

STUDY REGARDING DYNAMICS AND FUTURE ESTIMATES OF ANIMAL SECTOR IN ROMANIA

Maria Cristina STERIE

PhD Student, Bucharest University of Economic Studies, Romania

Email: steriemaria94@gmail.com

Abstract

This paper aims to analyze the number of animals in the period 2010-2020, as well as the calculation of the main statistical indicators, namely: standard deviation, coefficient of variation and dynamic, based on which a series of measures have been developed to encourage growth / mention of production of animal origin. With the help of the SPSS statistical processing program, simulations were performed on the evolution of livestock in Romania until 2030. Thus, estimates have provided data that cattle herds will decrease by 20% by 2030 compared to 2020. Pig herds will decrease by 34% compared to 2020, goat herds will increase by 18% in 2030, and sheep herds will reach 11.5 million heads, up more than 10% from 2020.

Keywords: *Livestock, statistical indicators, estimates, Romania.*

DOI: 10.24818/CAFEE/2021/10/01

Introduction

The aim of the paper is to highlight the current situation, the challenges encountered in the animal sector and to estimate the development trends for the next 10 years, in order to identify the causes that contribute to these issues, as well as to identify solutions to address these issues. problematic. This purpose involves the analysis of cattle, pigs, sheep, goats and birds in the period 2010-2020 and the calculation of the main technical indicators that can identify the dynamics of evolution. The distribution of livestock by development regions can provide an overview of the predominant species in the region. Also, with the help of the SPSS statistical processing program, based on INS data, in the period 2000-2020, estimates will be made for the next 10 years.

According to the National Institute of Statistics, during the analyzed period, the growth rate of cattle (-0.56%), pigs (-3.54%) and poultry (-1.26%) shows negative annual rates, and in the case of and sheep (2.02%) and goats (2.65%) show positive annual rates.

Thus, in the case of cattle, goats and birds in the next 10 years a downward trajectory has been estimated, while in the case of sheep and goats, the trend seems to be upward.

1. Literature review

According to Chetroiu (2020) "*Animal husbandry has the role of transforming products more difficult to access or even inaccessible to human consumption, in products with high biological value, with an essential role in human nutrition*".

According to Grigoraş (2016) „*Animal growing is a traditional activity in Romania' rural areas assuring the population consumption needs, sustainable farming and stability. Animals are a source of essential food for human diet like milk and meat, but also of skins, natural fertilizer and biogas*”.

Sandu (2015) considers that "Globally, animals contribute directly to reducing poverty and increasing food security, being the livelihood of nearly one billion people in the world and sources of income and jobs".

According to Popescu (2016), Romania occupies an important position in the EU for its herds, sheep and goats being raised in Romania for milk, meat and wool, which contribute 3.6% to milk production and 8% to dairy production. meat. Also, the dispersion of pig production reflects a relatively uniform level covering the demand of the population.

In the paper entitled "Study on consumer preferences on the purchase of animal products in the period before the pandemic and during the COVID 19 pandemic", the authors Ursu and Dumitru identified changes in consumer preferences with the emergence of the COVID-19 pandemic, on the purchase of food origin products. The study contributes, in particular, to the understanding and acceptance of lifestyle changes, in the context of significant changes in the economy, changes in the labor market, changes in income, rising prices for animal products, changes in the diet, which can lead to a change in the diet, the increase of consumer preferences for the supply of products of animal origin directly from the producer, etc.

2. Experimental section

In Romania, the cattle herds show oscillations in the analyzed period, thus in 2020, 1.88 million head of cattle were registered, decreasing by 6% compared to 2010 (2 million herds). (Table 1)

The herds of pigs show a downward trajectory in the period 2010-2020, so in 2010, 5.43 million heads were registered, reaching in 2020 3.78 million heads, representing a decrease of 30%. The swine fever that started in 2016 contributed to the decrease in herds, corroborated with the lower prices of imported pork. (Table 1)

Table 1. Analysis of livestock and birds in Romania in the period 2010-2020
(millions of heads)

<i>Species</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2020/2010</i>
<i>Cattle</i>	2.00	1.99	2.01	2.02	2.07	2.09	2.05	2.01	1.98	1.92	1.88	93.71
<i>Swine</i>	5.43	5.36	5.23	5.18	5.04	4.93	4.71	4.41	3.93	3.83	3.78	69.72
<i>Sheep</i>	8.42	8.53	8.83	9.14	9.52	9.81	9.88	9.98	10.18	10.36	10.28	122.14
<i>Goats</i>	1.24	1.24	1.27	1.31	1.42	1.44	1.48	1.50	1.54	1.59	1.61	129.90
<i>Poultry</i>	80.84	79.84	80.14	79.44	75.45	78.65	75.69	73.29	73.99	75.36	71.18	88.05

