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THE VEGETABLE SUPPLY – A COMPARATIVE ANALYSIS

ABSTRACT

The vegetable market in Romania has certain particularities that differentiate it from the markets of other agricultural products, among which the most important are the following: the supply and demand atomization, seasonality, and zonality. The poor organization of the vegetable chain is reflected in the high vegetable prices, while the import role is to contribute to supply completion and to a lesser extent to supply diversification.

Key words: market, vegetables, supply, price.

JEL Classification: Q13.

1. INTRODUCTION

Being an absolutely necessary foodstuff in human consumption, the vegetables have high consumption stability and a well-defined role in the individual consumption. At world and European level, the supply of vegetables is going through a renewal and diversification process under the influence of the technical advance in production, of the increase of consumers' exigency and of the competition on the market. The vegetables supply is closely linked to the demand, being influenced by the production, production costs and market price.

2. STATE OF THE KNOWLEDGE

The average daily consumption of vegetables as recommended by the World Health Organization is about 400 grams. This level is reached in most EU Member States. The main objective of the vegetables sector in Europe is represented by competitiveness increase and a firm market orientation. The domestic vegetables market is subject to strong competitional pressure, which is increased by certain dysfunctionalities.

3. MATERIAL AND METHOD

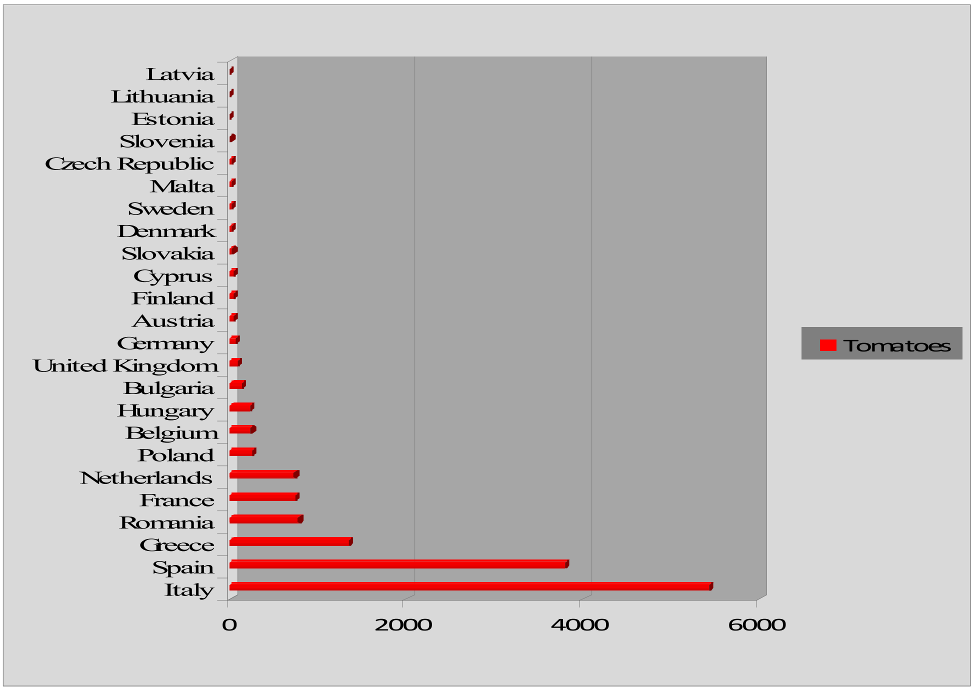
The study on the vegetables supply tried to investigate the *supply formation sources, the supply volume and structure, the factors influencing the supply,* to evaluate the *supply dynamics and distribution in the territory.* The data for this study were obtained from direct investigations and statistical sources. The processing of data enabled to draw certain conclusions regarding the supply evolution and the vegetable production profitability seen from the perspective of market prices.

4. RESULTS AND DISCUSSIONS

4.1. The Vegetable Supply on the European Union Market

In the European Union, the most important vegetables in terms of production are the tomatoes (about 14 million tons), the carrots (5.3 million tons) and the onion (5.5 million tons).

As a tomato producer, Romania is on the fourth place, with a total production of 5.55%, after Italy (38.69%), Spain (27.03%) and Greece (9.57%) (Graph 1).

