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# State support for the production of cattle meat: the experience of countries with high levels of self-sufficiency

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**Abstract.** The relevance of this study is due to the decline in recent years observed in the production of beef and veal, which does not allow to fully ensure food security. The article deals with the use of mechanisms of state support for the development of cattle meat production, as one of the main food products. The purpose of this article is to identify the mechanisms of state support for the development of beef cattle breeding in the most successful countries, which food security index for cattle meat production did not fall below 70% over the period of 2012-2016. Their experience of state support allows for a timely stabilization of the market situation. The leading method for studying this problem is statistical analysis. The study was based on official data of international organizations and foreign organizations. Based on the self-sufficiency assessment, 11 countries were selected to consider the existing state support mechanisms. The results of the study allowed us to identify the main areas of subsidies: research, modernization, support for pedigree cattle breeding, as well as support for developing farmers. Application of the experience of state support for the development of beef cattle through indirect measures will contribute to the prospects for the development of production, both quantitative and qualitative. At the same time, indirect support does not depend on the specifics of ensuring the production of cattle meat, associated with climatic factors and technological development of the country, which allows the application of measures in practice regardless of them.

## 1. Introduction

Cattle meat is one of the main foods, the most important source of protein. Its production is closely related to ensuring the country's food security, thereby determining it as one of the priorities for state regulation. In the field of state regulation, a significant place is occupied by the state support, as one of the most effective development mechanisms. In order to ensure a competitive market for meat products, the states make significant injections into the development of cattle meat production, but often, regardless of the amount of budget funds provided, the meat subcomplex does not develop, which may be due to the inefficiency of the government support mechanisms.

In order to identify the most advanced experience in providing state support for the development of the cattle meat market, 11 countries were selected for our analysis; the cattle meat self-sufficiency is more than 70% in these countries (from 2012 to 2016), which proves the development of production in them sufficient for providing the population with food volumes. In addition, changes in the number of



cattle livestock in these countries range from 2% to 9%, which is also a positive trend and may be the result of effective government support measures.

The theoretical basis of this study was the research conducted by various scientists on the analysis of state support and the cattle meat market: G. Mazūre (2012), M. Jankū (2013), V. M. Bautin & A. Y. Retum (2013), A. Borshcheva (2010), S. Y. Vasilieva & O. A. Frolova (2011), N. E. Yevdokimova (2011), A. A. Khanov (2006), R. M. Kotov (2007), A. G. Paptsov (2014), M. V. Shuvarin (2013), R. G. Yanbih (2015), U. A. Lemetti (2012), N. G. Baryshnikov (2007), A. G. Paptsov (1998), V. I. Nesterenko (2001), R. V. Romwnov (2005), and others.

The main *problem* addressed in this study is the allocation of effective measures of state support to promote the development of competitiveness in cattle meat production. Thus, the *purpose* of the study was to identify effective measures of state support for cattle meat production in countries with a high rate of product availability. To achieve this goal, the following tasks were implemented:

- Selecting those countries, the production of cattle meat in which is provided sufficiently and is characterized by positive trends;
- Assessing the effectiveness of state support in the framework of spending budget funds for the development of cattle meat production;
- Analyzing the experience of measures provided for the development of cattle meat production;
- Highlighting the general trends of best practices of state support for cattle meat production.

## 2. Data and Methodology

In order to conduct the study, an integrated approach was used, which included (a) an analysis of monographic and dissertation research, articles, and other scientific publications reflecting the state, problems of development of the system of state support for cattle meat production; (b) a comparative analysis of the legal framework of foreign experience of state support of meat cattle breeding; and (c) an analysis and synthesis of statistical data; economic statistical method.

The following indicators were used to assess the effectiveness of state support for cattle meat production:

- Food independence as the ratio of production volumes (and changes in stocks) to the volumes of personal and industrial consumption and export volumes. Accounting for export volumes was added in order to ensure the reality of calculating consumption volumes in the current world market environment, since the level of output of agricultural enterprises often takes into account the share of export-oriented products;
- The volume of production of cattle meat that needs to be assessed in order to consider the dynamics of development in the industry;
- Costs of production of cattle meat, on the basis of which the state support is provided;
- The amount of subsidies for the maintenance and breeding of cattle, which is estimated in order to determine the nature of the measures being applied;
- To assess the effectiveness of intergovernmental transfers from the state' point of view, we carried out an assessment of production volumes and government expenditures on the basis of a polynomial trend line in order to analyze the optimal expenditures with the highest performance.

