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SCIENTIFIC BASICS AND PROSPECTS OF DEVELOPMENT OF PRODUCTION OF ORGANIC ANIMAL PRODUCTS IN RUSSIA

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Abstract

The purpose of the study is to work out the scientific basics for the development of organic production livestock products for their application in the practice of the agro-industrial complex of Russia. In preparing the article, we took data from the Ministry of Agriculture of the Russian Federation, the Federal State Statistics Service of the Russian Federation, statistical materials FAOSTAT, EUROSTAT, scientific works of Russian and foreign scientists. The following methods of scientific research were used: statistical-economic, monographic, abstract-logical, calculation-constructive. Using the principles of a system approach, the scientific basics for the development of organic production, from the author's point of view, has been developed, which is a form of scientific knowledge that studies the sequence of creation and development of enterprises in organic agriculture, ensuring the effective construction and interaction of the system structure. A system analysis of the environment in which the development of organic livestock production is supposed to take place has made it possible to divide the scientific basics into three blocks of elements (technological, economic and social), including all its stages (problem-tasks-solution).The probable efficiency of production of organic livestock products is substantiated on the basis of its total cost indicator, predicted before 2030, taking into account the use of organic production methods and without them, using extrapolation and analogy of European experience.

Key words: *livestock, scientific basics, organic products, Russia, agriculture*

INTRODUCTION

At present, agricultural producers in Russia have understood the need to switch to organic production, the advantages of which are improving the quality and competitiveness of products on the market, increasing the efficiency of organizations by increasing the price of products, and also improving the living standards of the population through good nutrition and prevention.

Organic farming concepts were developed by Sir Albert Howard [16] in the early 20th century. He developed organic farming practices and distributed them through the British Soil Association and the Rodale Institute in the USA. He reflected his views on organic agriculture in the book "Agricultural Testament". Rudolf Steiner, a philosopher, social reformer, architect and esoteric, introduced the concept of "biodynamic farming", the main idea of which is to see a farm as a whole self-sustaining organism producing fertilizers and feed, and the disease appears to be a problem of this organism [26]. In modern times, biodynamic farming is widely used in many countries of the world. Also one of the scientists at the origins of organic farming is Lady Evelyn Barbara "Yves" Belfour [17]. In 1943, her book "Living Soil" was a breakthrough for the development of organic production and natural agricultural products. The term "organic farming" was first used by the english scientist J. Northbourne [18] in 1940. He considered the unity of God, man and the earth, and also negatively related to the industrial type of development. His views influenced the ideas of E.F. Schumacher [26], who believed that the economy should be oriented towards people in order to ensure sustainable development of the environment and man. Nowadays, many works by world