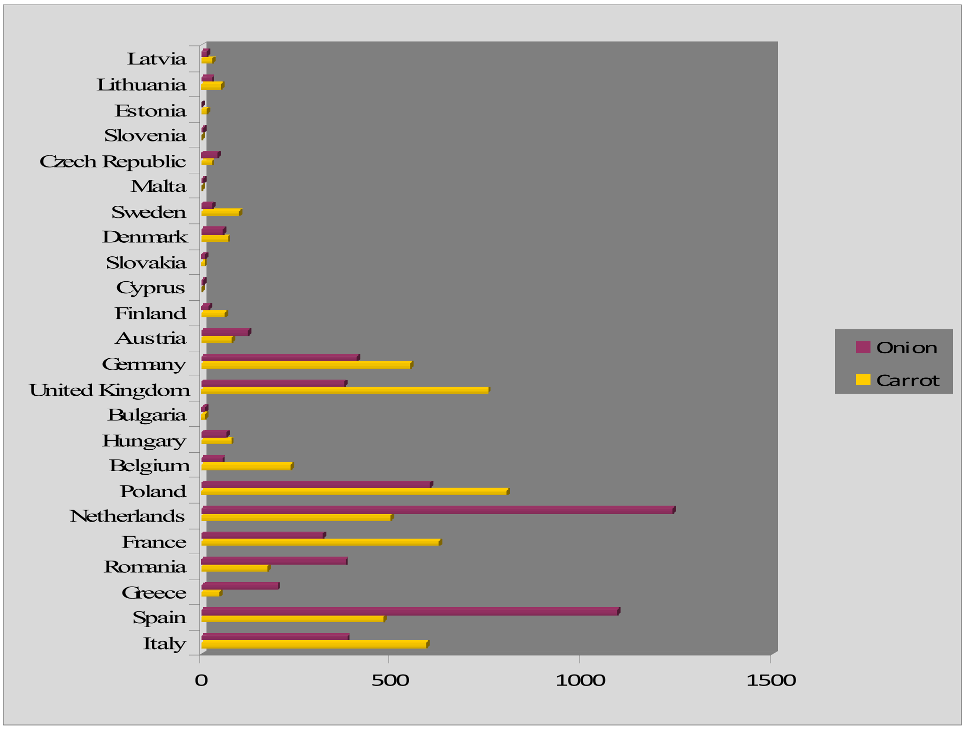


Source: Eurostat – Crop production.

Graph 1. The main tomato producers in the European Union.

The main carrot producers are Poland, with a share of 15.13% in total production, the United Kingdom (14.22%), France (11.82%), Italy (11.18%), Germany (10.35%), Netherlands (9.38%), Spain (9.04%) and Belgium (4.46%). Romania is on the 9-th position on this list, with only 3.33% in total production (Graph 2).

With a 7% share in total onion production, Romania is the sixth main producer, after Netherlands (22.62%), Spain (19.97%) Poland (10.96%) Germany (7.45%) and Italy (7.00%).



Source: Eurostat – Crop production.

Graph 2. The main carrot and onion producers in the European Union, thousand tons.

Compared to 2007, in the year 2008 in Romania, the producer prices were down in the main field vegetables (potatoes, tomatoes, onions and cabbages), except for the carrot prices. The same phenomenon took place in most EU Member States (Table 1).

From the hierarchy of producer prices, it can be noticed that for all the investigated products, Romania has higher prices compared to many European countries: the highest price is found in onion, i.e. 0.498 euro/kg; in tomatoes, Romania is on the 3rd place on the list, with 0.650 euro/kg, after Lithuania and the

Czech Republic; the 6th position in potatoes, with 0.228 euro/kg; compared to the countries from the same geographic zone, the price in Romania is by 158.9% higher compared to Poland, by 85.6% higher compared to Hungary and double compared to the Czech Republic; in white cabbage – 6th position, being outstripped by Luxemburg, Italy, Belgium, the United Kingdom and Greece; in carrots, with 0.612 euro/kg, Romania is on the 4th position, after Luxemburg, Greece and Cyprus.

