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## Innovative Development of the Food Sector in the Republic of Belarus and Poland: Status and Current Development Trends

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### **Abstract:**

**Purpose:** The study aims to develop a science-based economic mechanism for the innovative development of the food sector.

**Approach/Methodology/Design:** The research methodology is based on the systematic approach applied to the research of innovative development of food organizations using general scientific methods of analysis, synthesis, comparison, generalization, classification, etc.

**Conclusions:** The economic mechanism of organizations of the food sphere innovative development constitutes a set of methods, methodologies, and algorithms, with the help of which an influence on their innovative activity is provided to assure their effective activity and achievement of strategic purposes. A new approach to innovations as an ultimate result of activity, which includes creating and introducing new products, new technology, and management to increase competitiveness and efficiency of organizations of the food sphere, is proved. This together creates the prerequisites for the scientific substantiation of the conceptual model of formation of the economic mechanism and the implementation of the food organizations' strategy of innovative development.

**Practical implications:** It allows for a comprehensive analysis by the proposed evaluation indicators, considering external and internal factors, which enhance the possibilities of monitoring, planning, and forecasting of food organizations' innovative development in a competitive environment.

**Originality/value:** This novelty is based on the theoretical foundation's development of the economic mechanism formation in food industry organizations and the compilation of recommendations to ensure their effective functioning in current conditions.

**Keywords:** Innovation, development, organizations, food sphere, innovative products, evaluation, export, forecast, prospects.

**JEL Classification:** Q10, Q13, Q18.

**Type of document:** research paper.

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## **1. Introduction**

In the digital economy, the innovative way of its development is critical for ensuring national security and sustainable development of various countries. It is necessary to create a high-tech production of non-waste and resource-saving types in the food sector. New technologies using a biochemical modification of raw materials and technologies for the production of select food products are also to be developed to deepen the processing of agricultural raw materials. The main task in the functioning of food organizations is to form a sustainable system of increasing the economic efficiency of production, competitiveness, and their transition to innovative development.

At the macro level, measures have been taken to intensify these processes by developing public-private partnership mechanisms, improving cooperative relationships, and establishing corporate structures. These measures are enshrined in the normative legal acts regulating innovation activity, but in practice, there are many unresolved organizational and methodological problems related to the innovative development of enterprises.

Their practical realization assumes the presence of the mechanism determined by the features of food sphere organizations' activity and their conformity to the principles of continuity, consistency, practice-orientedness, knowledge-intensiveness, integration, motivation, cooperativeness, and informativeness. In this case, the most effective approach is integrative, based on combining educational, research, and production components of the corporate structure, ensuring the establishment, functioning, and development of effective products to manufacture innovative products with high consumer characteristics. This approach reduces the duration of innovative development and implementation and corresponds to the basic principles of formation and implementation of the economic mechanism of innovative development at various levels.

## **2. Literature Review**

Various interpretations of the “innovation” category are presented in economic literature. Innovation is transforming potential scientific and technological progress into real progress embodied in new products and technologies. The basis of economic growth is innovation, and, developing this theory, J. Schumpeter used the term “innovation” for the first time. The term “innovation” is widely used as a chance to introduce and use new types of consumer goods, new production and transportation mean, markets and forms of organization in the industry (Schumpeter, 1982).

This classification includes the technological sphere, but there are no social, managerial, informational areas.

Innovation is new or improved products, new or improved technology, new service, new organizational and technical solutions of production, administrative, commercial, or other nature introduced into civil circulation or used for their own needs (Law of the Republic of Belarus No. 425-3, 2012).

Innovation is studied as the use of intellectual (scientific and technical) activity aimed at improving the process of the activity or its results in a particular area of society (Fatkhutdinov, 2003).

The most common approach in which innovation is studied is not the process and change itself but the result that has been obtained due to qualitative changes in the production process. Innovation is "...the result of innovation activity displayed in the form of scientific, technical, organizational or socio-economic novelties that can be obtained at any stage of the innovation process" (Khariv, 2003).

Innovation is the result of an innovative activity realized in the form of a new or improved technological process used in practical activities (Fatkhutdinov, 2003).

Innovation (new developments) has been studied as a process in which an invention or scientific idea acquires economic content and achieves success through several factors: market orientation; compliance with organizational objectives; effective system of project selection and evaluation; effective project management and control; source of creative ideas; receptivity of the organization to innovation; individual and collective responsibility (Twiss, 1989).

