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STUDY ON CURRENT TRENDS ON THE VEGETABLE MARKET IN ROMANIA

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Abstract

The horticultural market in Romania is an unbalanced one, in which the demand is greater than the supply, as a result the phenomenon of price volatility appears for these categories of agri-food products. The objective of the paper is to present the main trends on the vegetable market in Romania at the level of the last 7 years, based on the statistical data available in the database of National Institute of Statistics (NIS) from Romania and International Trade Center (ITC). The results showed that the demand for vegetables increased, while the supply showed slight downward trends, the largest share of production being intended for self-consumption, thus, our country is forced to resort to imported vegetables. This situation had a negative influence on the trade balance with vegetable products. In the period 2015-2022, the trade balance for the category of horticultural products registered an increase in the deficit of 311%, from -8,335,747 thousand euro in 2015 to -34,269,689 in 2022.

Key words**:** *vegetables, demand, supply, trade, Romania*.

INTRODUCTION

Currently, the global population exceeds 8 billion people, and the trend is increasing. Estimates by the Food and Agriculture Organization (FAO) claim that the population will reach 8.5 billion by 2030, respectively 9.7 billion by 2050. Along with population growth, food needs also increase, and the pressure on the agri-food system to ensure food security is emphasized [1].

In the specialized literature, the research carried out at the level of Romania is focused on the analysis of the vegetable market and on the identification of the distribution channels of Romanian vegetables. Following the query of the keyword vegetable market in the Web of Science (WoS) database, 10,309 documents were identified, of which 149 documents were developed by authors from Romania.

The studies identified in the WoS highlighted Romania's very high production potential in terms of growing vegetables, both in the field and in protected areas, due to the favorable pedo-agroclimatic conditions. However, vegetable production is known for its seasonal nature, the population's consumption needs not being covered throughout the year.

Another particularly important feature is the perishability of the products, they must be consumed immediately after harvesting to preserve your vitamin content. In addition to these, characteristics such as: the homogeneity of the products, the variation of demand and supply, the high consumption of inputs in obtaining the products are also mentioned [10,12].

The vegetable sector represents a traditional activity at the level of Romania, having a very high economic importance.

The importance of the horticultural sector is demonstrated both by the cultivated area and by the high number of producers in the field.

From the perspective of total vegetable production, Romania cannot ensure the consumption requirements of the population, resorting to imports, which have a negative influence on the trade balance [2, 3].

In this context, the study aimed to present the main trends in Romania's vegetable market in the period 2015-2022.

MATERIALS AND METHODS

The research is based on the statistical data on the areas, productions and consumption of vegetables, available in the tempo online database of the INS [7] in Romania and the data on foreign trade in vegetables, provided by ITC [8]. The research method used in developing the study was quantitative and qualitative data analysis, as well as comparative analysis. At the same time, a study of the specialized literature at the level of Romania was carried out on the studied theme, based on the researches indexed in WoS [13]. Following the query of the keyword "vegetables market", 149 documents elaborated by Romanian authors were identified, which were reviewed, from which the most relevant works were selected, which are the subject of this research.

RESULTS AND DISCUSSIONS

In Romania, the area with vegetables showed a downward trend in the period 2015-2022, when a decrease of approx. 26%, from 239 thousand hectares in 2015 to 178 thousand hectares in 2022. The dependent variable (surface cultivated with vegetables) was expressed by the independent variable (year) in proportion to approx. 83% In this case, there was a strong relationship between time and cultivated area, as shown by the multiple value R 0.915 and R squared (√0.8373).
When there is an increase in the independent variable x by one year, there is a decrease in the dependent variable y by 7.8106 thousand hectares.
According to the trend equation y = -7.8106 x + 250.4, on average annually, the area with vegetables decreased by approx. 8 thousand hectares per year (Fig. 1).
Also, a decrease in horticultural production by approximately 34% was noted during the analyzed period, from 3,674 thousand tons in 2015 to 2,426 thousand tons in 2022. This time, the dependent variable - production of vegetables is expressed by the independent variable – year in a proportion of approx. 36%.

