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ASSESSMENT OF THE DEVELOPMENT OF ORGANIC PRODUCTION IN VARIOUS MARKET SYSTEMS

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Abstract

Organic agriculture, based on natural production technologies, has a great potential for the reversion of mankind to a healthy diet and living in harmony with nature by improving the state of the ecosystem. The share of organic products in the food market of the developed countries is already quite sizable; in the top countries various institutional systems of the industry have been introduced and improved. Russian agribusiness is lagging behind in these issues but the situation should be significantly changed by the adopted law and the state standard regulating the requirements for the organic sector. Our work is an application of applying a two-sided quantitative-and-qualitative approach to the survey of existing markets from the standpoint of extant results and dynamics, on the one hand, and their organizational-and-economic structure, on the other hand. The presented conclusions are confirmed by systematized absolute and relative indicators of the number of market entities, areas of land certified for organic production, retail sales in domestic markets and consumption of organic products per capita. The qualitative characteristic of organic production systems is reflected in the description of the national characteristics of regulatory and control and supervisory support, research support, state regulation of production and turnover, and ways of doing the business under study. Our research is addressed to the world business community operating in the organic food market and industry research institutions.

Key words**:** *organic production, two-sided approach, quantitative and qualitative approach, organic market*

INTRODUCTION

The state significance, promotion of healthy lifestyles, and informed personal objective necessity jointly stimulate and form a significant growth in demand for organic products and their market all over the world. The scientific basis for the development of organic segment of the economy started its formation with awareness of the need to live "in harmony with nature", and it was a prerequisite for emergence of the concept of organic agriculture as a promising area for eliminating the negative impact of chemical fertilizers, crop protection agents and animals on the ecosystem, promoting its social and environmental advantages compared to conventional intensive method of farming as mentioned by Bolotov (1770) [5], King (1911) [16], Lord Northbourne (1940) [19], Howard (1947) [14], Rodale (1961) [25].

The development of the ideas of "biodynamic agriculture" creates a systemic view of relationship between the quality of resources, technologies, standards and principles in use, spiritual aspects, and cosmic rhythms (Steiner, 1997) [29].

Conducted scientific experiments comparing conventional and organic agriculture, author's farming practices that contribute to soil conservation (non-plow tillage, weeding-free, pesticide-free, three-field system, and others) lay the practical foundations of the "green" economy as obtained by Balfour (1943) [2], Williams (1949) [31] and Bromfield (1954) [6]. The works of contemporary authors are aimed at comparing the indicators of productivity, nutrients content in the soil, crop rotation schemes, potential for providing food

to the population, including drawing an analogy with the results of growing genetically modified crops (Badgley, Moghtader, Quintero et al., 2007) [1], De Ponti, Rijk, & van Ittersum (2012) [9], Ceccarelli (2014) [7], and Firsov (2019) [11].

The problems of production and market of organic agricultural food products and their competitiveness are also covered in the works of contemporary Russian researchers such as: Revenko (2003) [24], Ushachev, Paptsov & Tarasov (2009) [30], Leksina, Popova &, Sapogova (2014) [18], Dolgushkin, Paptsov, Avarsky, etc. (2018) [8].

World statistics shows significant fluctuations in the number of organic producers and certified agricultural land. For example, in the period 2000-2010, the number of organic farms in Germany and Norway decreased by 10% each year, as farmers transferred back from "organic" to conventional agriculture, and this process is currently continuing. The main reasons for the reverse conversion are economic aspects: difficulties with certification and production control, problems with equipment needed for organic farming and infrastructure complexity. However, 10 years later, the same countries registered an increase in the total number of organic farms: by 50 % in Norway and by 70 % in Germany (Sahm, 2012) [26].

