

CONSIDERATIONS ON ROMANIA'S VEGETABLE MARKET

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Abstract

The paper aimed to present the situation of Romania's vegetable market in the period 2007-2011 based on the statistical data regarding the main vegetables: tomatoes, onion, garlic, cabbage, green peppers and melons. The vegetable production increased by 33.99 from 3,166.8 tons in 2007 to 4,176.3 tons in 2011. This was due to the yield gain as follows: 58.55 % for melons, 27.62 % for green peppers, 27.05 % for tomatoes, 25.99 % for dry garlic, 24.96 % for dry onion, 12.61 % for white cabbage. In 2011, the contribution of various categories of vegetables to production was: 24.55 % white cabbage, 21.81 % tomatoes, 15.45 % melons, 9.44 % onion, 6.06 % green pepper, 1.59 % garlic and 21.1 % other vegetables. The contribution of the micro regions to vegetable production in 2011 was: 19.46 % South Muntenia, 18.95 % South East Romania, 17.30 % South West Oltenia, 15.92 % North East Romania, 10.43 % West Romania, 8.47 % North West Romania, 6.54 % Central Romania, 2.93 % Bucharest Ilfov. Vegetable production per inhabitant is higher in Romania compared to the average production per capita in the EU. The average consumption increased as a positive aspect reflecting the obtained production and import. Vegetable production should increase in order to cover much better the domestic market needs and support export to the EU market.

Key words: cultivated area, market, production, Romania, vegetables

INTRODUCTION

Vegetables are rich in a large variety of nutrients important for human diet: fibers, vitamins (A, C, K, etc), minerals (K, Ca, Mg, Fe, Zn etc), and also proteins and fats in small amounts. Due to their chemical composition, vegetables are recommended to be consumed in the daily diet in 3-5 portions mainly as fresh, chopped, boiled vegetable and also as vegetable juice [1, 2].

Due to the intensive campaign on vegetable importance in the human diet for a healthy life, vegetable consumption has continuously increased. From this point of view, Romania comes on the 6th position in the EU, after Italy, Germany, Spain, France and Poland [5]. Romania has a high production potential being able to carry out a large variety of vegetable along the year due to its climate and soil conditions which offer them a special taste. Vegetable production has a seasonal character which means that is not able to cover market needs in all the seasons. Also, another feature is the fact that vegetables have

to be consumed immediately after harvesting, in general as fresh vegetables in order to preserve their content in vitamins.

In this context, this paper aimed to present the actual situation in Romania regarding cultivated area, yield and production, their distribution in the territory, consumption and trade in order to identify the main trends in the vegetable market.

MATERIALS AND METHODS

The paper is based on the data collected from Romania's Statistical Yearbook, 2012 and regards the period 2007-2011. Also, some data were collected from FAOStat, 2012 and EuroStat, 2012. The following aspects have been approached: vegetable cultivated area, its structure by vegetable category and by macro and micro regions in the territory, vegetable yield, vegetable production, its structure by vegetable category and its distribution in the territory, vegetable production per inhabitant, consumption and average annual consumption per inhabitant,

vegetable trade balance. They were processed using the well known index, share and comparison methods.

RESULTS AND DISCUSSIONS

Surface cultivated with vegetables increased by 3.94 % from 253.4 thousand ha in 2007 to 8,081.6 thousand ha in 2011. The share of cultivated area with vegetables in the total cultivated land registered a slight increase from 3.25 % in 2007 to 3.27 % in 2011 (Table 1).

Table 1. Evolution of cultivated area with vegetables and its share in the total cultivated land, 2007-2011

	MU	2007	2008	2009	2010	2011	2011/2007 %
Romania's cultivated area	Thousand ha	7,777.1	7,798.1	7,884.1	7,807.4	8,081.6	103.91
Cultivated area with vegetables	Thousand ha	253.4	268.6	267.1	262.7	263.4	103.94
Share of vegetables	%	3.25	3.44	3.38	3.36	3.27	-

Source: Romania's Statistical Yearbook, 2012. Own calculation. [3]

Cultivated surface by vegetable category.

The cultivated surface increased in general for all the categories of vegetables except dry onion and melons. The highest growth was registered by tomatoes in the period 2007-2011, accounting for 12.60 %. In 2011, the cultivated land with tomatoes was 51.8

thousand ha compared to 46 thousand ha in 2007. On the 2nd position, it is situated green pepper whose cultivated area increased by 7.52 % from 18.6 thousand ha in 2007 to 47 thousand ha in 2011.

