

Dairy farming. Prospects for digitalization

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Abstract — In conditions of geopolitical instability and uncertainty, the state bodies, whose powers include coordinating the development of the dairy cattle industry and the agro-industrial complex as a whole, bear an increased level of responsibility in terms of reducing barriers to the development of production and sale of milk and dairy products. Acute competition in the market forces milk producers entering foreign markets to apply new methods and technologies for the production and promotion of their products. In this regard, the industry needs a new generation of development programs aimed at: the use of big data and the introduction of information technologies, improving forecasting methods, improving systems and methods of management, which is a strategically important task not only in the context of the socio-economic well-being of the Russian Federation, but also as a condition for preserving sovereignty against the backdrop of globalization and implementation of digital development programs by other participants of the world market. At the moment, the primary task in dairy cattle breeding is to solve the problem of increasing the economic efficiency of milk production and sale by agricultural organizations.

Keywords— dairy cattle breeding, prospects, productivity, digitalization, efficiency

I. INTRODUCTION

Dairy cattle's breeding is one of the main branches of agriculture in the Russian Federation. The efficiency of milk production and sale determines the degree of food security, which is an integral part of the state national security. At the moment, the degree of efficiency of this industry in the Russian Federation is low and significantly inferior in terms of such indicators as milk yield per cow and milk production per capita in the developed countries of the world by 1.5 times. Despite the fact that agricultural organizations are the central element of ensuring the country's food security, they do not have the opportunity to significantly modernize their material and technical base, reduce high yield and infertility, improve the quality of the

feed base, and increase the level of breeding and genetic work, which does not ensure their sustainable development. Due to the lack of sufficient own funds, the vast majority of milk producers are unable to independently carry out technical re-equipment, introduce modern production methods, increase its technological level, which is one of the reasons for the reduction in the number of agricultural organizations.

It should be noted that the scientific works of domestic and foreign scientists lay the foundations of theory, methodology and applied problems of economic efficiency of production, industries, enterprises, intersectoral complexes. However, the rapidly changing economic and technological conditions of management, the instability of dairy farming in many regions of the country dictate the need to develop practical recommendations adequate to modern economic conditions for improving the economic efficiency of milk production and sale, which led to the relevance and practical significance.

II. THEORETICAL BACKGROUND

At the beginning of the XXI century, the world's population was 7 billion people. According to scientists' forecasts, by 2025 the population will increase more and amount to 10 billion, as a result, foreign and domestic researchers put the problem of the population's food security in the first place, which is explained by the growth rate of the population, significantly outpacing the growth rate of the production of necessary food. Therefore, ensuring food security is one of the most important goals of both agrarian and economic policy of all states, being the basis of their national security.

The scientific literature describes many problems related to the efficiency of the agricultural sector of the economy; there are many contradictory criteria and performance indicators. The efficiency category itself shows the relationship between the resources used and the production goals. We share this point of view that it is impossible to increase the efficiency and competitiveness of the sub-sector without upgrading farms. In the conditions of the present

time, livestock complexes should be based on the latest technologies and technical means. Serious work in this direction is already underway in many areas [1, p. 47].

Thus, U. Safronova and O. Stolyarova argue that efficiency can be achieved with proper and timely updating of resources [2].

Researcher A. Bolgov believes that it is possible to solve problems in the industry by developing and using innovative methods in all areas of production activities of cattle breeding organizations [3, p. 30].

Currently, many scientists are talking about the problems of developing and mastering innovations in domestic dairy farming [4-13].

Innovative and information technologies in the near future will determine the nature and efficiency of economic activity of agricultural enterprises. The development of digitalization in agriculture will allow farmers to achieve the desired results with the help of various technologies that reduce production costs.

Based on the works of marginalists, which in addition to K. Menger include U. Jevons and L. Walras, a theory of business processes aimed not at the production of goods, but at satisfying customer needs was formed [14].

Based on the above approaches to understanding the category of "efficiency", as well as on the sectoral features of its formation in dairy cattle breeding, we can say that the economic efficiency of the functioning of a dairy farm is the ratio of the economic effect obtained by milk producers during its production and sale to the total cost of resources spent on its production, storage and sale, when at the same time satisfying the needs of other branches of the national economy of the country.

In the current economic situation in our country, many researchers give different classifications of factors affecting the economic efficiency of milk production [15, p. 54].

A factor is usually understood as a cause, or the driving force of a process, phenomenon, determining its features or individual features [16, p. 1412].

Factors of economic efficiency reflect the processes of production and economic activity of the enterprise [17, p. 106].

So, N. Denisova, in her works, pointed out that "factors are divided into two large groups; these are external and internal factors. The author attributed the economic environment, the crisis, Russia's entry into the world trade organization to external factors. The internal ones are technical, technological equipment, social climate in the team and innovations" [18, p. 17].

