10% - small variation; between 10-20% - medium variation; over 20% - big variation.

The data used had as source: Eurostat, Faostat, National Institute of Statistics and data from the specialized literature.

RESULTS AND DISCUSSIONS

Analyzing the Eurostat database on the area of fruit trees (including the one with berries and nuts) at the European Union level, it is found that in 2018 it was 2.76 million ha, with 20.7% more than in the previous year [5].

The first three places with the largest surface cultivated with fruit trees in 2018 are owned by Spain in the first place with 1,024.42 thousand ha, which owns over 37.1% of the total area of the EU, followed by Italy with 418.4 thousand ha and Poland with 328.54 thousand ha.

Romania owns only 5% of the total area cultivated with fruit trees in the EU, with 137.86 thousand ha in 2018, placing it 7th.

The annual rate of -1.12%, shows us that the areas with trees decreased during the analyzed period in Romania, so that in 2018 we have 11.7% fewer hectares cultivated with fruit trees, compared to 2007.

Decreases in areas cultivated with fruit trees are also recorded in Italy with an annual rate of -1.18% and in France with a rate of -0.56%.

Spain has the highest annual growth rate in this period of 3.17%, the statistical data shows very large fluctuations of the surfaces, with a minimum of 76.71 thousand ha in 2008 and a maximum of 1,024.42 thousand ha in the year 2018. In the case of Spain and Italy, during the analyzed period, an increase of the surfaces with an annual rate of 1.25% and 1.15% is observed.

Table 1. Analysis of fruit tree surfaces and fruit production in the EU between 2007-2018

Fruits (including berries and nuts)		Greece	Spain	France	Italy	Poland	Portugal	Romania	EU
Surface (thousand hectares)	Minim	121.72	76.71	155.43	369.16	274.3	149.69	137.86	259.5
	Maxim	142.93	1,024.42	170.41	443.9	337.5	201.95	156.1	2,761.63
	Average	131.55	689.23	162.5	419.64	299.37	172.96	143.5	2,647.95
	STDEV	5.92	423.51	4.95	26.92	22.56	18.41	5.48	106.88
	Cvar (%)	4.5	61.45	3.05	6.42	7.54	10.64	3.82	4.04
	Annual growth rate	1.11	3.17	-0.56	-1.18	1.24	0.94	-1.12	*
	% of the EU at the level of 2018	5.2	37.1	5.8	15.2	11.9	7.3	5	100
Production (thousand tons)	Minim	1,394.8	2,840.9	2,754.5	5,684.6	1,266.6	488.6	1,001.5	25,794.1
	Maxim	1,965.1	4,895.1	3,500.8	5,954.4	4,872.9	787.9	1,754.4	28,146.3
	Average	1,603.3	3,929.8	3,137.7	5,857.4	3,214.7	620.3	1,248.7	26,970.2
	STDEV	195.9	852.2	251.2	107.3	990.7	80.5	202.3	1,663.3
	Cvar (%)	12.2	21.7	8	1.8	30.8	13	16.2	6.2
	Annual growth rate	2.72	6.55	-1.86	-1.15	14.42	2.04	4.69	*
	% of the EU at the level of 2018	6.98	16.67	9.79	20.2	17.31	2.41	6.23	100

Source: [5] Eurostat, [6] Ministry of Agriculture and Rural Development data processed - accessed 17.03.2020 - Cvar (%) <10% very homogeneous data series, the variation is small, the average is significant; 10-20% relatively homogeneous data series; > 20% heterogeneous data series, variation is very large, the average is not representative.

Regarding the fruit production obtained in 2018, Romania held a percentage of 6.23% of the total fruit production at European level,

ranking 6th, with a total production of 1.75 million tons, with an annual growth rate of 4.69% and a coefficient of variation of 16.2%

which indicates a relatively homogeneous data series. Even though it holds the largest share of the areas cultivated with fruit trees in the EU, Spain does not have the largest share of fruit production in the EU as a whole, with a percentage of 16.67%, being overtaken by Italy with a share of 20.20% and Poland with 17.31%.

In the case of fruit export, there is an oscillating trend, determined by the total productions obtained, which can influence the selling prices of the fruits for export. The highest value registered in the case of fruit export during the

analyzed period was in 2014 of 95,478 thousand euros.