Table 2. Evolution of cultivated area by vegetable category, 2007-2011 (thousand ha)

	2007	2008	2009	2010	2011	2011/2007 %
Cultivated land with vegetables	2534	268.6	267.1	262.7	263.4	103.94
Tomatoes	46.0	51.5	49.1	49.8	51.8	112.60
Dry onion	34.1	35.0	35.2	33.8	33.1	97.06
Dry garlic	11.5	13.8	13.1	12.8	12.1	105.21
White cabbage	46.1	49.0	48.3	47.0	47.0	101.95
Green peppers	18.6	20.2	20.0	21.0	20.0	107.52
Melons	31.0	29.7	33.5	31.5	30.9	99.67
Subtotal	187.3	199.2	199.2	195.9	194.9	104.05
Other vegetables	66.1	69.4	67.9	66.8	68.5	103.63

Source: Romania's Statistical Yearbook, 2012. Own calculation. [3]

The dry garlic comes on the 3rd position because its cultivated area increased by 5.21 % from 11.5 thousand ha in 2007 to 12.1 thousand ha in 2011. The surface cultivated with white cabbage increased by 1.95 % from 46.1 thousand ha in 2007 to 47 thousand ha in 2011. The cultivated land with melons decreased by 0.33 % from 31 thousand ha in 2007 to 30.9 thousand ha in 2011. The cultivated area with dry onion declined by 2.94 % from 34.1 thousand ha in 2007 to 33.1 thousand ha in 2011 (Table 2).

Structure of cultivated area with vegetables by vegetable category. In 2007, the cultivated land with vegetables had the

following structure: 18.19 % white cabbage, 18.15 % tomatoes, 13.45 % dry onion, 12.23 % melons, 7.34 % green peppers, 4.53 % dry garlic and 26.11 % other vegetables.

In 2011, it was recorded the following structure of the cultivated land with vegetables: 19.66 % tomatoes, 17.84 % white cabbage, 12.56 % dry onion, 11.73 % melons, 7.59 % green peppers, 4.59 % dry garlic and 26.03 % other vegetables.

Therefore, a slight increase of the share of the cultivated area was registered in case of tomatoes, garlic, green peppers, while a slight decline was recorded in case of dry onion and white cabbage.

Distribution of cultivated land with vegetables by macro and micro regions was the following one in 2011: 34.19 % macro region M2, 28.90 %, macro region M4, 21.50 % macro region M3 and 15.41 % macro region M1. By micro region, the order of importance regarding the cultivated land with

vegetables was the following one: 19.25 % South Muntenia, 17.69 % North East Romania, 17.25 % South Oltenia, 16.50 % South East Romania, 11.65 % West Romania, 8.67 % North West Romania, 6.74 % Central Romania, 2.25 % Bucharest-Ilfov (Table 3).

Table 3. Land cultivated with vegetables by macro and micro region in 2011

Macro/Micro Region	Cultivated land (ha)	%
Total	263,359	100.00
M1 Macro region	40,605	15.41
-North West	22,840	8.67
-Center	17,765	6.74
M2 Macro region	90,067	34.19
-North East	46,605	17.69
-South East	43,462	16.50
M3 Macro region	56,626	21.50
-South Muntenia	50,710	19.25
-Bucharest Ilfov	5,916	2.25
M4 Macro region	76,061	28.90
-South West Oltenia	45,439	17.25
-West	30,622	11.65

Source: Romania's Statistical Yearbook, 2012. Own calculation. [3]

Structure of cultivated land with vegetables in the territory by vegetable category in 2011.

-Tomatoes were cultivated in macroregions as follows: 39.18 % in M4, 34.68 % in M2, 24.79 % in M3 and 11.35 % in M1. By micro region, the share of cultivated land with tomatoes, in the decreasing order was the following one: 21.21 % South Muntenia, 19.84 % West Romania, 19.34 % South West Oltenia, 19.15 % South East Romania, 15.53 % North East Romania, 6.36 % North West Romania, 4.99 % Central Romania, 3.58 % Bucharest Ilfov.

-Onion was cultivated as follows: 37.05 % M2, 25.95 % M4, 19.40 % M3 and 17.58 % M1. By micro region, the situation was the following one: 21.33 % North Eastern Romania, 17.77 % South Muntenia, 15.72 % South Eastern Romania, 14.65 % South West Oltenia, 11.30 % West Romania, 9.09 % Central Romania, 8.49 % North Western Romania, 1.63 % Bucharest Ilfov.

