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## Factors of competitiveness of domestic livestock products in the international agri-food market

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**Abstract.** The article considers the current state and possibilities of exporting domestic production of livestock products. The main conditions and factors for the development of the export potential of the industry and the factors influencing its formation are determined. The key countries-importers of Russian food of animal origin and goods supplied to the world market have been established. Reflects trends and macroeconomic conditions for increasing the volume of exports of livestock products. Proposed measures to improve the mechanisms of state support for exporters of livestock products and products of its processing.

Increasing negative changes in market conditions associated with the volatility of prices for livestock products in the domestic market and the national currency exchange rate have led to a decrease in the profitability of the industry, putting some producers in an extremely difficult financial situation. These factors force manufacturers to look for new markets that are characterized by sustainable development, high capacity, and effective demand and also become an active participant in world trade.

At the same time, one of the key factors for increasing export deliveries is monitoring and analysis of existing internal risks and external threats to the competitiveness of domestic products in the international market and the improvement of mechanisms for providing state support for the “promotion” of goods and the “opening” of new markets (Table 1).

Considering the current state of exports of livestock products, it should be noted a significant increase in supply volumes, which was achieved not only by increasing the production of commodity products by domestic enterprises, but also by improving its quality and competitiveness in the global agrifood market due to the devaluation of the national currency [8, 15].

At the same time, the high growth rates noted are due to the actual absence of exports of food products of animal origin over the past few years. In 2012, domestic producers supplied only about 200 tons of cattle meat, 60 tons of pork, 80 tons of mutton, and 100 tons of food eggs to foreign contractors. At the same time for 2012-2016, the Russian producers managed to increase the volume of exports of cattle meat of all types to 2.1 thousand tons, to bring export supplies of pork and eggs to 18.7 and 15.8 thousand tons, respectively [4].



**Table 1.** Export of livestock products and products of its processing by domestic producers.

Name of products	Year									
	2012		2013		2014		2015		2016	
	Thous t	Million dollars	Thous t	Million dollars	Thous t	Million dollars	Thous t	Million dollars	Thous t	Million dollars
Frozen cattle meat	0.2	1.2	1.1	6.9	1.4	8.1	2.2	9.5	1.8	7.6
Fresh or chilled cattle meat	0.001	0.004	0.07	0.7	0.1	0.6	0.04	0.3	0,3	2.2
Fresh, chilled, or frozen pork	0.06	0.3	0.3	1.2	0.4	1.75	4.4	9.1	18.7	41.1
Lamb and goat meat: fresh, chilled, or frozen	0.08	0.03	0.02	0.3	0.04	0.5	0.02	0.2	0.1	0.7
Meat and edible offal of poultry: fresh, chilled, or frozen	25.0	29.0	53.8	62.7	61.6	65.0	73.5	78.0	114.9	11.5
Non-condensed milk and cream and no added sugar or other sweeteners	15.5	16.7	21.8	24.6	20.2	23.8	43.0	25.4	48.0	25.7
Condensed milk and cream or with added sugar or other sweeteners	28.0	46.1	29.6	62.2	31.5	63.9	25.1	32.4	26.5	32.4
In-shell eggs: fresh, canned, or boiled	0.1	0.4	1,8	24.8	13.3	19.1	13.7	16.2	15.8	17.1
Wool, not subjected to cardio or combed	3.4	12.1	6.0	19.0	7.9	17.8	12.1	23.2	7.0	16.7

\* Source: Compiled on the basis of data from the Federal Customs Service of Russia [1].

Sales volumes on the world market of dairy cattle and poultry meat products exceeded these figures, but still remained very small.

It should be noted that the main countries importing domestic food of animal origin are neighboring countries, the former USSR republics (Table 2).

**Table 2.** Main countries-importers of Russian goods of animal origin in 2016, tones.

Country	Product name			
	Frozen cattle meat	Fresh, chilled, or frozen pork	Meat and edible offal poultry: fresh, chilled, or frozen	Non-condensed milk and cream and no added sugar or other sweeteners
Abkhazia	-	47	1661	2764
Azerbaijan	2	-	232	489
Armenia	4	22	1711	41
Belarus	492	7146	1348	1285
Kazakhstan	748	1169	29496	11612
Kyrgyzstan	8	451	8496	544
Ukraine	362	9048	36819	29694
Total exported to neighboring countries	1616	17883	79763	46429
Exported to other states	231	862	35141	1600
Total exported	1847	18745	114904	48029
The share of neighboring countries in total exports, %	87.5	95.4	69.4	96.7

\* Source: Compiled on the basis of data from the Federal Customs Service of Russia [1].