Table 1

Producer prices for the main field vegetables, by EU Member States

Member State	**POTATOES**		**TOMATOES**		**CABBAGE**		**ONION**		**CARROT**	
	Price 2008	2008/ 2007	Price 2008	2008/ 2007	Price 2008	2008/ 2007	Price 2008	2008/ 2007	Price 2008	2008/ 2007
	euro/kg	%	Euro/kg	%	euro/kg	%	euro/kg	%	euro/kg	%
Belgium	0.087	-17.3	:	:	0.534	48.5	0.362	-10.0	0.375	10.6
Bulgaria	0.226	-11.2	0.249	-14.8	0.262	9.5	0.201	-28.9	0.254	-7.5
Czech Republic	0.142	-37.1	0.746	3.6	0.141	-14.4	0.213	-23.2	0.245	4.3
Denmark	0.299	28.1	:	:	0.330	-2.9	0.196	-37.1	0.325	0.3
Germany	:	:	:	:	:	:	:	:	:	:
Estonia	:	:	:	:	:	:	:	:	:	:
Ireland	:	:	:	:	:	:	:	:	0.512	5.1
Greece	0.462	-7.1	0.645	7.7	0.396	6.1	0.410	-16.4	0.653	13.3
Spain	0.222	-7.4	0.589	-8.2	0.300	0.2%	0.164	-33.2	0.292	8.8
France	:	:	:	:	:	:	:	:	:	:
Italy	:	:	:	:	0.630	36.0	:	:	:	:
Cyprus	0.560	48.3	:	:	:	:	0.390	13.6	0.620	-7.4
Latvia	0.141	13.6	:	:	:	:	0.275	12.7	0.186	61.3
Lithuania	0.182	-20.4	1.303	243.9	0.166	-15.0	0.212	-13.9	0.234	2.3
Luxembourg	0.362	-2.1	:		1.150	0.0	:	:	1.490	0.0
Hungary	0.155	-39.6	0.645	-8.1	0.274	4.2	0.179	-43.4	0.276	-7.2
Malta	0.240	-33.3	0.569	12.5	0.186	-12.8	0.476	-6.0	0.390	23.5
Netherlands	0.089	-50.4	:		0.210	10.5	0.066	-56.7	0.132	36.8
Austria	0.106	-43.4	0.341	32.9	0.238	8.9	0.104	-55.4	0.293	23.6
Poland	0.111	3.5	0.208	31.4	0.168	20.1	0.190	-14.9	0.092	19.8
Portugal	0.174	-15.4	0.394	23.4	0.285	-26.5	0.400	-23.6	0.219	25.6
Romania	**0.288**	**-12.7**	**0.650**	**-4.2**	**0.378**	**-12.5**	**0.498**	**-12.7**	**0.612**	**1.4**
Slovenia	0.185	1.1	:	:	0.230	17.4	0.284	-30.9	0.429	10.8
Slovakia	0.144	-27.4	0.159	13.5	0.126	0.0	0.180	-28.1	0.164	10.0
Finland	0.224	4.8	:	:	:	:	0.480	-20.4	0.477	0.5
Sweden	0.310	9.8	:	:	0.222	-16.0	0.176	-35.9	0.304	-1.4
United Kingdom	0.186	-10.7	:	:	0.460	-3.4	0.205	-47.1	0.451	-9.7

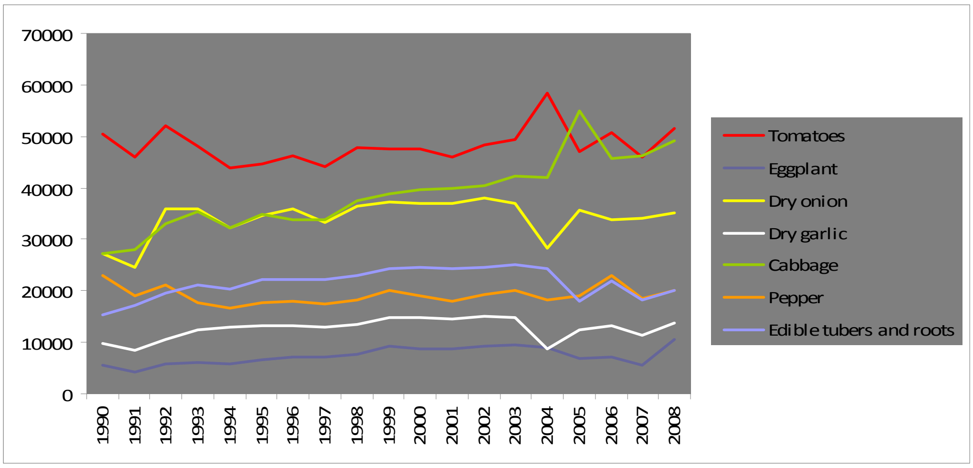
Source: calculations by:
http://epp.eurostat.ec.europa.eu/portal/page/portal/agriculture/data/database.