scientists on various aspects of the development of organic animal husbandry. Disclosure of the features of organic animal husbandry in comparison with traditional methods of raising animals was carried out by I. Blanco-Penedo [5]. The works of some authors are devoted to the study of world experience in the development of organic animal husbandry in various regions: Europe (S. Mirela [27], E. Herbut [14], S. Mihina [19]), Central Asia (H.R. Ansari-Renani [1], M . Chander [8]) and others. T.A. Boldanov [7], H.A. van de Weerd [29] is involved in the development of the organization of organic livestock management systems. Promising areas for the development and improvement of organic livestock are being studied by D.P. Bhandari [4], B. Horning [15] and E. Boehncke [6]. The market for Swiss organic products in households was investigated by S. Mann [13]. Romanian scientists Balan et al [2] and R.S. Cretu [11] studied organic farming. Issues of the business process and the risks of small and medium-sized organic farmland in Serbia were studied by D.V. Tsiyanovich [12]. The market of organic products of Moldova was analyzed in the works of Movileyanu P., Movileyanu V. [21]. A.T. Bolotov and V.R. Williams is considered the founders of organic agriculture in Russia. In the work of 1771 "On the separation of fields" A. Bolotov [3] proposed introducing crop rotation, as well as cultivating crops based on weather and soil. The works of Robert Williams [31] in the first half of the 20th century were devoted to grass field farming, as well as the fight against agrochemicals. Currently, the conceptual foundations of the development of the market for organic agricultural products have been developed [10] by such scientists as N.K. Dolgushkin, A.G. Paptsov, N.D. Avarsky, V.V. Taran, J.E. Sokolova, A.N. Osipov, H.N. Hasanova, V.M. Kruchinina, A.S. Lankin, E.A. Novoselov, S.M. Ryzhkova, E.A. Silko, A.N. Stavtsev, O.V. Zakarchevsky, D.S. Natarov. Theoretical and methodological foundations and strategies for the development of organic production are studied by O. Yu. Voronkova together with other scientists [30]. Measures for the development of organic management at enterprises and the methodology for organizing and controlling the production of organic meat raw materials described in the works of N. N. Zabashta, E. N. Golovko and others [32]. The development of the scientific basics for the development of the market for organic dairy cattle products was made by A. S. Nechitailov [22]. Despite the relevance and popularization of the concept of “organic production” in Russia, their theoretical study, conceptualization of basic concepts and terms, development of methods, principles and development factors have not yet been carried out. Therefore, at the present stage, it becomes necessary to develop the scientific basics for the development of organic production in Russia, in particular in the livestock industry, which is one of the main for providing the population with quality, safe and nutritious products.

MATERIALS AND METHODS

In preparing the article, the information used was taken in the Ministry of Agriculture of the Russian Federation, the Federal State Statistics Service of the Russian Federation and in statistical materials FAOSTAT, EUROSTAT. The subject matter was researched by the authors as a complex of interconnected elements, which corresponds to the methodology of the system approach. Such a perception and study of the conceptual-categorical apparatus made it possible to formulate the quintessence of the scientific basics for the development of organic production, which is a form of scientific knowledge that studies the sequence of creation and development of enterprises in organic agriculture, ensuring the effective construction and interaction of the structure system. System analysis is a combined component of a systematic approach and is a sequence of procedures to identify the correlation between the components of the system. The study of systems was carried out by many scientists, each of whom has his own vision of the concept, classification, structure, laws of their functioning, as well as characteristics and stages of system analysis. The development of the scientific basics for the

development of livestock production allowed us to conceptualize these stages as follows:

1. Definition of a problem – 2. Statement of tasks – 3. Searching of decisions

A system analysis of the environment in which the development of organic livestock production is supposed has led to the specification of the scientific basics in three blocks of elements, including all its stages (Fig. 1). The development of any production cannot be determined without the inclusion of the technological aspect, which is its basis. The market environment determines the goal of the functioning of any object to achieve the maximum financial result, which determines the allocation of the economic element in the development system of organic livestock. Understanding that the development of production and economic activity are the main forms of activity of society as a whole allows us to isolate a separate social element in the system. Conducting a phased system analysis of each element will allow us to formulate the scientific basics for the development of the production of organic livestock products.

