

## STUDY REGARDING THE EVOLUTION OF FOOD CONSUMPTION OF ROMANIA DURING 2007-2013, FROM THE PERSPECTIVE OF FOOD SECURITY INSURANCE AND EXPORT AVAILABILITY GROWTH

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### *Abstract:*

*Food security has become a more pressing issue for all the governments of the world who are forced to face a growing populations worldwide. But when discussing about the notion of food security one of the main issues addressed is that of food consumption. Therefore, the aim of this paper is to present the evolution of the main indicators related to food consumption in Romania and to make a brief analysis of this problem. To achieve this we used a number of indicators, such as average annual consumption per capita, average daily food consumption per person, the average annual production per capita for the main agricultural products, the average monthly consumption for the main food products. Following our analysis results led to the conclusion that besides a few exceptions, Romania has now and had during the entire period analyzed the production capacity necessary to cover the average annual consumption per capita from its own average annual production and therefore, to ensure its own food security.*

**Key words:** food consumption, agricultural production, food production, food security

### INTRODUCTION

In terms of concept, food security is seen as the need to produce more viands to provide enough food for the entire population. But this idea is incomplete because there are major differences between the needs of poor countries, underdeveloped or developing countries and the developed nations. If in the underdeveloped regions we can talk about food security insurance by increasing food production, in the developed countries to ensure food security involves more the quality of food than their quantity. Thus, the inadequate nutrition exists both in the poor countries and the rich ones (where the so-called phenomenon of "hidden hunger" comes out) [2], being classified into 3 types: *hunger*, causing calories and protein deficiency, *deficiency of microelements*, which causes the deficiency of vitamins and minerals and *overeating*, which causes excess calories often accompanied by the lack of vitamins and minerals [10]

In Romania, food security insurance policies are mainly focused on the quantitative notion,

namely, the insurance of sufficient agricultural production to cover the level of consumption of the population. Therefore we considered necessary analysis at quantitative level for the evolution of food consumption of the Romanian population, the main food and beverages, subsequently correlated with average annual production per capita for the main food products.

### MATERIALS AND METHODS

The database used is provided by the Romanian Statistical Yearbook and the website of the National Institute of Statistics - INS, specifically TEMPO online database.

The main indicators used were the average annual consumption per capita, average daily food consumption per person, the average annual production per capita for the main agricultural products. The annual average consumption of food products is calculated as consumption availability (production + import - export - industrial processing - loss - stock variation) related to the total population from July 1 of the reference period. [9]

The average daily food consumption per person is obtained by dividing the number of calories (or the amount of nutrients) corresponding the edible part of each product and per household to the number of man-days alimentation. [9]

The average annual production per capita for the main agricultural products is calculated by reporting the total quantity of agricultural products, meat, milk, wool and egg to the total population from 1 July of the year of reference. [7]

The main method used in conducting this analysis was the method of quantitative comparison over time, which can be applied by calculating the dynamic pace of the analyzed phenomenon in the time period considered. On this line, we determined the difference between the calculated percentage level of relative indices of dynamic with fixed-basis and / or variable basis and the percentage of 100%. For determining the coverage of food requirement per capita, the average annual consumption per capita was reported to the average annual production per capita, the ratio being subsequently multiplied by 100 in order to obtain the percentage evolution.

## RESULTS AND DISCUSSIONS

When considering Romania's food consumption and production possibilities in conjunction with their own consumption we must first analyze the consumption expenditure conducted by the households in our country.

It is interesting to notice the cash expenditure structure that a household allocates monthly for the necessary payments. Thus, in Figure 1 we can see that there aren't considerable differences in the distribution of total cash expenditure for major spending categories. The majority of cash expenses made monthly are those related to food, the percentage being slightly higher in 2013 compared to 2007 (with 0.4 percentage points respectively 1.12% higher). In addition, expenditure on services category increased slightly compared to 2007, rising by 0.6 percentage points (2.08%). In terms of non-food products,

consumption expenditure fell by 1 percentage point in 2013 compared to 2007. Expressed as a percentage, this decrease is:  $(1/35.4) * 100 = 2.82\%$ .