This situation can be explained by the low average yields, the higher costs and the extremely fragmented supply. At the same time, the subsidies received by the producers of vegetables in many EU Member States are significantly higher than those received in Romania. Another explanation provided by the professional organizations would be the absence of domestic supply organization, which makes it possible for intermediaries to establish the prices. The low purchasing power results in cheaper imports, even though the consumers prefer the domestic vegetables, which are tastier.

4.2. The Vegetable Supply on the Romanian Market

In the year 2008, the area under vegetables accounted for 2.9% of total arable area, and 3.4% of total cultivated arable area. At the European Union level, the share is quite similar.

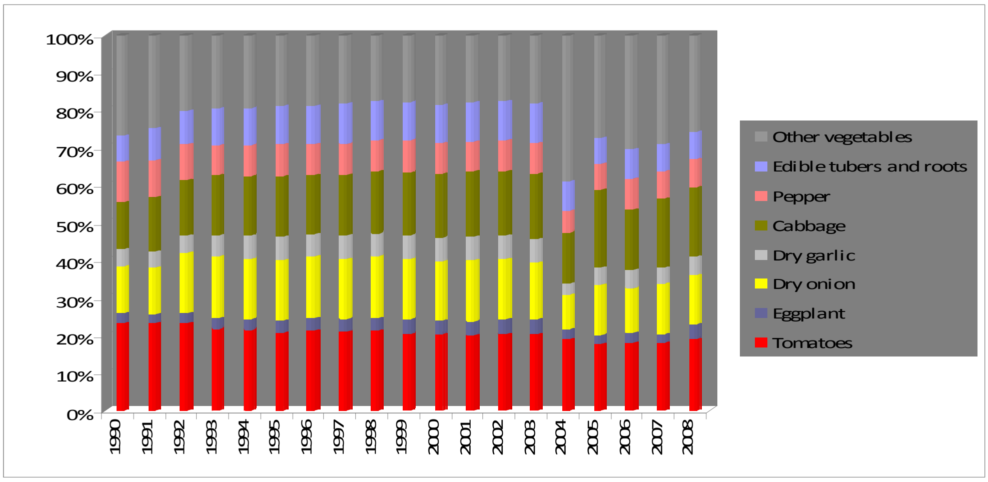
The total area cultivated with vegetables has an increasing trend with certain yearly variations: in the year 1990, the total area was 216 thousand hectares, in the year 2000 it increased to 234 thousand hectares, to reach 268 thousand hectares in 2008 (Graph 3).



Source: https://statistici.insse.ro/shop/

Graph 3. Evolution of the area under vegetables in the period 2000–2008, hectares.

This tendency is stronger in the case of white cabbage. In the structure, seven vegetable species cover almost 75% of the cultivated area. As share in the cultivated area, the tomatoes are on the first place, with 19%, followed by the white cabbage with 18%, dry onions with 13%, peppers 8%, edible roots and tubers 7%, dry garlic 5% and eggplants 4% (Graph 4).



Source: calculations based on the data from https://statistici.insse.ro/shop/.

Graph 4. Structure of area cultivated with vegetables in the period 2000–2008, %.

From the value point of view, the production of vegetables represented 19% of the total value of crop production in the year 2008. The total vegetable production increased in the period 2000–2008, with a maximum of 4774 thousand tons in the year 2004, but it significantly decreased in the year 2007, to reach only 3117 thousand tons of vegetables. The average yields per hectare are relatively low and different year after year, being strongly dependent on the weather factors (Table 2).