A number of researchers adhere to the opinion of N. Denisova [19-21]. Some authors argue that "integration processes, product sales markets, selection work, etc. should be attributed to the factors". At the same time, a

number of other scientists give the most complete classification of factors that affect the economic efficiency of the dairy cattle industry.

The prospects for the development of digital technologies in the field of dairy cattle breeding are discussed in the works of [22-27] scientists who have identified a number of tasks necessary to achieve the goals of effective management of the industry. Its essence is as follows: restructuring of planning of management methods; new investment policy; acceleration of scientific and technological progress; saving of production of resources. An important factor affecting the efficiency of the industry is the productivity of cows.

III. DISCUSSION

Having studied the classifications of factors affecting the production and sale of milk, we came to the conclusion that they do not take into account the qualitative shifts taking place in the Russian economy, the specific features of the development of dairy cattle breeding.

The classification of the author's factors is divided into two groups: external and internal factors. The group of external factors is divided into two subgroups: macro-level – affects the production and sale of products and micro-level – affects the sale of dairy cattle products.

At the macro-level, such factors as: social; economic and political; innovative; geographical are highlighted. The micro-level includes: consumers; competitors; intermediaries; sellers and it technologies.

In the internal group, organizational, managerial, production and technological factors are considered.

In the group of factors affecting the economic efficiency of milk production and sale, the author identified social factors (population size, migration inflow (outflow) of the population, and the share of the able-bodied population). Now, according to statistical data, the state does not fully provide the population of the Russian Federation with dairy products.

An important external factor attributed to the group of economic and political influence is state support, the development of agricultural organizations as a whole depends on it. Import substitution, a move of the state that will allow organizations to increase the volume of domestic production and enter new markets for products. It is a kind of economic strategy and industrial policy of the state to strengthen the role of domestic production and protect domestic consumption by exchanging imported goods with domestic relatives. In the modern economic situation, the development and implementation of innovations is a decisive factor in increasing the economic efficiency of production and sales of products. In the group of external factors – innovative factors – two necessary categories are identified: the development of scientific and technological progress and digitalization.

According to forecasts of the Ministry of agriculture of the Russian Federation, using innovative technologies, the expansion of the food embargo will have a positive impact on the agricultural and industrial complex of the country. It is expected that in 5-7 years Russia will be able to completely replace imported products with the domestic ones.

Digitalization significantly increases productivity; it has become one of the top priorities for business leaders around the world. Taking into account the trends in the formation of the digital economy in the Russian Federation, it becomes relevant to form a new technological order, which is based on the informatization of economic efficiency factors. At each stage of the formation of economic efficiency in an economy specializing in dairy cattle breeding, from the point of view of the process approach, the informatization of factors determining it should correspond to the end-to-end digital technology specified in the program "Digital economy of the Russian Federation". The micro-level group includes factors affecting the sale of products. Consumers (loyalty, the desire to consume dairy products); competitors (the level of competition, the risk of new brands); intermediaries (the price of advertising, transport services); sellers and IT (mobile and online trading, personalized offers, the use of big data) have an impact on the sale of products.

The author proposed a factor – IT. They will assist in adapting the offer to demand, through the placement of discounts and special offers, personalized offers (as consumers increasingly expect offers specially prepared for them), the use of big data will allow analyzing consumers' behavior and customizing offers for the target audience. Also using multi-channel trading, for example, mobile and online trading (a modern person wants to make purchases at any time convenient) thereby increases the economic efficiency of milk sales.

In the group of internal factors that influence the economic efficiency of production, organizational and managerial factors are highlighted, for example, the effectiveness of management. The primary task at present is the need to form an attractive image of agriculture in order to attract competent specialists.

Free stockyards belong to a subgroup of production and technological factors, their presence may be formed due to the introduction of restrictions on the supply of products. The factor level of automation affects the economic efficiency of production, as the use of mobile electronic devices (weighing machines, dispensers, and feed mixers) reduces the cost of production.

Each organization has different development conditions and, as a result, this affects the efficiency of its economic activities. When studying the economic efficiency of an organization, much attention should be paid to the factors that affect it.

It is important to apply the principle of "data in exchange for support". The state should encourage agricul-

tural producers to implement digital management platforms (digital management, digital inventory, and digital logistics). In exchange for objective data obtained automatically, for subsidizing and applying incentive measures.

IV. CONCLUSION

Summarizing the theoretical foundations of the formation of the economic efficiency of milk production and sale, we can say that at the present stage of the development of economic science, domestic and foreign scientists have a large amount of developments. However, the classification of factors affecting the economic efficiency of milk production and sale, clarified by the author, will allow taking into account the peculiarities of the development of the dairy subcomplex in the digital economy.

Assessment of the influence of factors determining the economic efficiency of milk production and sale contributes to the qualitative construction of the economic policy of dairy producers, which has a significant impact on the level of its development.

and increasing the degree of using information technologies. This requirement is explained by the fact that information support for the management of the agricultural economy sector, its composition and structure must clearly correspond to the implemented functions of the agricultural sector management system at all levels.

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