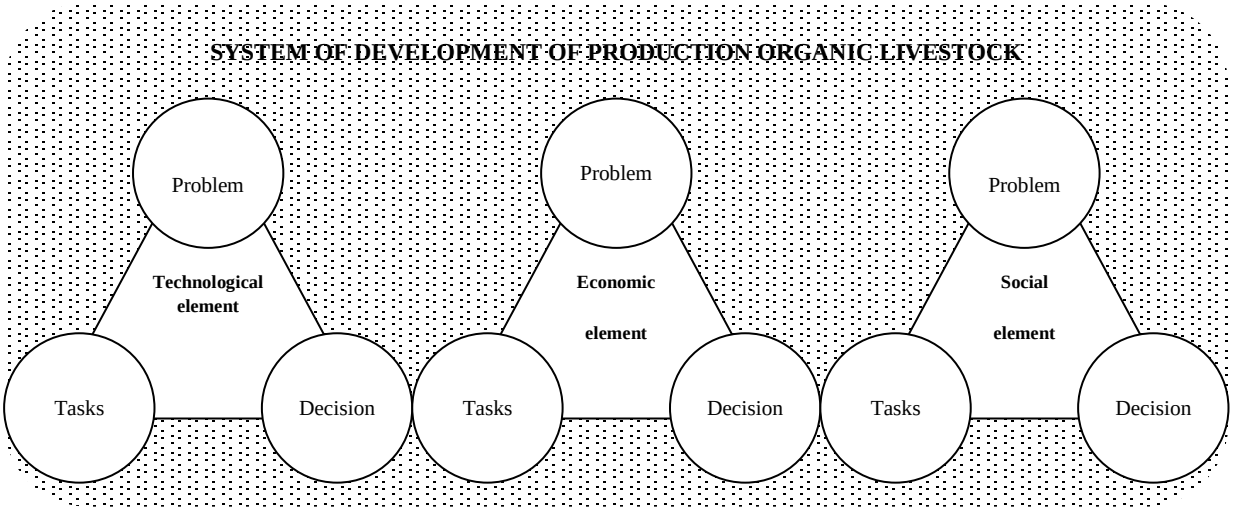

Fig. 1. The introduction of elements of scientific basics in the system of development of production organic livestock
Source: Compiled by the authors.

The principles of systems and dynamics allow us to rely on the theory of Harvard school, in particular, W. Mitchell [20] and W. Persons [24], in developing the scientific basics for the development of organic production. The created Harvard barometer was based on the understanding that in the dynamics of various elements of the economy there are indicators that go ahead of others in their changes, and therefore can serve as harbingers of the latter. He described the empirical laws of the three curves (A is the stock market; B is the commodity market and C is the money market), which is the arithmetic average of the series of indicators included in them and extrapolated to a given time period. The barometer predicted a change in each curve based on a change in the others. One of the main methods of knowing the sphere of economic activity is the analogy, which is the knowledge of a phenomenon or object by transferring its nature to another phenomenon or object for the purpose of studying. A.I. Uyomov [28] developed an ontological-methodological concept used in system analysis, one of the directions of which is the creation of a theory of conclusions by analogy. “An analogy can also be determined through modeling (although the opposite approach is often used); in this case, the analogy should be called «transfer of information» from the prototype to the model and vice versa.” The variety of forecasting methods made it possible to choose one that is most closely related to analogy. Extrapolation can be interpreted as to some extent an analogy for a number of signs. In the definition of extrapolation, its relationship with analogy is traced. It is a research method in which the conclusions drawn from observation of a part of a phenomenon are transferred to its other part, that is, forecasting occurs (Fig. 2).

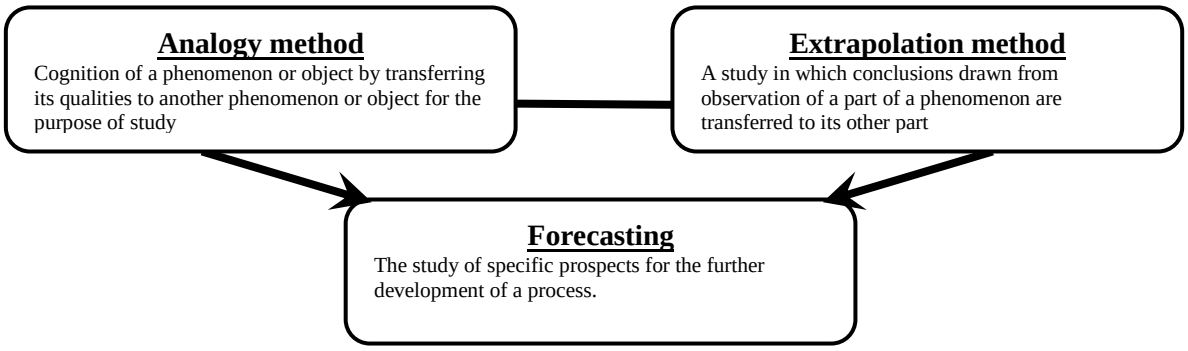

Fig. 2. Correlation of economic research methods to justify the development of production of organic livestock products
Source: Compiled by the authors.