Source: inss.ro, accessed on 17.09.2020

The total number of sheep shows an increasing trend, so in 2010 there were 8.4 million heads, reaching in 2020 to 10.3 million, showing an increase of 22%. In the case of goat herds, there is an increasing trend since 2010 when 1.24 million heads were registered, reaching 1.61 million heads in 2020, showing an increase of about 30%. Increased exports of sheep and goats to Arab countries lead to increased herds and can be real opportunities for Romania. During the analyzed period, there is a decrease in the number of birds by approximately 12% in 2020 (71.18 million heads) compared to the number of birds registered in 2010 (80.84 million heads). (Table 1)

**Table 2. The main technical indicators for livestock
(millions of heads)**

Species	Minimum (million heads)	Maximum (million heads)	Average (million heads)	Deviation standard	* The coefficient variation (%)	The beat growth rate (%)
Cattle	1.88	2.09	2.00	0.06	0.03	-0.65
Swine	3.78	5.43	4.71	0.63	0.13	-3.54
Sheep	8.42	10.36	9.54	0.70	0.07	2.02
Goats	1.24	1.61	1.42	0.14	0.10	2.65
Poultry	71.18	80.84	76.72	3.22	0.04	-1.26

Source: Edited by the authors based on INS data, accessed on 17.09.2020

*Coefficient of variation (<10 - small; 10-20 - medium;> 20- high)

Following the analysis carried out in the period 2010-2020, it is observed that the average number of cattle was 2 million herds, the annual rate is negative (-0.65%), and according to the coefficient of variation (0.03%), the data series shows a small variation. Regarding the pig herds, in the period 2010-2020, the average was 4.71 million heads, the annual rate is negative (-3.54%), the variation of the data being medium, the coefficient of variation being 0.13%. The average number of sheep is 9.54 million herds, with a positive annual rate (2.02%), and the variation of the data series according to the coefficient of variation (0.07%) is small. For goat herds, the annual rate is positive (2.65%), the variation of the data series being medium. It is observed that the annual rate in the case of poultry is negative (-1.26%), and the variation of the data according to the coefficient of variation (0.04%) is small. (Table 2)

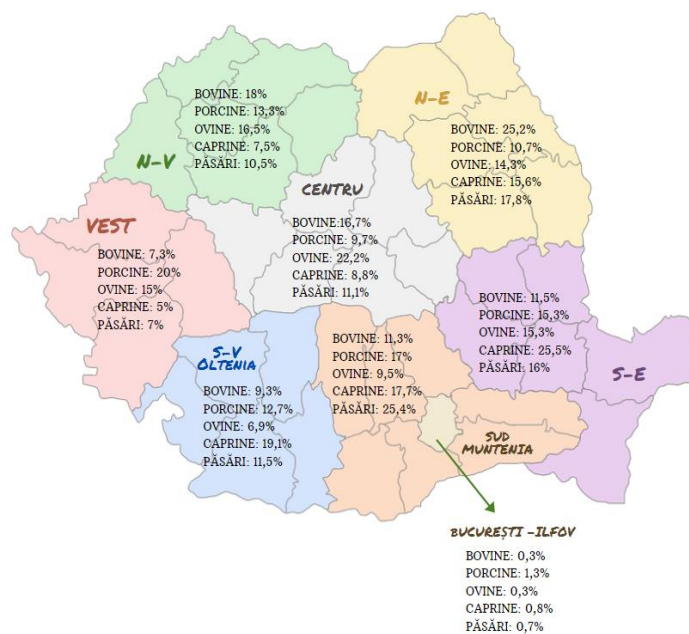


Figure 1. Distribution of livestock by development regions

Source: Edited by the authors based on INS data

In figure number 1.1. the regions of Romania in which animal species are widespread in the period 2010-2020 are observed and the share of each species in the total number of herds in the region is presented. Thus, the cattle herd predominates in the North-East region with 25.2%, being followed by the North-West region with 18% and the Center region with 16.7%. At the opposite pole are the West region with 7.3% and Bucharest-Ilfov with 0.3%. The West region concentrated 20% of the total number of pigs in the total region, followed by the South Muntenia region (17%). The lowest number of pigs is found in the Center region (9.7%) and Bucharest-Ilfov (1.3%). On the first position in terms of sheep herd is the Central region with a share of 22.2% and Northwest with 16.5%. Most goat herds are found in the South-East region (25.5%) and South West-Oltenia (19.1%), the least being registered in the West region (5%) and Bucharest-Ilfov (0, 8%). Birds are predominant in the South Muntenia region (25.4%) being followed by the North-East (17.8%) and South-East (16%) region. (Figure 1.)