In 2007 the total income per household was 1,686.74 lei/month, reaching in 2013 a value of 2,559.1 lei/month. [6] Thus, while household income increased by 51.72% this increase was not sufficient to cover permanent increase in prices of food and services (electricity, gas, public transportation, etc.) in the period under review. Therefore it came to these evolutions of the cash expenditure distribution, the population being forced to spend more on the same amount of food and the same services offered and to give up on non-food related costs.

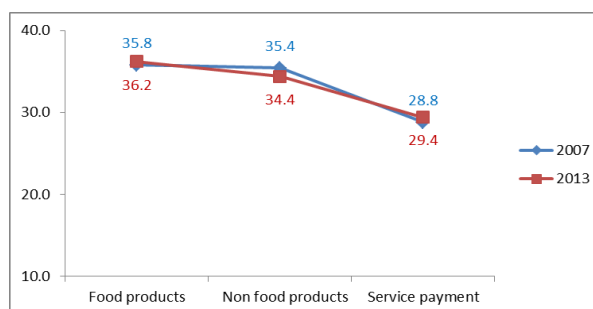


Fig. 1. Structure of monetary consumption expenditure for households - 2007-2013 (%)

Also, if we study Table 1 and the graphs made based on data from Table 1 (Fig. 2 and Fig 3), we can see increasing total consumption expenditure for the period under review, reaching the point were in 2013 to spend with 565.34 lei / month (51.18%) more than in July 20.

Although total consumption expenditure increased, the share of spendings on food products has not undergone great changes, ranging from 40.9% (in 2008 and 2009) to 41.9% (in 2012) of total expenditure, throughout the entire period under review. As a share, the level of consumption for agricultural products slightly decreased in 2013 compared to 2007, by 0.3 percentage points (Fig. 3). But there were significant changes on the physical volume of expenditure, Romanians spending in 2013 with 50.17% more on food products and soft drinks than in 2007 (Fig. 2). This increase in physical volume but decrease in percentage of

total expenses results on the one hand from the continuous increase in food prices but also from the changing consumer preferences of the population. For example, young people between 18 and 25 years, frequently prefer to consume organic products [3] that normally are more expensive due to higher production costs obtain in the case of practicing organic farming [5].

Instead, spendings on alcohol and tobacco increased continuously, the difference compared to 2007 reaching 1.3 percentage points in 2013. This is due to the introduction of new European regulations concerning alcohol and tobacco taxation and excise, regulations that had to be respected also by the legislation in Romania. These increases in excise have increased the price for this type of products, increasing physical value of expenditure with 82.38%, while the percentage growth was only by 1.3 percentage points.

If we talk about the share of each category of expenses from total consumption expenditure, from the analysis of Fig. 3 we can observe that the differences are not significant, not exceeding 1.2 percentage point increase (in the case of housing-related expenses).

There is also a decrease in the share of total expenditure, as in the case of expenses related to dwelling endowment and maintenance (-0.77 percentage points), communications (-0.4 percentage points), recreation and culture (-0.5 percentage points), education (-0.3 percentage points), the largest decrease being in the case of expenses related to clothing and footwear (-1.6 percentage points).

However, if we analyze in terms of physical volume of expenditure, there are significant differences between the structure in 2007 and in 2013. Thus, the costs related to housing the growth is 63.15% in 2013 compared to 2007, due to rising prices for electricity, gas supply, fuels, etc.

As for the costs that suffered declines as level of share of total expenditures, the only expense that decreased from the physical volume of expenditure point of view is education, which decreased by 9.02% compared to 2007.

Also, in terms of volume of expenditure,

expenses related to health increased significantly (by 75.19%), due most likely to the reorientation of Romanians to the private health system, where prices are considerably higher.

