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THE EVOLUTION OF EGG PRODUCTION AND CONSUMPTION AT THE LEVEL OF ROMANIA IN THE PERIOD 2016-2020

ANDREEA-DANIELA GIUCĂ^{1*}, DIANA MARIA ILIE²

Abstract

Poultry farming is one of the most dynamic agricultural sectors in Romania. Currently, the production activity in the poultry sector registers a downward trend at national and European level, however, Romania is among the main member countries of the European Union producing eggs for consumption, this being influenced by the growing demand for these products. In recent years, there has been an increase in sales of packaged eggs, which are supported by the growing number of producers operating in the industrial system, thus highlighting a highly fragmented market. However, domestic production of eggs for the market cannot meet the needs of consumers, so the presence of imported eggs is necessary. This paper analyzes the evolution of egg production and consumption at the national level, in the period 2016-2020. Thus, based on statistical data, indicators such as: average, standard deviation, coefficient of variation and annual growth rate were calculated and analyzed, thus highlighting the evolutionary trends that took place during this period and the main factors that influenced domestic production. and egg consumption.

Keywords: production, consumption, eggs, poultry sector, food security

JEL classification: Q13

INTRODUCTION

The Romanian poultry sector has similar results to those of major European producers. Among the products obtained from domestic birds, the egg is one of the most nutritious foods, due to its high nutritional and biological value, being a balanced source of protein and fat.

The poultry sector in Romania is a safe and very important one, the manufactured products being appreciated for export, but unfortunately it is not sufficiently appreciated on the Romanian market. In Romania, approximately 80% of poultry farms operate in a fully integrated system, which means that they own the entire production chain, from grain cultivation, production, reproduction, slaughter, processing and distribution. (Șcerbacov E., 2019)

At EU-28 level, the total number of laying hens is over 350 million heads, of which 53% are raised in enriched cages, and the largest exporter of eggs in Romania is Poland, the country with the highest number of hens. grown in cages in the European Union. Poland annually exports to Romania about 150 million eggs, ie 15% of the production of eggs in cages in Romania. (Șumanschii A., BizguI., Modvala S., 2010)

MATERIALS AND METHODS

The research is based on statistical data provided by the National Institute of Statistics in the period 2016-2020. During the research, the following indicators were calculated and analyzed:

- Arithmetic mean calculated as the ratio between the sum of the values in the data series and the number of years taken into account:

$$m = \frac{x_1 + x_2 + \dots + x_n}{n}$$

- The standard deviation that tells us how much the values are dispersed compared to the average

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$$\sigma = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n - 1}}$$

in which:

σ = standard deviation;

x_i = data series values over a number of years;

n = number of years considered.

- Coefficient of variation:

$$C = \frac{\sigma}{\bar{X}} * 100$$

Between 0-10% - higher degree of homogeneity of the series;

Between 10-20% - medium variation;

Over 20% - big variation.

- The annual growth rate shows us the annual growth of the analyzed phenomenon:

$$r = \sqrt[n-1]{\prod \left(\frac{p_n}{p_{n-1}} \right)} - 1$$

r = average annual growth rate;

$\prod p_n / p_{n-1}$ = chained growth indicators.

The research method used consisted in the quantitative and qualitative analysis of the data to highlight the evolution of the analyzed indicators. The statistical research process cost the following stages: data collection and recording, data processing, analysis and interpretation of results.(Ceapoiu N., 1968)

RESULTS AND DISCUSSIONS

There are over 350 million laying hens in the European Union, which produce almost 6.7 million tonnes of eggs annually. According to UPCR data, Romania is among the first countries in the EU in terms of the low number of hens raised in cages, respectively 4.79 million heads, which represents 14.7% of the total of 32.5 million existing laying birds in our country. (European Commission, Egg Sector)

At the level of the European Union, in 2019, France had the largest production of eggs, 13,100 million pieces, followed by Spain (12,871.18 million pieces), and Poland (10,291 million pieces), Romania registering a production of 4,887.40 million pieces.