The study was based on the official data of Rosstat, international organizations (FAO, WTO, OECD), and other official sources of indicators measuring the production of foreign cattle meat.

## 3. Results and Discussion

On the basis of official international statistics, according to the OECD, 12 countries have been identified (Table 1) with the food independence index being higher 70%. Dynamics of indicators indicates that there were significant changes in ensuring the production of cattle meat in 2014. At the

same time, the indicator is characterized by growth in some countries, which indicates the presence of effective stabilization measures in difficult periods, allowing to both overcome crises and continue to develop.

**Table 1.** Food independence of cattle meat production, %.

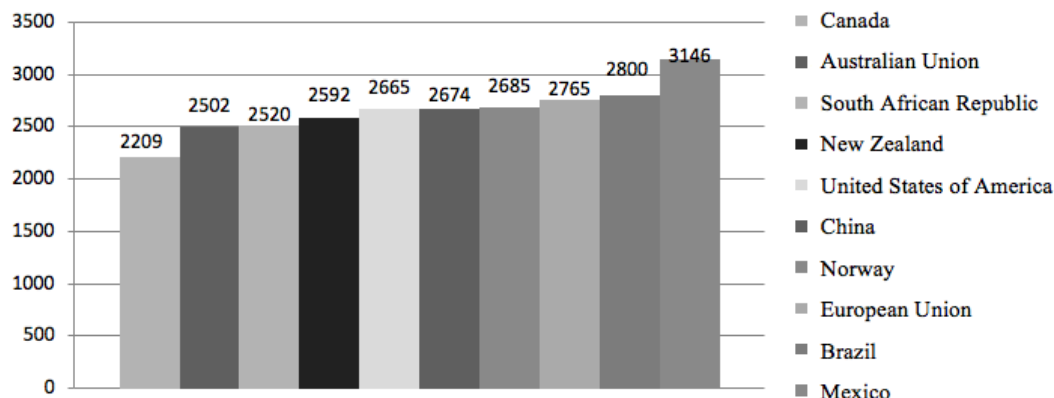
Country	2011	2012	2013	2014	2015	2016	2017
Canada	76	76	76	71	71	72	74
New Zealand	94	95	91	87	82	82	81
USA	89	89	89	86	85	86	87
China	100	100	96	94	93	93	93
Mexico	88	90	90	87	89	89	90
India	100	100	99	99	100	100	100
South Africa	92	94	95	92	90	91	92
Brazil	100	100	100	100	99	99	99
Argentina	100	100	100	100	100	100	100
European Union (28)	102	103	102	102	102	103	102
Australia	112	116	106	92	100	101	101
Norway	91	89	91	90	91	91	91

The numbers of cattle in selected countries (Table 2) do not have unambiguous trends. At the same time, the indicator does not decrease by more than 2% in any country, with the exception of Turkey. In the latter, the growth of livestock volumes occurs on a small scale and only in the period covering 2015-2016, which does not allow to determine the nature of government support as effective.

**Table 2.** Cattle livestock, % by previous year.

A country	2012	2013	2014	2015	2016
Australia	0,27	-3,03	0,64	5,81	8,91
Canada	-0,74	-0,49	0,69	2,41	-0,92
European Union (28)	-0,16	-0,17	-1,11	-0,71	-0,48
Norway	0,26	0,96	1,60	-1,59	-2,13
New Zealand	-1,59	-0,02	-1,83	3,24	-1,19
Turkey	-8,99	-12,32	-3,64	1,29	1,51
USA	1,86	1,17	1,74	-0,70	-3,11
South Africa	-1,46	0,19	-0,39	1,59	2,15
Argentina	-3,95	-2,27	-1,27	0,42	-2,35
Brazil	0,73	-0,26	-0,28	-1,36	-1,39
China	2,50	0,16	-0,40	-1,85	-2,26
India	0,34	0,40	0,47	0,45	-0,89
Russia	-0,71	0,90	1,83	1,53	1,41

All selected countries have different climatic conditions and different technical and technological support, which does not allow to consider them in the same way. However, from an economic point of view, all features of production are reflected in the costs. So, the cost price characterizes the “share of features” of production in a particular country, as a cost indicator of their accounting. Also, having estimated the cost of production, Mexico (as the country with the largest cost of production) was excluded from the analysis (Figure 1).