Organic production in Russia at this stage is only beginning to develop. There is still no precise study of regulatory issues, state support, a ready-made certification and conversion mechanism. To justify the prospects for the development of organic production in the region, we consider it reasonable to use the methods of economic analogy in symbiosis with the extrapolation method in forecasting.

RESULTS AND DISCUSSIONS

Currently, nearly 200 countries are engaged in the production of organic products in the world. Over the past 20 years, the market for such products has grown more than 5 times. The leading place in this market is occupied by the USA, Germany and France.

A review of data on the production of organic products in various geographical regions showed that in Africa and Asia they are mainly engaged in crop production, since arable land and perennial plants occupy a large share in the structure of land use. In Europe and North America, arable land and pasture land occupy approximately equal shares. Australia and Latin America are the leaders in the share of livestock production.

In most countries, organic livestock is represented by the production of beef, milk and lamb. The stock of all types of animals used for the production of organic products is growing [23]. The main problem is the difficulty in providing certified feed for monogastric animals such as pigs and poultry. And also the need to bear sufficiently large costs to create conditions for the maintenance of such animals (cages, pens). Accordingly, for the consumer, this increases the final price of the product. It is much easier to keep and feed organic animals on a walk (cattle, sheep).

In terms of per capita consumption of organic products, the USA and European countries are considered leaders, here the population has the opportunity to overpay for organic products to add them to their daily diet.

At present, Russia does not keep a statistical record of organic production - data are not collected or accumulated, which made it difficult for the authors to assess the current condition of organic production. Available information has led to the following conclusions. The volume of organic production in Russia is growing. For the period from 2014 to 2016 it increased by almost $ 20 million to $ 160 million. However, this amounted to only 0.02% of the global volume, and the number of people who constantly consume organic products was about 1%. Organic production is most developed in such constituent entities of the Russian Federation as the Krasnodar Territory, Yaroslavl and Moscow Regions, as well as the Republic of Tatarstan, where the program Development of agricultural production and the creation of the innovative cluster "Econutrition" has been adopted. In Tatarstan, for the first time in Russia, territories were ranked according to the degree of readiness to carry out organic production.

The website of the National Organic Union provides a list of Russian certified producers of organic products as of today. In total, there are more than 80 organizations on this list, mainly having a certificate for the production of crop products. This is information obtained from

open sources, that is, voluntarily. Only eight enterprises announced the production of livestock organic products and two for milk processing. Organic farming is mainly concentrated in the Kaluga and Yaroslavl regions.

The work of two farms with recognizable brands in Russia – the "AgriVolga" holding of the Yaroslavl region and the eco-company "Stories from Bogimovo" of the Kaluga region was considered as an object of research on organic livestock production. Each of them had its own way of developing the organization of organic production. "AgriVolga" is a large holding that has united dozens of enterprises, transformed and reorganized their production into organics. "Stories from Bogimovo" is a small enterprise organized "ab initio" by a group of volunteer activists who have applied the European experience in organizing organic animal husbandry.

In general, in Russia, the livestock industry is represented by a small number of farms producing certified organic products. However, this does not mean that there is no production of such products. Due to the imperfection of the legislative base and limited information, producers have not received the necessary certificates. After the entry into force of Federal Law No. 280–FZ from 01.01.2020, all previously obtained certificates for the production of organic products are canceled, and you can get them again only at an organization accredited by the Federal Accreditation Agency. To date, the accreditation process has passed "Organic Expert", certificate number RA.RU.10HB01.

Having studied the theory and methodology of the scientific basics of the development of production, as well as the practice of developing the production of organic livestock products in the world, the authors proposed a scheme of its scientific basics (Fig. 3).

The technological component involves the creation, implementation or change of livestock production technology, taking into account the requirements of the standard for the transition to the production of organic products.

