Organizational and economic aspects of functioning of the field of cattle breeding in Ukraine

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Abstract. The article conducted with a scientific assessment and substantiated organizational and economic aspects of the functioning of the field of cattle breeding. The field of cattle breeding has been traditionally and remains one of the leading ones for Ukraine. The dynamics of livestock, milk production and beef and veal production were analyzed. It was established that the main producers of products of cattle breeding were the economy of the population, which provide more than 70 % of production volumes. The problematic issues of the functioning of the field of cattle were generalized: a reduction in the number of cattle, reducing its productivity, deterioration of production indices and its efficiency, unsatisfactory level of feed base, breeding and tribal work and technological support, insufficient state support, reduction of the level of consumption of products of cattle breeding. It was substantiated that the further functioning of the industry and its efficiency depends on the policy of the government and the motivational mechanism. The important areas for increasing the efficiency of the field of cattle are the concentration of production, including on the basis of co-operation of manufacturers, improvement of feed base and tribal affairs, modernization of logistical support, investment and innovation activity was argued

1 Introduction

Cattle breeding is one of the fastest growing agricultural industries. Sustainable cattle breeding systems can contribute to reducing poverty and termination of hunger, as well as improving nutrition and its safety. They also have complex interactions with ecosystems. Contribute to solving problems of environmental degradation and climate change and biodiversity conservation. It was estimated that the existence of 60% of rural households in low and average income levels depends on livestock [1].

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It belongs to the most important industries of agriculture of Ukraine and provides the population with milk, beef, veal and products of their processing [2]. These products are included in the list of indicators of food safety.

The formation markets of milk and meat cattle production has the ultimate goal of social orientation and efficiency both for commodity producer and the consumer [3]. Cattle breeding is an industry that except for the population of products of animal origin creates conditions for year-round functioning of production and maintenance of social stability in rural areas due to employment.

At the same time, during the period of market transformations, the field of cattle breeding in Ukraine has undergone significant changes and has lost a significant part of its resource potential. Determining and taking into account the importance of the industry and products of cattle breeding for both the country and for the population, it is necessary to focus on the problem aspects of their functioning. The current state of the field of cattle breeding is actualizing and requires further research in this direction.

Literature review. Questions of the functioning, revival, industry and market development of cattle breeding are devoted to many works of domestic scientists, in particular: Varchenko O. M., Radka V. I., Rudich O. O., Svynousa I. V., Tkachenko K. V. [4], Gladiya M.V., Sabluka P. T., Kopytets N. G. [5], Diyesperova V. S. [6], Ilchuka M. M., Konovala I. A. [2], Petrichenka O. A. [7], Shiyan N., Koloshy V. [8], Shust O. A. [9].

The problem and tangent of the issues are investigated and foreign scientists. So, Zezza A., Pica-Ciamarra U., Mugera H. K., Mwisomba T., Okello P. performed an estimate of the role of cattle in the economy of farms. The role of livestock in the wellbering of rural communities of Timor-Leste was determined Bettencourt E. M. V., Tilman M., Narciso V., Carvalho M. L. S., & Henriques P. D. S [10]. Based on the empirical data of Germany F. Frick, J. Sauer investigated the bonds of deregulation and productivity and efficiency of redistribution of resources in the dairy sector [11]. Competitiveness of Polish Dairy Farms E European Union was an object of research Parzonko A., Bórawski P. [12].

Developed a microeconomic model for analyzing compromises between milk production, feed and organic fertilizers on Dutch dairy farms G. S. Samson, C. Gardebroek, R. A. Jongeneel [13].

However, taking into account the meaningful scientific and practical developments of researchers, in the conditions of strengthening of crisis phenomena, the field of cattle breeding of Ukraine needs a scientific assessment of the organizational and economic principles of functioning and substantiation of directions of further development.

2 Materials and methods

The theoretical and methodological and information base of the article are scientific achievements of domestic and foreign scientists regarding the functioning and development of the field of cattle breeding, the data of the State Statistics Service of Ukraine and the Food and Agricultural Organization of the United Nations (FAO). The set of generally accepted methods and techniques were used in the research process: abstract and logical method – to elaborate the theoretical provisions and analysis of the field of cattle breeding, to formulate conclusions; monographic – when detailing of the field of cattle breeding; comparative analysis – to compare indicators and identify trends in their change over time; statistical – to assess the changes of the field of cattle breeding; table – for a visual representation of the results of the research; graphic – to identify and illustrate trends of economic phenomena.

The main purpose of the article is the scientific assessment and substantiation of organizational and economic aspects of the functioning of the field of cattle breeding.

3 Results and Discussion

Organizational and economic transformations in the state significantly influenced the state of the field of cattle breeding. Currently, in animal husbandry of Ukraine there was a situation that led significant changes in the investigated industry.