**Figure 1.** The cost of production of cattle meat, thousand dollars per thousand tons.

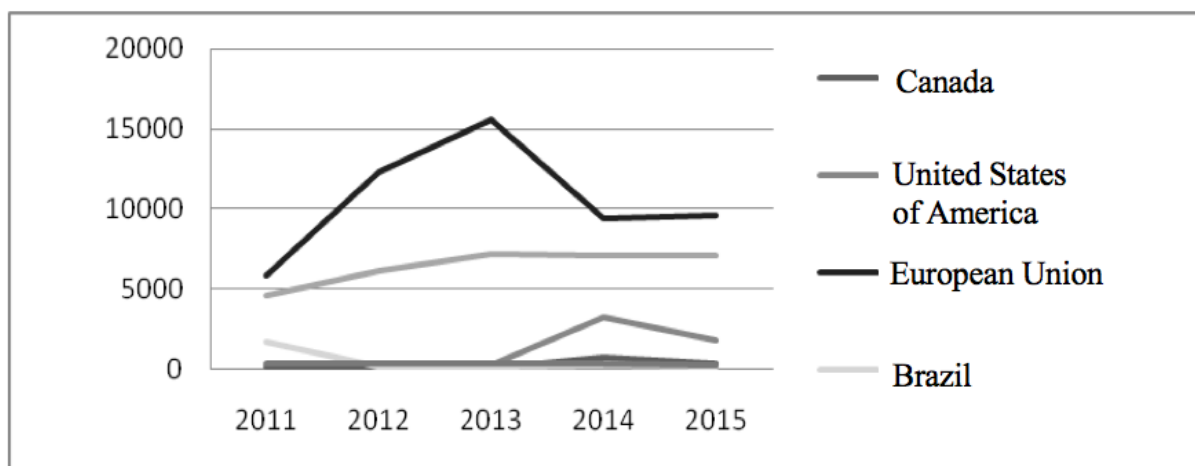
Some of the countries selected on the basis of food independence could not be assessed, due to the lack of official economic statistics.

In Australia, there is no product-specific government support after 2010. OECD official statistics for India are not calculated. In 2010-2012, the US subsidy volumes do not exceed 5%, preventing us from analyzing this period. In Argentina, product-specific government support does not exceed the threshold level of funding for distorting government support measures (the “de minimis” principle) within the World Trade Organization and, therefore, is not calculated.

Due to the impossibility of conducting a quantitative assessment for these countries, a qualitative analysis was carried out.

Similar cost values and the absence of a noticeable increase in production volumes imply a high level of expenditure on stabilization of production, scientific research in the sub-sectors aimed at technical and technological modernization of production, as well as large production volumes [11].

Despite the fact that Brazil, the USA, and Canada provide the smallest amounts of state support (Figure 2), the results of their production do not differ significantly, which implies the use of the most effective government support measures, as well as the implementation of indirect measures that have a positive effect on development industries.

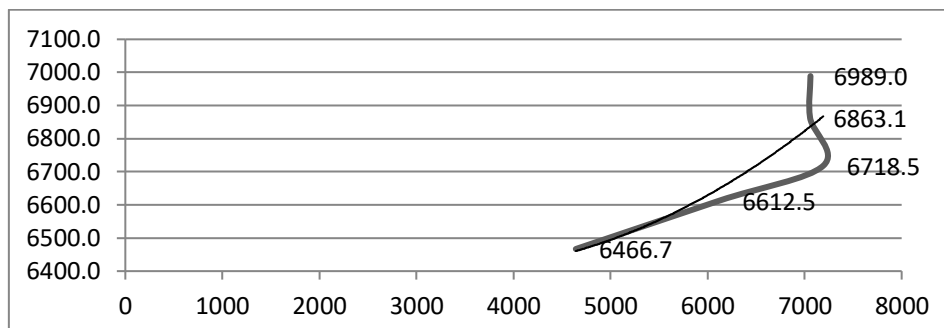


**Figure 2.** Subsidies for the maintenance and breeding of cattle, million US dollars.

By analyzing the dependence of production and the amount of government support funds spent, the effectiveness of subsidies in the industry was determined (Figure 3).