Table 1. Structure of total consumption expenditure of households 2007-2013 (lei, monthly per household)

	2007	2008	2009	2010	2011	2012	2013 <sup>1)</sup>
<b>Total consumption expenditure</b>	<b>1104.70</b>	<b>1365.36</b>	<b>1468.60</b>	<b>1486.43</b>	<b>1532.29</b>	<b>1614.10</b>	<b>1670.04</b>
<b>Food products and soft drinks</b>	460.93	558.25	600.94	608.64	639.36	676.77	692.18
Alcoholic beverages, tobacco	71.79	89.55	103.92	113.91	116.52	125.15	130.93
Clothing and Footwear	74.63	91.28	88.01	80.55	76.9	81.17	87.15
Housing, water, electricity, gas and other fuels	171.17	213.17	232.37	246.85	250.09	268.88	279.27
Furniture, dwelling endowment and maintenance	51.05	65.29	67.27	59.44	61.31	61.97	64.9
Health Care	42.48	55.59	65.63	67.42	71.18	70.08	74.42
Transport	65.48	84.14	84.56	89.29	92.34	99.13	98.45
Communications	56.45	67.89	74.87	73.8	72.12	76.87	78.62
Recreation and culture	51.06	61.27	64.92	59.54	61.75	60.94	67.79
Education	8.54	11.32	13.93	10.81	9.54	9.78	7.77
Hotels, cafes and restaurants	13.33	18.95	18.6	19.06	19.74	20.82	24.45
Miscellaneous goods and services	37.79	48.67	53.58	57.12	61.44	62.51	64.11

Also, a significant increase in spendings occurred in terms of transport expenditures (50, 35% higher than in 2007) and the costs of hotels, cafes and restaurants (with 83.42% higher than in 2007).

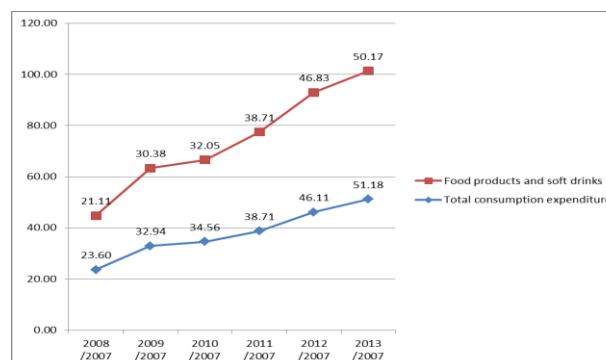


Fig. 2. Dynamics of total consumption expenditure and of food products and soft drinks, in 2007-2013 (%); <sup>1)</sup>Provisional data.

Source: TEMPO online

These increases are due both to the increase in fuel prices and hospitality services, and to changed preferences of residents. Thus, the

Romanians began to prefer traveling by private car to the detriment of means of transport and began to have higher expectations in terms of hospitality of restaurants, hotels and cafes, preferring to pay more for better service.

The high level of poverty, but also their remaining reminiscents from the period when there was a shortage of products, leads many to sacrificing product quality for quantity and often detrimental to health.

Analyzing statistical indicators related to consumption, there are indications that the conduct of Romanians to orient more towards the quantity than to the quality of food

products is gradually changing. This can be seen from Tables 2 and 3 that shows the average monthly consumption for the main food and beverages and it's evolution compared to the base year 2007.

Analyzing Table 2 concerning the average monthly individual consumption for the main food and beverages, and Table 3 concerning the average monthly consumption trends compared to the reference year 2007, we see a continued evolution of the consumption for the main food products. For example, meat consumption had a linear increase since 2007, reaching in 2013 to be with 9.52% higher than in 2007.