The importance of having motivation for transition of economy to "organic" category is confirmed by many studies (Mala & Maly, 2013) [20], Plews-Ogan, Mariola & Ananta, 2017) [23]). For example, in Canada, health and safety are the primary issues and dominant for conversion, while economic reasons are less important for farmers (Granfield, Henson, & Holliday, 2010) [12]. Social decisions, sustainable and environmentally friendly agriculture are the main goals in transition to organic production in Europe (Koesling, Flaten & Lien, 2008, and Best, 2010 [17, 3]. The results of the surveys of farmers in West Germany (Best, 2009) [4] show that when taking decision on conversion, farmers think primarily about the daily production process (Can I effectively control insects and weeds? How will productivity change when transferring to organic methods?). The second key factor is economics (Can I sell my products on the market? Can I ensure the long-term economic stability of the farm?). This is followed by the issues of subsidies and ecology.

MATERIALS AND METHODS

As a basis for the development of organic production, we propose to take an interconnected system of theories recognized as classical (Serdobintsev, Leksina, Chernyaev, et al., 2020) [27]:

(1) Pareto optimality (a success of the industry can be achieved by taking into account the conservation of a key production resource, that is land, based on the consistency between material and environmental interests);

(2) maximum flow of total income J. Hicks-E. Lindahl (2006) [13], in terms of the economic approach (the necessary condition for achieving economic growth of any economic system is not just the effective use of production resource with which the public product was created, but also its preservation);

(3) state regulation (Keynes, 1978) [15] (the revival of economic situation is facilitated by an increase in public investment, which can act as an "ignition key" that triggers the multiplier mechanism);

(4) Harvard School, in particular Warren M. Persons (1923) [22] and Wesley C. Mitchell (1930) [21], allowing the use of the Harvard barometer to predict events (in the dynamics of various elements of the economy, there are such indicators that are ahead of others in their changes, and therefore can serve as precursors for the latter).

To make decisions of transition to organic production technologies, we have formulated the key principles addressed to producers:

• principle of alternativeness, which assumes that producers can choose one or another type of farming – conventional (industrial) or organic;

• principle of maintaining ecological equilibrium, which is realized through the compromise of replacing the technogenic management system with an organic one;

• principle of interdependence, based on the presence of a direct relation between the output

product and the resources necessary for its creation, formation of the organization's income and the environmental component of the production processes;

• principle of reclamation, based on the availability of land that has not been cultivated for a long time, has passed the phase of natural self-cleaning, which opens up wide opportunities for reducing the conversion period and transformation costs;

• principle of dynamism in the development of production, which allows assessing the transformation of the phenomenon under the influence of the determinants acting on it, which must be constantly adjusted depending on the course of events (growth in demand and the cost of gross output, etc.);

• principle of forming an optimal price policy that ensures the establishment of such a level of price markup (premium) for organic products that will allow taking into account the high quality of the products sold while maintaining a sufficient level of demand.

Organic products markets of the top countries of the world were selected for the study: – the United States, Germany, Canada (was selected as the country's climatic conditions and production potential of which are the most comparable to those of Russia), and Austria (the Austria's market is characterized by a strategically-oriented flexible system of state support). For the purpose of scientific substantiation of the formation of the system of an effectively operating Russian organic market, we have studied these markets from the standpoint of extant results and dynamics, on the one hand, and their institutional structure: mechanisms for development, regulation, control, supervision and interaction, on the other hand. The theoretical, methodological and informational base of the study was made up of the works of scientists devoted to various organizational and economic aspects of organic business, as well as FiBL materials [10]. Along with general scientific research methods (dialectical, abstract-logical, structure, optimality, etc.), general logical (analysis, generalization, etc.), specific scientific (comparison, formalization, etc.), specific (monographic, economic-statistical, etc.) methods.