The average growth rate of fruit export registered during 2007-2018 was 5.11%, with an average of the period of 64,268.45 thousand euros and a big coefficient of variation of 30.68%, so the average is insignificant.

The main countries in which Romania exported fruits are Italy (14,805 thousand euros), Germany (11,478 thousand euros) and France (8,878 thousand euros), with annual growth rates of 10.4%, 4.55% and respectively 29.89%.

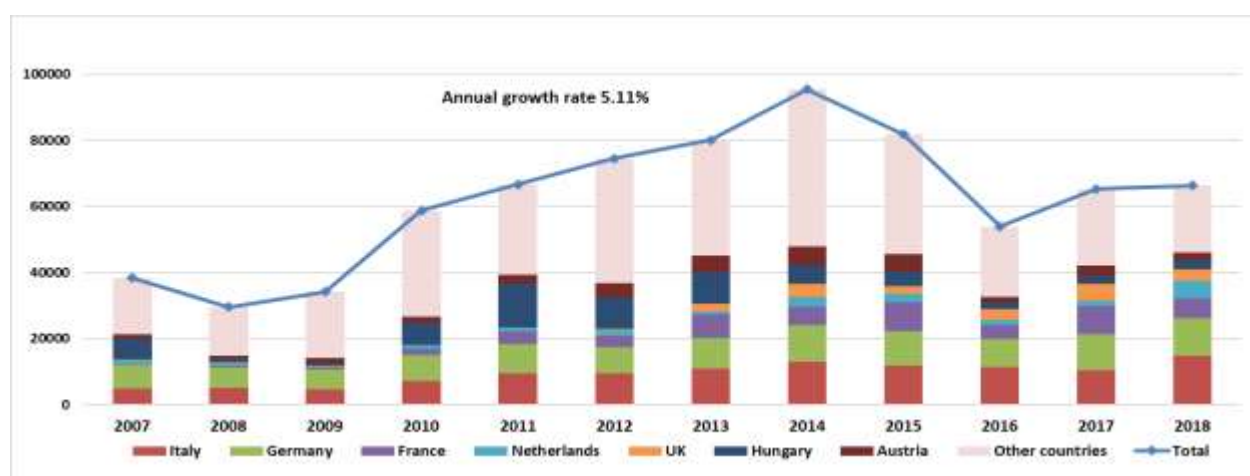


Fig. 1. The value of the fruits exported by Romania (thousands of euros)
 Source: Trade Map data [9], Accessed on 17.02.2020.

According to the data in Figure 1, the value of fruit imports followed an increasing trend reaching the amount of 639,428 thousand euros in 2018, due to the non-coverage of consumption from domestic production. It is noteworthy that the value of fruit imports has exceeded three times the value of the reference year 2007.

The average annual rate of increase in the value of fruit imports during the period studied (2007-2018) is 9.27%, the average period being 358,303 thousand euros, with a big coefficient of variation of 52.39%, so the data series is heterogeneous and the average is insignificant (Fig. 2).

Among the main countries from which Romania imported fruits in 2018, are Greece, Turkey, Holland, Germany and Poland with values of 117,215 thousand euros, 78,347 thousand euros, 75,237 thousand euros, 70,418 thousand euros and 65,796 thousand euros with annual growth rates of 10.91%, 5.79%, 17.46%, 20.71% and 27.03% respectively.

Figure 3 shows the trade balance of Romania, which registered an increasing deficit during the analyzed period, especially in the last years of the period, reaching a maximum of -573.09 million euros in 2018.