The structure of exports of livestock products in the world shows that the geography of supplies of goods of animal origin is very limited, which is due, on the one hand, by established counterparties from the post-Soviet republics, and, on the other hand, still relatively low competitiveness of products and weak marketing policies of domestic companies in the global market [4].

At the same time, the share of export deliveries of pork and processed milk to neighboring countries is 95.4% and 96.7%, respectively, which significantly exceeds the share of sales of cattle meat in frozen form and poultry meat products, which is 87.5% and 69.4%.

The valuation of exports of livestock products allowed us to determine the most competitive products in the global agrifood market and to establish the amount of money raised in both dollar and ruble terms (Table 3).

The data presented in Table 3 indicate the growth for 2014-2016 in cash from the sale on the foreign market of livestock products for all categories of goods.

The largest increase in the volume of proceeds was recorded in foreign economic export operations with pork and poultry meat, which was due to a significant increase in the volume of export of pig products 46.7 times and poultry production by 86.5%, as well as an increase in the sales prices of 9.5% and 69, 1%, respectively, due to the devaluation of the national currency.

In terms of value, exports of poultry products, milk and its products are predominant, which is associated with both higher export sales and more developed diversification of supplies to various regions of the world [14].

**Table 3.** Monetary valuation of exports of animal products.

Name products	Year								
	2014			2015			2016		
	Total amount, mln. doll.	Total amount, mln rub.	Price for 1 kg rub.	The total amount of US \$, mln.	Total amount, mln. rub.	Price for 1 kg, rub.	The total amount of US \$, mln.	Total amount, mln. rub.	Price for 1 kg, rub.
Frozen cattle meat	8.1	311.2	222.2	9.5	579.1	263.2	7.6	509.4	283.0
Fresh or chilled cattle meat	0.6	30.7	230.5	0.3	18.3	457.2	2.2	147.5	491.6
Fresh, chilled, or frozen pork	1.7	65.3	134.5	9.1	554.7	147.3	41.1	2754.9	147.3
Lamb and goat meat: fresh, chilled, or frozen	0.5	19.2	480.3	0.2	12.2	610.0	0.7	46.9	469.0
Meat and edible offal of poultry: fresh, chilled, or frozen	65.0	2497.3	40.5	78.0	4754.9	64.7	117.5	7876.0	68.5
Non-condensed milk and cream and no added sugar or other sweeteners	23.8	828.7	44.8	25.4	1548.4	36.0	25.7	1722.7	35.9
Condensed milk and cream, or with added sugar, or other sweeteners	63.9	2455.0	77.9	32.4	1975.1	78.7	32.4	2171.8	82.0
In-shell eggs: fresh, canned, or boiled	19.1	733.8	55.2	16.2	987.6	72.1	17.1	1146.2	72.5
Wool, not subjected to cardio or combed	17.8	683.9	86.6	23.2	1414.3	116.9	16.7	1119.4	160.0

\* Source: Compiled on the basis of data from the Federal Customs Service of Russia [1] and the Bank of Russia [2].

At the same time, an increase in the revenue from the export of such items as milk and cream, non-condensed, without adding sugar or other sweetening substances, and small ruminant meat was achieved while reducing the unit cost of exported products by 19.9% and 2.3%, respectively.

Proceeds from the sale for export of processed milk in the form of condensed milk and cream with the addition of sugar or other sweeteners for 2014-2016 decreased by 11.5%, due to the replacement of the needs of the domestic market after the introduction of economic response measures and the low demand in the international market for the products of the domestic dairy industry [4].

Among all types of exported goods of animal origin, poultry meat products prevail, which surpasses other products of animal origin, both in physical terms, reaching 114.9 thousand tons in 2016, and in value, exceeding 117.5 million dollars or about 7.9 billion rubles.

At the same time, despite the successes achieved in recent years in the development of domestic livestock and poultry farming, the Russian Federation is still a weak player in the international agro-industrial market, which does not have a significant impact on world trade [1].