RESULTS AND DISCUSSIONS

Two-sided quantitative-and-qualitative approach to the study of the state of national organic products markets

The growth of the world organic food market is more than 2 times faster than the growth of the conventional food market. According to FiBL [10], the world organic market in 2017 amounted to USD 97 billion (EUR 92 billion) and has grown 5.4 times since 2000 (from 17.9 USD billion). The study of the vector of changes allows characterizing the state of the business under study as growing in all key indicators. Retail sales of organic products in domestic markets for the period 2007-2017 increased 3 times in the United States, 1.9 times in Germany, 2.7 times in Canada, 2.3 times in Austria, and 4 times in Russia. Statistics shows significant fluctuations in the area of land certified for organic production in the United States, the number of producers – in the United States, Austria and Canada (Figure 1, Tables 1 and 2). Germany demonstrates absolute stability in the growth of these indicators. In Russia, the greatest range of fluctuations in the rate of land area growth is observed (in 2010 it decreased from 78.5 to 44 thousand hectares; in 2011 it increased 2.9 times; in 2017 it increased 2.1 times) as well as the growth rate in the number of organic producers (from 12 in 2007 to 89 in 2017; with a slight reduction by 2, 3 and 16 in 2011, 2014 and 2016, respectively). This situation is a typical feature of the beginning of growth of a new industry in the life cycle and a vivid reflection of the ongoing institutional changes that determine the basic "rules of the game".

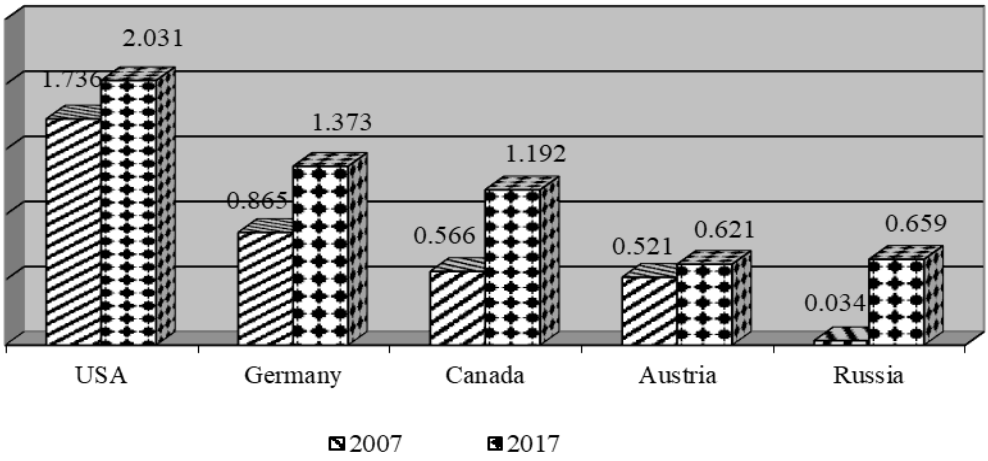

Fig. 1. Dynamics of growth in the area of land certified for organic production (thousand hectares)
Source: calculated by the authors according to FiBL.

Table 1. Growth rate of the area of land certified for organic production (%)

Countries	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
USA	12.3	0.0	-9.2	23.2	0.0	0.0	-28.6	30.5	0.1	0.0
Germany	4.9	4.3	4.6	2.5	1.9	1.0	0.3	3.9	14.9	9.7
Canada	13.0	12.0	0.0	19.5	-0.9	4.2	4.0	4.5	16.4	8.4
Austria	2.3	2.7	4.0	-1.0	-0.1	-0.5	-1.3	0.5	3.3	8.6
Russia	39.1	67.0	-43.9	188.4	15.3	-1.4	70.4	56.6	-18.1	108.4

Source: calculated by the authors according to FiBL.

Table 2. Growth rate of the number of organic producers, %

Countries	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
USA	13.9	0.0	1.9	-2.3	0.0	0.0	3.1	12.0	-4.4	27.8
Germany	5.9	6.2	4.3	2.6	2.3	1.0	0.6	5.7	9.7	9.7
Canada	-1.8	5.4	-4.6	-0.4	-3.4	-2.1	7.6	12.9	-1.4	14.2
Austria	0.8	4.5	5.2	-0.4	-1.0	-0.1	-3.9	0.5	15.4	3.2
Russia	108.3	60.0	25.0	-4.0	18.8	15.8	-4.5	30.2	19.5	34.9

Source: calculated by the authors according to FiBL.