With the help of the SPSS statistical processing program, forecasts of livestock in Romania were made by 2030.

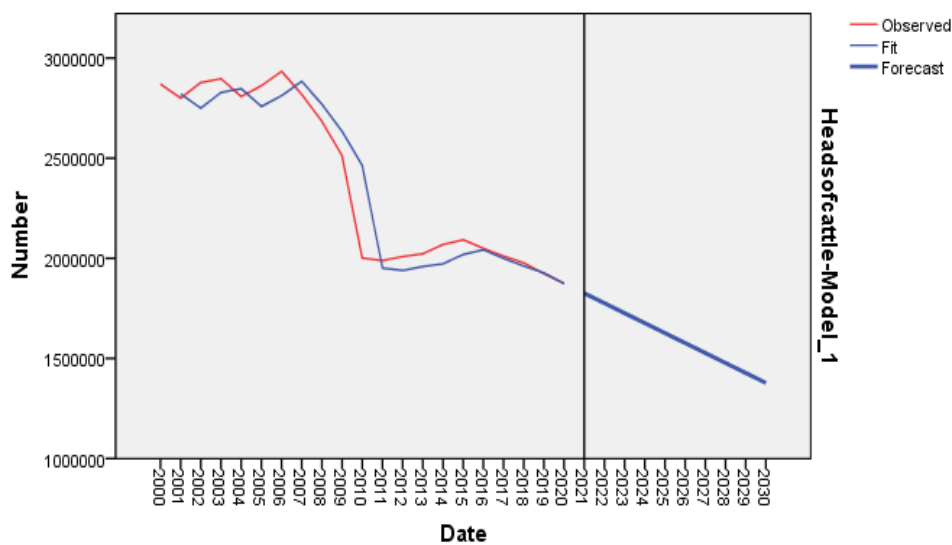


Figure 2. Estimates regarding the evolution of cattle in Romania (millions of heads)

Source: Own processing based on INS data

Thus, in 2010, 2 million heads were registered, reaching in 2020 1.88 million staff. According to estimates, cattle herds will reach 1.4 million heads, down 20% compared to 2020. (Figure 2)

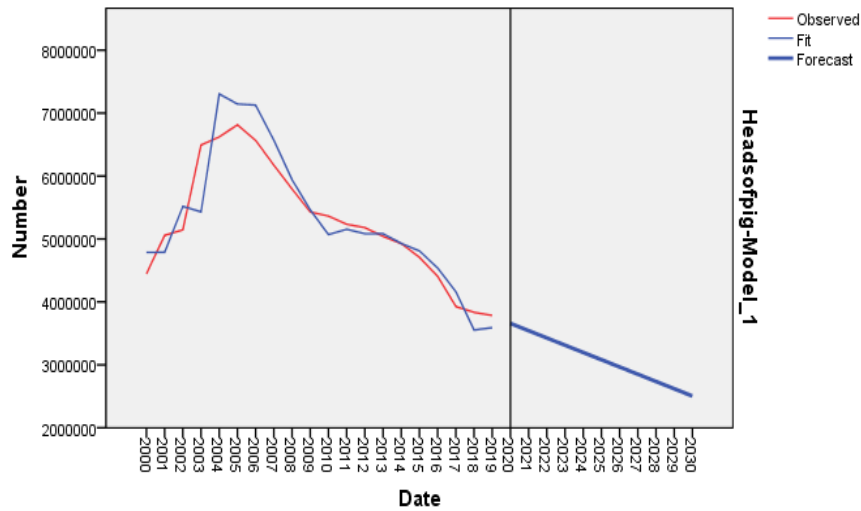


Figure 3. Estimates regarding the evolution of pig herds in Romania (millions of heads)

Source: Own processing based on INS data

In 2001, the herd of pigs registered 4.4 million flocks, reaching in 2020 with 3.8 million flocks. Estimates show that in 2030 it will reach a number of 2.5 million, decreasing by 34% compared to 2020. (Figure 3)