The economic component of the scientific basics for the development of organic livestock production is determined by the change in the financial and economic situation of the economic entity in the transition to the production of organic livestock products.

The social component of the scientific basics for the development of organic animal husbandry involves reducing social tension and improving the quality of life of the population through the formation of the habit of consumption of certified organic meat and dairy products.

The developed scientific basics are recommended to be put into practice as a single mechanism for organizing the production of organic animal husbandry, that is, all three components must be included – technological, economic and social, then the tasks set to improve product quality, enterprise performance and improve the nutritional quality of the population will be achieved by response proposed decisions.

The practice of organic farming in the world shows its effectiveness and attractiveness to investors [9]. The increase in the selling price of organic products significantly outstrips the growth in costs of its production, the volume of production of such products in value terms is also increasing. In Russia, due to the fact that until 2020 there was no legislative base (Federal Law No. 280–FZ entered into force only in January 2020), organic production is poorly developed, the lack of a single base of organic producers does not allow collecting and processing the available statistical information about them activities.

SYSTEM OF DEVELOPMENT OF PRODUCTION ORGANIC LIVESTOCK

THEORETICAL PROVISIONS:
- Theories of Harvard School W. Mitchell and W. Persons;
- theory of conclusions by analogy A.I. Uyomov;
- systems approach

METHODS:
- economic analogy;
- extrapolation;
- system analysis.

PRINCIPLES:
- systematic;
- dynamic;
- integrity;
- structuring.

Factors

	Technological		Economical		Social	
Problems	Transition to organic production technology	♦ organic production of animal feed; ♦ conditions in which animals are kept; ♦ risk of illness and death; ♦ work on breeding animal breeds	Cost increase production	♦ keeping animals; ♦ biological means of combating diseases; ♦ organic feed production; ♦ to work on breeding or acquiring animals	Unpopularity organic products among the population	♦ high prices; ♦ lack of information about the benefits; ♦ distrust due to fraud; ♦ insufficient number of points of purchase products
Tasks	Product quality improvement	♦ organic meat; ♦ organic milk; ♦ organic processing	Improving economic effect performance	♦ growth in production volumes; ♦ increase in profitability	Improving nutritional quality for the prevention of chronic diseases заболеваний	♦ rejection of products containing GMOs, antibiotics, etc.; ♦ balanced diet
Decisi	Advice on the transition to organic production and its certification	♦ scientific approach to the selection of the industry of organic livestock; ♦ establishment of advisory bodies for the transition to organic livestock	State support and search for markets	♦ subsidizing production costs, soft loans, taxation, insurance; ♦ development of infrastructure; ♦ cooperation	Education on healthy nutrition and the benefits of organic products	♦ marking with a single quality mark; ♦ holding fairs, popularization of products; ♦ government procurement and distribution of products to children's educational and medical institutions

Fig. 3. The scientific basics for the development of production of organic animal products in Russia
Source: Compiled by the authors.

To assess the effectiveness and attract potential producers, a forecast was developed for the development of organic animal husbandry in Russia until 2030 using extrapolation and analogy methods.

The use of extrapolation in forecasting is due to the sufficiency of the time period of the source data to identify development trends. When forecasting, the method of selecting functions was used. When plotting trend lines for all types of animals, a high tightness of communication was observed – the determination coefficient $R^2 > 0.9$.

In general, the forecast showed the following results: a reduction is expected only for the number of cattle, for the rest of the animal species, an increase is expected by 2030 (Fig. 4).