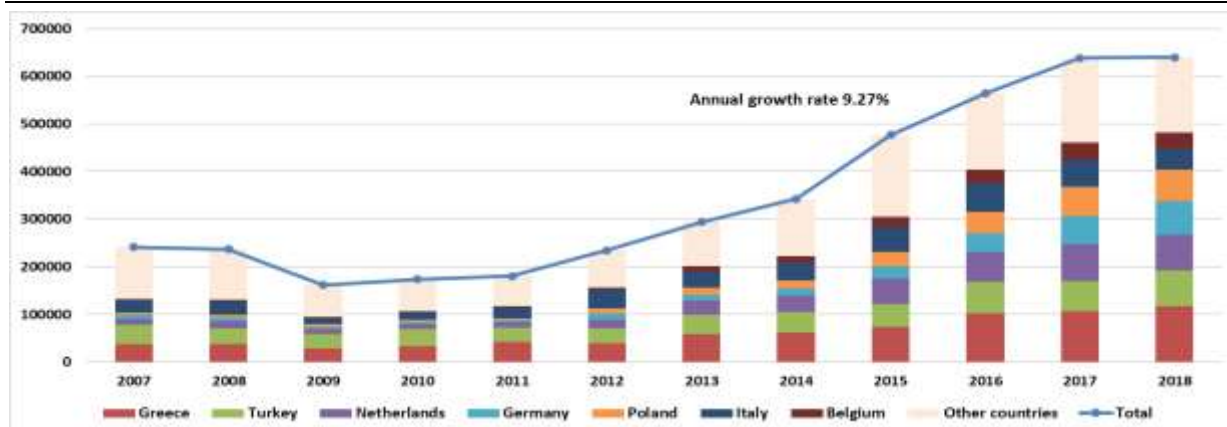


Fig. 2. The value of the fruits imported by Romania (thousands of euros)
 Source: Trade Map data [9], Accessed on 17.02.2020.

One reason why the trade balance has negative values is the massive import due to the lower prices of the imported products than the domestic ones as well as the fact that the

domestic production cannot cover the consumption and diversity of consumption of the national population [7].

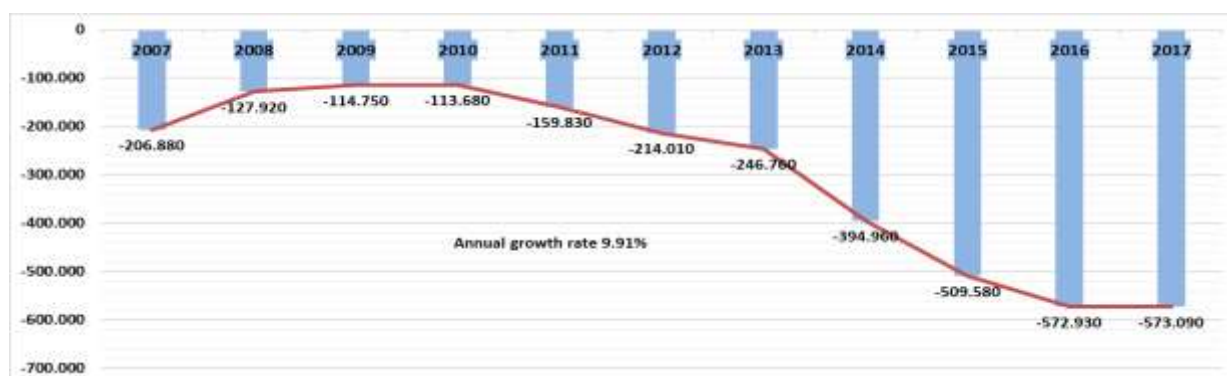


Fig. 3. Fruit trade balance for period 2007-2018 (million euros)
 Source: Trade Map data [9], Accessed on 17.02.2020.

In the following, we will analyze the situation at European level of the surfaces and vegetables production during 2007-2018.

It can be seen, from the data in Table 2, that the highest share of the total area cultivated with vegetables in the EU is owned by Italy with a percentage of 18.9%, even if during the analyzed period there is a negative annual growth rate of - 2%, followed by Spain with 17.7%.

Romania ranks 5th, after Poland, with a share of 6.7% of the total area cultivated with vegetables in the EU. In our country during the analyzed period the surfaces with vegetables decreased with an annual rate of -1.45%.

In 2018, the production of vegetables in the EU was 63.9 million tons, 2.7 million tons lower than the previous year, respectively by 4.2%.

Of the total EU production, over 42% is obtained in Spain and Italy with a share of 23.33% and 19.52% respectively. During the analyzed period, the production of vegetables in Romania grows at an annual rate of 1.8% but, at the level of 2018, Romania obtains only 4.2% of the production of vegetables in the EU, ranking 6th, after Germany which obtains 5.54%.

Romania, in order to ensure the need for vegetable products on the domestic market, is forced to resort to significant imports.