In Canada, the growth in expenditure was accompanied by a drop in production volumes by 2015. The extreme minimum of production volumes is achieved with state support of at least \$400 million. The lowest positive results in Brazil are observed in 2011. It is when the state support was the highest

for the period in question, while the production was minimal. In the European Union, a period of decline in state support and a simultaneous increase in production volumes begins in 2013. In China, production volumes increase simultaneously with government support until 2013.



**Figure 3.** Dependence of cattle meat production on government expenditures to support it: the case of China.

The distinction of the agrarian policy of the European Union is that it consists of two levels: co-financed by all EU member states and financed by one EU member state. Most direct payments are currently implemented in the form of a single agricultural payment to the farmer. A complementary system involves a gradual departure from the mechanism providing for the payment of subsidies depending on the volume of production, and the creation of a system that will be regulated primarily by the demand for specific goods. Budget funds are issued for specific target programs and only subject to the established requirements.

Beef cattle in India are particularly specific, which is associated with religious beliefs and a ban on the slaughter of cows. So, cattle sold for meat in India is represented by buffaloes. The support measures that India has to take in order to support the crop industry have created the necessary conditions for increasing exports of beef cattle products (1.7 million tons in 2016): implementation of a program to write off outstanding debt, including on the basis of low production and income, subsidizing the purchase of raw materials by low-income farmers (whose economy occupies less than 10 hectares), government programs (in the format of investing in the industry) for livestock development.

The Canadian beef cattle are maintained at the regional level and receives a larger share of funding (more than 2.4% in 2014). In addition to direct subsidies, government support for Canada provides for stabilization programs that are aimed at resolving specific problem situations (such as the long-term closure of the US-Canadian border) for a limited period of time.

In Argentina, the cost of beef cattle does not exceed the “de minimis” rules (a threshold level of measures limited in scope that have a distorting effect on trade, which is 5% of the value of all agricultural output produced by developed countries and 10% for developing countries). The Argentine government support is provided in the direction of improving the quality of the production itself, i.e. additional equipment, farm modernization, research, and advisory services.

The only type of state support for beef cattle in New Zealand is spending on research, personnel training, breeding.

The state support for beef cattle in South Africa is aimed at reducing protectionist measures. State influence on the industry is the exception rather than the rule. There are no measures of direct subsidies, except for individual cases of provision of funds for specific purposes, which are mainly provided to small businesses. Support is provided to the farmers with limited resources and developing farmers.

The government support for agriculture in China is focused on the domestic market (direct payments and subsidies are paid based on the size of the livestock population, subsidies are provided for the purchase of breeding animals). Their continuous growth has been marked by research grants and the protection of animals from diseases.

The results of the study demonstrate the possibility of identifying certain groups of measures that contribute to the development of cattle meat production, including (a) support for beginning farmers, (b) development of breeding base, and (c) research and technological modernization. These measures, with the exception of supporting livestock reproduction, are indirect and can also be used when a farmer combines several types of production.

The application of these measures in other countries will have a beneficial effect on the production of cattle meat in the future in a long period, as they are aimed not at a temporary increase in livestock numbers, but at the development of the industry. The proposed measures are also used in order to build a comprehensive system for the provision of measures of state support for the development of beef cattle in the Russian Federation [12].

In the future, it is proposed to explore specific areas of research for which budget funds are provided. So, it is possible to determine the main directions of development of the industry.

#### 4. Conclusion

The analysis made it possible to identify countries with the most developed production of cattle meat. On the basis of which, a proposal was made to provide them with effective state support measures through the provision of subsidies, which made it possible to identify best practices in developing production through government support.

The analysis of foreign experience in the provision of subsidies (the European Union, China, and Canada) made it possible to identify new mechanisms of state support for the development of meat cattle breeding that do not affect the features of ensuring the production of meat cattle.

Direct payments are provided by most countries, but with conditions on the number of livestock and restrictions on the amount of provision, including aggregate support. At the same time, all countries realize the minimization of direct payments.

Regarding compensation payments, even representatives of the Cairn Group provide support to stabilize problem situations. At the same time, such expenses are limited by them in terms of the objective needed to eliminate the consequences. Some countries also suggest support in two areas: the development of livestock breeding (a selective approach) and the support of developing farmers. Research expenditures are allocated in all the countries considered in our research, which is due to the need for technological and technical progress.

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