

The Balkans Scientific Center  
of the Russian Academy of Natural Sciences

**4**<sup>th</sup>  
International  
Symposium

**MODERN  
TRENDS IN AGRICULTURAL  
PRODUCTION,  
RURAL DEVELOPMENT  
AGRO-ECONOMY  
COOPERATIVES  
AND ENVIRONMENTAL  
PROTECTION**

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29 - 30 June 2022  
Vrnjacka Banja

# **The Balkans Scientific Center of the Russian Academy of Natural Sciences**



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**Modern Trends in Agricultural Production, Rural Development,  
Agro-economy, Cooperatives and Environmental Protection**

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## AGRICULTURE AND THE ECONOMIC SIGNIFICANCE OF LIVESTOCK PRODUCTION FOR THE REPUBLIC OF SERBIA

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**Abstract:** *The aim of this paper is to point out the state and possibilities of improving Serbian livestock production, based on the analysis of important available data. Namely, it is known that animal husbandry is a strategic branch of the economy and that the degree of its development significantly affects the intensity of agricultural development, and thus the overall economy of a country. The Republic of Serbia has extremely favourable natural conditions for breeding all species of domestic animals and a long tradition in livestock breeding. Also, our country has excellent crop production, ie. has an adequate fodder base for feeding far more animals than it now has. Also, it is known that in the Republic of Serbia there has been a trend of reducing livestock for years and that the warnings of experts about the need to stop this trend are becoming more dramatic. Based on the above, this paper presents the results of the analysis of the number by calculating average values for five-year periods, starting in 2000. In addition, the average production of important animal products such as meat, milk, eggs and wool by analyzed periods was calculated. Furthermore, when it comes to the number of livestock and their production, indexes were calculated and based on them, trends in the past two decades were analyzed. Based on the established trends in the above indicators, conclusions were drawn on the state and possibilities of further directions in the development of Serbian livestock production.*

**Key words:** *agriculture; livestock; the number of domestic animals in Serbia; production of milk, meat, eggs and wool; improvement of livestock production.*

### **Introduction**

Agriculture is synonymous with food production and food security in the country, but it is also important for the production of raw materials for other industries and export. It has multiple meanings and roles in the socio-economic development of the Republic of Serbia. When we add to this the availability of significant natural and human resources, as well as the achieved level of production and processing, social, demographic and other aspects, it is clear that agricultural production is determined as an extremely important economic activity in our country. In support of this are data on the share of GDP of agriculture in the total GDP of Serbia, and that share ranged from 17% in 2002, ie. 9.0% in 2012, to 7.8% in 2020. Although the above data show a declining trend, analyzes have shown that agricultural production itself is not the cause, but the fact that some other activities, primarily services, have significantly improved their position (Novaković, 2019).

Livestock production is a particularly important branch of agriculture. It provides the necessary products (milk, meat, eggs) for the nutrition of the domestic population. In addition, livestock production provides raw materials for the food industry, dairies, slaughterhouses, confectionery industry and leather processing industry. Livestock production in Serbia is facing serious challenges as a result of the transition and development of new applications in food production (Petrović et al., 2012). This branch of agriculture is expected to provide quality products for export, primarily beef and lamb. Also, there is an opportunity for the export of cheese (especially sheep and goat milk cheese) with a defined origin and standard of quality (Aleksić et al., 2009). In addition, livestock production as a strategic branch of an economy affects the intensity of agricultural development, ie. the intensity of agriculture is measured by the degree of development of livestock production and its participation in the structure of the total agricultural production. Hence, the share of livestock production in highly developed countries is more than 66% of the total value of agriculture. Also, 85% of crop production is used as animal feed. In this way, crop products are further refined and converted into high-quality protein products of animal origin.

Based on the above, statistical analyzes of data on the value of agricultural and livestock production in Serbia in the past two decades have been performed. These analyzes showed that the share of plant production in the total value of agricultural production in our country was on average about 69%, and the share of the value of livestock production was 31% (Novaković, 2009). Further analysis showed that the total value of crop production statistically significantly contributes to the formation of GDP agriculture, which leads to the conclusion that extensive production is still dominant in our country. On the other hand, the



total value of livestock production does not significantly contribute to the realization of the GDP of agriculture, so the search for answers and solutions to the long-term unfavourable state of livestock production in Serbia is still current and extremely important.