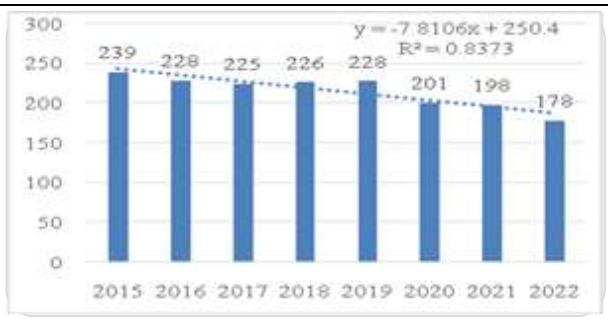

Fig. 1. Dynamics of vegetable areas in Romania, in the period 2015-2022 (thousands of hectares)
Source: Own processing based on data from NIS, Accessed on 29.11.2023 [7].

In this case, there is a direct and moderate relationship between time and vegetable production as shown by Multiple R value is 0.602 and R squared (√0.3622).
It can be appreciated that when the independent variable x increases by one year, the dependent variable y decreases by 104.55 thousand tons. According to the trend equation y = -104.55 x + 3,895.7, vegetable production decreased on average annually, by approx. 105 thousand tons per year. The most significant production was recorded in 2018, respectively 3,797 thousand tons (Fig. 2).

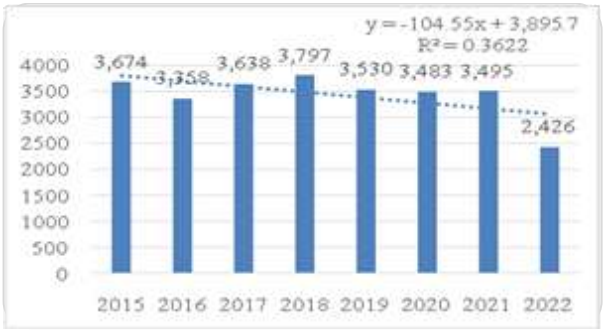

Fig. 2. Dynamics of total vegetable production in Romania, in the period 2015-2022 (thousands of tons)
Source: Own design and calculations based on NIS data, Accessed on 29.11.2023 [7].

In Romania, vegetable production is carried out at low salt, by family farms, being intended in a very large proportion for self-consumption, the surplus being sold by traditional means directly to consumers (at the farm gate) [9].
Studies have shown that farmers grow many types of vegetables in large numbers, both for diversity and to sell the vegetables throughout the year, given their seasonality and crop rotation. Also, the vast majority of farmers

plan production according to the season as follows: spring: early crops and greens; in summer: tomatoes, cucumbers and peppers and in autumn root vegetables are grown [4].

From the analysis of vegetable production per inhabitant, a decrease of approx. 31%, at the level of the analyzed period. The highest production per capita was recorded in 2018 (0.194 tons/capita), and the lowest in 2022 (0.127 tons/capita). With a relatively constant population and a vegetable production with a decreasing trend, the inability of the horticultural sector to ensure the demand for products at the national level can be distinguished, thus resorting to imported products (Fig.3).

