

Economic mechanism of the region breeding service activity

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Abstract. The article examines the concept and elements of the economic mechanism of breeding in the region. The main goal of this work is to determine the features of the economic mechanism of the breeding service in the region for its further optimization. At the same time, the following tasks are being solved: - to reveal the features of the economic mechanism of the breeding service of the region; - to determine the main factors influencing the activities of the breeding service in the region; - to analyze the effectiveness of state support for the breeding service of the region. We note that the technologies of cattle reproduction using the method of artificial insemination with sexed semen and the method of embryo transfer in agricultural enterprises in practice have proven their economic efficiency and high profitability indicators. But to obtain the described results, the source material (sexed seed and embryo), as well as the qualities of the donor and recipient, as well as systematic work in the industry of dairy and beef cattle breeding in the Samara region, are extremely important. Raised cows with high genetic potential, obtained from artificial insemination with sexed semen and embryo transplantation, can then be used as donor cows to obtain embryos and their further transplantation in other agricultural enterprises.

1 Introduction

Livestock is one of the main branches of agricultural production. At the same time, it was on livestock production that the decline of the nineties and early 2000s was most strongly affected [1-4]. In the conditions of the Samara region, there is a significant reduction in the number of all types of farm animals in comparison with the Soviet period. If in crop production the self-sufficiency of the region is more than 100%, in animal husbandry it is about 50%. Therefore, the role of stimulating measures on the part of the state is increasing [5-8].

The economic mechanism of management is a means of influencing subjects of economic activity through their economic interests for the implementation of economic activities and continuous reproduction processes. [9, 10]

An economic mechanism is a mechanism for the coordination and regulation of economic activity based on the use of a set of economic methods, instruments of influence on economic entities in order to implement the type and scale of reproduction of gross

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output necessary in accordance with the changing needs of society through the rational use of available factors of production, timely high-quality reimbursement of their costs in value and in kind. [11-15]

The main structural components of the economic mechanism are systematized in two main directions: market and state regulation. The first group includes demand, supply, price, competition, market infrastructure. The second - state regulation of pricing, subsidies, subsidies, compensation, lending, insurance, taxation, antimonopoly regulation, commodity purchases and interventions, regulation of foreign economic relations. [16]

Based on these definitions, a general diagram of the structure of the economic mechanism of the activity of the tribal service of the region is proposed, shown in Fig. 1. In accordance with this approach, the complex nature of this concept is clearly visible. Therefore, it is necessary to work out methodological approaches to stimulate the activities of the breeding service in the region, taking into account the whole variety of its elements. These methods should implement a multilateral approach to stimulate the economic activity of agricultural producers in the region related to the breeding business and its results.

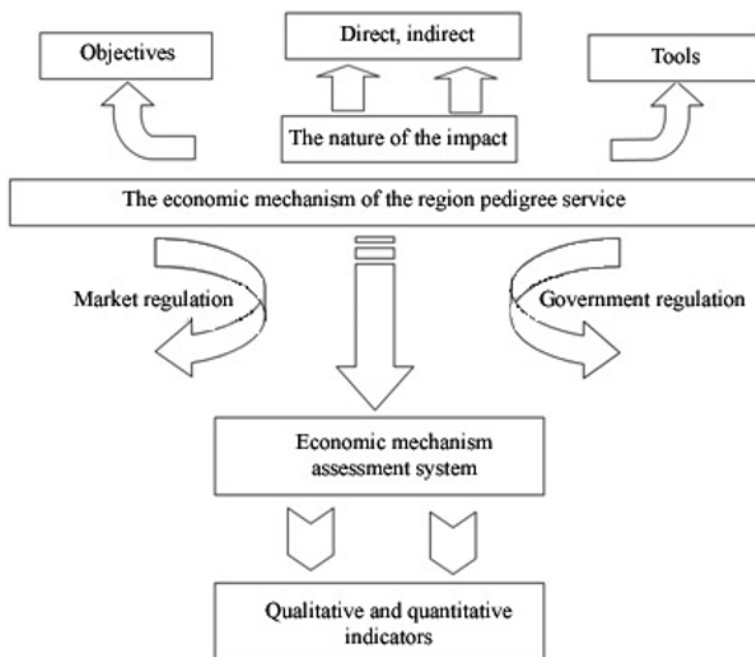


Fig. 1. Generalized structure of the region breeding service economic mechanism.

2 Methods and materials

The main goal of this work is to determine the features of the economic mechanism of the breeding service in the region for its further optimization. At the same time, the following tasks are being solved:

- to reveal the features of the economic mechanism of the breeding service of the region;
- to determine the main factors influencing the activities of the breeding service in the region;
- to analyze the effectiveness of state support for the breeding service of the region.

The object of the research is the economic relations of breeding farms, state bodies regulating breeding, agricultural producers. The research methodology consists in analyzing the features of the economic mechanism of the breeding service of the region, including state support, in relation to the conditions of the Samara region. In the course of the study, the abstract-logical method, situational and system analysis, economic and statistical methods, and the method of expert assessments were used.