### **State and future trends for the development of livestock production in Serbia**

The number and quality of livestock are indispensable indicators for drawing relevant conclusions in assessing the state of livestock production. Also, it is known that the generation interval and the reproductive cycle in animal husbandry are quite long and they last several years for some species of domestic animals. In addition, the oscillations from year to year in numbers and production are large, and cyclical fluctuations are also characteristic. Given these specifics that significantly complicate the analysis of livestock production and achieved results, the analysis should include a longer period and multi-year results.

Based on the above, and to understand the trends in the number of livestock and poultry, as well as the production of the most important animal products, five-year averages for the period from 2000 to 2020, was calculated and presented in Tables 1 to 4.

Thus, Table 1 shows data on the number of cattle, as well as milk and beef meat production in the past two decades.

**Table 1. Number of cattle and production of cow's milk and beef meat in Serbia in period 2000-2020**

Year	Number of cattle (1000)	Index	Cow's milk production (million litres)	Index	Beef meat production (1000 t)	Index
2000	1246	100	1566	100	104	100
2001-2005	1117	89.6	1589	101.5	92.5	88.9
2006-2010	1038	83.3	1522	97.2	94.6	91.0

2011-2015	921	73.9	1472	94.0	76.6	73.7
2016-2020	891	71.5	1501	95.8	74.0	71.2

Source: Statistical Office of Serbia, Ministry of agriculture, forestry and water management

The data in Table 1 clearly show the decreasing trend in the number of cattle in our country. Thus, the average number of cattle in the previous five-year period was 891 000, which is 355 000 or almost a third less than in 2000, which can be concluded from the movement of the index, which in the five years 2016-2020 amounted to 71.5 compared to the index of 100 from 2000. The decrease in the number of cattle was especially reflected in the production of beef meat, which reduced from 104 000 tons in 2000 to 74 000 tons in the period 2016-2020. It can be concluded that the trend of decreasing beef meat production has continuously followed the decreasing trend of the number of cattle.

**Production of milk** in Serbia is one of the major livestock production regarding many agricultural households engaged in this production as well as in the value of this production which is additionally increased (added value) by the processing of milk into dairy products (Aleksić et al., 2009). It is important to note that the decrease in cow's milk production in the period 2000-2020 is much smaller. This can be concluded from the absolute numbers on the average milk production by the analyzed five-year periods, but also the calculated index. There is no doubt that such results in milk production are a consequence of the genetic improvement, but also the improvement of breeding technology. All this affected the increase in milk yield of cows and higher overall milk production in Serbia. It should be borne in mind that the current average milk yield per cow is 3 500 litres of milk in lactation, which is higher than the average production than it was in the first three analyzed five-year periods. However, we cannot be satisfied with the average milk yield per dairy cow, especially if know that it is lower by about 20% compared to the world average and by as much as 40% compared to the European average. With the production of about 1.5 billion litres of milk and about 74 000 tons of meat annually, cattle production in Serbia participates with about 41% in the value of our livestock production, while in the total meat production it has a share of 14%. In addition to the above data on the number of cattle and their production, should certainly be borne in mind that the Simmental breed makes up about 75%, a group of black and white Holstein-Frisian cattle about 15%, while beef, indigenous breeds and crossbreeds make up about 10% of the total number of cattle in Serbia (Institut for Animal Husbandry Belgrade-Zemun, 2021).

**Pig breeding** is another important branch of animal husbandry that participates significantly in the total meat production in Serbia and significantly contributes to the gross value of our livestock production. Table 2 shows data on the number of pigs and the production of pork meat.