The basis for the formation of a supply of cattle breeding is the economic process of reproducing a number of cattle and its main quantitative parameters - the size of the herds, volumes of production as the inalienable components of a scientific approach to the analysis of the current state [14].

The primary offer on the meat market is a result of agricultural producers that are engaged in fattening livestock for its implementation or sales of slaughter. Its volume is formed under the influence of the factors system. The resource potential of meat industries is the most significant. Others are financial and economic state of agricultural producers; the standard of living of rural population; technologies used in fattening cattle and poultry; state policy. The constituent parts of the resource potential are livestock, provision of production capacities and feed base. The key element is the number of farm animals, which greatly affects the production of products [15].

Cattle breeding has traditionally developed in the direction of dairy and meat-dairy breeding of cattle in Ukraine. Negative tendency to reduce the number of cattle lasts from the 90's of the last century.

Since 1990, dairy farming has declined, there has been a spontaneous breakup of existing collective farms which accumulated experience for over several decades). Increasing of large collective and state farms has led to growing number of farms, dispersion of main production assets, massive sale of cows, disruption of the feeding system, physical and moral aging of the material and technical base, and impoverishment of previously successful enterprises [16]. The main reason was that the growth rate of prices for material and technical resources significantly outposed purchasing prices for milk.

There is a rather significant reduction in the number of cattle by this time, which has not only the economic ground was remarked. The number of cattle decreased by 67.2% or from 9423.7 thousand heads in 2000 (at the end of the period) to 3092 thousand heads in 2019. Or more than 6 million heads, with which are almost 4.5 million heads – this is a valid herd of cows (Table 1).

Table 1. Cattle population in Ukraine at the end of the period, thousand heads

	2000	2010	2018	2019	2019/2000, %	2019/2018, %
Agricultural enterprises						
Cattle	5037.3	1526.4	1138.1	1049.5	20.8	92.2
Including: cows	1851.0	589.1	467.8	438.6	23.7	93.8
Households						
Cattle	4386.4	2968.0	2194.8	2042.5	46.6	93.1
Including: cows	3107.3	2042.1	1451.6	1349.9	43.4	93.0

Source: Formed and calculated by the author (State Statistics Service of Ukraine) [17].

In the period from 2015 to 2020, the number of cattle in farms of all categories in Ukraine decreased by 20.4%. It should be noted that 32.1% of the total cattle at the beginning of 2020 was kept in such five regions of Ukraine: Vinnytsia, Poltava, Khmelnytskiy, Zhytomyr and Kharkiv. Consequently, 2020 in Ukraine began with the lowest in the modern history the number of cattle. In general, the number of cattle decreased 8.0 times from 1990 to 2019. The reduction occurred both in agricultural enterprises and in households. Significant structural changes were found in the number of cattle, depending on the categories of commodity producers during the investigated period (Fig. 1).

The largest losses of cattle took place in agricultural enterprises. It should be noted 85.6% of cattle and 73.9% of cows were held in agricultural enterprises in 1990. And the number of cattle in agricultural enterprises at the end of 2019 were 33.9% and 24.5% of cows. In households, 66.1% of cattle including in 75.5% of cows were focused.

It should be emphasized that the number of cattle in households undergo some smaller losses compared to agricultural enterprises.

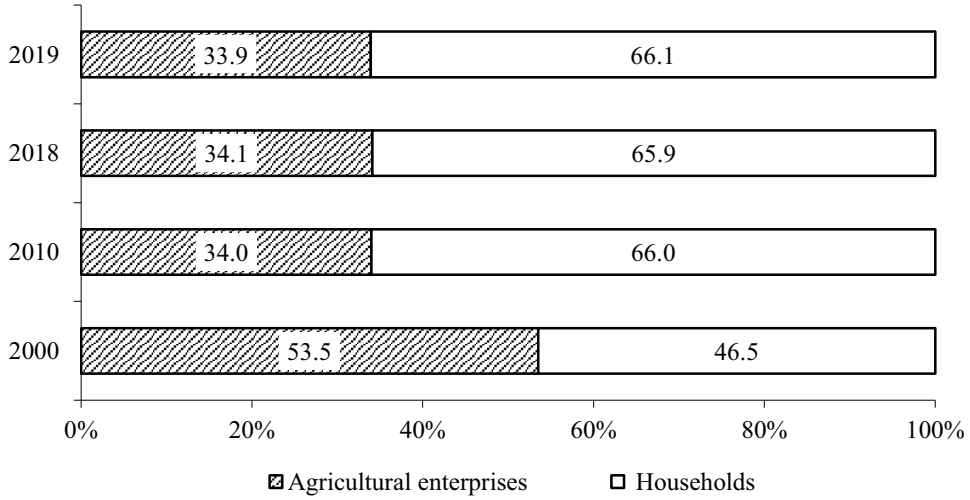

Fig. 1. Structural changes in cattle stock by categories of farms
Source: Formed and calculated by the author (State Statistics Service of Ukraine) [17].

