

REPUBLIC OF AZERBAIJAN

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

PRIORITY DIRECTIONS OF MODERNIZATION OF FOOD PRODUCTION IN AZERBAIJAN

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GENERAL CHARACTERISTICS OF THE RESEARCH

The actuality and the degree of problem development of the research. Global challenges make it an objective necessity to implement specific structural changes in the national economy of each country. This trend is especially important for the economies of developing countries. Thus, the process of economic diversification in developing countries, especially in oil-dependent countries, is of great importance in terms of the country's economic security. It should be borne in mind that the emergence of threats to the country's economic security is formed by internal and external factors. Although import dependence acts as an important external risk factor, in fact, the formation of this process can also stem from internal disproportions. Thus, processes such as the failure to ensure sustainable development of the non-oil sector, especially in oil-dependent countries, lead to the emergence of economic and structural problems in that sector. The non-oil sector is a fairly broad-spectrum sector, and the food industry plays an important role in the structure of this sector.

The development of the food industry acts as an effective result of measures to ensure the satisfaction of the needs of the entire population for food products, and is of great importance in terms of creating favorable conditions for both eliminating import dependence and increasing the volume and variety of exports. Therefore, the development of the food industry, as an important component of the non-oil sector, is of great strategic importance in the national economy of each country. When implementing processes related to accelerating the development of the food industry, it is important to pay attention to the modernization of the mentioned area. This is due to the fact that the modernization of the food industry reflects precisely the departure from past traditional technologies. The necessity of modernizing the food industry includes precisely the reduction of costs per unit of product (or the cost of the product), increasing the volume of labor productivity, and also improving the competitiveness, including the quality, of the food products produced.

In this regard, in our Republic, which is experiencing its 34th year

of independence, a fairly large number of measures and state programs have been adopted in order to adequately respond to global challenges. These programs, in addition to playing a significant role in accelerating the socio-economic development of the regions, have also resulted in the creation of new food industry enterprises in the region, as well as the development of the infrastructure system. The “Azerbaijan 2030: National Priorities for Socio-Economic Development”, approved by the Decree of the President of the Republic of Azerbaijan dated February 2, 2021, states that – new “driving forces” must be found for sustainable economic growth, deep diversification of the national economy, and full realization of the export potential of goods and services. Although the oil sector is one of the pillars of socio-economic development, the non-oil economy should become the center of development.¹ As noted in the national priorities, accelerating the development of the non-oil sector will play a significant role in ensuring sustainable economic growth. In this regard, the modernization of the food industry should be the most important component of the process.

Within the framework of the State Programs for the modernization of food production, a number of goals of great importance for the modernization of the food industry have been identified in the “Socio-economic Development Strategy of the Republic of Azerbaijan for 2022-2026”, approved by the Order of the President of the Republic of Azerbaijan dated July 22, 2022. The aforementioned strategy states that “with the application of modern technologies in the agricultural sector, industry and service sectors, productivity will increase, and new jobs will be created. With the stimulating support of the state, sustainable integration of the sectors into the global value chain will be ensured. The state will actively participate in the creation of infrastructures supporting the development of the agricultural sector, industry and service sectors, various industrial parks and neighborhoods, tourism and recreation zones will be created, and the export of manufactured products and services to foreign markets will

¹ Azerbaijan 2030: National Priorities for Socio-Economic Development // Approved by the Decree of the President of the Republic of Azerbaijan dated February 2, 2021. – Baku, 2021.

be stimulated. As a result, the average annual growth rate in agriculture in 2022–2026 will be 4%. The average annual growth rate in the transport sector will exceed 5%. The country's income from transit shipments will increase by 2 times from 227 million manat in 2019 to 450 million manat. The non-oil industry will grow by an average of 8.3% annually. The share of industrial zones in the non-oil industry will be 15%, and the share in non-oil industry exports will be 25%.²

Modernization of food production should be assessed as a continuous network of measures aimed at ensuring the country's food security, improving the quality and safety of the produced product, and adapting it to the changing market and global environment. The necessity of modernizing food production is of great importance both in terms of ensuring the country's food security, increasing its competitiveness, implementing adaptation processes appropriate to changing conditions, and most importantly, applying the latest achievements of scientific and technical progress to food industry enterprises and increasing its efficiency.