In Romania, at the level of the period 2016-2020, there was a downward trend in egg production in Romania in 2020, highlighting a decrease of 12% compared to production recorded in 2016. During this period, production recorded values between 5,428 million pieces in 2020 and 6,182 million pieces in 2016, obtaining an average of the period equal to 5,777 million pieces. By development regions, the highest egg production was recorded in the South-Muntenia, North-East and South-East regions.

Table 1. Evolution of egg production by development regions, in the period 2016-2020 (millions of pieces)

Specification	The region	Years					Minimum	Maximum	Average	Standard deviation	Coefficient of variation (%)	Annual growth rate (%)
		2016	2017	2018	2019	2020						
	Northwest	718	637	639	610	620	610	718	644.8	42.66	6.62	-3.60
	Center	565	562	567	510	561	510	567	553	24.16	4.37	-0.18
	North East	1,035	1,029	982	893	841	841	1,035	956	85.79	8.97	-5.06

Specification	The region	Years					Minimum	Maximum	Average	Standard deviation	Coefficient of variation (%)	Annual growth rate (%)
		2016	2017	2018	2019	2020						
EGG PRODUCTION	South East	1,161	1,151	883	865	779	779	1,161	967.8	176.28	18.21	-9.49
	South Muntenia	1,374	1,313	1,410	1,413	1,349	1,313	1,413	1,371.8	42.25	3.08	-0.46
	Bucharest Ilfov	58	58	45	48	47	45	58	51.2	6.3	12.31	-5.12
	South West Oltenia	770	720	718	740	766	718	770	742.8	24.6	3.31	-0.13
	West	501	526	468	487	465	465	526	489.4	25.17	5.14	-1.85
	Total	6,182	5,996	5,713	5,564	5,428	5,428	6,182	5,776.60	309.54	5.36	-3.20

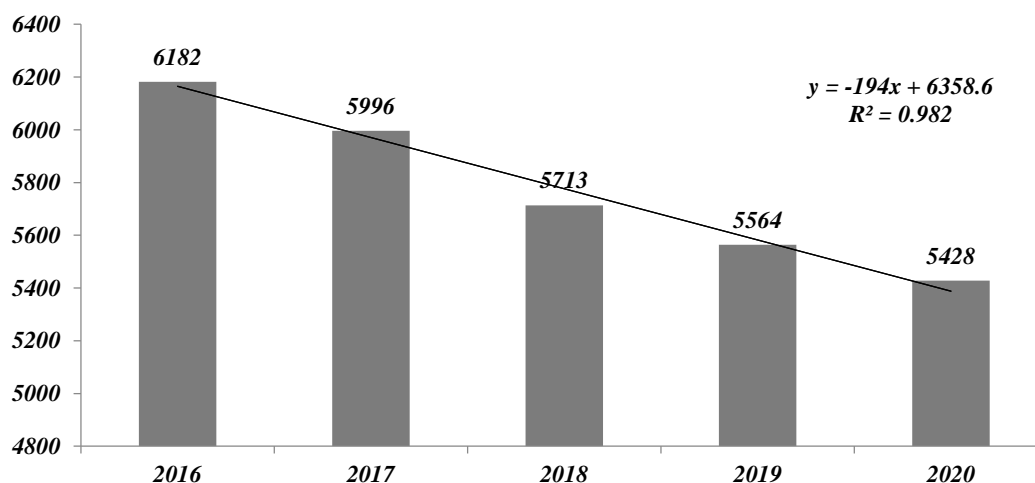
Source: www.insse.ro, accessed on 23.08.2021

In the South Muntenia region, egg production ranged between 1,313 million pieces in 2017 and 1,413 in 2019, obtaining an average period of 1,372 million pieces, and in the North-East the production varied between 841 million pieces in 2020 and 1,035 million pieces in 2016, achieving an average of the analyzed period of 956 million pieces.

