DE GRUYTER OPEN

ADVANCED RESEARCH IN LIFE SCIENCES
*1*(1), 2017, 53-58

www.degruyter.com/view/j/arls

**DOI: 10.1515/arls-2017-0009**
Research Article

# Research Regarding Food Security in Georgia – Dynamics of Livestock, Animal Productions and Self-Sufficiency

**Tamar Jangulashvili[1], Ioana Mihaela Balan[*2], Tiberiu Iancu[2], Levan Jangulashvili[1], Luminita Pirvulescu[2]**

[1]Tbilisi Teaching University, Georgia
[2] Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Faculty of Agricultural Management, Timișoara, Romania

*Accepted June, 2017*

**Abstract**
Georgia, the country at the intersection of Europe and Asia, is an important actor on agricultural market, both from Europe and from Asia. The climate of Georgia makes it ideal for growing cereals for animal productions. This climate and the high quality of soil have made the agriculture one of the most important Georgian sectors. The mixed team of researchers from Georgia and Romania has analysed the dynamics of livestock and animal productions in Georgia in order to highlight their future trends and the level of food security in that country.

**Key words:** livestock, food security, self-sufficiency, animal productions.

## Introduction

Animal husbandry, especially cattle, pigs and sheep were represented 25% of Georgia's agricultural output, even if technical equipment and poor mechanization have hampered efficiency. Until 1992, other former Soviet republics bought 95% of tea produced by Georgia, 62% of wine, and 70% of preserved products. But at that time, Georgia imported 75% of the grain from Russia. So, the entire animal products sector was depending by imports. Approximately 30% of meat and 60% of dairy products consumed in Georgia were purchased outside of the country. Subsequently, the cancellation of these trade relations contributed to the food crises in Georgia in the early 1990s [1].

Nowadays, the situation has changed consistently. The self-sufficiency level for food of animal origin has increased considerably, even surpassing national needs.

As in other countries, Georgia has invested in improving animal genetics, which has led to an increase in the profitability of livestock production [2].

## Material and Methods

For this research were used statistical analysis methods, with retrospective studies, with multivariable secondary data, provide by National Statistics Office of Georgia.

The data analysed are provided by this institution and represents the values achieved at the end of each period, with some few exceptions, mentioned on text.

## Results and Discussions

Georgia's livestock has undergone transformations over the past ten years, both in the downward direction and in the reverse direction of its growth. Political conditions, fluctuations in national and international markets as well as climate conditions have led to some major changes in Georgia's livestock.

* Corresponding author: **Ioana Mihaela Balan,** ioanambalan@yahoo.com

**Table 1**

**Livestock of all categories in Georgia since 2006 to present (ths. heads)**

| Year | Cattle | | Pigs | Sheep and goats | | Poultry |
|---|---|---|---|---|---|---|
| | | of which cows | | | of which sheep | |
| **2006** | 1080.3 | 591.2 | 343.5 | 789.2 | 696.8 | 5400.7 |
| **2007** | 1048.5 | 541.0 | 109.9 | 797.1 | 711.0 | 6149.7 |
| **2008** | 1045.5 | 560.5 | 86.3 | 769.4 | 690.0 | 6682.3 |
| **2009** | 1014.7 | 537.6 | 135.2 | 673.8 | 602.3 | 6674.8 |
| **2010** | 1049.4 | 561.7 | 110.1 | 653.9 | 596.8 | 6521.5 |
| **2011** | 1087.6 | 587.7 | 105.1 | 630.4 | 576.8 | 6360.2 |
| **2012** | 1128.8 | 602.4 | 204.3 | 742.6 | 688.2 | 6159.1 |
| **2013** | 1229.7 | 641.1 | 191.2 | 856.8 | 796.0 | 6760.7 |
| **2014** | 1278.0 | 665.2 | 204.8 | 919.6 | 865.9 | 7272.6 |
| **2015** | 1325.5 | 650.3 | 197.7 | 891.4 | 841.6 | 8805.9 |
| **2016*** | 932.1 | 491.9 | 134.2 | 781.9 | - | 8057.5 |

Source – National Statistics Office of Georgia GEOSTAT
* Preliminary data

Decreases have present in almost species, and these species are those that are in quantitative terms, the largest producer of meat (body mass) and milk (Table 1) [3].

Pigs, however, present the most dramatic situation. The swine livestock decreased from one year to the next at less than 30%, and in the next year with almost another 20% from the previous year, a situation without precedent in Georgia's livestock and without repetition in the future.