Table 2

Evolution of the average yields in vegetables in the period 2000–2008, tons/ha

Yield/hectare	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Vegetables – thou.tons	10.8	12.6	12.1	13.9	15.5	13.6	14.8	12.3	14.2
Tomatoes	13.2	14.2	13.6	16.6	22.7	13.3	16.5	13.9	15.8
Eggplant	10.9	12.7	13.1	13.7	16.8	14.2	14.0	11.7	14.6
Dry onion	8.0	10.7	9.0	9.5	11.8	10.2	11.6	9.5	11.3
Dry garlic	4.6	5.7	4.8	5.2	7.5	5.5	4.9	4.4	5.2
Cabbage	18.5	20.6	20.3	24.2	21.8	18.4	24.2	19.4	19.7
Peppers	9.2	10.3	10.3	12.4	13.1	10.7	12.1	9.9	11.8
Edible tubers and roots	10.4	12.5	12.3	13.2	14.4	12.7	13.3	11.5	13.3

Source: calculations by https://statistici.insse.ro/shop/.

Variability can be noticed in tomatoes, with minimum yields in 2007 and maximum yields of 22 tons/ha in 2004, and maximum 24t/ha in cabbage in 2003. Compared to the EU average, the average yield per hectare in tomatoes in Romania is almost 3-4 times lower. The yields slightly increased in 2008, except for the average yields in onions. The Romanian market features certain particularities that differentiates it from the markets of other agricultural products, among which the most important are the following: demand and supply atomization, seasonality of vegetable crops, and the existence of a low developed marketing system; at the same time, the demand for vegetables has a continuous character, while the supply is seasonal. In the National Institute for Statistics, the observance and collection of prices used in the calculation of average prices is made on a selective basis, by representative marketing channels, depending on the nature of product, using a sample consisting of 100 agri-food markets, 50 stockyards, about 100 processors, about 60 wholesalers and 50 commercial companies and research and agricultural production units.

Table 3

Average monthly and yearly prices of agricultural products sold on the agri-food markets, RON /kg

	Year 2008	**Jan. 2009**	**Feb. 2009**	**March 2009**	**Apr. 2009**	**May 2009**	**Jun. 2009**	**Jul. 2009**	**Aug. 2009**	**Sept. 2009**	**Oct. 2009**
Autumn cabbage	1.26	1.52	1.66	1.82	2.17	:	:	:	:	1.19	1
Field tomatoes	2.45	:	:	:	:	:	3.16	2.15	1.69	1.85	2.22
Field cucumbers	2.2	:	:	:	:	3.75	2.11	1.48	1.56	1.77	2.45
Carrots	2.25	2.1	2.04	2.03	2.28	2.76	3.24	2.84	2.3	2.18	2.1
Dry onions	1.83	1.81	1.78	1.72	1.74	1.76	1.81	1.88	1.72	1.64	1.69
Peppers	2.92	:	:	:	:	:	:	2.59	2	1.89	2.05
Eggplants	3.21	:	:	:	:	:	:	4.05	1.74	1.81	2.07
		2009 as compared to 2008, RON/kg									
Autumn cabbage	–	-0.59	-0.51	-0.49	-0.34	:	:	:	:	-0.11	-0.21
Field tomatoes	–	:	:	:	:	:	0.11	-0.05	-0.48	-0.45	-0.84
Field cucumbers	–	:	:	:	:	0.96	0.34	-0.11	-0.36	-0.71	-0.97
Carrots	–	-0.06	-0.05	-0.09	-0.01	0.21	0.45	0.38	0.18	0.1	-0.01
Dry onions	–	-0.14	-0.13	-0.16	-0.17	-0.16	-0.15	-0.06	-0.06	-0.11	-0.05
Peppers	–	:	:	:	:	:	:	-0.75	-0.73	-0.75	-1.08
Eggplants	–	:	:	:	:	:	:	-0.27	0.23	-0.03	-0.37

Source: calculations by https://statistici.insse.ro/shop/.

From the NIS data, it results that in the year 2009, the monthly price of fresh vegetables was significantly lower compared to 2008, except for the prices in May and June.