The implementation of scientific research on the modernization of food production is important in terms of continuously responding to these challenges. Therefore, the aforementioned factors have made the dissertation research an objective necessity.

As for the degree of development of the topic, it should be noted that both theoretical-methodological and practical aspects related to the solution of the aforementioned problems have always been in the focus of attention of the country's economists, as well as various representatives of foreign countries. Among the scientists who have conducted research in this direction, Z.A. Samadzadeh, A.Kh. Nuriyev, E.A.Guliyev, B.Kh.Atashov, I.H.Ibrahimov, A.E.Guliyeva, A.B.Abbasov, V.A.Gasimli, V.J.Akhundov, T.H.Huseynov, V.H.Abbasov, E.A.Ibrahimov, A.F.Abbasov, F.V.Guliyev, E.B.Mammadova, S.I.Valiyeva, N.J.Gafarov, M.M.Huseynov and others can be mentioned. Among the economists of the CIS

² Socio-economic development strategy of the Republic of Azerbaijan for 2022-2026
// Approved by the Decree of the President of the Republic of Azerbaijan dated July 22, 2022. – Baku, 2022.

countries, E.V.Moisev, I.G.Frolov, S.U.Glazev, V.N.Flomev, and among the western economists, G.Emerson, I.Ansoff, D.McClelland and others have conducted in-depth research in this area. However, most of the research conducted has focused on one or another sub-sector of the food industry sector, and the modernization of food production has not been given sufficient attention in a comprehensive manner, taking into account the specifics of the Azerbaijani economy. The research conducted by us to eliminate this gap can be considered as part of new scientific challenges in terms of ensuring the country's food security.

Object and subject of the research. The object of the research is the food industry sector of the national economy of the Republic of Azerbaijan. The subject of the research is the economic and organizational relations, development trends and modernization mechanisms formed in the process of modernization of food production.

The purpose and aims of the study. The purpose of the study is to investigate the scientific and theoretical foundations of the modernization of food production, analyze the current state of the modernization of food production, and develop scientifically substantiated practically significant proposals for determining the main directions of the modernization of food production. To achieve this goal, the following tasks have been set:

- Investigation of the theoretical foundations of modernization, its characteristics and role in accelerating economic development;
- Identification of the essence, characteristics and factors affecting the modernization of food production;
- Study of international experience in the modernization of food production and the possibilities of its application in our country;
- Analysis of the current state of the modernization of the food industry;
- Determination of the role of the modernization of agricultural production in the development of the food industry in the Republic of Azerbaijan;
- Identification of directions for improving the mechanisms for the modernization of food production;

- Specification of directions for stimulating the application of innovations in the production of food products;
- determination of the role of stimulating green technologies in the modernization of food production.

Research methods. The methods of the research include economic, statistical analysis, systematic approach method, logic, generalization, comparative analysis method, etc.

Main provisions put forward for defense. The following apply to the main provisions put forward for defense:

- there is a need to determine the impact of economic modernization on reducing the growing socio-economic inequality in the global space;
- in the context of globalization, determining the impact of economic modernization on ensuring the economic security of the state is the need of the day;
- the justification of the impact of modernization of agricultural raw materials production on the modernization of food production should be kept in the spotlight;
- there is a need to justify the role of modernization of agricultural and food production in the regions in eliminating the harmful effects of urbanization;
- the role of modernization of food production in improving the country's food supply and ensuring food security should be brought to the fore;
- it is important to determine the prospects for using green technologies in the modernization of food production;
- There is a need to identify priority areas of innovative technologies and their prospects in the modernization of food production.

Scientific novelty of the research. The scientific novelty of the research consists of the following:

- The role of technological modernization in increasing the competitiveness of the food industry has been determined;
- The existing problems in our country related to the modernization of food production and ways to solve them have been identified;

- Factors affecting the modernization of food production in the regions have been identified;
- The specific features of the modernization of food production have been identified and the possibilities of the impact of these features on the economic efficiency of production have been specified;
- The role of the modernization of food production in reducing import dependence has been substantiated;
- The priorities of the modernization of food production have been determined to ensure the efficient use of the food market by the population and accessibility to the food market.