The current situation is due to the small volumes of deliveries, mainly raw materials with a low level of processing, which are significantly inferior in price to higher quality goods. In turn, an increase in exports of products with a high depth of processing and added value requires access to more developed and competitive markets, characterized by high quality requirements and strict contractual obligations.

High competition in the international agrifood market and adverse crisis phenomena in the Russian economy, accompanied by sharp fluctuations in the national currency and increasing devaluation processes, require monitoring and analysis of factors affecting the competitiveness of livestock products produced [1].

This problem was especially acute for manufacturers after the devaluation of the national currency that took place at the end of 2014 and the almost double increase in the cost of imported equipment and working capital of foreign production, which, as a rule, do not have high-quality Russian analogues.

To assess the impact of macroeconomic factors on the development of the export potential of the industry, an analysis of the economic efficiency of livestock production was carried out. It was established that the sale of livestock products, with the exception of milk and pork, is unprofitable for most agricultural organizations (Table 4).

**Table 4.** Economic efficiency of production and sales of livestock products \*.

Product name	Year						2016 In % by 2011
	2011	2012	2013	2014	2015	2016	
Production cost for 1 centner of products, rub.							
Cattle milk	1208	1238	1411	1540	1685	1793	148.4
Cattle meat	10946	11571	12865	13652	14891	14178	129.5
Pig meat	6067	6020	6130	5966	6787	7240	119.3
Sheep and goats meat	6018	6715	7192	7571	8247	8782	145.9
Sheep wool	11075	11008	11533	9600	10690	11615	104.9
Costs for 1 centner of sales, rub.							
Cattle milk	1290	1292	1489	1631	1780	1892	146.7
Cattle meat	9068	9940	10590	11558	13059	13587	149.8
Pig meat	6374	6953	6978	7128	7996	7885	123.7
Sheep and goats meat	5605	6189	6662	7362	7901	8721	155.6
Sheep wool	11618	11278	11233	10311	11064	10521	90.6
Selling price for 1 centner of products, rub.							
Cattle milk	1486	1450	1697	2067	2181	2282	153.6
Cattle meat	6859	7527	6917	7534	9630	10308	150.3
Pig meat	7829	8660	7514	10183	10773	9712	124.1
Sheep and goats meat	5319	6401	6501	6846	7351	8564	161.0
Sheep wool	5150	4978	5209	4520	5800	7131	138.2
Profit (loss) from the sale of 1 centner of production, rub.							

Cattle milk	196	158	208	536	411	390	199.0
Cattle meat	-2209	-2413	-9893	-4024	-3429	-3279	148.4
Pig meat	1455	1707	538	3055	2777	1827	125.6
Sheep and goats meat	-286	212	-161	-516	-550	-157	54.9
Sheep wool	-6468	-6300	-6024	-5791	-5264	-3390	52.4
<b>The level of profitability (unprofitability) from the sale of 1 centner of production, %</b>							
Cattle milk	15.2	12.2	14.0	35.0	23.1	20.6	5.4 p.p.
Cattle meat	-24.4	-24.3	-93.4	-34.8	-26.3	-24.1	3.0 p.p.
Pig meat	22.8	24.6	7.7	42.9	27.8	23.2	0.4 p.p.
Sheep and goats meat	-5.1	3.4	-2.4	-7.0	-7.0	-1.8	3.3 p.p.
Sheep wool	-55.7	-55.9	-53.6	-56.2	-49.4	-42.6	13.1 p.p.

\* Source: Compiled based on data from the Ministry of Agriculture of Russia [5].

In 2016, the loss ratio from the sale of meat of small cattle was 24.1% and 1.8%, respectively, and sheep wool reached 42.6%, which caused stagnation of domestic beef cattle and sheep breeding, and a significant increase in the share of imported products by domestic market [6].

One of the key factors for the sustainable development of domestic livestock in modern economic conditions is the formation of a stable pricing environment in the domestic agrifood market (Table 5).

**Table 5.** Formation of price conjuncture and money supply from the sale of products of animal origin in the domestic agrifood market.