Table 2. Analysis of the areas cultivated with vegetables and vegetables production in the EU between 2007 and 2018

Vegetable		Germany	Spain	France	Italy	Poland	Romania	UK	EU
Surface (thousand hectares)	Minim	107.82	254.8	186.53	349.31	170.29	138.56	109.1	2,069.41
	Maxim	124.96	380.08	256.14	497	238.4	178.36	115	2,169.17
	Average	113.42	337.9	242.07	421.59	197.66	160.08	112.32	2,107.68
	STDEV	5.55	34.66	19.63	42.42	21.45	14.95	2.45	41.26
	Cvar (%)	4.89	10.26	8.11	100.06	10.85	9.34	2.18	1.96
	Annual growth rate	1.03	0.7	0.23	-2	0.17	-1.45	0.25	0.44
	% of the EU at the level of 2018	5.8	17.7	12.2	18.9	9	6.7	5.4	100
Production (thousand tons)	Minim	3,290.7	8,859.9	5,297.4	11,668.3	4,278.5	2,151.6	2,445.5	62,296.8
	Maxim	3,952.4	15,040	6,893.6	13,972.9	5,733.9	2,888.1	2,630.7	65,000.5
	Average	3,553.4	12,857.4	5,863.2	12,737.3	5,002.9	2,551.1	2,522.5	53,960.2
	STDEV	198.3	2,529.6	591.1	828.3	555.7	202.8	79.6	1,455.6
	Cvar (%)	5.6	19.7	10.1	6.5	11	8	3.2	2.3
	Annual growth rate	0.2	1.4	-1.8	-1	0.5	1.8	-0.1	-1.8
	% of the EU at the level of 2018	5.54	23.33	9.08	19.52	8.48	4.2	3.96	100

Source: [5] Eurostat, [6] Ministry of Agriculture and Rural Development data processed, Accessed 17.03.2020 - Cvar (%) <10% very homogeneous data series, the variation is small, the average is significant; 10-20% relatively homogeneous data series; > 20% heterogeneous data series, variation is very large, the average is not representative.

Figure 4 shows the upward evolution of the value of vegetable imports in Romania. Thus, if in 2007 the value of vegetable imports was about 141.2 million euros, in 2018 the value exceeded 424.5 million euros, being three times higher than in the reference year. The annual growth rate of vegetable imports during the study period was 10.53%. At the level of 2018, among the main countries from which Romania imported vegetables are Turkey (79.9 million euros), Holland (48.2

million euros) and Poland (48.5 million euros), with annual rates of growth for the period 2007-2018 of 5.07%, 16.92% and 13.23%. In the case of the value of vegetable exports, an oscillating trend is observed for the period 2007-2018, reaching the maximum of the period in 2017, with an export value of 139.7 million euros (Fig. 5). The annual growth rate of exported value was 7.8%.

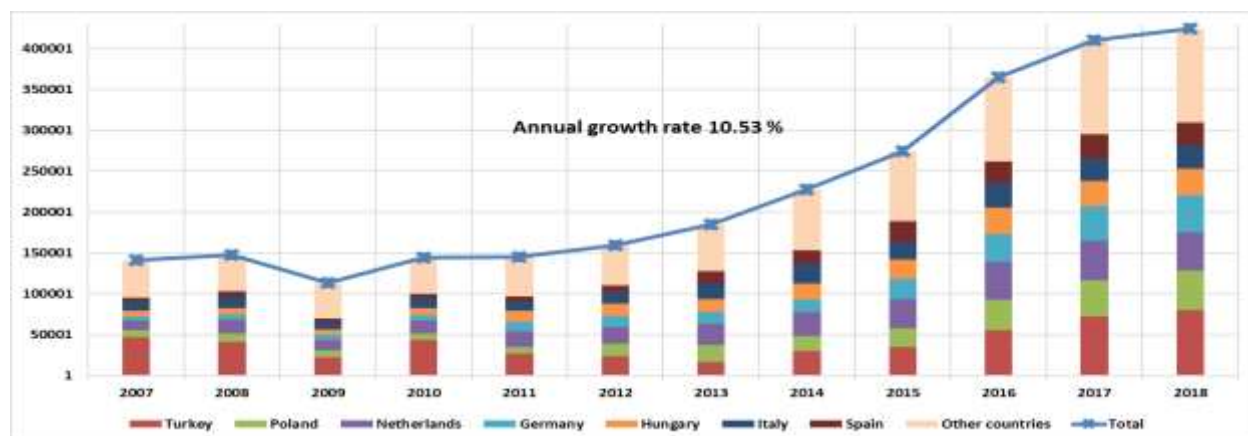


Fig. 4. The value of vegetables imported by Romania (thousands of euros)
 Source: Trade Map data [9], Accessed on 17.02.2020.