The researchers also revealed that the goats also had an interesting dynamics. From one year to the next, the goat livestock in Georgia has declined steadily. This has happened with some exceptions in 2012 and 2013, when there was a slight increase.

However, in the coming years, goat livestock began to fall again, reaching the end of the analysed period to less than 50% of the livestock that existed at the beginning of the same period. Numerically, expressed in thousands of heads, this cattle breed was 92.4 in 2006, reaching in 2015 only 49.8. The opposite is the situation of poultry. The number of poultry for meat production increased considerably, reaching almost 150 % at the end of the analysed period, compared to the beginning of the period. This is also revealed in the egg production of Georgia, which will be analysed below (Fig.1.).

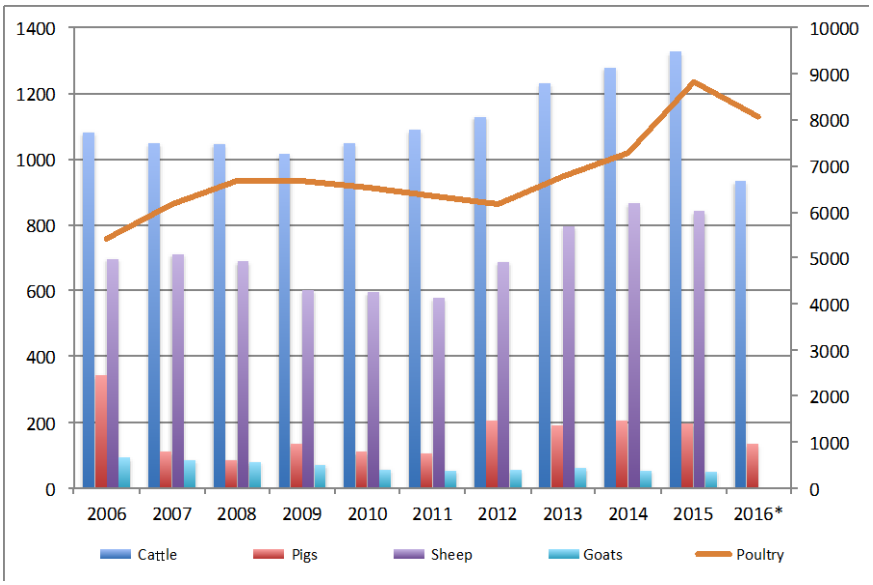


**Fig. 1. Dynamics of livestock in Georgia in period 2006-2016 (ths. heads)**

In cattle the situation of the number of reproduction females (the cows), of the total livestock, had an interesting evolution (Fig.2.).

**Table 2**

**Production of main animal productions**

| Year | Quarte | Meat (Slaughtered weight mln.kg) | Milk (mln.litres) | Eggs (mln.units) |
|---|---|---|---|---|
| **2007** | I Q | 20.5 | 126.2 | 80.8 |
| | II Q | 16.7 | 210.6 | 129.0 |
| | III Q | 11.9 | 190.4 | 121.8 |
| | IV Q | 23.9 | 97.5 | 106.5 |
| **2008** | I Q | 13.7 | 108.6 | 107.7 |
| | II Q | 14.6 | 237.6 | 122.0 |
| | III Q | 10.3 | 184.2 | 101.5 |
| | IV Q | 18.7 | 115.4 | 106.3 |
| **2009** | I Q | 12.8 | 89.9 | 113.9 |
| | II Q | 13.7 | 192.8 | 120.8 |
| | III Q | 11.2 | 174.7 | 102.8 |
| | IV Q | 16.6 | 94.0 | 93.1 |
| **2010** | I Q | 11.1 | 102.8 | 112.2 |
| | II Q | 10.9 | 205.3 | 118.9 |
| | III Q | 14.4 | 186.6 | 111.9 |
| | IV Q | 20.0 | 93.0 | 101.5 |
| **2011** | I Q | 9.9 | 96.5 | 109.0 |
| | II Q | 10.0 | 212.3 | 125.5 |
| | III Q | 12.0 | 172.7 | 121.4 |
| | IV Q | 17.4 | 100.6 | 127.2 |
| **2012** | I Q | 7.3 | 101.7 | 111.1 |
| | II Q | 9.5 | 209.8 | 135.4 |
| | III Q | 8.3 | 177.0 | 112.0 |
| | IV Q | 17.5 | 100.9 | 115.5 |
| **2013** | I Q | 9.4 | 105.1 | 125.4 |
| | II Q | 11.0 | 209.3 | 132.2 |
| | III Q | 9.3 | 179.9 | 110.7 |
| | IV Q | 18.7 | 110.5 | 126.9 |
| **2014** | I Q | 12.1 | 106.8 | 127.2 |
| | II Q | 11.1 | 232.7 | 151.1 |
| | III Q | 11.2 | 192.5 | 127.1 |
| | IV Q | 20.4 | 124.2 | 144.0 |
| **2015** | I Q | 10.5 | 125.3 | 153.0 |
| | II Q | 15.0 | 247.7 | 159.9 |
| | III Q | 15.0 | 191.5 | 149.5 |
| | IV Q | 21.6 | 112.0 | 138.8 |
| **2016*** | I Q | 8.5 | 92.8 | 146.9 |
| | II Q | 13.5 | 187.0 | 149.2 |
| | III Q | 13.0 | 149.0 | 138.1 |
| | IV Q | 17.5 | 77.3 | 130.5 |