On the other hand, the Bucharest-Ilfov region was registered with the lowest production of eggs for consumption, with a production between 45 million pieces in 2018 and 58 million pieces in 2016 and 2017, respectively, and with an average of the period equal to 51 million pieces. (Table 1)

The coefficient of variation for egg production ranged between 3.31% in the South-West-Oltenia region and 18.21% in the South-East region. The calculated coefficients of variation had low values, below 10%, for the regions: North-West, Center, North-East, South-Muntenia, South-West-Oltenia and West, which means the homogeneity of the data series. For the other regions, respectively South-East and Bucharest-Ilfov, the coefficient of variation registered average values, falling below the threshold of 20%, which means a medium variation of the data series. At the country level, the coefficient of variation was 5.36%, expressing a homogeneous series of data. Regarding the annual growth rate recorded for egg production, it was highlighted that negative values were recorded for all regions, the growth rate being between -0.13% in the South-West-Oltenia region and -9.49% in South-East, thus highlighting decreases in egg production in the regions of the country. (Table 1)

Figure 1. Evolution of egg production in Romania, in the period 2016-2020 (millions of pieces)



Source: data processed on www.insse.ro, accessed on 23.08.2021

According to the trend equation $y = -194x + 6,358$, egg production decreased on average annually, during the analyzed period, by approx. -194 million pieces. (Figure 1)

Table 2. Average annual per capita consumption of eggs in Romania, at the level of the period 2015-2019 (pieces / inhabitant)

Specification	Years					Minimum	Maximum	Average	Standard deviation	Coefficient of variation (%)	Annual growth rate (%)
	2015	2016	2017	2018	2019						
Egg	262	267	255	236	241	236	267	252.2	13.33	5.29	-2.07

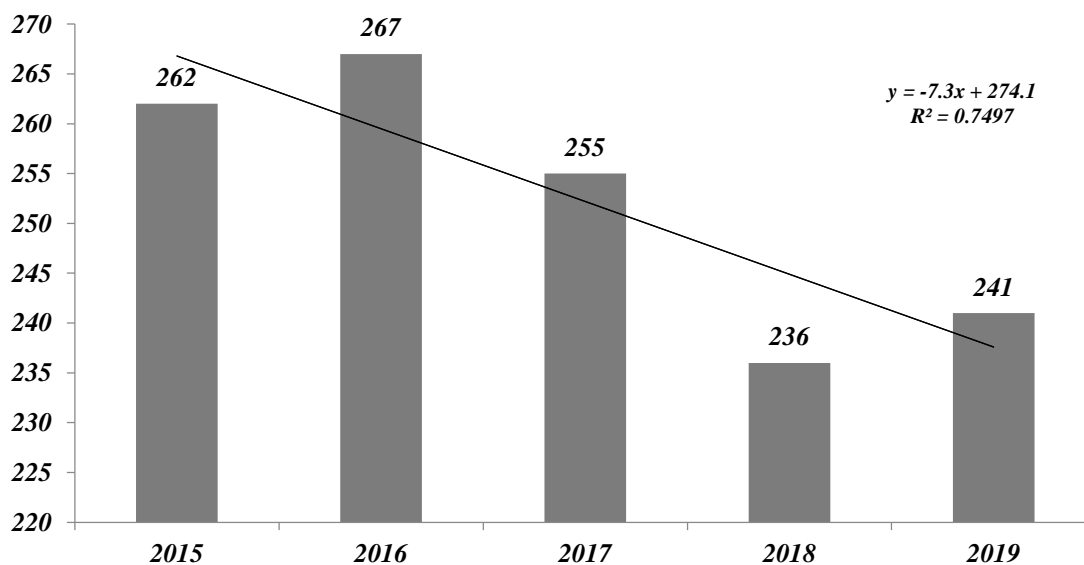
Source: www.insse.ro, accessed on 12.04.2021

According to the data presented by UPCR, a Romanian eats, on average, 240 - 250 eggs per year, which represents a consumption of 20 to 22 eggs in a typical month, but during the period when Easter is celebrated, consumption per capita grows to about 30 eggs. Romanians buy between 170 and 180 million eggs during the Easter holidays, 50% more than in an ordinary month (Roalment, 2019)

During the analyzed period, the consumption of eggs registered a downward trend, with variations between 236 pieces / inhabitant in 2018 and 267 pieces / inhabitant in 2016, obtaining an average of the period of 252 pieces / inhabitant. At the level of 2018 (236 pieces / inhabitant) there was a decrease in consumption by about 10% compared to the consumption recorded in 2015 (262 pieces / inhabitant), and in 2019 (241 pieces / inhabitant), the consumption of eggs was recorded a decrease of 8% compared to the one registered in 2015 and by 2% compared to 2018.