Indicators	Year					On average for 2012– 2016
	2012	2013	2014	2015	2016	
Food price indices and consumer inflation						
Producer price index of agricultural products, %	110.8	102.7	114.1	108.5	101.8	107.6
Price index for food and non-alcoholic beverages, %	106.7	106.0	116.4	114.8	104.2	109.6
Consumer price index for goods and services (consumer inflation), %	106.6	106.5	111.4	112.9	105.4	108.6
The index of really disposable incomes of the population, %	104.6	104.0	99.3	96.8	94.1	99.8
Price index for livestock products, %						
Cattle milk	97.6	117.0	109.5	109.1	106.3	107.9
Cattle meat	109.7	91.9	108.9	127.8	107.0	109.1
Pig meat	110.6	86.8	135.5	105.8	90.2	105.8
Sheep and goats meat	120.3	101.6	105.3	107.4	116.5	110.2
Sheep wool	96.7	104.6	86.8	123.9	127.3	107.9
Proceeds from the sale of agricultural products, billion rubles						
Proceeds from the sale of agricultural products	1384.0	1403.8	1798.1	2232.2	2288.7	9106.8**
including crop production	555.8	527.2	665.8	905.4	961.3	3615.5**
livestock products	828.2	876.6	1132.3	1326.9	1327.4	5491.3**
Proceeds from the sale of livestock products, billion rubles						
Cattle milk	186.7	206.1	261.4	284.8	304.8	1243.8**
Cattle meat	81.8	75.9	81.6	102.0	101.5	442.8**
Pig meat	185.8	206.3	317.0	357.2	314.3	1380.6**

Sheep and goats meat	2.9	3.0	3.4	3.5	3.3	16.1**
Sheep wool	0.3	0.3	0.3	0.4	0.6	1.9**
<b>The index of revenue from sales of agricultural products, %</b>						
<b>Index of proceeds from the sale of agricultural products</b>	120.5	101.4	128.1	124.1	102.5	114.3
including crop production	127.8	94.9	126.3	136.0	106.2	118.2
livestock products	116.0	105.8	129.2	117.2	100.1	113.7
<b>The index of revenue from the sale of livestock products, %</b>						
Cattle milk	101.4	110.4	126.8	109.0	107.0	110.9
Cattle meat	111.2	92.8	107.4	125.0	99.5	107.2
Pig meat	136.3	111.1	153.7	112.7	88.0	120.4
Sheep and goats meat	119.7	101.1	111.7	104.3	95.2	106.4
Sheep wool	87.0	94.6	108.8	128.6	148.2	113.4

\* Source: Compiled on the basis of data from the Ministry of Agriculture of Russia [5] and Rosstat [8].

\*\* The total amount of proceeds from product sales for 2012-2016.

At the same time, the domestic livestock production has a great production potential and enormous opportunities for ensuring the sustainable development of the industry and increasing production volumes of high-quality products that are competitive both in the domestic and international markets.

The analysis of the current state of the market conditions and the monetary capacity of the domestic market showed a steady price trend for livestock products that do not exceed the growth rates for agricultural products and are comparable to the level of consumer inflation.

However, despite the overall stability of the price situation on the domestic market, sharp fluctuations in prices were recorded for certain types of products. The introduction of economic response, the sharp increase in the cost of foreign goods due to the devaluation of the national currency and the reduction in domestic production of beef led to a significant jump in 2015 by 27.8% of the sale price of cattle meat, exceeding the average annual rate of consumer inflation by 14.9% [7].

A substantial increase in 2014 by 35.5% of the selling prices of agricultural producers for pork was due to a reduction in the capacity of the domestic market after the introduction of a ban on the import of pig products from the North American and some Western European countries by the Rosselkhoz nadzor.

In turn, the rise in prices has led to an increase in the volume of proceeds from the sale of livestock products. Total for 2012-2016, livestock products were sold for a total amount of 5,491.3 billion rubles, representing 60.3% of the total revenue received from the sale of agricultural products for the same period. Moreover, the share of milk and pork accounted for 1,243.8 and 1,380.6 billion rubles, respectively, or 22.7% and 25.0% of the total revenue from the sale of livestock products [6].