Theoretical and practical significance of the research. The theoretical significance of the research consists in summarizing different scientific and theoretical approaches to the modernization of food production and preparing a theoretical basis for determining the relevant priority directions, taking into account the natural and specialization characteristics of the Republic of Azerbaijan. At the same time, innovative directions of modernization of food production were identified and the impact of these directions on increasing the competitiveness of food production was determined.

The practical significance of the research is to put forward proposals for the successful implementation of modernization in the food industry sector of the Republic of Azerbaijan, to develop practical approaches to the application of mechanisms for the modernization of food production. These results can be used in the development and implementation of specific programs for the modernization of food production, and in the training of qualified personnel in economic universities.

Approval and application: The main theoretical provisions, practical results and recommendations of the dissertation were reported at international and republican level conferences, a total of 8 articles and 4 theses (2 articles and 1 thesis abroad) on the topic were published. Thus, the main provisions of the research were reflected in the theses “Some issues of stimulating the production of food products” (Baku, 2023), “Ecological and economic problems of food production” (Baku, 2024), “Priority directions for ensuring sustainable

development of the food industry in modern conditions” (Baku, 2024), “The Role of Global Trends in Stimulating Food Production” (Gomel, 2024). Among the published scientific works, the following articles can be cited: “Stimulation of the application of green technologies in the production of food products” (Baku, 2024), “The role of global challenges in the process of food production” (Baku, 2024), “Economic Problems of Stimulating Food Producers” (Baku, 2024), “The Role of Global Trends in Stimulating Food Production” (Galati, 2024), “Assessment of the Modernization of the Food Industry in the Context of Globalization from the Perspective of Food Security” (Baku, 2025), “Modernization of food production and issues of economic diversification” (Baku, 2025), “Global Experience in the Modernization of Food Production” (Moscow, 2025), “The role of foreign investments in the modernization of the food industry” (Baku, 2026).

Name of the organization where the dissertation work was carried out. Azerbaijan Cooperative University.

The total volume of the dissertation in characters, indicating the volume of the structural sections of the dissertation separately. The dissertation consists of an introduction, 3 chapters, a conclusion and a list of references. The introduction is 12704 characters, the first chapter is 85561 characters, the second chapter is 48732 characters, the third chapter is 65997 characters, the conclusion is 7632 characters and the list of references is 14624 characters. The total text part of the dissertation is 220626 characters, excluding tables, figures and a list of references.

MAIN CONTENT OF THE WORK

The Introduction of the **dissertation work** substantiates the relevance of the topic, reflects the level of development, provides the object and subject of the research, goals and objectives, methods, main provisions and scientific innovations.

In Chapter I of the dissertation work, entitled “**Scientific and theoretical issues of modernization of food production**”, the

essence of modernization, its characteristics and role in accelerating economic development, the essence of modernization of food production, its characteristics and factors affecting it, international experience in the modernization of food production and the possibilities of its application in our country are studied.

This chapter notes that modernization is a process of renewal and improvement that reflects the adaptation of all spheres of society to changing realities, modern requirements and standards. Renewal of production, technologies, the system as a whole, in essence, reflects the improvement of the quality of the produced product and the service provided, the use of modern technologies in the production of products and the provision of services. From this point of view, modernization can be characterized not as a result, but rather as a process aimed at increasing economic and social efficiency. The transition from old technologies to new technologies, in addition to primarily leading to increased productivity, also creates favorable conditions for increasing the quality of the product and increasing its competitiveness. It would not be correct to evaluate the modernization process only from an economic aspect. The modernization process has retained its relevance from a philosophical, social, and natural science point of view.

There are quite a few types and forms of modernization. According to the results of the study, in order to increase the efficiency of the modernization process, there is a need for parallel application of all types of modernization. In cases where this need is met efficiently and optimally, it is possible to achieve acceleration of socio-economic development in society.

The important strategic importance of the food industry is also related to ensuring the country's food security. Approaching the problem from the perspective of the country's food security, it can be considered that the food industry, as an important component of the food complex, plays an important role in meeting the demand for food products. In this regard, the creation of strategic reserves of food products and the formation of state food funds directly depend on ensuring the sustainable development of the food industry, as well as the successful formation of integration relations between agriculture

and the processing industry.