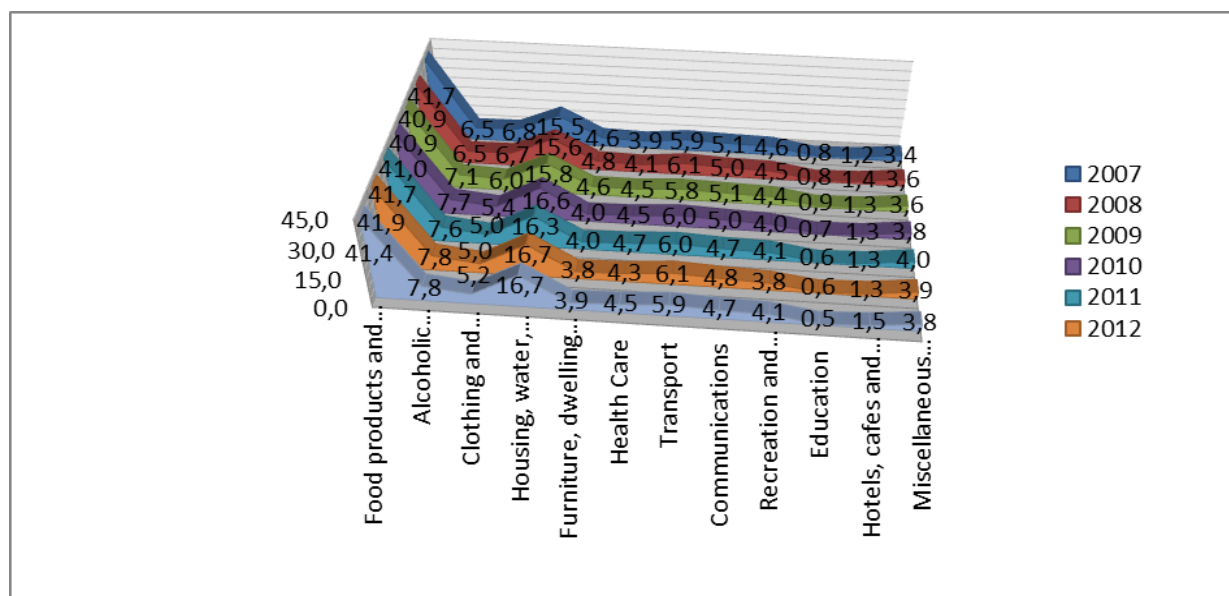


Fig. 3. Total monthly consumption expenditure in 2007-2013 by households, by category of expenditure (%)

In exchange, the consumption of meat products has decreased in recent years compared to 2007 people orienting itself more on the consumption of fresh meat. Thus, in 2013 there was a monthly average consumption per capita by 1.81% lower than consumption in 2007. This is explained by the fact that with the entry into the EU area Romania and the increasing access to information on the processing of food products, Romanians began to prefer consumption of fresh products, as little processed as possible.

Also, fat consumption has likewise seen a decrease from 2007, being in 2013 by 4.56% lower than the reference year 2007.

Unfortunately, as a consequence of the milk

crisis in recent years, of the quotas imposed by the EU and the constant increase in the milk price, average monthly consumption of this basic food product suffered significant declines towards the end of the analysis period, being in 2013 with 3.29% lower than in 2007.

Returning to the Romanians tendency in recent years to eat fewer processed foods, the category of vegetables and fruits has also known an increase compared to 2007 in terms of consumption. Thus, in Table 3, concerning the average monthly consumption trends in 2007-2013, in 2013 the growth in those type of products was by 8.20% for vegetables and by 11.98% for fruit.

Table 2. Average monthly consumption <sup>1)</sup> for the main food products and beverages

	MU	2007	2008	2009	2010	2011	2012	2013
Fresh meat	kg	2.91	3.07	3.12	3.10	3.08	3.14	3.19
Meat products	kg	1.05	1.11	1.11	1.07	1.02	1.04	1.03
Fats	kg	1.25	1.24	1.23	1.22	1.20	1.20	1.19
Milk	l	6.07	6.15	6.17	6.19	5.96	6.06	5.87
Eggs	pc	12.98	13.07	13.06	12.99	13.15	12.81	13.38
Sugar	kg	0.78	0.76	0.76	0.75	0.74	0.73	0.75
Potatoes	kg	3.64	3.61	3.59	3.49	3.47	3.48	3.31
Vegetables and canning vegetable	kg	7.04	7.31	7.63	7.38	7.60	7.58	7.62
Fruits	kg	3.08	3.31	3.55	3.56	3.40	3.39	3.45
Mineral water and other soft drinks	l	4.26	4.83	4.82	4.86	4.57	4.54	4.49
Beer	l	1.08	1.20	1.17	1.11	1.08	1.13	1.21
Wine	l	0.91	0.93	0.97	0.94	0.86	0.87	0.88
Plum brandy and natural brandy	l	0.21	0.22	0.23	0.22	0.22	0.21	0.21

<sup>1)</sup> Monthly average amounts per person (in individual households).