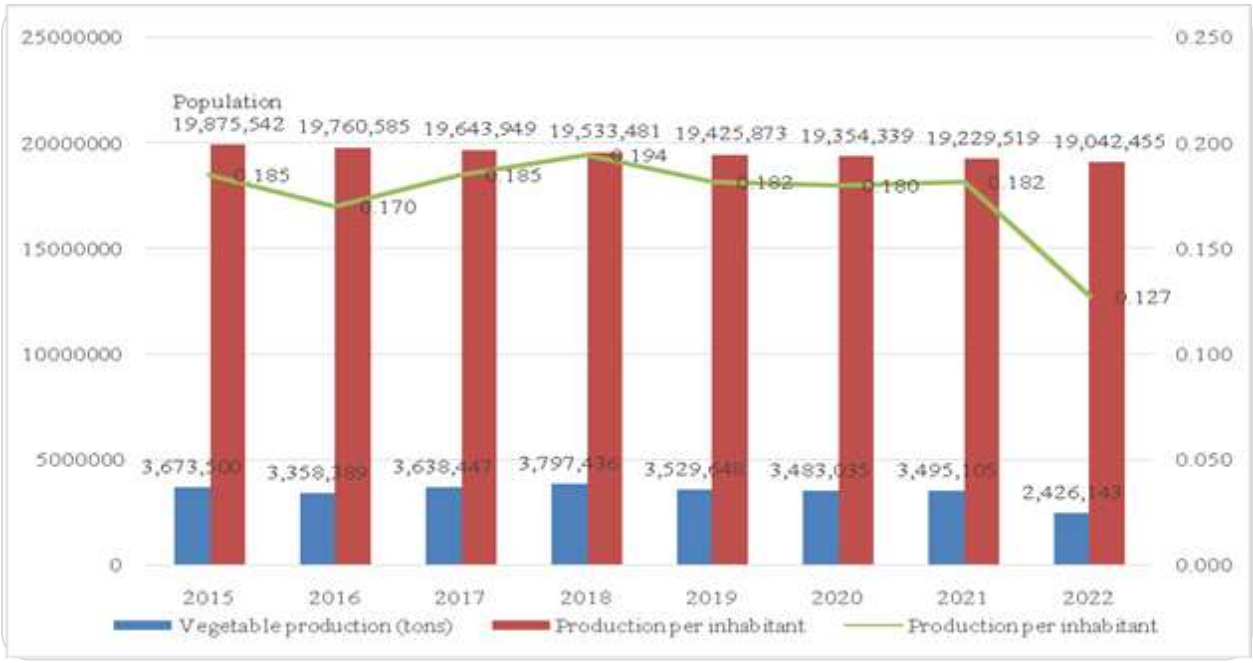

Fig. 3. Dynamics of vegetable production per inhabitant in Romania, in the period 2015-2022 (tons/inhabitant)
Source: Own design and calculations based on NIS data, Accessed on 29.11.2023 [7].

Regarding the average annual consumption of vegetables per inhabitant, an increase of 13% was observed during the analyzed period, from 159 kg in 2015 to 180 kg in 2021. The dependent variable (average annual consumption of vegetables), is expressed by the independent variable (year), in proportion to approx. 87%, the correlation coefficient being 0.9379 and R-squared (√0.8797), which signifies a direct and strong relationship between time and vegetable consumption. When there is an increase in the independent variable x by one year, there is an increase in the dependent variable y by 3.9857 kilograms. According to the trend equation y = 3.9857x +151.94, the average annual consumption of vegetables per inhabitant increased on average annually, by approx. 4 kilograms per year.

The increase in vegetable consumption among the population can be attributed to the trends towards a healthy lifestyle, as well as public information campaigns on healthy eating and its benefits (Fig. 4).

Fig. 4. Dynamics of the average annual consumption of vegetables per inhabitant in Romania, in the period 2015-2022 (kilograms)
Source: Own design and calculation based on the data from NIS, Accessed on 29.11.2023 [7].

Rădulescu et al. (2021) analyzed consumer behavior regarding fruit and vegetable consumption, conducting a survey on a sample of 268 people. The results showed that the

consumption trends of the sampled population are largely influenced by the information they have available regarding the characteristics of the products consumed, such as: the country of origin, the cultivation system (conventional or organic) and the producer [11].

Although it is known that the consumption of vegetables has many benefits for the body, in Romania, it is significantly lower than the recommendations of doctors and nutritionists. The FAO and the World Health Organization (WHO) recommend the consumption of at least 400g of vegetables, excluding potatoes and starchy tubers, to prevent the occurrence of chronic diseases [6].

A study carried out by the publication Progresiv, shows that from the basic foods of the Romanian population, vegetables and fruits are frequently consumed by 81% of Romanians, being the most consumed agri-food products [5].

The exported value of vegetables in Romania showed an increase of 57% in the period 2015-2022. Among the top 5 importing countries of vegetables exported by Romania are: Italy (66,512 thousand euro in 2022), Germany (13,564 thousand euro in 2022), Poland (11,162 thousand euro in 2022), Ukraine (10,158 thousand euro in 2022) and Hungary (10,158 thousand euro in 2022). Significant increases in the value of exported products were noted in countries such as Cyprus (+2,495%), Ukraine (+112,767%) and Poland (684%) and the Netherlands (647%) (Table 1).