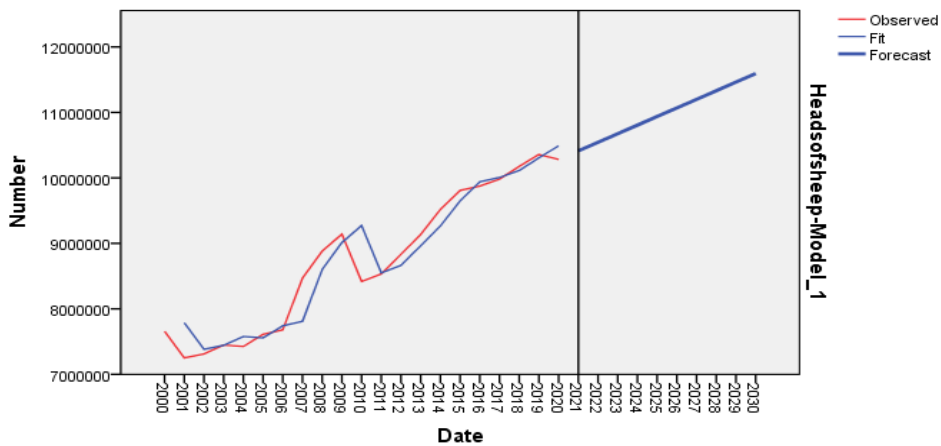


Figure 4. Estimates regarding the evolution of sheep herds in Romania (millions of heads)

Source: Own processing based on INS data

In terms of sheep herds, 7.6 million sheep were registered in 2000, reaching 10.3 million herds in 2020. It is observed, according to estimates, that the number of staff reaches 11.5 million staff, increasing by more than 10% compared to 2020. (Figure 4)

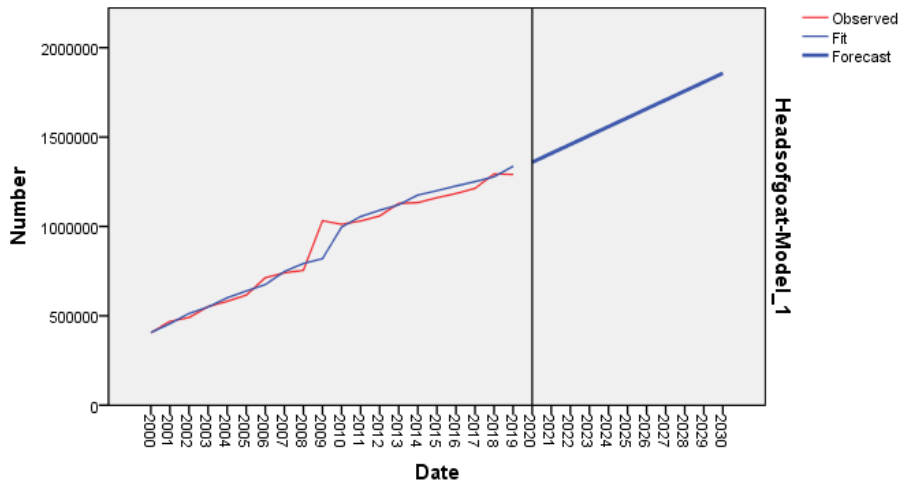


Figure 5. Estimates regarding the evolution of goat herds in Romania (millions of heads)

Source: Own processing based on INS data

In 2001, a number of 405.5 thousand goats was registered, reaching in 2020 to 1.6 million flocks. According to estimates, in 2030, goat herds will reach 1.9 million herds, increasing by 18% compared to 2020. (Figure 5)