**Table 2. Number of pigs and production of pork meat in Serbia in the period 2000-2020**

Year	Number of pigs (1000)	Index	Pork meat production (1000 t)	Index
2000	4066	100	283	100
2001-2005	3488	85.8	255.5	90.3
2006-2010	3709	91.2	266.2	94.1
2011-2015	3218	79.1	261.6	82.4
2016-2020	2920	71.8	301.5	106.6

Source: Statistical Office of Serbia, Ministry of agriculture, forestry and water management

From the data in Table 2, we can see the decreasing trend in the number of pigs since 2000, analyzed based on five-year average values. Today, Serbia has about 2 900 000 pigs, which is about 28% less than in 2000. Despite the reduction in the number of pigs, pork meat production is stable with slight oscillations. The average annual production in the previous five-year period amounted to 301 000 tons, which is slightly more than in 2000 (by about 6.6%).

Pork meat production ranks second in Serbian livestock production, with a share of 42% in gross value. On the other hand, in the total meat production in Serbia, pork meat participates with more than 55%. Interestingly, family farms are engaged in pig farming in our country, with about 80% of the total number of heads. Namely, small farms and medium-sized farms are the most numerous and 2/3 of all pigs are reared on them. This is especially important because, in the description of the situation in this branch of animal husbandry, it is important to point out the dominant traditional breeding on family farms. On these farms, pig production has a highly expressed natural character, ie. the average marketability is low and amounts to only 20% in some years.

*Sheep breeding* is also an important branch of animal husbandry, which in our country significantly contributes to the overall results of livestock production. Table 3 shows the data on the number of sheep and the production of sheep meat, milk and wool in the past two decades.

**Table 3. Number of sheep and production of sheep's milk, meat and wool in Serbia in period 2000-2020**

Year	Number of sheep (1000)	Index	Sheep's milk production (million litres)	Index	Sheep meat production (1000 t)	Index	Wool production (t)	Index
2000	1611	100	19	100	19	100	2264	100
2001-2005	1523.2	94.5	13.5	71.1	19.5	102.6	2424.5	107.1
2006-2010	1549.2	96.2	12.6	66.3	21.8	114.7	2490.4	110
2011-2015	1649.6	102.4	16	84.2	26.6	140	2700	119.3
2016-2020	1681.6	104.4	13.8	72.6	33	173.7	2826	124.8

Source: Statistical Office of Serbia, Ministry of agriculture, forestry and water management

The data in Table 3 point to the conclusion that sheep breeding is the only branch of animal husbandry in Serbia where there has been a slight increase in the number of animals. Thus, in the last analyzed five-year period (2016-2020), about 1 681 000 sheep were reared in Serbia, which is about 70 000 more than in 2000. Also, the data in this table point to the conclusion that in the analyzed period, the production of sheep's milk was significantly reduced, but also the production of sheep's meat and wool was significantly increased. These results of sheep production point to the conclusion that in the past two decades, rearing

sheep for meat production has been an absolute priority concerning milk production, which is understandable because market demands and marketing opportunities were far more favourable for meat. On the other hand, it should be borne in mind that sheep's milk was only significantly realized through meat production because the milk was sucked by lambs in the period of their intensive growth and development.

Sheep breeding in Serbia is realized with about 98% in small and medium-sized (in terms of economic strength) agricultural households. This is especially important and should be kept in mind when creating future development programs that would encourage the intensification of sheep production in Serbia. By the way, the analysis showed that in the past few years, sheep production was in the fourth place in the gross value of Serbian animal husbandry with a share of about 8.7% and the fourth place in terms of meat production. According to Institut for Animal Husbandry Belgrade - Zemun (2019, 2021) about 80% of animals belong to Pramenka (the Sjenica strains makes about 80% and Svrlijig about 16% of the controlled Pramenka population). Tzigai sheep participate with about 5% of the total sheep population, and 15% are crossbreds of Pramenka and imported foreign breeds. Merinolandshaf (72,5%) and Ille de France (21.5%) dominate the total number of imported breeds.

**Poultry breeding** in Serbia is also an extremely important branch of animal husbandry, which is best illustrated by the fact that, in the past decade, meat production is in second place in the total meat production in Serbia. Data on this, as well as on the movement of poultry and egg production are shown in Table 4.