It should be noted that the formation of production costs occurred in the conditions of devaluation of the national currency in 2014-2015 and restrictions on the supply of financial resources in the market due to the sharp increase in the key rate by the Central Bank of Russia and the subsequent increase in the cost of credit resources, which led to an abrupt increase in costs and production costs in the most vulnerable sub-sectors of animal husbandry, which are highly dependent on foreign suppliers, and are distinguished by a long investment cycle (Table 6).

Thus, the average annual increase in the cost of production and sale of milk over the past five years was 8.3% and 8.1%, respectively. In this case, the overall increase in the production cost of milk for 2011-2016 amounted to 48.4%, which exceeded the growth rate of costs for the production of other types of livestock products, having a negative impact on the development of dairy cattle breeding and the formation of its investment attractiveness.

The overall dynamics of indicators of economic efficiency of the implementation of livestock products for 2012-2016 indicates an increase in profitability of pig production and milk production with an average annual growth rate of profits from the sale of 74.7% and 28.3%, respectively, while increasing the unprofitability of production of cattle and small cattle by 48.1% and 21.1%.



A significant increase in profitability from the sale of pig meat and milk, noted in 2014, is due to a reduction in imports and capacity of the domestic market, and a subsequent significant increase in prices for animal products after the introduction of the food embargo and the cost of imported products due to the weakening national currency [7].

**Table 6.** The effect of inflation and devaluation processes on the efficiency of production and sales of livestock products.

Indicators	Year					On average for 2012– 2016
	2012	2013	2014	2015	2016	
Price index for industrial goods, energy resources and the weighted average exchange rate of major world currencies against the ruble, %						
Industrial producer price index	105.1	103.7	105.9	110.7	107.4	106.6
Producer manufacturing price index	103.2	101.6	108.5	111.2	107.7	106.4
Fuel price index	105.7	110.0	92.4	110.6	116.5	107.0
Index of the weighted average dollar exchange rate (USD) to ruble	105.8	102.4	120.6	158.7	110.0	119.5
Index of weighted average euro (EUR) to ruble	97.7	105.9	120.1	133.4	109.5	113.3
The cost of production index 1 kg of products, %						
Cattle milk	102.5	114.0	109.1	109.4	106.4	108.3
Cattle meat ***	105.7	111.2	106.1	109.1	95.2	105.5
Pig meat	99.2	101.8	97.3	113.8	106.7	103.8
Meat of sheep and goats **	111.6	107.1	105.3	108.9	106.5	107.9
Sheep wool **	99.4	104.8	83.2	111.4	108.7	101.5
Cost index for industrial processing and sales of 1 centner of products, %						
Cattle milk	65.9	144.4	116.7	104.4	104.2	107.1
Cattle meat ***	86.8	139.5	92.0	87.5	32.3	87.6
Pig meat	303.9	90.9	137.0	104.0	53.3	137.8
Meat of sheep and goats **	127.4	102.5	38.8	165.6	17.6	90.4
Sheep wool **	49.7	111.1	237.0	52.6	292.5	148.6
The cost index of 1 centner of sales, %						
Cattle milk	100.2	115.2	109.5	109.1	106.3	108.1
Cattle meat **	109.6	106.5	109.1	113.0	104.0	108.4
Pig meat	109.1	100.4	102.1	112.2	98.6	104.5
Meat of sheep and goats **	110.4	107.6	110.5	107.3	110.4	109.2
Sheep wool **	97.1	99.6	91.8	107.3	95.1	98.2

\* Source: Compiled on the basis of data from the Ministry of Agriculture of Russia [5], Rosstat [8], and the Central Bank of Russia [2].

\*\* The indicator indicates the growth rate (decrease) of the loss.

However, the impact of this factor was short-lived, since the increase in the cost of technological equipment and material and technical resources of foreign production led to a significant increase in production costs and costs for the sale of products.

In this regard, in our opinion, the technological import dependence of the industry, which has been formed in recent years, is a key factor preventing domestic livestock production from reaching the

vector of sustainable development and increasing production volumes to replace imported livestock products on the domestic market [6].

Improving the economic efficiency of livestock development and increasing the export potential of the industry requires the development of a set of measures and mechanisms for the implementation of its production and material and technical potential that meet the requirements of the modern market, which increase the investment attractiveness of the industry.