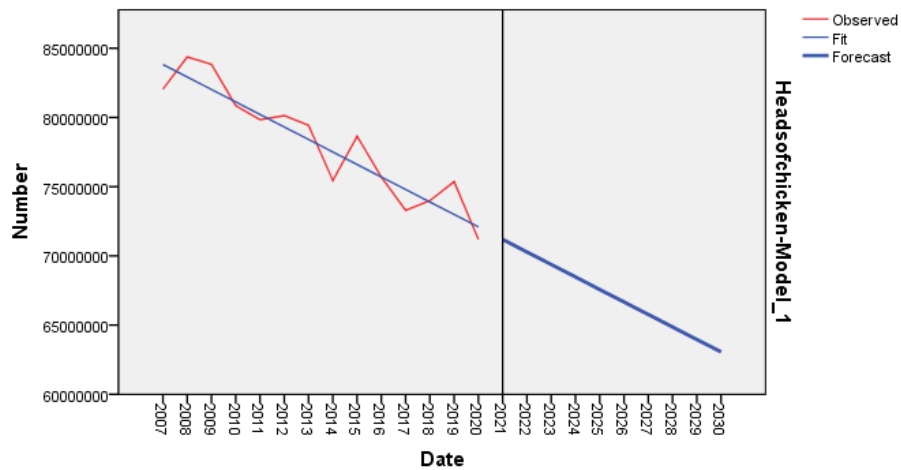


Figure 6. Estimates regarding the evolution of overrunning in Romania (millions of heads)

Source: Own processing based on INS data

In 2007, 82 million staff were registered, reaching in 2020 71.2 million staff. According to estimates, the number of flocks of birds will reach 62.5 million flocks in 2030, down 12% compared to 2020. (Figure 6)

Conclusions

Following the analysis, it was found that the sheep and goat sector has an increasing trajectory in the period 2010-2020, while the pig and poultry sector has a downward trajectory. Also, following the calculation of the indicators, the negative growth rate of cattle, pigs and poultry is highlighted. Since 2010, swine herds have a downward trajectory, the sector being severely affected since 2016 when swine fever led to instability in the sector, encouraging massive meat imports.

At present, the regional distribution of animals analyzed in the total region illustrates that cattle herds predominate in the North-East (25.2%) and North-West (18%) region, with pig herds predominating in the West (20%) and South Muntenia (17%). In the case of sheep herds, they are predominant in the Center region (22.2%) and North-West (16.5%), goat herds predominate in the South-East (25.5%) and South West-Oltenia regions (19.1%), and the flocks of birds in South Muntenia (25.4%) and North-East (17.8%).

With the help of the estimates made in the SPSS program, we can provide an overview for the next 10 years and we can identify the direction of development of the sector, to provide recommendations and suggestions.

According to estimates, cattle herds show a declining trajectory over the next 10 years, reaching 1.4 million heads in 2030, down 20% compared to 2020. Sheep and goats show upward trends in 2030 increasing by 46% and 10% respectively compared to the herds registered in 2020. In the case of pigs and poultry, the estimates made show downward trends in the next 10 years, in 2030 decreasing by 34% and 12% respectively compared to 2020.

Causes that contribute to the decrease in livestock include difficulties in organizing the livestock sector, the lack of cooperatives and meat processing factories. Also, the existence of a large number of semi-subsistence farms has a low technical-material level compared to other EU countries and also low productivity. The development of the livestock sector can be achieved by building sustainable and competitive farms, which use high-performance farming systems and which can lead to the association of farmers in order to increase productivity and economic efficiency.

The effects of swine fever on this sector are more than obvious, so local authorities need to take much more drastic measures to expand these outbreaks, which occur cyclically, but especially to compensate for the damage done to farmers. Part of the European funds can be reallocated exclusively through measures aimed at increasing security at the level of a livestock farm, to prevent possible infections.

Funding

This paper was co-financed by The Bucharest University of Economic Studies during the PhD program.

References

1. Chetroiu R., Iurchevici L., Marin A., Cofas E., Cișmileanu A., (2020), *Eficiența economică a sectoarelor de creștere a animalelor – context și evaluare*, Editura Ceres, București.
2. Grigoras Mircea Adrian, (2016), Trends in Romania's animal production, *Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 16, Issue 4.
3. National Institute of Statistics (NIS) – www.insse.ro.

4. Popescu Aghata, (2016), Research on concentration of pork production in Romania, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*.
5. Popescu Aghata, (2020), Trends in sheep and goat livestock and meat production concentration and their economic impact in Romania in period 2009-2018, *Academy of Romanian Scientists Series Agriculture, Silviculture and Veterinary Medicine Sciences Online ISSN 2344 – 2085 Volume 9*.
6. Sandu M., Sandu S., Paraschivescu M., (2015), Evolution of Romanian livestock from the perspective of availability of food products, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 15, Issue 2.
7. Ursu Ana, Dumitru Eduard, (2020), Studiu privind preferințele consumatorilor asupra achiziționării de produse de origine animală în perioada anterioară pandemiei și în timpul pandemiei COVID 19”, Conferința Științifică Internațională "Economic And Social Implications Of The Covid-19 Pandemic: Analysis, Forecasts And Consequences Mitigation Strategies".