**Table 4. Number of poultry and production of eggs and meat in Serbia in the period 2000-2020**

Year	Number of poultry (1000)	Index	Egg production (millions)	Index	Poultry meat production (1000 t)	Index
2000	20360	100	1374	100	67.0	100
2001-2005	17736	87.1	1449	105.5	63.0	94
2006-2010	18635	91.5	1293.8	94.2	77.0	114.9

2011-2015	17963	88.2	1952.4	142.1	93.8	140
2016-2020	15968	78.4	1777.8	129.4	103.6	154.6

Source: Statistical Office of Serbia, Ministry of agriculture, forestry and water management

From the data in Table 4, the number of poultry has decreased in the period from 2000 until today. Thus, the average number of poultry in the last five-year period (2016-2020) was lower by 21.5% than in 2000 and about 10% lower than the average for the period 2001-2005. On the other hand, the production of poultry meat and eggs had a predominantly growing trend in the analyzed period. Thus, the average annual production of poultry meat in the period 2016-2020 was as much as 55% higher than in 2000. The growing trend was in egg production, which is clear from the absolute values, but also the calculated index is given in Table 4. Reduction in the number of poultry, and at the same time growth in egg and meat production point to the conclusion that in the past two decades, Serbian poultry marked has a qualitative improvement in terms of using more productive hybrids and significantly improved breeding technology. Thus, the production results per housed bird have been significantly improved, as well as the overall results of Serbian poultry production. Also, it is interesting that the carriers of poultry production in our country are large agricultural farms where more than 60% of the total number of poultry is reared (Popović, 2015). These are farms with a high degree of production specialization, which also contributes to the improvement of the overall production results of this branch of animal husbandry in our country.

From the data shown in the previous tables, it is clear that livestock production in the past two decades marked a significant decrease in the number of cattle, pigs and poultry, but also the production of the most animal products had a positive growth trend. However, the positive trends did not contribute to a higher share of livestock production in the total gross value of agriculture, as it remained at around 30%. Thus, the analysis of the contribution of certain branches of livestock production to agriculture GDP in the past two decades amounts to an average of 13.2% for cattle, 1.8% for sheep, 10.6% for pigs and 5% for poultry, ie. the overall contribution of livestock was on average 30.6% (Novaković, 2019). The presented analysis of important indicators of the state and trends in animal husbandry in our country indicates the importance of stopping the decreasing trend in the number of livestock and further and even more intensive work on

modernizing livestock production following the latest scientific knowledge and achievements in this field. Only in this way is it possible to significantly improve the share of the value of livestock production in the agriculture GDP in our country in the next years.

## **Conclusions**

Livestock production plays an important role in achieving better results in Serbian agriculture and its greater contribution to total GDP. The previous analysis showed numerous weaknesses of our livestock production. Hence, its share in the GDP of agriculture is small (about 31%) and far below compared to agriculturally developed countries. In addition, this situation in animal husbandry determines our overall agriculture as underdeveloped, because it is dominated by plant production with a share of over 50% of crop production. Namely, a small percentage of crops are used as animal feed, while most are exported as a primary product. In economic terms, the export of value-added products such as meat, milk and eggs, would be far more profitable. Therefore, our livestock production needs fast and big steps towards positive changes and new, much more pronounced positive trends.

It is extremely important to stop the further decrease in the number of livestock and poultry, especially breeding categories, to create conditions for gradually more significant renewal and strengthening of the base of this branch of our agriculture. Increasing its competitiveness is also important for the revitalization and intensification of our livestock production. In the long term, the strategy of livestock development is important, which should be based on efficiency in the production of the most important animal products. In that sense, the good connection and organization of our farmers are also important. Stable and well-known prices for livestock products, as well as well-set price parities, are a guarantee for stable livestock production (Petrović et al., 2013).

Also, previous experiences in the improvement of animal husbandry and the achieved results in the world, as well as experiences in technology transfer, point to the conclusion that better organized and strengthened professional and scientific infrastructure is necessary for faster overall improvement of animal husbandry. Only in this way, through the solid synergy of society, agriculture, science and profession, changes can be initiated and significantly better results in livestock production can be achieved.

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