Thus, the realization of the export potential of the industry is directly dependent on the organizational, economic, industrial, and climatic factors of production, which determine the volume of production and its competitiveness in the global market. Thus, favorable climatic and technological conditions for the production of milk and beef in the countries of Oceania and Latin America, associated with the presence of a significant number of pastures and favorable temperature conditions, allow agricultural producers to provide year-round grazing for cattle. This makes it possible with the lowest operating costs and management costs to continuously increase the production of milk and its processed products, and occupy a key position in the global dairy market [1, 16].

At the same time, our comparative analysis of the production cost of milk showed that domestic producers, even under the current economic conditions, are competitive compared to producers from Western Europe and North America.

To determine the production cost of milk, we used official data of state authorities in the field of agriculture and branch associations of foreign countries and the weighted average rate of the national currency set by the Central Bank of Russia (Table 7).

**Table 7.** Comparative analysis of the production cost of milk in Western Europe and North America, rubles / kg.

Country	Year				
	2012	2013	2014	2015	2016
Russia	12.4	14.1	15.4	16.9	18.1
USA	7.9	9.8	10.9	16.5	17.4
Canada	24.2	23.9	27.5	37.2	38.7
Netherlands	17.1	18.9	25.6	28.6	31.9
Germany	17.6	19.4	22.6	28.5	30.4
France	16.3	18.5	23.1	28.7	30.4
Denmark	16.7	18.1	21.7	27.0	29.7
Belgium	16.1	13.2	21.5	31.0	30.3

\* Source: Compiled on the basis of data from the Ministry of Agriculture of the Russian Federation [5], United States Department of Agriculture (USDA) [9], Canadian Dairy Commission (CDC) [10], European Milk Board (EMB) [11], and Central Bank of Russia [8].

The data presented show the competitiveness of domestic dairy cattle breeding and wide opportunities for increasing the volume of exports of milk and its products. At the same time, the past devaluation had a significant impact on the development of the export potential of the industry, increasing the production cost of milk in ruble terms.

A similar situation is observed in a comparative analysis of the production cost of pig meat in the leading countries of pork producers and exporters on the world market (Table 8).

**Table 8.** Production cost of pork in the leading producer countries, rubles / kg.

Country	Year				
	2011	2012	2013	2014	2015
Russia	60.7	60.2	61.3	59.7	67.9
USA	47.8	53.1	51.6	51.8	74.6
Canada	53.1	58.3	60.0	62.0	86.1
Brazil (South Region)	48.6	46.7	47.8	50.4	65.0
Brazil (Central Region)	55.6	58.3	56.3	65.6	80.7
Netherlands	66.2	67.1	74.9	83.3	107.1
Germany	72.8	73.5	77.9	83.9	105.1
France	67.5	68.3	74.0	80.8	101.6
Denmark	65.4	67.5	71.5	77.8	99.0
Spain	65.8	65.9	69.4	75.7	99.0
Sweden	80.1	83.1	87.6	91.9	117.9

\* Source: Compiled on the basis of data from the Ministry of Agriculture of Russia [5], Hoste, R. [12], Agriculture and Horticulture Development Board (AHDB) [13], and Central Bank of Russia [8].

The analysis showed that, in terms of production costs, the Russian producers today are second only to the pig-breeding enterprises in southern Brazil, where the main production facilities are concentrated. More favorable climatic conditions of production allow for the production of pig products with low production costs.

The economy of the industry was positively influenced by the devaluation of the national currency, which significantly increased the competitiveness of domestic pig products on the world market and ensured a significant increase in the volume of exports of pork in 2014-2016, both in real terms and in value terms.

The development of exports of livestock products requires the improvement of measures and mechanisms of state support aimed primarily at stimulating the growth of foreign trade activities of domestic producers, promoting Russian products to new markets and protecting their interests in international structures governing world trade [4].

One of the key areas of state support for the export of livestock products, in our opinion, is intended to be the allocation of subsidies for the sale of products of animal origin on the foreign market, which will increase the competitiveness of domestic producers and will help stabilize the price situation on the domestic market, ensuring a steady level of profitability in the entire commodity chain.

Another direction of support from public authorities should be to facilitate the passage of administrative and veterinary-sanitary barriers for domestic goods in the leading world markets. In modern conditions of globalization, characterized by the rapid spread of infectious diseases, this area has acquired particular importance not only for expanding the possibilities of foreign economic activity on the international agri-food market, but also for protecting the internal from the introduction of pathogens of especially dangerous diseases causing significant economic damage to the national economy and public health.