Source: NIS

With the entry into the EU and the imposition of more restrictive rules on alcohol, combined with increased excise duty on alcoholic beverages, the drinking of wine, plum brandy and natural brandy fell by 3.74% respectively 1.9% in 2013 compared to 2007.

However, with the decreasing alcohol consumption for the categories mentioned above, beer consumption relatively increased

over the period of analysis, being in 2013 with 11.57% higher than in 2007. This increase can be explained by Romanians tendency and general preference for beer over other alcoholic beverages linked to the price which is generally lower than other alcoholic beverages but also linked to the diversification in recent years of the types of beers sold in Romania.

Table 3. Evolution of the average monthly consumption 2007 -2013

Fixed Base 2007	MU	2008 /2007	2009 /2007	2010 /2007	2011/ 2007	2012 /2007	2013/ 2007
Fresh meat	%	5.50	7.04	6.63	5.81	8.01	9.52
Meat products	%	5.81	5.33	1.71	<b>-2.57</b>	<b>-1.14</b>	<b>-1.81</b>
Fats	%	<b>-0.96</b>	<b>-1.76</b>	<b>-2.48</b>	<b>-3.92</b>	<b>-4.32</b>	<b>-4.56</b>
Milk	%	1.33	1.61	1.91	<b>-1.78</b>	<b>-0.13</b>	<b>-3.29</b>
Eggs	%	0.65	0.58	0.08	1.27	<b>-1.35</b>	3.05
Sugar	%	<b>-2.69</b>	<b>-2.82</b>	<b>-3.33</b>	<b>-5.00</b>	<b>-6.15</b>	<b>-4.49</b>
Potatoes	%	<b>-0.71</b>	<b>-1.48</b>	<b>-4.18</b>	<b>-4.81</b>	<b>-4.40</b>	<b>-8.96</b>
Vegetables and canning vegetable	%	3.76	8.34	4.86	7.91	7.60	8.20
Fruits	%	7.53	15.32	15.49	10.36	10.03	11.98
Mineral water and other soft drinks	%	13.45	13.17	14.06	7.30	6.62	5.38
Beer	%	11.20	7.87	2.96	<b>-0.28</b>	4.17	11.57
Wine	%	2.53	6.48	3.52	<b>-5.05</b>	<b>-3.96</b>	<b>-3.74</b>
Plum brandy and natural brandy	%	6.67	9.52	3.81	3.33	<b>-2.38</b>	<b>-1.90</b>

In terms of individually average daily consumption, depending on the number of calories and nutrients consumed, it can be seen a slight downward trend. This

consumption is shown in Table 4: "The average daily food consumption per person, per components of consumption."

Thus, if we talk about the number of calories consumed daily by a person, there is a small decrease, the lowest value being in 2012 when a Romanian consumed 73.3 less calories compared to 2007.

Bearing in mind the fact that the daily requirements recommended by nutritionists and regulated by the state for children and

adolescents up to 19 years, for example, is in the range of 1500-3500 calories per day [4], we notice that despite the decline average number of calories consumed daily, the Romanian population is approaching however the extreme top of the recommended daily requirement.