-White cabbage was cultivated by macro region as follows: 29.35 % M4, 27.16 % M2, 24.40 M3 and 19.99 % M1. By micro region, in the decreasing order of the share of the cultivated surface, the situation was the

following one: 22.16 % South Muntenia, 18.74 % North East Romania, 16.09 % South West Oltenia, 13.26 % West Romania, 10.10 % North West Romania, 8.99 % Central Romania, 8.42 % South East Romania, 2.24 % Bucharest Ilfov.

-Green peppers weight in the cultivated area with vegetables by macro region was : 43.39 % M2, 34.90 % M4, 18.50 % M3 and 3.21 % M1. By micro region, the situation was the following one: 33.91 % South East Romania, 28.42 % South West Oltenia, 18.07 % South Muntenia, 9.48 % North East Romania, 6.48 % West Romania, 2.67 % North West Romania, 0.54 % Central Romania, 0.43 % Bucharest Ilfov.

Vegetable Yield increased in case of the vegetable categories taken into consideration in this study, reflecting a better use of varieties and applied technologies. Tomato yield increased by 27.05 % from 13,916 kg/ha in 2007 to 17,602 kg/ha in 2011. Dry onion yield increased by 24.96 % from 9,526 kg/ha in 2007 to 11,904 kg/ha in 2011. Dry garlic yield increased by 25.99 % from 4,359 kg/ha in 2007 to 5,492 kg/ha in 2011. White cabbage average production increased by 12.61 % from 19,364 kg/ha in 2007 to 21,807

kg/ha in 2011. Melon average production grew by 58.55 % from 13,161 kg/ha in 2007 to 20,868 kg/ha in 2011 (Table 4).

Table 4. Vegetable Yield, 2007-2011 (kg/ha)

	2007	2008	2009	2010	2011	2011/2007 %
Tomatoes	13,916	15,814	15,395	15,443	17,602	127.05
Dry onion	9,526	11,294	10,748	10,908	11,904	124.96
Dry garlic	4,359	5,244	4,812	5,250	5,492	125.99
White cabbage	19,364	19,680	20,724	20,858	21,807	112.61
Green peppers	9,931	11,824	12,295	11,592	12,674	127.62
Melons	13,161	18,942	19,490	21,055	20,868	158.55

Source: Romania's Statistical Yearbook, 2012. Own calculations. [3]

Vegetable production increased by 33.99 % from 3,116.8 tons in 2007 to 4,176.3 tons in 2011. This was due to the increase of cultivated surface and mainly due to the yield gain. Tomatoes production increased by 42.17 % from 640.8 tons in 2007 to 911 tons in 2011. Dry onion production increased by 21.32 % from 325 tons in 2007 to 394.3 tons in 2011. Dry garlic production increased by

33.46 % from 49.9 tons in 2007 to 66.6 tons in 2011. White cabbage production increased by 14.78 % from 893.2 tons in 2007 to 1,025.3 tons in 2011. Green peppers production grew by 37.10 % from 184.9 tons in 2007 to 253.5 tons in 2011. Melon production increased by 58.21 % from 408 tons in 2007 to 645.5 tons in 2011 (Table 5).

Table 5. Evolution of vegetable production, 2007-2011 (tons)

	2007	2008	2009	2010	2011	2011/2007 %
Vegetable production:	3,166.8	3,819.9	3,901.9	3,863.6	4,176.3	133.99
Tomatoes	640.8	814.4	755.6	768.5	911.0	142.17
Dry onion	325.0	395.6	378.1	369.1	394.3	121.32
Dry garlic	49.9	72.3	63.2	67.2	66.6	133.46
White cabbage	893.2	964.6	1,001.9	981.2	1,025.3	114.78
Green peppers	184.9	238.7	245.7	243.5	253.5	137.10
Melons	408	562.3	652.8	662.9	645.5	158.21
Subtotal	2,501.8	3,047.9	3,097.3	3,092.4	3,296.2	131.75
Other vegetables	615	771	804.6	771.2	880.1	143.10

Source: Romania's Statistical Yearbook, 2012. Own calculations [3]

Contribution of various vegetables to production. In 2007, the situation was the following one: 28.65 % white cabbage, 20.55 % tomatoes, 13.09 % melons, 10.42 % dry onion, 5.93 % green peppers, 1.60 % dry garlic, 19.76 % other vegetables. In 2011, the decreasing order of the contribution of vegetables to production was: 24.55 % white cabbage, 21.81 % tomatoes, 15.45 % melons, 9.44 % onion, 6.06 % green pepper, 1.59 % garlic and 21.1 % other vegetables.