We believe that one of the most significant factors in the reduction of cattle is the economic disinterest of commodity producers. Loss of production due to its high cost is a consequence of the use of outdated technologies, increasing prices for incoming material and technical resources and services (feed, mainly cereals, veterinary preparations, logistics services, energy resources, etc.) and are not contribute to the increase of cattle in farms of all categories.

The technological features of cultivation of cattle and poultry are significantly influenced in the structure of the offer of meat of cattle. Thus, the production cycle in the cultivation of cattle is 18-24 months, in pig breeding – 6-9 months, meat poultry farming – 1.5 months. Indicators of capital turnover are unequal in various meat industries. This affects the prospects of their investment.

Therefore, poultry farming and pigs are significantly mobile industries. They are intensively developing based on specialized enterprises. The cattle continues to decrease. As a result, there are noticeable changes in the structure of supply of agricultural products in the context of various types of meat [5].

The proportion of beef and veal in the structure of production of all types of meat decreased to the critical level. In 2000 the beef and veal amounted to 45.4%, then in 2019 – only 14.8%. This actually narrows the formation of a rational meat balance of the country where beef must take at least 30%. Such structural changes have become the result of crisis phenomena in the field of cattle breeding.

The milk production in 2019 decreased by 23.7% compared to 2000 and amounted to 9663.2 thousand tons. The production of beef and veal in 2019 decreased by 51.0% compared to 2000 and amounted to 369.5 thousand tons. The production of meat-total has increased by 49% (Table 2).

Table 2. Dynamics of production of cattle breeding, thousand tons

Indicator	2000	2010	2018	2019	2019/2000, %	2019/2018, %
Milk	12657.9	11248.5	10064.0	9663.2	76.3	96.0
Beef and veal	754.3	427.7	358.9	369.5	49.0	103.0

Source: Formed and calculated by the author (State Statistics Service of Ukraine) [17].

It is desirable to note that the level consumption of milk, beef and veal remains low. In particular, the consumption of milk and dairy products was only 53% of the rational consumption rate per capita in 2019. Ukrainians consume 7.7 kg of beef and veal per capita, which amounted to 23.4% of the rational consumption rate of this type of meat.

Currently, the production of cattle meat is most problematic. Reducing the production of cattle meat, reduction of the number of cattle and the unreasonability of realization prices stipulated the decline and loss of the industry. The cultivation of cattle remains not a profitable business [18].

There is no doubt that the focus of the cattle in households has affected the level of commodity of cattle breeding. The main producers of milk and meat of cattle in the domestic market have become precisely these economic entities. In 2019, 72.5% volumes of beef and veal and 71.7% volumes of milk were produced in households.

A private producer of milk and of beef and veal became the main commodity producer, because of a decrease in the production of these types of products by collective agricultural enterprises.

Suitable is the argument of Svynous I.V. and Ibatullin M.I., which most personal peasant farms are focused on the consumption of grown products within the household, and received revenues are considered as a source of survival in a difficult life situation, an additional resource for overcoming material difficulties. There is no orientation for commodity production for such an economy. But to maintain the life of a household, important the use of all available resources that make it independent of an unstable external economic environment, help maintain material and social status [19].

By assessing the state of the field cattle breeding, it is also necessary to take into account the qualitative component of the livestock (breed and performance direction). The offer of beef and veal is mainly formed due to the use of a number of young and the selected cattle of dairy, dairy and meat breeds in Ukraine. In this case, the share of specialized meat cattle does not reach 5% of the number of cattle in farms of all categories. While in other countries of the world, the problem of ensuring the population with high-quality beef and veal decides due to an increase in the structure of the herd of cattle of specialized of the meat productivity. The share of cattle of the meat productivity in the structure of cattle is more than 75% in Australia, Argentina, Brazil, Uruguay and Canada. The share of cattle of the meat productivity varies within 25-75% in Europe (France, Spain, and Ireland) and the United States. In the structure of cattle in Germany, the Czech Republic and Hungary, the share of cattle of the meat productivity is about 25%.

The current state of the field of cattle breeding is characterized by a systemic crisis for which inherent:

- reduction of cattle livestock, low level of animal productivity;
- the lack of a full feed base, a low level of provision of their full feeds, in particular, a protein component;
- high physical wear and moral aging of fixed assets, which is due to the low rates of their renewal;
- a complicated financial condition of most corporate sector enterprises as a result of the growth of material and technical means, a high level of interest rates for credit resources and other negative factors;
- decrease in the level of milk consumption and dairy products;

- low innovative activity associated with the lack of an economically substantiated normative base and an effective mechanism for stimulating innovation [7].