*Source – National Statistics Office of Georgia GEOSTAT, * Preliminary data*

Thus, the ratio between the two was the lowest at the beginning of the period under review, meaning 1.83 in 2006, and then rising to 1.92 in 2013, reaching the maximum value of 2.04 in 2015. Currently, this indicator has regressed, being estimated for 2016 at the level of 1.89.

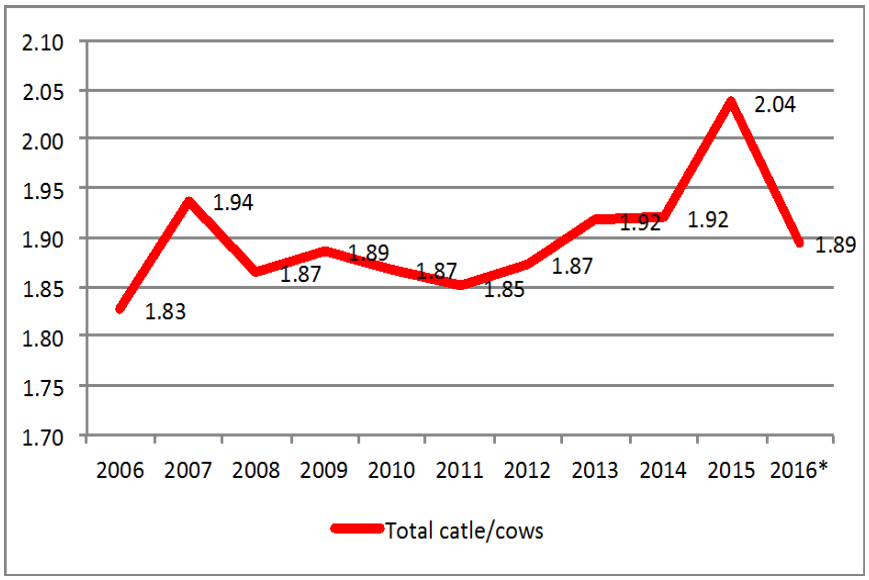


**Fig. 2. Dynamics of the indicator between the number of reproduction females relative to the total number of cattle**

We have analysed this indicator because it is very representative in terms of the future trend of the livestock. Cows, the female giving birth calves, are ensuring the future of livestock. This indicator predicts the level of exploitation of the herds and their economic efficiency. Thus, a low coefficient denotes a more efficient operation than a higher coefficient.

With regard to the main animal products, they were in line with the dynamics of the livestock. There are, however, variations in the seasons in which these productions were obtained (Table 2) [3].

In the case of meat production, it is observed that its highest level is in the fourth quarter. This is a well-known fact, because in the winter season the slaughter rate increases due to the animal husbandry specificity and the traditional consumption of meat during the winter holidays.

With regard to milk productions, they were higher during warmer seasons, spring and summer. This is normal if we consider that these periods following season's births of new-borns when mothers milk production are high.

Although the situation should be similar in the case of egg production during the analysed period in Georgia, this has only been revealed only sporadically.

The annual analysis of the production achieved during the research period, it is revealed that the only production that grew relatively constant was the production of eggs. The other two annual productions, the meat and the milk decreased from year to year, with some variations, from 73 million kilograms of slaughtered weight in 2007 to 52.5 million kilograms of slaughtered weight estimated for 2016 and from 624.7 million litres of milk in 2007 to 506.1 million litres of milk estimated for 2016. (Fig. 3.).