Distribution of vegetable production in the territory by macro region was the following one in 2011: 34.87 % M2, 27.73 % M4, 22.39

% M3 and 15.01 % M1. In the decreasing order, the contribution of the micro regions to vegetable production was the following one in 2011: 19.46 % South Muntenia, 18.95 % South East Romania, 17.30 % South West Oltenia, 15.92 % North East Romania, 10.43 % West Romania, 8.47 % North West Romania, 6.54 % Central Romania, 2.93 % Bucharest Ilfov.

-Tomato production was achieved by macro region as follows: 36.64 % M2, 26.57 % M4, 25.05 % M3 and 11.74 % M1. By micro region, tomato production was carried as follows: 23.04 % South East Romania, 19.01 % South Muntenia, 18.18 % South West

Oltenia, 13.60 % North East Romania, 8.39 % West Romania, 7 % North West Romania, 6.04 % Bucharest Ilfov, 4.734 % Central Romania.

-Onion was achieved as follows: 24.10 % M4, 38.45 % M2, 19.24 % M3, 18.21 % M1. By micro reion, the situation was the following one: 20.99 % North East Romania, 18.04 % South Muntenia, 17.46 % South East Romania, 13.09 % South West Oltenia, 10.10 % Central Romania, 9.01 % West Romania, 8.82 % North West Romania, 1.20 % Bucharest Ilfov.

-Cabbage was produced as follows: 27.24 % in M3, 27.24 % in M2, 26.50 % in M4 and 19.02 % in M1. The production achieved by macro region was presented as follows: 24.42

% South Muntenia, 18.94 % North East Romania, 14.87 % South West Oltenia, 11.63 % West Romania, 9.81 % North West, 9.21 % Central Romania, 8.30 % South East Romania, 2.82 % Bucharest Ilfov.

-Melon production was carried out by the following contribution of macro regions: 44.63 % M2, 35.71 % M4, 16.25 % M3 and 3.41 % M1. The contribution by micro region was: 36.10 % South East Romania, 29.11 % South West Oltenia, 15.86 % South Muntenia, 8.03 % North East Romania, 6.60 % West Romania, 3.02 % North West Romania, 0.39 % Central Romania and 0.39 % Bucharest Ilfov (Table 6).

Table 6. Vegetable production by macro and micro region, 2011 (kg)

Region	Vegetable production	Tomato	Onion	Cabbage	Melons
Production:	4,176,298	910,978	394,305	1,025,293	645,486
M1	627,034	106,949	71,814	195,022	22,016
North West	353,968	63,847	34,795	100,587	19,558
Center	273,066	43,102	37,019	94,435	2,458
M2	1,456,416	333,839	151,648	279,369	288,121
North East	665,168	123,929	82,766	194,282	51,835
South East	791,248	209,910	68,882	85,085	236,286
M3	935,294	228,284	75,883	279,373	104,944
South Muntenia	813,045	173,177	71,170	250,423	102,418
Bucharest Ilfov	122,249	55,107	4,713	28,950	2,526
M4	1,157,554	241,906	94,960	271,529	230,405
South West Oltenia	722,782	165,626	51,165	152,548	187,964
West	434,772	76,280	43,345	118,981	42,441

Source: Romania's Statistical Yearbook, 2012.Own calculations. [3]

Vegetable production per inhabitant increased by 34.76 % from 144.7 kg in 2007 to 195 kg in 2011 as a consequence of the increased production (Table 7).

This is a pozitiv aspect for Romania taking into account as the average production per inhabitant in the EU is smaller: 127 kg (2007), 125 kg (2008) and 131 kg (2009). This reflect Romania's high production potential [5].

Table 7. Production per inhabitant (kg/capita)

	2007	2008	2009	2010	2011	2011/2007 %
Production per capita	144.7	177.6	181.7	180.3	195	34.76

Table 8. Vegetable Consumption, 2007-2009

	MU	2007	2008	2009	2009/2007 %
Vegetable consumption	Thousand tons	3,245	3,738	3,643	112.26
Average annual consumption per inhabitant	Kg/capita	149	173	169	113.42

Source: FAOStat, 2012[4]

Vegetable consumption Romania comes on the 6th position in the EU based on vegetable consumption after Italy, Germany, Spain, France and Poland.

This happens while in other EU countries like Luxembourg, Malta, Latvia, Slovenia and Denmark vegetable consumption is low due to

the climate conditions unfavorable to produce vegetables and the high import price.

Average purchase price increased in general in case of all vegetables. For example, in case of tomatoes, it increased by 15.57 % from Lei 1.22/kg in 2007 to Lei 1.41/kg in 2011 (Table 9).