The achievements in the development of the organic market of the United States are characterized by increase in retail sales of products in domestic markets from EUR 13.3 billion to EUR 40 billion for the period 2007-2017 and increase in exports 10 times (to EUR 3 billion) in the period 2011-2017. The study of the systems of state regulation and management of organic production, types of products and their turnover in the food market of the United States allows drawing a conclusion of the effective integrated management approach to this sphere of economy. Thus, the activities of five of the nineteen structural divisions that are part of the United States Department of Agriculture (USDA) are related to the implementation of long-term Federal product quality programs and introduction of innovative technologies in the organic sector.

The advantage of the organic market of Germany is its clear regulation, impressive state support (to 580 EUR/ha) and the established mechanism for certification and labeling of the relevant products with the famous national logo "Bio-Siegel", which guarantees the buyer the declared quality (Figure 2). In addition, the significant "players" in the market are 9 farmers' associations of organic producers with their own standards (more stringent than the state ones) and logos, as well as supporters of biodynamic agriculture with their own certification and the «Demeter» trademark.

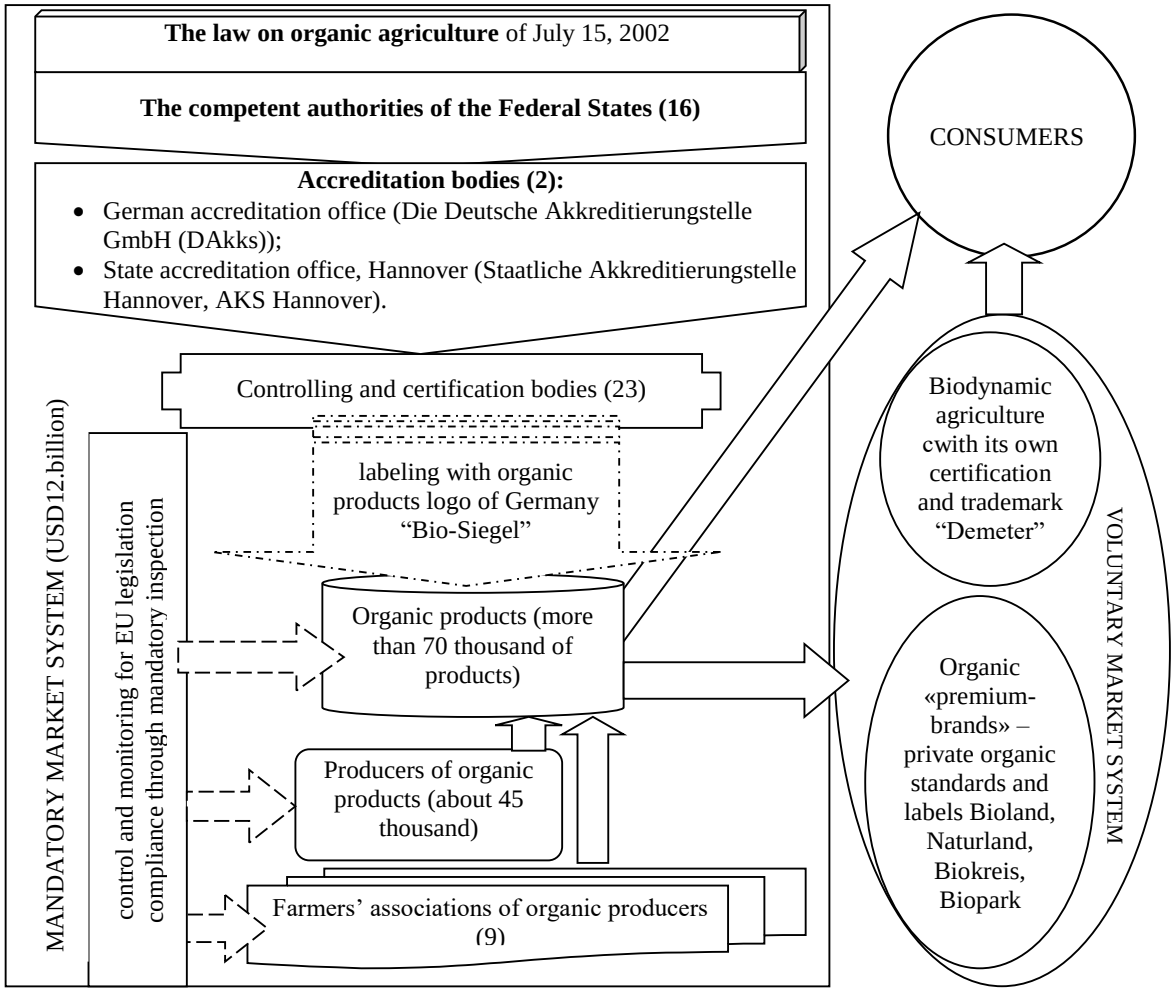

Fig. 2. Characteristics of organic market in Germany
Source: generalized and systematized by the authors.