Among the main countries to which Romania exported vegetables are Italy (48.6 million

euros), Spain (15.8 million euros) and Germany (12.3 million euros).



Fig. 5. Value of vegetables exported from Romania (thousands of euros)
 Source: Trade Map data [9], Accessed on 17.02.2020.

The trade deficit registered by Romania presents an increasing trend, reaching a maximum of 327.27 million euros in 2018.

The annual growth rate recorded for the analyzed period was 11.52% (Fig. 6).

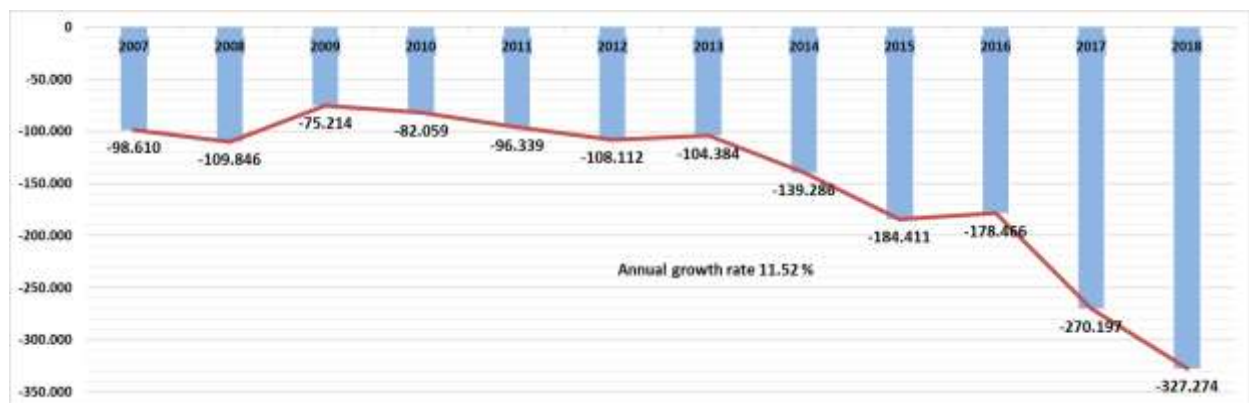


Fig. 6. Vegetable trade balance (million euro)
 Source: Trade Map data [9], Accessed on 17.02.2020.

CONCLUSIONS

From the studies and analyzes available so far, it turns out that in our country, in this sector, small farms predominate, with cultivated areas below 3ha. Their administration is done by individuals, without specialized knowledge, which leads to a poor organization of production, a low degree of technology and marketing of products, which are generally valorized at the farm gate.

Although Romania is not yet aligned with the requirements characteristic of the market economy of vegetables and fruits, it occupies an important place within the EU as the share of the areas cultivated with fruit trees and vegetables as well as of the products obtained

from fruits and vegetables, ranking in the first ten countries.

Within the Union, the largest area occupied by fruit trees is found in Spain, followed by Italy and Poland. Regarding this surface Romania is ranked 7th.

In terms of fruit production, at the level of 2018, Spain ranks first, while Romania ranks 6th.

Romania has exported fruit to Italy, Germany and France, while Romania's fruit import in 2018 was from Greece, Turkey, Holland, Germany and Poland.

Romania's trade balance registered a deficit as a result of the increase of fruit imports, the need for fruits at national level could not be covered from domestic production.

Regarding the areas cultivated with vegetables, the first place in the EU is owned by Italy, followed by Spain. Romania ranks 5th in this area.

In order to ensure the need for vegetable products on the domestic market, Romania has to resort to significant imports.

The main countries from which Romania imported vegetables in 2018 are: Turkey, Holland and Poland, while exporting to Italy, Spain and Germany.

As in the case of fruits, the trade balance of Romania registered a deficit as a result of the increase of the import of vegetables during the analyzed period.

In order to support the vegetable and fruit sector, the Romanian state has provided support measures for tomatoes and garlic, measures that could be extended to other horticultural products.

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