Thus, disproportions in the development of animal husbandry, due, on the one hand, to the economic and biological characteristics of breeding certain types of agricultural animals and the natural and climatic conditions of livestock production, and, on the other hand, the level of development of the market infrastructure and the passing macroeconomic processes in the economy predetermine the competitiveness of the products produced and the efficiency of the realization of the export potential of the industry.

## References

- [1] Tikhomirov A I and Fomin A A 2018 Macroeconomic factors in realizing the export potential of livestock *International Agricultural Journal* **3** pp 65-72
- [2] Database of customs statistics of the Federal Customs Service of the Russian Federation (<http://stat.customs.ru/apex/f?p=201:1:4091907215289809>)
- [3] Official exchange rates of the Central Bank of the Russian Federation ([https://www.cbr.ru/currency\\_base/](https://www.cbr.ru/currency_base/))
- [4] Tikhomirov A I 2018 Exports of livestock products: the main trends and factors of development *Economics of Agricultural and Processing Enterprises* **6** pp 24-28
- [5] Committee of the State Duma on Agrarian Issues 2017 *The main indicators of financial and economic activities of agricultural organizations Materials of the Parliamentary hearings in the State Duma of the Russian Federation on February 21, 2017 "Legal aspects of increasing the profitability of agricultural production"*
- [6] Tikhomirov A I 2018 Economic efficiency of development of livestock sub-sectors *Economics of Agriculture of Russia* **1** pp 76-84
- [7] Tikhomirov A I and Chinarov V I 2017 Economic efficiency of production and sale of livestock livestock products *Economics of Agricultural and Processing Enterprises* **9** pp 25-29
- [8] Official statistics of the Federal State Statistics Service of the Russian Federation ([http://www.gks.ru/wps/wcm/connect/rosstat\\_main/rosstat/ru/statistics/enterprise/economy/](http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/economy/))
- [9] United States Department of Agriculture Economic Research Service (<https://www.ers.usda.gov/topics/animal-products/dairy/>)
- [10] *Cost of Production Study* The Canadian Dairy Commission (<http://www.cdc-ccl.gc.ca/CDC/index-eng.php?id=3941>)
- [11] *What is the cost of producing milk?* The European Milk Board ([http://www.europeanmilkboard.org/fileadmin/Dokumente/Milk\\_Production\\_Costs/BAL\\_cost\\_study\\_milk\\_2016\\_DE\\_NL\\_BE\\_DK\\_FR.pdf](http://www.europeanmilkboard.org/fileadmin/Dokumente/Milk_Production_Costs/BAL_cost_study_milk_2016_DE_NL_BE_DK_FR.pdf))
- [12] Hoste R 2017 *International comparison of pig production costs 2015 Results of InterPIG* Wageningen Wageningen Economic Research Report p 28
- [13] *Pig Cost of Production in Selected Countries* ([http://agricultura.gencat.cat/web/.content/de\\_departament/de02\\_estadistiques\\_observatoris/27\\_butlletins/02\\_butlletins\\_nd/documents\\_nd/fitxers\\_estatics\\_nd/2016/0186\\_2016\\_SProductius\\_Preus-costos-porci-Europa-2015.pdf](http://agricultura.gencat.cat/web/.content/de_departament/de02_estadistiques_observatoris/27_butlletins/02_butlletins_nd/documents_nd/fitxers_estatics_nd/2016/0186_2016_SProductius_Preus-costos-porci-Europa-2015.pdf))
- [14] Bogoviz A V, Gulyaeva T I, Semenova E I and Lobova S V 2019 Transformation changes in the system of professional competences of a modern specialists in the conditions of knowledge economy's formation and the innovational approach to training *Studies in Systems, Decision and Control* **169** pp 193-200
- [15] Bogoviz A V, Lobova S V and Bugai Y A 2018 Effective import substitution in the agro-industrial complex: competition or monopoly? *Advances in Intelligent Systems and Computing* **622** pp 30-36
- [16] Semenova E I and Shumeiko N N 2012 Milk products subcomplex of the Smolensk region *AIC: Economy, Management* **4** -pp 62-65