Analyzing the statistical indicators calculated for the average annual consumption of eggs in the period 2015-2019, we noticed a low value of the coefficient of variation of 5.29%, which indicates the homogeneity of the data series. The annual growth rate was -2.07%, its negative value indicating decreases in consumption in the analyzed time interval. (Table 2)

Figure 2. Evolution of the average annual consumption per inhabitant for eggs in the period 2015-2019 (pieces / inhabitant)



Source: data processed on www.insse.ro, accessed on 12.04.2021

Calculating the trend equation $y = -7.3x + 274.1$, it is found that on average annually, the average consumption of eggs per capita increased by 7.3 pieces. Also, it is observed the existence of a strong link between the two variables (Correlation ratio $R_x / y = 0.749$) the variation of egg consumption per capita being explained in proportion of 75% by the time factor, the rest being the influence of other factors not included in the model (Figure no.2).

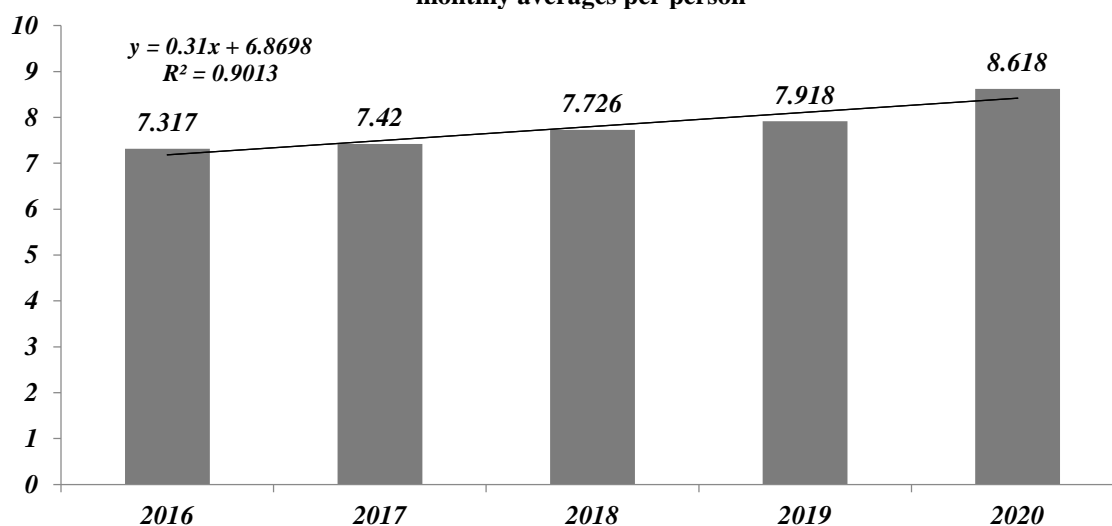
Table 4. Quantities of eggs bought by a household in the period 2016-2020 (pieces) - monthly averages per person

Specification	YEARS					Minimum	Maximum	Average	Standard deviation	Coefficientul of variation (%)	Annual growth rate (%)
	2016	2017	2018	2019	2020						
Egg	7.317	7.42	7.726	7.918	8.618	7.317	8.618	7.80	0.52	6.62	4.18

Source: data processing on www.insse.ro, accessed on 12.04.2021

Following the analysis of the quantities of eggs bought by a household, an upward trend was noticed. At the level of 2020 (8,618 pieces) registering an increase of approximately 18% compared to the reference year 2016 (7,317 pieces). Analyzing the statistical indicators calculated for the quantities of eggs bought by a household in the period 2016-2020, there were variations in the quantities purchased between 7,317 and 8,618 pieces, the average period equal to 7.80 pieces, and the standard deviation being 0, 52. Regarding the coefficient of variation, a small value of 6.62% was noticed, the edition of the period being significant. The annual growth rate was 4.18%, its positive value indicating increases in the quantities of eggs purchased in a household during the analyzed period (Table 3).