Table 1. List of important markets for edible vegetables and certain roots and tubers imported from Romania (Export value- thousands of euro)

Exported value (thousands of euro)									
Importers	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2022/2015**
World	90,798	86,781	143,306	96,016	95,338	95,104	106,738	142,631	57%
Italy	47,063	37,459	50,904	44,859	45,307	48,953	51,026	66,512	41%
Germany	12,483	10,943	11,265	11,375	10,641	8,387	12,143	13,564	9%
Poland	1,423	1,761	2,467	3,047	4,418	6,437	9,034	11,162	684%
Ukraine	9	16	29	5	15	832	1,043	10,158	112,767%
Hungary	3,720	3,364	3,935	4,167	4,285	5,754	6,537	7,816	110%
Spain	4,358	4,537	11,828	15,642	13,235	5,875	7,101	4,750	9%
Moldova, Republic of	1,164	926	2,886	1,837	2,582	4,296	3,690	4,526	289%
Bangladesh	0	0	0	0	0	0	62	4,196	
France	4,685	2,633	2,817	4,865	3,947	4,281	4,522	4,109	-12%
Austria	2,567	2,363	2,166	2,985	2,790	2,202	2,580	3,070	20%
Netherlands	291	243	271	613	253	209	284	2,174	647%
Switzerland	1,183	382	424	133	600	945	739	1,444	22%
Belgium	853	596	383	340	238	394	958	1,416	66%
Bulgaria	3,908	2,158	1,357	1,279	1,590	904	435	1,061	-73%
Cyprus	40	32	18	50	12	20	25	1,038	2,495%

Source: Intracen, Trade Maps, Accessed on 10.11.2023 [8].

Regarding the imported value of vegetables imported by Romania, an increase of 131% is observed in the period 2015-2022. Among the top 5 exporting countries from which Romania imports vegetables are: Turkey (134,119 thousand euro in 2022), the Netherlands (92,418 thousand euro in 2022), Germany (90,798 thousand euro in 2022), Poland (52,785 thousand euro in 2022) and Spain (40,823 thousand euro in 2022). Large increases of imported values were recorded in Turkey (+291%), Egypt (+289%) and Germany (+270%) (Table 2).

The existence of significant gaps in the production of vegetables in Romania was observed, with imports covering most of the domestic demand for vegetables. Therefore, support is needed to develop the horticultural

sector in such a way as to stimulate Romanian vegetable exports.

Table 2. List of supplying markets for edible vegetables and certain roots and tubers imported by Romania

Imported value (thousands of euro)									
Exporters	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2022/2015**
World	273,492	364,921	403,333	427,704	517,882	479,775	530,486	632,188	131%
Türkiye	34,306	55,478	69,380	81,127	75,916	92,225	113,442	134,119	291%
Netherlands	35,761	46,273	47,537	46,706	73,037	67,570	71,445	92,418	158%
Germany	24,551	34,320	41,493	46,302	62,408	58,928	70,216	90,798	270%
Poland	22,904	36,551	44,366	48,476	56,258	41,626	42,563	52,785	130%
Spain	24,404	26,738	28,034	28,454	42,006	35,549	37,020	40,823	67%
Egypt	8,000	5,697	12,875	10,199	16,877	17,933	19,790	31,089	289%
Greece	15,439	25,668	26,001	22,892	28,415	25,318	29,527	30,489	97%
Hungary	24,052	32,732	30,359	31,924	29,515	27,317	26,936	29,772	24%
France	15,827	15,698	11,147	14,501	22,978	19,821	18,255	27,622	75%
Italy	21,309	29,572	27,416	29,282	30,734	20,286	26,348	27,219	28%
Belgium	11,472	10,101	10,314	12,277	17,783	19,542	21,660	25,519	122%
Bulgaria	7,905	10,542	17,900	15,628	14,790	17,338	17,949	15,209	92%
Austria	4,144	6,676	6,388	7,732	7,275	4,302	4,992	7,958	92%
Serbia	2,831	1,450	2,273	4,306	6,383	4,608	4,812	5,442	92%
Macedonia, North	1,895	3,525	2,109	3,467	5,698	4,989	4,377	5,092	169%

Source: Intracen, Trade Maps, Accessed on 10.11.2023 [8].