Regard to human consumption and animal husbandry potential to cover the needs of the Georgian population for the main important animal products, the level of self-sufficiency in meat and meat products, along with milk and dairy products, as well as eggs over the period under review, varied with a fairly high dynamics (Table 3) [3].

Almost all the auto-sufficiency indicators for livestock production are below the needs of the population of Georgia, excluding eggs and sheep and goats in 2008. As noted in Table 3, with some exceptions, the level of these indicators has fallen over the last ten years.

But the milk self-sufficiency indicator has increased in recent years compared to the beginning of the analysed period, from 82% to 91% and 88%. This is an extremely positive fact if we take into account that milk proteins are some of the best qualities for human nutrition.

The most accentuated fall in the level of self-sufficiency recorded in pork production. Compared to the beginning of the analysed period, since 2006, when it was 79%, it dropped dramatically in 2009, by 42%, to only 37%.

This situation is also found in the coming years, after slight recovery, reaching 36% in 2012, down 43% from the beginning of the analysed period.

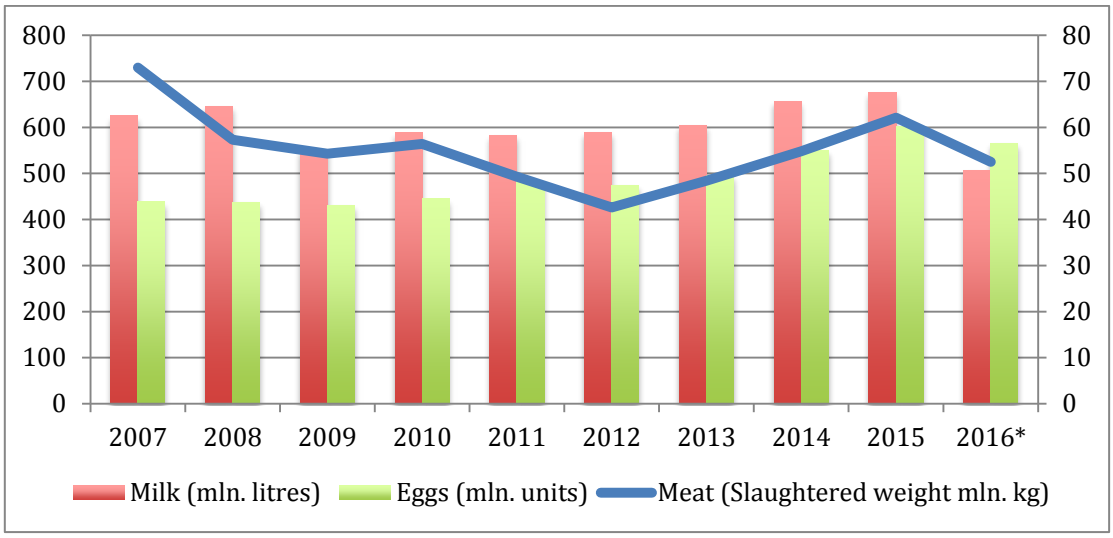


**Fig. 3. Dynamics of annual main animal productions**

**Table 3**

**The self – sufficiency indicator for the main important animal productions (%)**

| | Beef | Pork | Sheep and goats | Poultry | Milk and dairy products | Eggs |
|---|---|---|---|---|---|---|
| **2006** | 81 | 79 | 99 | 43 | 82 | 85 |
| **2007** | 73 | 61 | 99 | 31 | 89 | 100 |
| **2008** | 68 | 47 | 101 | 26 | 93 | 95 |
| **2009** | 76 | 37 | 98 | 24 | 92 | 101 |
| **2010** | 77 | 49 | 98 | 22 | 93 | 98 |
| **2011** | 68 | 43 | 93 | 21 | 93 | 99 |
| **2012** | 61 | 36 | 83 | 21 | 92 | 100 |
| **2013** | 71 | 41 | 85 | 18 | 91 | 95 |
| **2014** | 70 | 42 | 79 | 25 | 91 | 96 |
| **2015** | 77 | 45 | 76 | 31 | 88 | 102 |

*Source – National Statistics Office of Georgia GEOSTAT*

In the opposite situation is Georgia's egg production. It has recorded spectacular values year after year, reaching the level of self-sufficiency exceeding 100% in more years, by 1% and even 2% (Fig. 4.). The realization of these indicators denotes that Georgia has good technology and favourable conditions for the development of egg poultry production, being able to provide internal resources for eggs, while also being able to cover part of this need also on international agricultural markets.