3 Results and discussion

In the region, there is a decrease in state support for agriculture. If in 2016-2017 the amount of financing of agricultural production reached 6 billion rubles, then at present it is about 4 billion rubles. All articles of state support were reduced, including those for animal husbandry [17-20]. Currently, the size of budget payments is about 1 billion rubles. (Table 1).

Table 1. Amounts of financing in the areas of state support, mln rubles.

Subsidies	2018			2019		
	regional budget	federal budget	total	regional budget	federal budget	total
Subsidies for the development of beef farming	43.06	79.96	123.02	36.19	58.13	94.32
Subsidies to support certain areas of animal husbandry	74.13	-	74.13	96.44	-	96.44
Feed subsidies	-	-	-	89.93	-	89.93
Livestock development subsidies	106.74	142.91	249.65	70.77	131.44	202.21
Insurance premium subsidies	1.78	3.31	5.09	6.22	3.33	9.55
Subsidies for increasing productivity in dairy farming	179.48	71.39	250.87	202.15	71.49	273.64
Subventions to increase productivity in dairy farming	322.46	-	322.46	352.57	-	352.57
Total	727.65	297.57	1025.22	854.27	264.39	1118.66

As can be seen from the data in the table, the bulk of funding is provided by the regional budget (70.9% in 2018, 76.4% in 2019). The largest share is taken by support aimed at increasing productivity in dairy farming (in total, more than 50% of the allocated funds).

Table 2. Results of the implementation of measures of state support for animal husbandry.

Indicator	2008	2019	2019 in % to 2018
The number of beef cows and crossbred beef cows in agricultural organizations and peasant farms, thousand heads	24.2	25.0	103
Production of beef and veal in live weight in agricultural organizations and peasant farms, thousand tons	11.9	14.8	124
Milk herd productivity in agricultural organizations, kg	5567	5920	106
The share of pedigree livestock in the total livestock in agricultural organizations and peasant farms, %	9.9	10.6	+0,7
The share of the insured livestock of farm animals in the total livestock, %	9.22	19.36	+10,14

Based on the data in Table 2, it can be seen that as a result of government support measures, the indicators of the development of livestock farming in the region are increasing. For example, there is an increase in the number of meat animals. For a long time, there was no specialized meat herd in the region, and only in the last 15-20 years the prerequisites for its appearance have been created. There is an increase in the productivity of dairy cattle (by 106%), which is associated, among other things, with an increase in the proportion of breeding animals with high genetic potential (Table 3).

Table 3. Performance indicators of agricultural organizations - recipients of subsidies for increasing productivity in dairy farming. *

Indicator	2008	2019	2019 in % to 2018
Share of milk production by recipients of subsidies in the total volume produced by agricultural organizations of the Samara region,%	51.0	54.0	+3.0
Milk production by recipients of this subsidy, thousand tons	73.1	78.0	107
Number of dairy cows, thousand heads	9.7	10.1	104
Average annual productivity of dairy cows, kg	7521	7748	103

* - the recipients of this type of state support are 17 agricultural organizations with a livestock of dairy cows with a productivity of 6000 kg of milk and above.

Special attention from the leadership of the region is paid to specialized enterprises with high production rates [21-25]. In dairy cattle breeding, a conditional "pool" of 17 enterprises has been formed, with a productivity of more than 6,000 kg of milk per cow. They receive about a quarter of all funding for the development of livestock in the region. This allows increasing both productivity (on average up to 7748 kg of milk in 2019) and the share in total milk production (up to 54%).

The growth of insurance coverage for animals is increasing in the region. Their share increased to 19.36%. Despite the shortcomings of the existing insurance methodology, enterprises are forced to do this due to the deterioration of the epizootic situation in the region (ASF, rabies, brucellosis, etc.) [26].

Despite the growth in livestock production in agricultural organizations and peasant farms, the volume of production in the region practically does not increase. Due to these sources, it is not possible to fully compensate for the decline in production in the private household plots sector [27-29]. Despite the system of subsidies, support for this type of agricultural producers is significantly less compared to other forms of agricultural production. Without equalizing the conditions of state support, it is impossible to reduce the reduction in livestock in private household plots, in the volume of products produced, and to reduce the number of complete abandonment of animals.

The development of the breeding service in the region is characterized primarily by the breeding farms production indicators (Table 4). The productivity of cows in almost all farms is growing, which testifies to the effectiveness of zootechnical measures.

Embryo transplantation is one of the factors behind the dramatic increase in productivity. From an economic point of view, embryo transplantation is especially interesting for commercial farms that do not have breeding animals, but intend to create a breeding nucleus of cattle. For such agricultural enterprises, it is enough to have a broodstock - recipients (outbreds), to whom embryos can be transplanted [30-35].