Modernization of the food industry means the restructuring of the food industry, its adaptation to changing conditions, the abandonment of the use of outdated technologies in the food industry, and the implementation of new technologies. The main goal of the modernization of the food industry is to achieve increased economic efficiency, ensure a decrease in the cost of production, and also increase the competitiveness of the food industry. In this regard, the objective necessity of food production modernization can be classified as follows:

- Food production modernization is important because currently, especially in the countries of the former Soviet Union, the market share and competitive position of foreign food producers in the country's food market is high;

- Food production modernization is closely related to ensuring the country's food security and limiting the outflow of foreign currency from the country due to a decrease in imports from abroad;

- Food production modernization is, first of all, one of the most important means of replacing old technologies. Old technologies do not allow for economically efficient production, and product production is more expensive due to production costs;

- One of the factors determining the objective necessity of food production modernization is the need to reduce the energy intensity of food production. If food production is not modernized, high-energy-intensive production will be carried out, which will lead to a disruption of the ecological balance and environmental pollution. Food production modernization primarily emphasizes the use of green technologies;

- Modernization of food production involves reducing the specific weight of fixed and variable costs incurred in product production. This calls for the restructuring of production and the installation of new technological flow lines;

- As a result of the modernization of food production, it is possible to transform agricultural raw materials into finished products in a short period of time, which can lead to positive changes in the country's balance of payments. Naturally, exporting agricultural products to the

world market as raw materials is more disadvantageous than exporting them in the form of finished food products;

– Modernization of food production can create favorable conditions for accelerating socio-economic development, especially in the regions. As is known, in the case of our Republic, agriculture, which constitutes the material basis of the food industry, is scattered in almost all regions of the country. In this regard, the modernization of the food industry in the regions, the creation of new processing enterprises, the restructuring of former processing enterprises, can also create favorable conditions for ensuring employment of the population and preventing the urbanization process.

The specific aspects of food production modernization are primarily related to the efficiency of product production. The efficiency of food production modernization is mainly assessed in economic, social, environmental and institutional aspects. In this regard, the efficiency of food production modernization is reflected in Figure 1:

As can be seen from the figure, it is considered appropriate to assess the efficiency of food production modernization in four aspects - economic, social, environmental and institutional aspects. In the efficiency of food production modernization, economic factors come to the fore first of all. Thus, modernization appears as an objective necessity precisely to increase economic efficiency. In this case, reducing product cost, saving energy costs, increasing labor productivity and other such factors are one of the characteristic aspects of economic efficiency. For economic efficiency, as well as for institutional efficiency, one of the issues of mutual interest from a mutual aspect is related to increasing the competitiveness and competitiveness of produced food products.