Table 9. Vegetable average purchase price, 2007-2011 (Lei/kg)

	2007	2008	2009	2010	2011	2011/2007 %
Vegetable average purchase price	1.22	0.82	1.06	1.07	1.41	15.57

Source: Romania's Statistical Yearbook, 2012. Own calculations. [3]

The price indices for cabbage and onion are presented in Table 10. The highest increase compared to 2005 level was registered in 2010 (+29.8 %) for cabbage and in 2011 (+101.3 %) for onion.

Table 10. Vegetable price indices (%)(2005=100)

	2007	2008	2009	2010	2011
Cabbage	108.3	103.3	103.3	129.8	92.5
Onion	169.4	164.4	160.4	190.4	201.3

Source: Romania's Statistical Yearbook, 2012. Own calculations. [3]

Average prices for the main vegetables sold in the agro-food markets in 2011 varied from a market to another depending on offer/demand ratio. The average price was Lei 2.19 per kg for onion, Lei 2.16 per kg for tomatoes and Lei 1.01 per kg for cabbage.

-Tomato price varied between the highest level registered as follows: Lei 4 per kg at Sf.Gheorghe, Lei 3.99 in Arad, Lei 3.65 in Miercurea Ciuc, Lei 3.61 in Brasov and Lei 3.59 in Sibiu and the lowest levels: Lei 1.62 in Slatina, Lei 2.01 in Tg. Jiu, Lei 2.02 in Galati, Lei 2.15 in Focsani and Lei 2.19 in Vaslui.

-Onion price varied between the highest level: Lei 3.21 in Miercurea Ciuc, Lei 3.20 in Zalau, Lei 3.12 in Sibiu, Lei 3.06 in Brasov and the lowest levels: Lei 1.75 in Braila, Lei 1.84 in Craiova and Lei 1.99 in Bacau.

-Cabbage price varied between the highest levels: Lei 2.42 in Brasov, Lei 2.34 in Vaslui, Lei 2.29 in Piatra Neamt and the lowest levels: Lei 1.04 in Alexandria and Giurgiu, Lei 1.10 in Drobeta-Turnu Severin, Lei 1.12 in Craiova.

Romania's trade with vegetables. Romania's vegetable trade balance was

characterized in the period 2000-2009 by the following figures: exported vegetable 256 thousand tons, imported vegetables 448 thousand tons, reflecting that Romania is a net importing country as import exceeds export. A part of fresh vegetables are needed to be imported in order to cover internal market needs in the extraseason, which is an incentive to increase consumption and assure a healthy food for population. Vegetables are imported mainly as fresh products and also as frozen products. Market demand is in general relatively constant along the year, except some celebration moments when consumption increases.

CONCLUSIONS

The most adequate areas for cultivating vegetables are, in the decreasing order: for tomatoes: South Muntenia, West Romania, South West Oltenia and South East Romania; for onion: North East Romania, South Muntenia, North East Romania, South West Oltenia and West Romania; for white cabbage: South Muntenia, North East Romania, South West Oltenia, West Romania; for green peppers: South Eastern Romania, South West Oltenia, South Muntenia, North East Romania.

Average vegetable production increased in case of all categories. In the decreasing order, the production gain in the period 2007-2011 was the following one: 58.55 % for melons, 27.62 % for green peppers, 27.05 % for tomatoes, 25.99 % for dry garlic, 24.96 % for dry onion, 12.61 % for white cabbage.

The production gain by vegetable category registered in the period 2007-2011 was the following one: 58.21 % for melons, 42.17 % for tomatoes, 37.10 % for green peppers, 33.46 % for dry garlic, 21.32 % for dry onion, 14.78 % for white cabbage.

In 2011, the contribution of various categories of vegetables to production was: 24.55 % white cabbage, 21.81 % tomatoes, 15.45 % melons, 9.44 % onion, 6.06 % green pepper, 1.59 % garlic and 21.1 % other vegetables.

The contribution of the micro regions to vegetable production in 2011 was: 19.46 % South Muntenia, 18.95 % South East Romania, 17.30 % South West Oltenia, 15.92 % North East Romania, 10.43 % West Romania, 8.47 % North West Romania, 6.54 % Central Romania, 2.93 % Bucharest Ilfov.

Vegetable production per inhabitant is higher in Romania compared to the average production per capita in the EU. The average consumption increased as a positive aspect reflecting the obtained production and import. Vegetable production should increase in Romania in order to cover much better the domestic market needs and support export to the EU market.

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