Table 4. Average daily food consumption per person, per components of consumption

Food consumption components - calories and nutrients	MU	2007	2008	2009	2010	2011	2012	2013
Calories	Number	2473	2484.3	2487	2445.8	2405.8	2399.7	2402.9
in which								
Animal origin	Number	600	620.9	621.9	617.8	609.1	616.6	618.5
	%	24.26	24.99	25.01	25.26	25.32	25.69	25.74
Protein	Grams	81.8	82.8	83.1	81.8	80.7	80.8	81
in which								
Animal origin	Grams	38.2	39.7	40.3	40	39.2	39.6	40
	%	46.70	47.95	48.50	48.90	48.57	49.01	49.38
Lipids	Grams	83.6	85	85.2	84.3	82.8	83.1	83.5
in which								
Animal origin	Grams	41.8	43.3	43	42.7	42.2	42.7	42.9
	%	50.00	50.94	50.47	50.65	50.97	51.38	51.38
Carbohydrates	Grams	318.8	316.6	316.4	310.1	305.5	303.2	302.6

Source: NIS

If this trend will continue in the next period and no action will be taken for reducing the number of calories, the number of overweight people will increase withal.

A negative aspect is the increasing percentage of calories from animal origin in total calories, going in 2013 to 25.74% of total average daily consumption of calories, with 1.48 percentage points more than in 2007.

The protein level of animal origin consumed by a person daily increased in percentage by 2.68 percentage points in 2013 compared to 2007.

The fats level of animal origin consumed by an individual daily increased in percentage up to 1.38 percentage points in 2013 compared to 2007.

Regarding individual average daily consumption of carbohydrates, it has been in a continuing downward trend over 2007-2013, in 2013 coming to be by 5.08% (16.2 grams) lower than in the reference year 2007 ( Fig. 4).



Fig. 4. The dynamics of average daily consumption per person, per components of consumption, in 2007-2013 (%)

In terms of quality, despite the decline of daily carbohydrate level with 5.08%, the quality of daily consumption of nutrients is still problematic. This is because there are differences between the quality of food consumption in different social categories of consumers, differences created by different levels of income. [3]

Table 5. Average annual production for the main agricultural products per capita

Main agricultural products	MU	2007	2008	2009	2010	2011	2012	2013
Cereal grain	Kg	374.2	819.3	730.2	825.5	1034.5	639.3	1045.7
Potatoes	Kg	177.8	177.7	196.6	162.2	202.3	122.9	164.6
Vegetables	Kg	149.3	186	191.6	190.8	207.3	176.2	198.2
Fruits	Kg	52	57.4	65	70.1	73.5	56.3	65.1
Meat	Kg	72	69.4	70.8	64.5	67.4	66.4	65
Milk	Liters	292.3	287.3	276.8	242.7	248.5	241	243.8
Eggs	Buc	312	326	305	306	314	319	320

Source: NIS

Table 6. Average annual consumption per capita, for the main products

The main food products	MU	2007	2008	2009	2010	2011	2012	2013
Cereals and cereal products in grain equivalent	Kg	213.4	213.6	211.7	211.3	217.7	208.5	218.1
Potatoes	Kg	99.1	104.2	98.1	103.9	103.3	104.7	103
Vegetables and vegetable products	Kg	149.9	158.9	148.7	155.7	162.9	151.4	152
Fruits and fruit products	Kg	69.9	69.8	65.7	67	74.7	71.1	73.7
Meat and meat products	Kg	64.7	66	67.3	59.9	56	55.3	54.4
Milk and dairy products (excluding butter)	Liters	268.6	274.6	253.2	244.2	248.5	241.1	244.5
Eggs	Buc	276	280	256	253	264	245	247

Source: NIS

We must analyze, however, what happens in terms of quantity with the Romanian population consumption. Therefore, using tables 5, 6 and 7 we performed an analysis of the coverage of food requirements per capita.

This degree of assurance from own resources was determined by dividing the average annual consumption per capita for the main food products (data from Table 6) to the average annual production of the main agricultural products per capita (data from Table 5).

Data obtained from this report represents the percentage of consumption from own production of the main agricultural products and the results are found in Table 7.

Following the analysis of Table 7 we can observe that in terms of cereals Romanians

reached a point of coverage ensurance of domestic consumer demand rather high (from 57.03% of production in 2007 to only 20.86% of production in 2013), due mostly to the significant increase in average annual production volume per capita, to 1045.7 kg / person / year in 2013.