The results of the development of such market system in the period 2007- 2017 are characterized by an increase in the area of land certified for organic production by 58.7%, retail sales of products in domestic markets - by 89.4%, the number of producers and processors - by 16,702, consumption of the products in question per capita - from 64.5 to 122.3 EUR/person/year.

A detailed analysis of Canadian organic market (Figure 3) allows stating a stable positive dynamics of its development (since 2007 retail sales of organic products in domestic markets have increased from EUR 1.1 billion to EUR 3 billion, since 2008 the volume of exports increased from EUR 0.1 billion to EUR 0.4 billion) thanks to the powerful work of the "research unit", which was aimed at offering the best options for production and marketing technologies, well-functioning and coordination of associations, agencies and committees of the "regulatory control-and-supervision unit", confirming the quality for the final buyer, as well as a stable system of state support and effective cooperative relations.

The European practice of developing the organic segment of the food market has shown that the high efficiency of this process is ensured when there is a so-called Action Plan, which, for example, in Austria is accompanied and financed in accordance with the governmental Organic Farming Action Programme (in German: Bio-Aktionsprogramm). In Action Plans and related programs of Austria, a significant place is given to information-intellectual support for organic market operators. In 2004 an Austrian branch of the Research Institute for Organic Agriculture was established in the country. The results of the approach are the highest indicators of the share of the land certified for organic production in the total amount of agricultural land (24%)

and consumption of organic products per capita (196.4 EUR/person/year) among the analyzed countries.