Figure 3. Evolution of the quantities of eggs purchased by a household in the period 2016-2020 (number) monthly averages per person



Source: data processed on www.insse.ro, accessed on 12.04.2021

According to the trend equation $y = 0.31x + 6.869$, the average quantity of eggs purchased by a household increased on average annually, during the analyzed period, by approximately 0.31 pieces. (Figure 3).

CONCLUSIONS

At the level of the period 2016-2020, the production of eggs for consumption had a trend, registering significant decreases of the registered values, in 2020 there was a decrease of 12% compared to the production achieved in 2016. At the same time with the production decreased average annual consumption per capita in 2019, egg consumption decreasing by 2% compared to consumption in 2018, this decrease being influenced by the trend of consumers towards a healthy and balanced lifestyle, however the egg market during this period it was a relatively balanced one.

Analyzing the average quantities of eggs purchased by a household, an increase of about 40% was observed in the analyzed period, thus noticing an increase in sales for eggs, the increase being

supported by the increasingly significant number of producers. However, domestic market production of eggs cannot meet the needs of urban consumers, plus a few rural consumers, which makes the presence of imported eggs necessary. The value of imported eggs is higher than exports, thus resulting in a deficient trade balance, highlighting Romania's dependence on egg imports, Poland (10,285 thousand euros), Hungary (7,212 thousand euros) and Bulgaria (4,594 thousand euros) being the main countries from which Romania imported eggs in 2020.

Romania is one of the countries affected by the epidemiological situation in the world, due to the presence of COVID-19 virus, which has a major negative impact on all economic sectors of the country, the agricultural sector and the food industry, being also affected by the implementation of measures restricting the movement and social distance imposed by the government. Due to the exceptional circumstances created by the COVID-19 pandemic, companies of all types have faced a severe lack of liquidity. This has been true in the short and medium term and has severely affected the economic situation of many companies with possible consequences even in the long term, jeopardizing the continuation of their business. In this context, the poultry sector has encountered difficulties in not being able to market products of animal origin, thus incurring significant economic losses.

Currently, the most important problems of the poultry sector, regarding the egg market, are related to the production from the stock, the lack of support measures at European and national level, the deficient extension of the trade to the large third markets, the dependence on external purchases of chickens. day, the invasion of eggs from other Member States and the lack of a coherent production-import-trade balance policy.

REFERENCES

1. Ceapoiu N., 1968, Statistical methods applied in agricultural and statistical experiences, Ed. Agro-Silvica, Bucharest;
2. European Commission, ec.europa.eu, accessed on 12.04.2021;
3. European Commission, Egg Sector, https://ec.europa.eu/info/food-farming-fisheries/animals-and-animal-products/animal-products/eggs_en
4. Giucă A.D., Ilie D.M., Sterie C.M., Stoica D.M, Marin A., 2021 Egg market study;
5. The National Institute of Statistics, www.insse.ro, accessed on 12.04.2021;
6. Roaliment, 2019, <https://www.roaliment.ro/piata/ucpr-romania-se-afla-printre-primele-tari-din-ue-in-ceea-ce-priveste-numarul-mic-de-chickens-raised-in-cages/>
7. Șcerbacov E., 2019, Analysis of the export potential of milk, dairy products and eggs production, Competitiveness and Innovation in the knowledge economy ", XXI Edition, Chisinau, pp. 221-224;
8. Șumanschi A., Bizgu I., Modvala S., 2010, Study of the development of the poultry sector at national and international level, Conference "Animal husbandry and biotechnologies", Chisinau, pp. 122-126;
9. Țimiraș L.C., 2016, Marketing research. Applications and case studies.