The essence of innovation is more fully revealed by the process approach, which takes into account both relations of production in the development (or creation) of innovations, distribution relations in the dissemination of the new, and relations of exchange in the commercialization of innovations as well as consumption relations in the development (implementation, use) of innovations (Chebykina, 2017).

Innovation in the objective-utilitarian approach is characterized by two directions: 1) as an innovation (new developments), an object is understood as a new consumer value, based on the achievements of science and technology; 2) the emphasis is placed on the ability to meet social needs with the most significant "useful effect" (Kudashov, 2011).

Innovation in the framework of the process-financial approach is studied as an investment in innovation, investment in developing new equipment, technology, and scientific research.

All these approaches consider innovation in a specific situation but do not reveal the economic essence of innovation; there are no clear criteria for defining innovation from its effectiveness. In this situation, any novelty can be studied as an innovation (Trifilova, 2003; 2004).

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In a market environment, novelty, innovation and investment are the main factors of innovation activity. Innovation forms the market for innovation, investment forms the capital market, and innovation forms the market for a pure innovation competition. Together, the three factors mentioned above form the sphere of innovation activity (Volkova, 2016).

Innovations in organizations are carried out in various spheres of activity, and they are considered as an element of development, and innovation activity as the practical use of scientific, technical, and intellectual potential in order to obtain innovative, new products (technology), the method of organization of production, management (Saiganov, 2019).

Depending on the tasks and areas of research, innovation is presented as a process, a system, a change, and a result. As an economic category, innovation has different meanings depending on the context, the specific objectives, and the analysis of the system of economic relations in the field of innovation (or new developments) (Chebykina, 2017).

The review of literary sources has shown that the definition of the concept “innovation” has three main directions of its research: a) as a change, renewal that occurs in a product, technology, system; b) as a process of implementation, development, and use of new solutions; the process of changing and improving the product and c) as a result of a creative process in the form of new (or improved) products, services, and technologies.

This variety of approaches expands the field of research into the essence of the concept of “innovation,” leading to the need for further search, improvement, and development.

### **3. Research Methodology**

Official statistical information on innovation activity is formed based on annual statistical observation data. The methodology is based on international recommendations of the Organization for Economic Cooperation and the Oslo Manual on data collection and analysis on innovation, and *innovation* is defined as the result of innovation activity embodied in a new or improved product, a new or improved technological process used in practical activities, or a new approach to social services (Oslo Guide, 2010). This article applies a comprehensive approach that includes the study and evaluation of various processes and innovative factors in the development of the food sphere in modern conditions.

### **4. Results and Discussion**

The role of the processing and food industry in the development of the national economy is determined primarily by the fact that it provides rational nutrition for the

population, contributes to the elimination of uneven consumption of food products, both in time and in the regional context, allows the efficient use of agricultural raw materials and reduce its losses. Food industry organizations of the Republic of Belarus, with their numerous specialized productions, carry out various activities (National strategy for sustainable socio-economic development of the Republic of Belarus for the period up to 2030, 2015).

A shift towards knowledge-intensive production of high value-added products, which requires considerable innovation, is necessary. The volume of innovative products shipped by food sector organizations of the Republic of Belarus is shown in Table 1 (Industry of the Republic of Belarus, 2020).

**Table 1.** *Dynamics of the volume of innovative products shipped by industrial organisations in the Republic of Belarus*

Name	2017		2018		2019		Growth rate, % 2019/2017
	RUB thousand	%	RUB thousand	%	RUB thousand	%	
Industry	13040740	100	16170970	100	15288732	100	117.2
of it: manufacturing industry	12997794	96.9	16114363	99.6	15287699	99.9	117.6
including food, beverages and tobacco production	564307	4.3	551220	3.4	701148	4.5	124.2

*Source:* Own creation.

The data given in Table 1 show that the growth rate of the volume of shipped innovative products of the processing industry was 24.2% during the study period. One of the main factors influencing the processing industry's effective functioning and innovative development is foreign economic activity. Table 2 shows the dynamics of foreign trade in agricultural products and foodstuffs in Belarus.

**Table 2.** *Dynamics of foreign trade in agricultural products and foodstuffs, USD million*

Name	Years			Growth rate, %, 2019/2017
	2017	2018	2019	
Foreign trade in agricultural products and foodstuffs	9555.0	9704.5	10192.6	106.7
- export	4971.2	5280.1	5536.8	111.4
- import	4583.8	4424.4	4655.8	101.6
- balance	387.4	855.7	881.0	227.4

*Source:* Own creation.