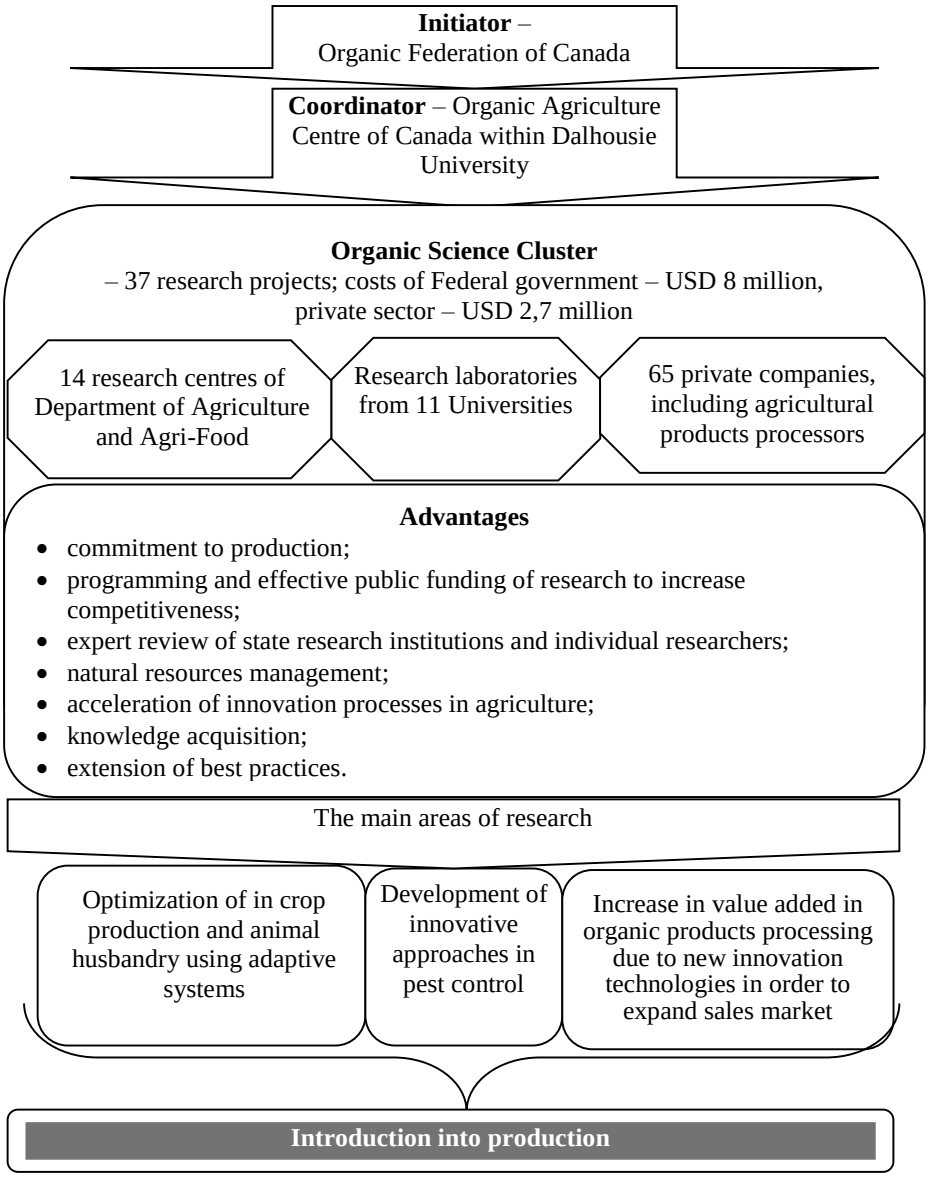

Fig. 3. Canadian model of functioning of "research block" of organic market
Source: generalized and systematized by the authors.

For the development of production, it is traditional to use the organizational and economic mechanism, which we consider as a combination of the system and the purposeful processes of different levels and properties occurring in it, based on the optimal work patterns of all its elements, leading to a synergistic effect. Producers, consumers and the infrastructure of the organic market act as the controlled elements of the system, and the state authorities, administrations and the network of research institutions in organic agriculture act as managers (Figure 4). To develop the main processes that ensure the receipt of the result - preparation and maintenance of production facilities, departments and equipment in accordance with the standard, supply, production, processing, packaging, transportation, storage, sale, import, export (including during the transition period and during parallel production), inspection, certification, identification and labeling of

organic products - it is proposed through the adaptation of classical management methods to the specifics of the issue.