The main number of cattle though concentrated in households, however, but there is a process of unrelenting reduction. It is necessary to state that in present conditions, the field cattle breeding has lost its attractiveness, both for business structures and households.

Research of other scientists confirm the results obtained. The maintenance of cattle in a personal economy requires a continuous supervision of her without outgoing, leave. It is possible to provide cattle by feed with great difficulty. The cow now accounts for an average of 8 - 9 rural courtyards, and often on much more. It is difficult to form herd for grazing with such a dispersal number of cattle. Great costs requires milk collection in a few cows owners. Dairy products are resolved because of reducing and remoteness of the raw material base. Even worst prospects for growing young animals. The number animals of this category cattle in households decreases accelerated. Calves scored, because their growth does not cover even the value of the populous milk. In a dynamic market economy, the field cattle breeding in small farms with a small-mechanized technology, with low labor productivity can not be competitive [6].

Among the reasons that restrain the development of this industry, they refer to the need for significant investments, a shortage of highly skilled specialists, and limited market of sales, significant risks of technological and biological nature. However, one of the most important is the lack of state support policies and instability of milk prices and beef and veal [8].

Fully support the position of Ilchuka M.M. et al., that one of the ways to increase the efficiency of the livestock industry is to increase the concentration of cattle and poultry at enterprises and raising the level of specialization. The concentration of production allows you to apply scientifically sound technologies for the maintenance and feeding of animals, to introduce effective, rational technical means for the complex mechanization of all production processes, use high-performance breeds of animals [20].

The concentration of milk production is a global trend characteristic of many countries in the world [21]. In particular, Charikova O. G. and Popova E. A. noted that the analysis of the volumes of beef and veal production by categories of farms showed that it is concentrated in households. However, in recent years, in these farms there has been a decline in production while simultaneously increasing rates of volume in agricultural organizations. This positive tendency allows us to apply the latest advanced technologies [22].

Polish scientists investigating the competitiveness of dairy farms in the European Union also indicate that the scale of production has a significant level of impact on economic efficiency, including labor productivity, which may contribute to further consolidation of dairy farms and reduce their total number [12].

The conclusion is substantiated that for reliable food independence and security requires:

- state support of tribal affairs;
- the creation of economic conditions to increase the volumes of milk production;
- the creation of a market of tribal young animals by stimulating demand and simultaneous technological modernization;
- improvement of personnel potential;
- internal organization of the field of cattle breeding to jointly solve economic tasks (increase of qualitative parameters of cattle, improvement of the tribal business system, etc.) [9].

To increase the number of cattle you can use the following methods of breeding and variants of crossing, as an expanded reproduction of pureborn animals of specialized meat breeds; absorbent (transformative) crossing of meat breeds with dairy and combined; a two- and three-row crossing of dairy cows and adhesives with meat bulls, as well as crossing animals of meat breeds with each other; multiplayer (synthetic) crossing for obtaining

animals that have desirable productive qualities, as well as for further formation of new types and rocks [9].

To overcome crisis phenomena in cattle breeding without state support and attracting significant investment resources are practically impossible. The potential of domestic agricultural production will be rationally used subject to the creation of large modern of the field of cattle breeding [2, 6].

4 Conclusions

Based on the study and evaluation of scientific achievements of domestic and foreign researchers, the importance of the field of cattle breeding is substantiated to ensure the food security of the country and the development of rural areas in terms of ensuring the employment of the rural population and obtaining foods of the first need and family income.

The field of cattle breeding has been traditionally and remains one of the leading ones for Ukraine. Although in the period of reforming of the agrarian sector this industry has undergone structural changes. It is determined that 66.1% of the total of cattle, including 75.5% of cows, focused on households. The dynamics of livestock and of milk production and beef and veal production are analyzed. The main producers of products of cattle breeding were the economy of the population, which provide more than 70 % of production volumes. The reorganization and destruction of large existing dairy and meat complexes and the reorientation of production in the households did not provide increased volumes and efficiency of production of products of cattle breeding. Internal production does not provide rational norms of milk consumption, beef and veal per capita.

The current state of the field of cattle breeding indicates catastrophic crisis phenomena. It is worthwhile to speak, first about the revival of the industry, and then already develop. First of all, it is necessary to suspend the unceasing tendency to reduce the number of cattle in the farms of all categories. Further functioning of the industry and its effectiveness depends on the policy of the government and the motivational mechanism. One of the areas of increasing the efficiency of the industry, as preliminary experience and foreign practice is the concentration of production, including based on co-operation of producers. In addition, for the development of the field of cattle breeding it is necessary to improve the feed and tribal base, to provide modernization of the material and technical base, to increase investment and innovation activity.

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