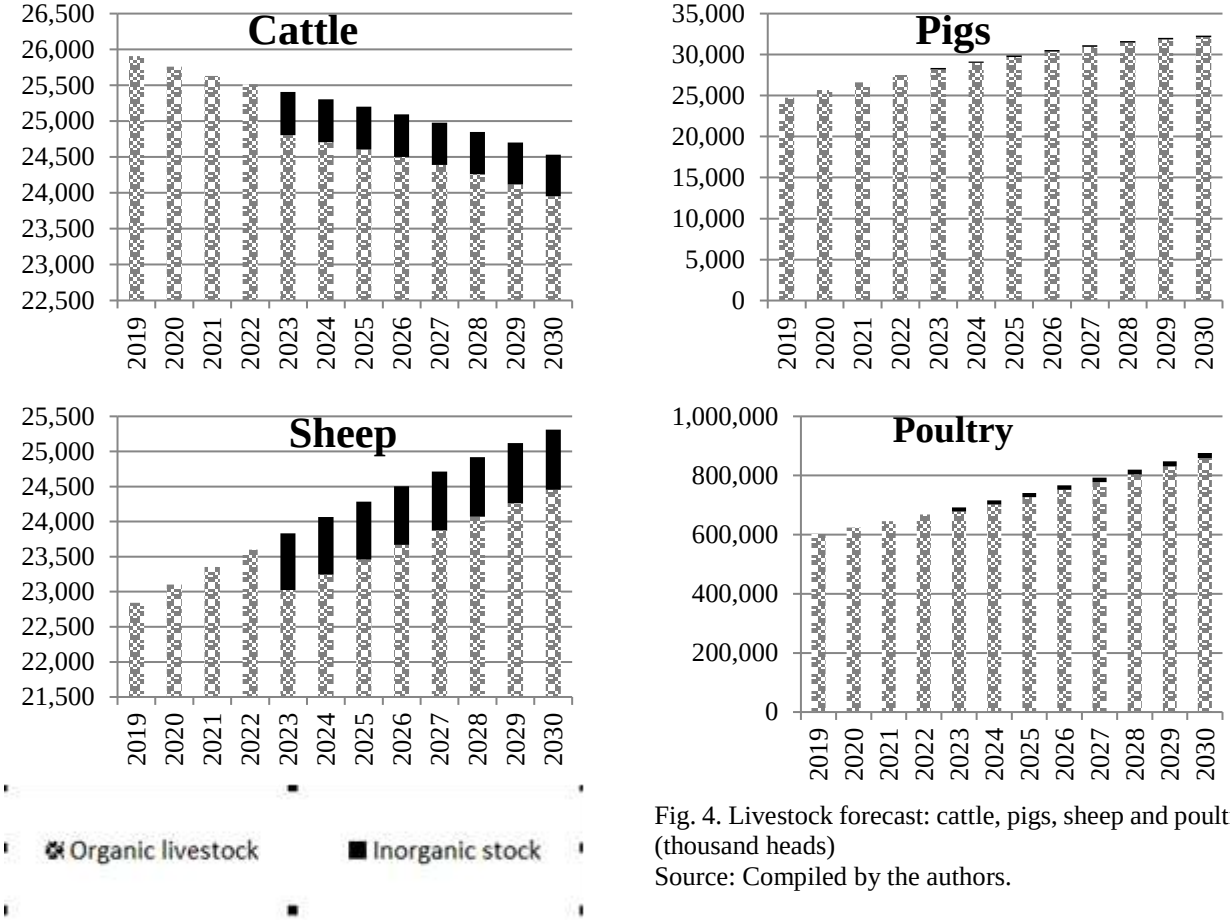

Fig. 4. Livestock forecast: cattle, pigs, sheep and poultry (thousand heads)
Source: Compiled by the authors.