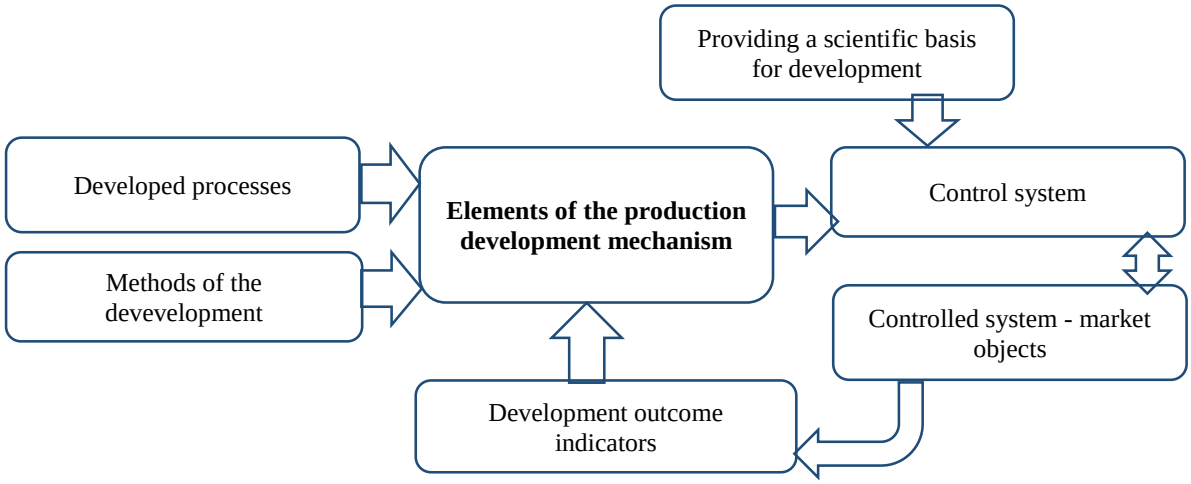

Fig. 4. Scheme of the organizational and economic mechanism for the development of organic production
Source: developed by the authors.

Administrative methods for the development of organic production in the region include, first of all, the implementation of organic food programs for the production and circulation of organic products in order to preserve the environment; update of the Russian standard GOST 33980-2016 "Organic products. Rules of production, processing, labeling and sale" [28] taking into account technical progress and experience in its application; development of a system of authorized state bodies and/or officially recognized certification and/or inspection bodies to supervise the operation of market facilities. Organizational methods should include the introduction into production of relevant scientific developments for organic production, the formation of a system of consumer cooperatives and associations of various types, the development and implementation of integrated labor and product quality management systems (LPQMS), the creation and promotion of a regional brand of organic products, the creation of a supply system organic products from municipal canteens. The system of guaranteed prices (including within the framework of programs) is an effective economic method; long-term cooperation programs between producers, processors, processors, suppliers and consumers; affordable loans and insurance, subsidies for the development of production; optimization of transaction costs. Organizational and technical methods should be formed within the framework of traditional approaches - this is the development of methods for controlling the production of organic products, as well as the development and implementation of methods for its regulation. Indicators of development results should be divided into 4 groups: for producers, processing organizations, infrastructure and social facilities.

CONCLUSIONS

We presented a two-sided approach for the scientific justification of the formation of an effective Russian organic market system based on the study of the existing markets from the perspective of existing trends and patterns, on the one hand, and their institutional structure: mechanisms for development, regulation, control, supervision and interaction, on the other. Using the method of analogy the studied and presented materials on foreign markets of organic products with a high degree of persuasiveness allow forming the scientific basis of market development in Russia as a system of effectively functioning studied elements adapted to national conditions. In particular, it seems appropriate to use:

- cooperative component of functioning model of the farmers' "production block" of Canadian organic market (Ontario);
- "transparent" for producers (sellers) and understandable for buyers (intermediaries) German procedure for quality control, certification and labeling of products;
- clear planning, information-intellectual support and state support for operators of Austrian organic market;
- American effective integrated management approach to this area of agribusiness.

Mechanism for the development of organic production should be based on a combination of systemic and process approaches and that allows linking managed (producers, consumers, infrastructure) and managing (initiators, coordinators, national network of research institutes) systems, improved processes, methods and performance indicators of organic market development.

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