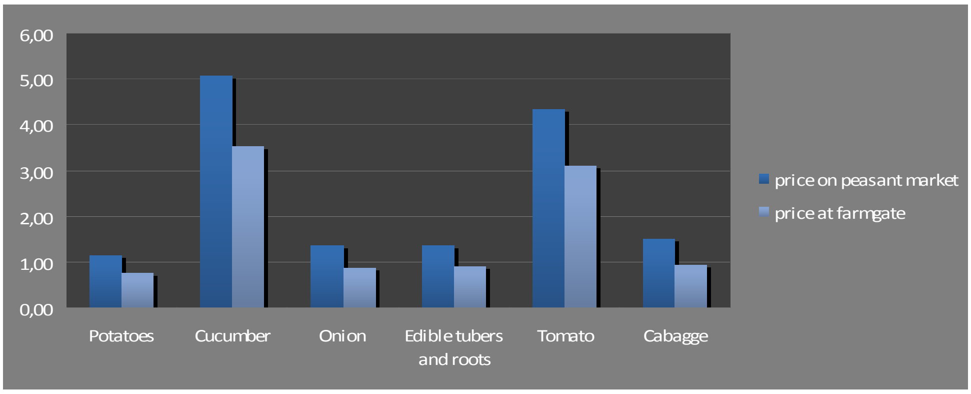
4.3. The analysis of prices from Agronet Prices database

The information coverage area is represented by the prices of eight products collected on the territory of 14 counties. The minimum number of products per county is one (for example, in the county Suceava there are prices only for potatoes), and the maximum number of products is 4 (e.g. the county Galați with: peppers, cucumbers, lettuce and tomatoes). The prices are given by two marketing channels: at farm gate (for the production delivered to processing) and prices on the peasant market. We mention that the prices do not include value added tax (VAT).

The prices for the following products were inputted and processed in the Agronet Prices database:

– peppers: Galaţi, Ialomiţa, Ilfov;
– potatoes: Braşov, Constanta, Harghita, Suceava;
– cucumbers: Brăila, Buzău, Galaţi, Ilfov, Olt,Prahova;
– onions: Brăila: Buzău Constanta Olt;
– roots: Braşov Constanta Dâmboviţa Dolj Ialomiţa Olt Prahova;
– tomatoes: Brăila Galaţi,Ilfov Olt Prahova;
– cabbages: Buzău Dâmboviţa Ialomiţa Prahova;
– lettuce: Buzău Dâmboviţa Galaţi Ilfov.

The yearly price for each product in part was calculated for the products for which prices were supplied throughout the year and it represents an average of the above-mentioned counties. A synthesis of the results for the yearly prices, by the two marketing channels, is given in Graph 5.



Source: Agronet Prices database.

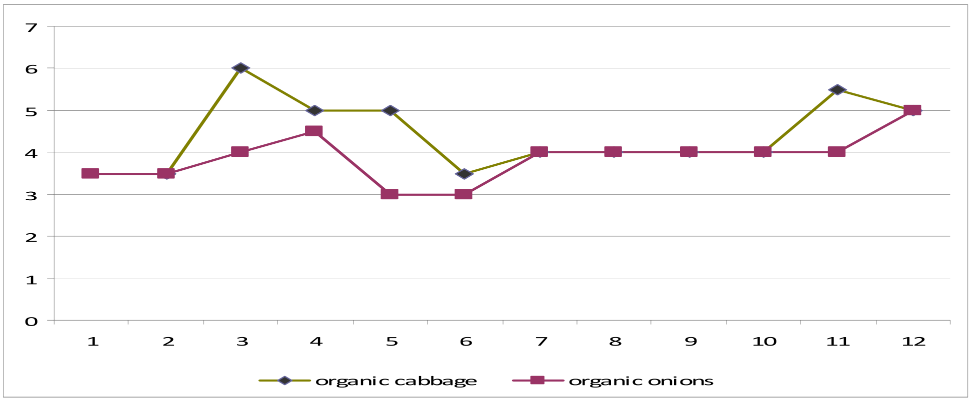
Graph 5. The average yearly price by marketing channels in the year 2009, RON/kg.

The difference between the price on the peasant market and the farm gate price does not represent only the profit, the transport and handling costs being also included here, as well as other costs related to the marketing of products. In this respect, the calculated differences by each product, in decreasing order, are the following: 64% for lettuce, 57% for cabbages, 55% for potatoes and onions, 50% for roots, 44% for cucumbers, 40% for tomatoes. Yet a higher percentage for lettuce does not mean a higher profitability compared to cabbages, as the high perishability level may lead to higher losses through depreciation.