The data in Table 2 shows that the growth rate of foreign trade in agricultural and food products in 2019 compared to 2017 was 6.7%, including an 11.4% increase in exports.

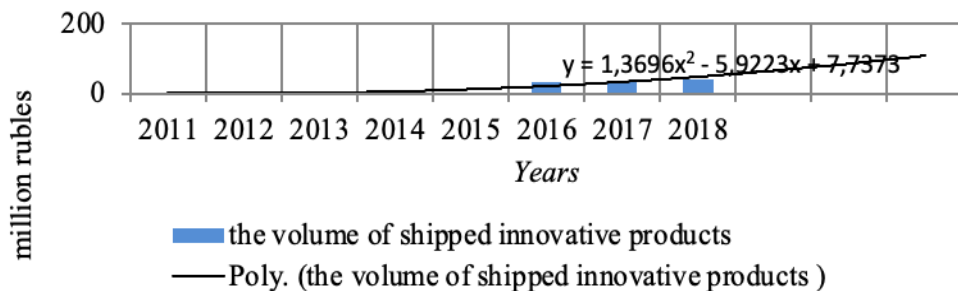
For the period under study, we will assess the impact of factors on the innovative development of the processing industry of the Mogilev region. The chosen indicator is the volume of shipped innovative products (Y); the factors influencing its change are: the cost of technological innovation ( $X_1$ ) and the number of organizations engaged in technological innovation ( $X_2$ ). We obtained a linear regression equation that reflects the relationship between the volume of innovative products shipped (Y), the cost of technological innovation ( $X_1$ ) and the number of organisations implementing technological innovation ( $X_2$ ), and it has the following form (Efimenko, 2017):

$$Y = 33,32 + 8,44X_1 - 7,64X_2 \quad (1)$$

The calculations indicate that the increase in expenditure on technological innovation by 1 million rubles on average leads to the growth of the volume of shipped innovative products of processing industry organizations of the Mogilev region by 8.44 million rubles. The multiple correlation coefficient is equal to  $R^2=0.81$ , which indicates a close relationship between the selected factor attributes and the volume of shipped innovative products. The coefficient of determination shows that 67% of the variation of the resulting indicator – the volume of shipped innovative products – is explained by the variation of the factor attributes included in the model.

We will calculate the forecasted value of the shipped innovative products by organizations of the processing industry of the Mogilev region in the medium term (Figure 1).

**Figure 1.** Forecast of the volume of shipped innovative products of organizations of the Mogilev region processing industry.



*Source:* Own creation.

With the help of the growth curve equation, we are forecasting the volume of innovative products shipped by organisations of the processing industry in the Mogilev region (Table 3).

**Table 3.** Forecast of the volume of innovative products shipped by organisations of the Mogilev region, million rubles.

Name of parameter	Forecast			Growth rate, %, 2021 by 2019
	2019	2020	2021	
Volume of innovative products shipped	65.3	85.4	107.46	164.5

*Source:* Own creation.

The calculations show steady growth in the volume of shipped innovative products of processing industry organizations of the Mogilev region in the medium term. The application of the developed approach allows obtaining a generalized assessment of the state and types of activity of processing organizations of agro-industrial complex, determining the trends, factors, and opportunities for further growth; to develop a forecast for the future; to form a strategy of priority directions in the development of innovative activity; to develop a system of indicators for monitoring and planning their innovative development.

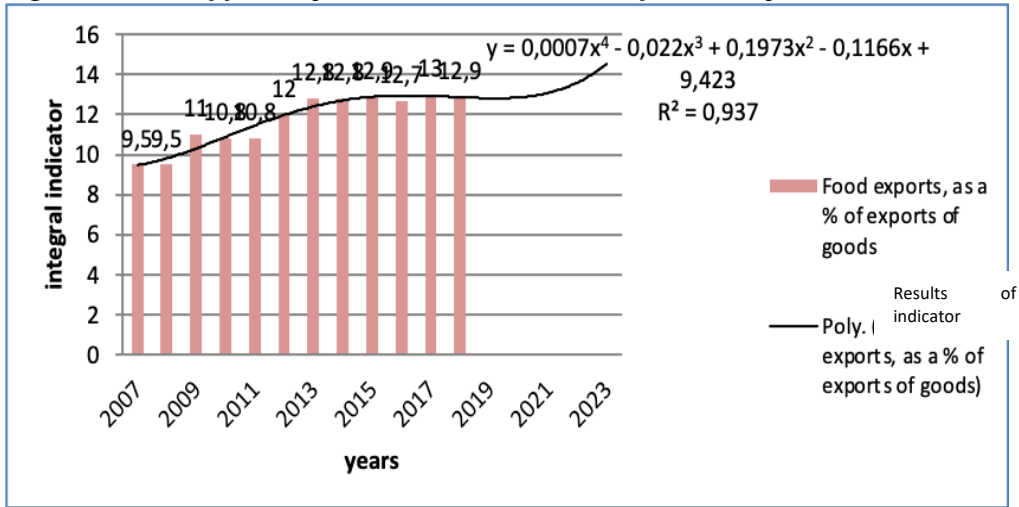
## **5. Innovative Development of the Economy of Poland**