The rapid development of the biotechnological method for obtaining embryos should be simple and reliable [36-41], allowing with high results to obtain embryos from outstanding cows not only in the Center for Reproductive Technologies, but also in the conditions of the breeding farms of the Samara region.

Table 4. Breeding sales and milk yield in breeding farms of the Samara region.

Agricultural enterprise	Sale of pedigree livestock, heads				Milk for 1 cow, kg			
	2014	2015	2017	2018	2014	2015	2017	2018
Pedigree plant "Druzhba"	66	70	83	44	6366	6422	7153	7989
Krasnogorskoe	125	142	17	0	5775	5780	3551	4519
Radna	0	90	157	157	7003	7007	7898	6900
Pedigree plant "Kryazh"	55	52	55	53	4417	4462	5106	5802
Collective farm named after Kuibyshev	79	79	73	73	5200	5252	5440	5713
Collective farm named after Kirov	53	53	53	53	5949	5996	6428	6507
Severnoy Klyuch	100	101	116	116	6750	6750	6776	6777
Niva	48	29	0	0	7459	8105	8868	9028
Klondike	0	30	28	16	9224	9249	9260	9277
Usinskoe	0	0	44	42	6886	6923	6091	6687
Total	526	646	626	554	6368	6466	6755	6947

To date, the Samara region does not keep statistics on the number of transplants in the region. But as for the survival rate of embryos, it depends directly on the health of the animals (donor / recipient) and the breed of cattle.

As an example, let us take the experience of cattle embryo transplantation on the basis of Center for Reproductive Technologies (Samara).

This organization began its work on embryo transfer in 2012. The aim of this project was to obtain high-value Holstein bull calves on heifers, first generation black-and-white crossbreeds, as well as to assess the economic efficiency of this method.

The purchase of embryos was carried out at the Osnabrück Livestock Breeding Association (OHG Germany) and their subsequent transfer was carried out with the involvement of OHG specialists. 59 embryos were transferred, resulting in 10 calves and 14 heifers. The gobies were subsequently used to obtain semen at Center for Reproductive Technologies. Thus, the survival rate of embryos in 2012 was 47.4%.

In 2016, 10 more heifers were purchased for embryo transplantation, the first generation crossbreeds of the black-and-white breed. The embryos were also obtained from the Osnabrück Livestock Breeding Association (OHG Germany). The characteristics of the fathers of the purchased embryos are shown in Table 5. In 2016, 4 bulls were received and the survival rate was 50%.

Table 5. Cost-effectiveness of obtaining bulls by embryo transplantation.

Indicator	Value
Purchased heifers (1st generation hybrids), heads	10
Total costs for the purchase of 10 heifers, rubles	680000
Transplanted embryos, pcs	10
Cost of 1 purchased embryo, rubles	30000
Total cost of purchased embryos, rubles	300000
Received bulls, heads	4
Costs for obtaining and raising 4 bulls from the moment of transplantation to the beginning of obtaining semen (taking into account the proceeds from the sale of 10 heads for meat), rubles	1363626
including 1 bull, rubles	340906.5
Costs of keeping 1 bull-producer on a bull-barn during the year, rubles	590000
Average number of cryopreserved doses of semen received from 1 bull per year, rubles	5100
Cost of selling 1 dose of semen (in 2019 prices), rubles	270
Planned proceeds from the sale of semen received per year from 1 breeding bull, rubles	1377000
The cost of obtaining and raising 1 bull-producer from the moment of transplantation to the beginning of obtaining semen (taking into account the proceeds from the sale of 10 heads for meat) and its maintenance for 1 year in the bull barn, rubles	930906.5
Expected gross profit (after 1 year of receiving and selling semen from 1 breeding bull), rubles	+446093.5

In September 2019 Center for Reproductive Technologies began to obtain the semen of bull calves obtained by the method of embryo transplantation. As a result, for 1 year of receipt and sale of semen for 1 bull amounted to 446093 rubles. On the basis of the data obtained, the economic efficiency was calculated and the economic benefit from the use of the embryo transplantation method for obtaining high-value breeding bulls - producers of the Holstein breed was experimentally proved.

Nevertheless, I would like to note that the survival rate of embryos directly in Germany, in the Osnabrück Livestock Breeding Association for 2018 averaged 77%. These results have been achieved thanks to the careful selection of genomically evaluated heifers with high genetic potential and excellent health in Germany as donors.

4 Conclusion

In conclusion, we note that the technologies of cattle reproduction using the method of artificial insemination with sexed semen and the method of embryo transfer in agricultural enterprises in practice have proven their economic efficiency and high profitability indicators. But to obtain the described results, the source material (sexed seed and embryo), as well as the qualities of the donor and recipient, as well as systematic work in the industry of dairy and beef cattle breeding in the Samara region, are extremely important. Raised cows with high genetic potential, obtained from artificial insemination with sexed semen and embryo transplantation, can then be used as donor cows to obtain embryos and their further transplantation in other agricultural enterprises.

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