The trade balance recorded for the analyzed product category was a deficit throughout the analyzed period, oscillating between -8,335,747 thousand euros in 2015 and -34,269,689 in 2022. An increase in the trade balance deficit by 311% was observed (Fig. 5).

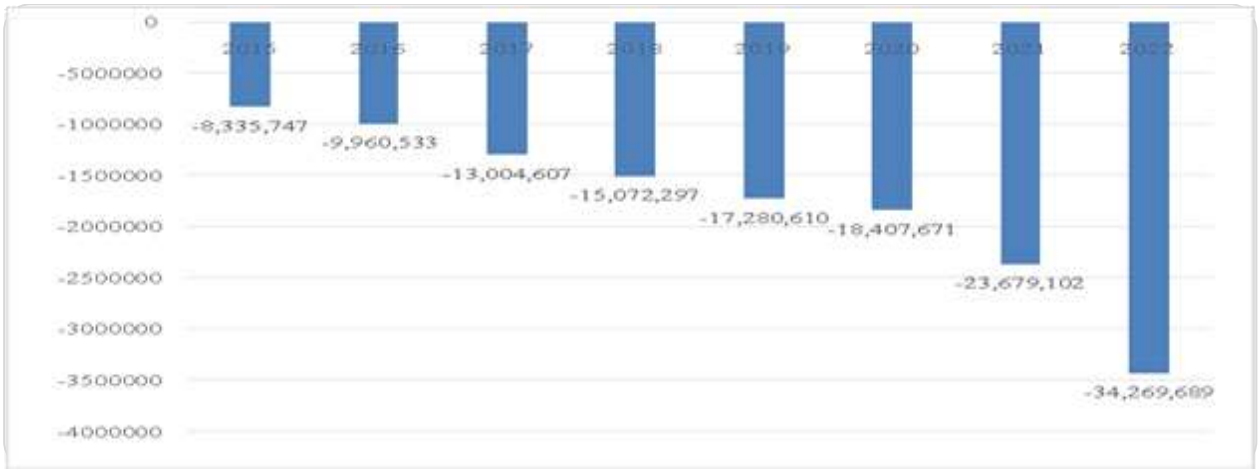

Fig. 5. The trade balance recorded in the product category – edible vegetables and certain roots and tubers, in Romania, at the level of the period 2015-2022
Source: Intracen data processing, Trade Maps, Accessed on 10.11.2023 [8].

Currently, Romania is focused to the greatest extent on the export of raw materials and massively imports finished products, which does not ensure the sustainable growth of the export of agri-food products, but on the contrary, accentuates the trade balance deficit even more. In conclusion, Romania should focus on the creation of added value of agri-food products by developing the activity of processing agricultural products, and then on the export of finished products.

CONCLUSIONS

The chernozem type soils in Romania, especially those in the Western Plain, the Romanian Plain, the Transylvanian Plain, the Moldavian Plateau and Dobrogea, are extremely favorable for growing vegetables.
However, the national production of vegetables is not sufficient to meet the consumption needs of the national population. The vast majority of horticulturalists are small farmers (family farmers), and most of the production is intended for self-consumption, with a very small share being intended for sale. On the other hand, vegetables are seasonal and perishable agri-food products, the supply of horticultural products cannot be ensured throughout the whole year, the only solution to satisfy the demand is the import, which during the last 3 years has recorded increasingly large increases , negatively influencing the trade balance, which is a deficit, at the level of 2022, it reached -34,269,689 thousand euros.
At the same time, both producers, processors and distributors face problems that negatively influence the economic-financial results. The use of non-performing technologies that contribute to the decrease in vegetable production, the difficulty of marketing products in an optimal time frame and the use of non-performing seeds, represent only some of the most important problems faced by Romanian farmers. An optimal solution for solving these problems is represented by the association of small producers within agricultural cooperatives that have all the resources, both economic and material, for a viable commercialization, ensuring an adequate and efficient distribution of vegetable production.

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