At the present stage, the economy of Poland is a socially-oriented market economy. Per capita GDP growth at purchasing power parity has increased by 6% per year over the last 20 years, which is the most dynamic in Central Europe. At the same time, the GDP doubled in 2019 compared to 1990 (Mickiewicz, 2020).

Poland has the most significant agricultural sector among the EU states. Agriculture plays a vital role in the economy, although its structure, based on the historically established farming system, differs from other European countries. At this stage, agribusiness, crop and livestock production, and processing are developing dynamically in Poland (Global Food Security Index, 2020).

In current conditions, the Polish economy's essential innovative development factor is the intensification of foreign trade. The volume of goods and services exports in 2018 amounted to USD 325.3 billion, while imports amounted to USD 305.3 billion. In the structure of exports of goods and services, the most significant shares are engineering products (43%), food (13%), products of light as well as the pulp and paper industry (8%), and construction services (5%) (Mickiewicz, 2020). Every year, goods and services are becoming more competitive in the world and European markets. It should be noted that exports of food products (fruits and vegetables, meat and dairy products) tend to increase (in recent years, the growth rate has been 3.4%) (Figure 2).

**Figure 2.** Share of food exports in the total structure of Polish exports, %



Source: Own creation.

According to estimates, the share of foodstuffs export is forecast to reach 14.2% of the total export of goods and services by 2023 (Table 4).

**Table 4.** Forecast of the Polish food export

Name	Forecast value, %					Growth rate, %, 2023 / 2018
	2019	2020	2021	2022	2023	
Poland's food exports, as % of total exports of goods	12.9	13.3	13.7	14.0	14.2	110.1

Source: Own creation.

An essential advantage of the agrarian high-tech business is access to a diverse and competitive food market.

To increase the efficiency of food production, the EU is committed to stimulating research and innovation in the agricultural sector. Knowledge is becoming a decisive factor in increasing European agriculture's productivity and consolidating the EU's position on global food markets. Intensification of scientific and innovation activity, stimulation of innovations, and giving impulse to the innovative development of agricultural production are reflected in the EU strategy for development until 2020, which envisages sustainable growth using "smart technologies" that will provide EU countries with competitive advantages in the international market.



Overall, the Common Agricultural Policy and the food sector should be developed, using innovation and green technologies to produce organic products and high-quality food while maintaining global and regional markets.

## **6. Conclusion**

At its current stage, the Belarusian economy follows a socially-oriented model of economic development in which innovation is the underlying factor. Belarus has substantial scientific and technical potential and has gained significant achievements in various fields of science and technology.

A systematic approach to the mechanism of formation and development of innovation potential of food organizations provides a dynamic accounting of many different factors and their study in conjunction with external and internal trends in the development of innovative environment. One of the conditions for the effective functioning of food organizations is innovation activity – a type of activity associated with the transformation of ideas-innovations into a new product introduced into the market; improvement of the range of products and services; purchase of new or modernization of fixed assets and introduction of new technologies.

Innovation is defined as the use of innovations in the form of new technologies, types of products, and services and management activities to solve social issues and ensure profits.

Innovative development of food organizations is the improvement of the system of factors and conditions necessary to implement the innovation process. The external factors include supply and demand, level of competition, innovation climate, etc. Internal factors are internal resources (human resources, technology, innovation potential, financial condition) and factors that form a system of internal economic relations and interaction with external environment factors (a form of ownership, organizational structure, type of activity, size of the organization, etc.).

The carried out research testify that in current conditions, a priority direction of food sphere organizations development of various countries is an increase of manufacture volumes of innovative production and increase of efficiency of foreign trade in ready-made foodstuff.

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