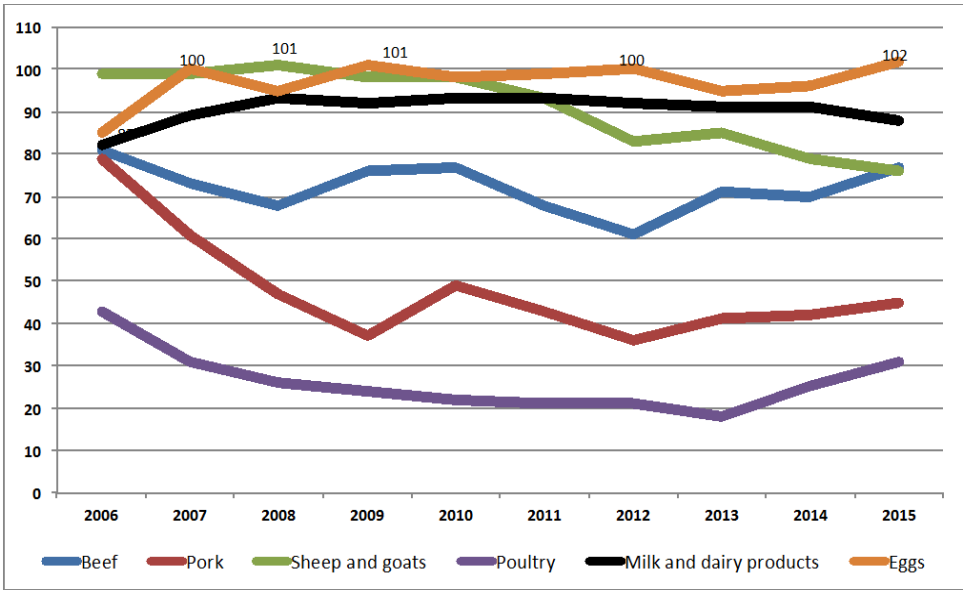


**Fig. 4. Dynamics of the annual indicators of self-sufficiency for the main important animal productions**

## Conclusions

Animal production is an important source of protein in human nutrition to ensure food security in Georgia. Even though Georgia has a major agricultural potential, which could be reflected in a self-sufficient level of over 100% in all categories of animal products, this has only been achieved in the production of eggs in some years [4].

Although if the level of self-sufficiency in some animal products is below the Georgia requirement are products where the level of self-sufficiency exceeds the need, even not 2% in some years. This denotes that Georgia's food security is assured and can be predicted to remain the same in the coming years.

The political situation in the past decade, as well as the economic changes at European and world level, have made, for most countries in the Eurasian and not only, the self-sufficiency level of animal products to decline.

In order to be in the international trend in terms of quality of production, it is recommended that Georgia turn its attention to the goat livestock. The increasingly low values of Georgian goats livestock, specific to several Eurasian countries, are expected to be improved because the goats, although they are animals with lower animal yields compared to sheep or other animals, have certain exploitation advantages, which aims at the exceptional quality of milk and the rusticity and resistance of goats to diseases.

The results of the research show clearly that Georgia has been and can be predicted to remain an important player in the food markets. With regard to food security, which is extremely important for any country, including Georgia, surely Georgia's high agricultural potential, coupled with favourable weather conditions, will make food safety indicators a positive dynamics in the coming years.

## Acknowledgements

The paperwork and the results presented in it, are the outcome of research conducted by an international team of researchers from Asia and Europe, respectively from Georgia and Romania, as a result of the official international partnership between Tbilisi Teaching University from Tbilisi, Georgia and Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Romania.

## References

1. **Curtis, G. E.** (1991). Georgia: A Country Study: Agriculture, *Washington GPO for the Library of Congress*

2. **Balan, I. M., Constantinescu, S. C., Csosz, I., Durau, C. C., Ciolac, R. M. & Sicoe, O. M.** (2016). Genetics-source for improving the quality of beef in Romania, *Lucrări Ştiinţifice Management Agricol*, 18 (2), 23-26.

3. National Statistics Office of Georgia GEOSTAT - *Agriculture, Environment and Food Security*, from www.geostat.ge

4. **FAO**, (2012). *Assessment of the Agriculture and Rural Development Sectors in the Eastern Partnership countries – Georgia*, from http://www.fao.org/europe/resources/assessment-of-agriculture-and-rural-development-sectors-in-the-eastern-partnership-countries/en/