For tomatoes and cucumbers, which are also perishable products, a higher profitability can result from their production all over the year, under intensive systems (in glasshouses and under plastic foil) and the storage of this production in specially equipped storage houses, under controlled environment.

This can contribute to the prolongation of the supply period on the market. Although in the out of season period, the vegetables consumption is significantly lower, the prices are quite attractive, which is a serious reason for the domestic supply enlargement.

For the organic vegetables, the farm gate price is maintained constant, starting with the seventh month up to the tenth month of the year, when it is lower compared to the winter and the spring months. For the cabbage produced under organic system, the average yearly price was 4.12 RON/kg, while for the organic onion 3.87 RON/kg. The price difference between the organic and the conventional vegetables is almost 3 RON/kg for onions and 2.7 RON/kg for cabbages.



Source: Agronet Prices database.

Graph 6. Evolution of monthly farm gate prices for organic vegetables, in the year 2009, RON/kg in Călăraşi county.

4.4. Market supply balance

The market analysis reveals that the imports of vegetables doubled in the last five years (Table 4).

Table 4

Supply balance, total vegetables (melons included), thousand tons

Specification		2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008
A.	**RESOURCES**	**3814.2**	**4412.4**	**4827.6**	**4049.8**	**4502.6**	**3578.1**
1	Utilizable production	3514.9	4122.9	4476	3624.7	4138.9	3116.8
2	Imports	299.3	289.5	351.6	425.1	363.7	461.3
B.	**UTILIZATIONS**	**3814.2**	**4412.4**	**4827.6**	**4049.8**	**4502.6**	**3578.1**
3	Exports	49.7	16.5	26.4	23.7	24.2	21.0
4	**Stock variation (+/-)**	–	**23.5**	**2.7**	**-26.2**	–	–

Table 4 (continued)

5	**Domestic use**	**3764.5**	**4395.9**	**4801.2**	**4026.1**	**4478.4**	**3557.1**
–	Seeds	4.3	4.3	4.1	2.4	3.8	3.3
–	Fodder	381	453.5	492.4	254.6	262	342.8
–	Losses	152.6	176.5	193.1	391	328.2	250.1
–	Human consumption	3226.6	3738.1	4108.9	3404.3	3884.4	2960.9
	Share of imports in consumption	**9.3%**	**7.7%**	**8.6%**	**12.5%**	**9.4%**	**15.6%**
	Share of exports in production	1.4%	0.4%	0.6%	0.7%	0.6%	0.7%

Source: Supply balances for the main agri-food products, year 2008, NIS.

The imports of vegetables have as main purpose to meet the demand and to a lesser extent supply diversification. Thus, most often vegetables are imported – tomatoes, potatoes and onions – which together account for 50% of the country's imports of vegetables.

5. CONCLUSIONS

Owing to the natural soil fertility and diversity of weather conditions, Romania stands out by its high potential for the field vegetables production. This potential is put into value used by the diversified range of cultivated vegetables and increase of land areas cultivated with competitive vegetable varieties.

There are serious dysfunctionalities along the vegetables chain that result from production organization. Among these, the following are worth mentioning:

– large number of small-sized units, the holdings up to 3 ha prevailing, with a poor endowment in modern production and harvesting means;

– high fragmentation level of land areas under vegetables;

– excessive dependence on the weather factor;

– deficiencies in irrigating the crops in due time;

– abandoned protected spaces.

The production commercialization represents the most difficult problem along the chain. The vegetables are most often directly sold at the farm gate to the beneficiary or to the intermediaries that supply the urban markets.

The domestic vegetable supply is competing against the large supermarkets that prefer homogeneous batches and a smooth supply of fresh vegetables: less than 10% of the domestic production is sold along this channel.

A strength of the domestic production of vegetables is represented by their good taste, which remains one of the main appreciation criterion. However, the high price of the domestic supply as compared to imports determines the consumers with low purchasing power to opt for imported vegetables.

A positive aspect represented by the modernization of the processing units could act as a stimulating factor of the supply for processing and not only to absorb the production surplus on the fresh vegetable market.

The main strategic point to be reached remains the supply concentration through marketing association forms, which can represent sector modernization vectors.

An opportunity for labour force use in the vegetable farming sector is represented by the organic production; at present, in EU, the demand of organic products is higher than the supply of such products. This presupposes the existence of long-term measures to support conversion to organic production.

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