For the potatoes it can be observed a consumption of around 50% of the average annual production over the entire period, with consumption growth trends in recent years, but these increase is mainly due to production decrease.

Regarding vegetables, if at the beginning of the analysis period we consumed by 0.40% more than we produced at individually level, the situation has improved gradually, as in 2013 to consume 76.69% of what we produce. This was possible due to continued growth in the production of vegetables.

Table 7. Percentage of average annual consumption from average annual production per capita

The main food	MU	2007	2008	2009	2010	2011	2012	2013
Cereals and cereal products	%	57.03	26.07	28.99	25.60	21.04	32.61	20.86
Potatoes	%	55.74	58.64	49.90	64.06	51.06	85.19	62.58
Vegetables and vegetable products	%	100.40	85.43	77.61	81.60	78.58	85.93	76.69
Fruits and fruit products	%	134.42	121.60	101.08	95.58	101.63	126.29	113.21
Meat and meat products	%	89.86	95.10	95.06	92.87	83.09	83.28	83.69
Milk and dairy products (excluding butter)	%	91.89	95.58	91.47	100.62	100.00	100.04	100.29
Eggs	%	88.46	85.89	83.93	82.68	84.08	76.80	77.19

In the case of fruit, intervention is required, as people began to consume more and more fresh fruits or fruit products, but production has not increased in line with demand, thus leading to a situation where we consume much more than we produce.

In 2009-2011 the gap between consumption and production has decreased, but this happened due to lower consumption level of the population and less to the growth of average production per capita.

## CONCLUSIONS

In the past decade the level of consumption in terms of quantity has increased, Romania getting to have a consumption close to the quantitative average of the European Union.

In terms of quality consumption there have been improvements as against the periods before the entry into the Union, trying as much as possible to comply to the rules recommended by experts in nutrition. Unfortunately, even today one cannot say that Romania has come to ensure a high level of food safety, food consumed by the population is either insufficient (which is the case of fruit and fruit products) or in sufficient quantity but of poor quality (talking here about nutrient content of foods consumed by the population of Romania).

It is necessary to improve methods of correlation the consumption behavior of our own population to the type of food that we produce and their production levels.

From the data processed in this paper we conclude that Romania has the capacity to ensure their food security. The country provides it's necessary resources from it's own sources, especially in the case of cereals, potatoes and vegetables.

Given the coverage of domestic consumer demand for foodstuffs it results a high availability for export, with the exception of two categories of products: fruits and fruit products and milk and milk products, where we do not have yet sufficient production to cover domestic consumption of the population.

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## REFERENCES

[1]Alec, I., Constantin, M., Necula, R., 2014, The comparative structure of agrifood productis consumption in Romania, Scientific Papers Series

Management, Economic Engineering in Agriculture and Rural Development Vol. 14(1):7-12

[2]Brown, L., 2000, Starea lumii 2000, Editura Tehnică, Bucharest

[3]Dinu, T., A., Stoian, E., Micu, M.M., Condei, R., Alec, I.N. 2014, Study regarding consumption of organic products in Romania, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 14(2):113-118

[4]Ministry of Public Health, 2008, Order approving the list of recommended foods and pre-school children and the principles that underpin a healthy diet for children and adolescents, Annex 3 A. The daily calories and nutrients for children

[5]Muscănescu, A., 2013, Organic versus conventional: Advantages and disadvantages of organic farming, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 13(1): 253-256

[6]National Institute of Statistics, 2014, Romania in figures 2014 – Statistical abstract, INS, Bucharest

[7]National Institute of Statistics, Data base, <http://www.insse.ro/>

[8]National Institute of Statistics, - TEMPO Online database, [www.statistici.insse.ro/shop/](http://www.statistici.insse.ro/shop/)

[9]Statistical Yearbook of Romania, 2012

[10]Zahiu, L., Dachin, A., 2001, Politici agroalimentare comparate, Editura Economică, Bucharest, p. 58.