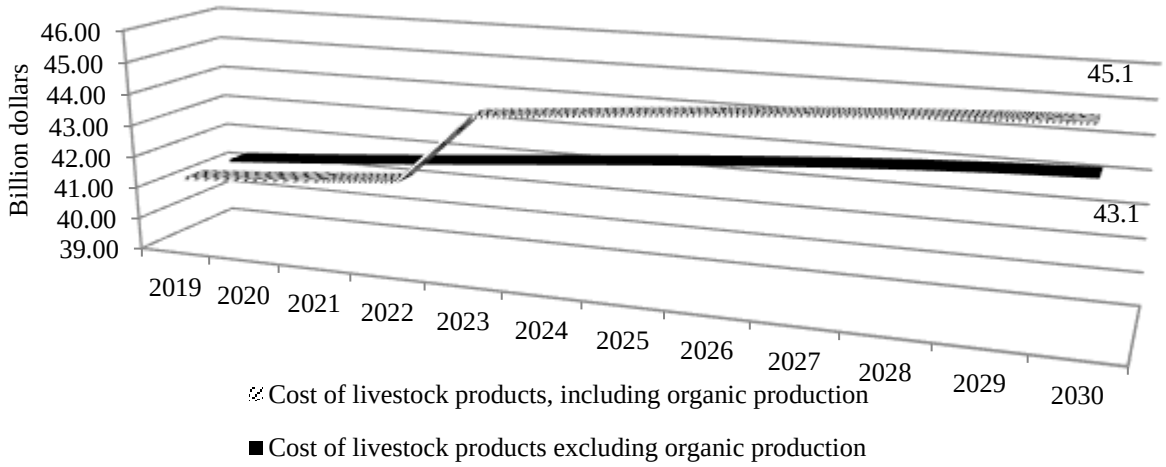

Fig. 5. Development of production of organic animal products in Russia (forecast)
Source: Compiled by the authors

Using the initial data, an organic livestock was set aside. This was done taking into account the ratio of organic livestock to total livestock in Europe. It was also taken into account that after the entry into force of Federal Law No. 280–ФЗ from 01.01.2020, the conversion period will begin, during which the products will not be organic for 3 years.

Using special conversion factors, as well as selling prices of inorganic and organic agricultural products, a forecast was obtained for the development of production of organic livestock products in Russia in value terms (Fig. 5).

2020-2023 – the period of transition to organic production (conversion), starting from 2023, the cost of livestock products will begin to

increase, and given that the price of organic livestock products is higher than inorganic, its cost will be higher, according to the forecast, by 2030 it will reach 45.1 billion dollars.

The decrease in the number of certain animal species in Russia will be offset not only by an increase in the number of other animals, but also by an increase in the selling price of products that will be certified as organic. The developed forecast shows that the development of organic livestock in the Russian Federation will be a catalyst for increasing the efficiency of agricultural production in general.

CONCLUSIONS

Studying the principles of a system approach made it possible to formulate the scientific basics for the development of production of organic livestock products. All tasks were divided into 3 blocks of elements: technological, economic and social. Technological block involves the creation, implementation and change of production technology, taking into account the requirements of the standard for the transition to the production of organic products. The economic block of the scientific basics of development is determined by a change in the financial and economic situation of an economic entity in the transition to organic animal husbandry. Social block determines the reduction of social tension and the improvement of the quality of life of the population through the formation of the habit of consumption of certified organic meat and dairy products. The practical application of the developed proposals should be carried out taking into account the simultaneous involvement of all elements, then the tasks set for the organization of organic animal husbandry will be achieved by the response of the proposed decisions.

Organic livestock production in the world is growing dynamically – the number of animals and pasture areas are increasing. Due to technological and production features, the main organic products in the world are beef, milk and lamb. In Russia, according to the National Organic Union, about 10 enterprises received certificates for organic livestock, mainly in the Kaluga and Yaroslavl regions. However, one cannot assume that organic livestock farming is completely absent in Russia Federation, because due to the imperfection of the information and legislative frameworks, some enterprises producing products that can be considered organic by technical characteristics did not receive the necessary certificates. Studying the experience of the organization and functioning of organic production in Russia showed two ways of its development - large holdings, the transformation of technological processes into organics and small enterprises organized “ab initio”.

The forecast for the development of organic livestock in Russia until 2030 showed an increase in the cost of livestock production, taking into account the transition of part of production to organic. When forecasting, the data on the ratio of the organic population of animals to the total in Europe were taken as the basis. After the completion of the conversion period, starting in 2023, the cost will increase sharply and, according to the forecast, by 2030 it will reach $ 45.1 billion.

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