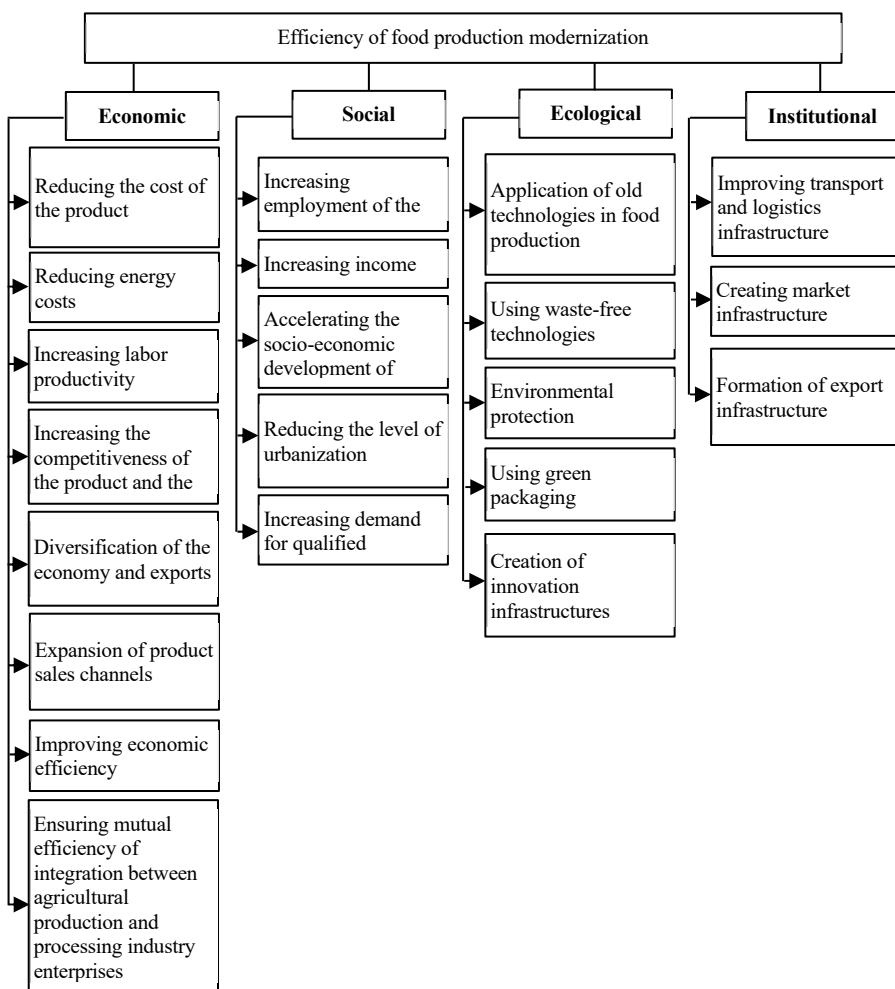


Figure 1. Efficiency of food production modernization

Source: compiled by the author.

As the process of globalization deepens, a large number of factors affect the modeling of food production. These factors play an important role in the modeling of food production, and also affect the competitiveness of production. In this regard, it is possible to distinguish the factors influencing the modeling of food production in figure 2:

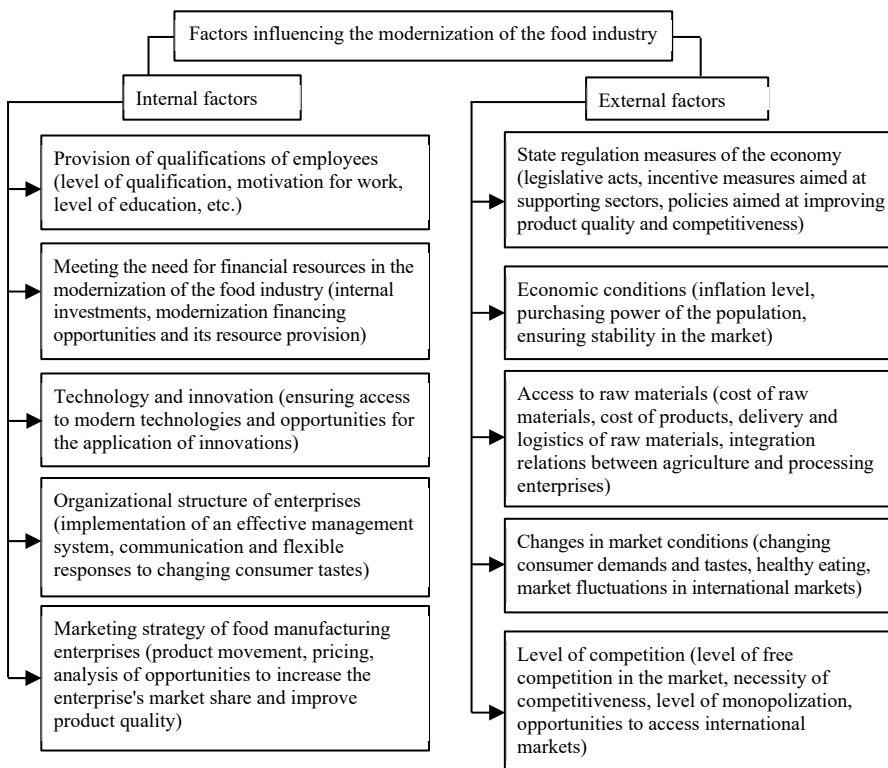


Figure 2. Factors influencing the modernization of the food industry
Source: compiled by the author.

As can be seen from the figure, both the specific features of the modernization of food production and the factors affecting the modernization process play an important role in increasing the economic efficiency of the product and increasing the competitiveness of the product.

In the USA, a significant part of the food industry sector is made up of large clusters, and these clusters receive a significant part of the funds allocated from the state budget in the USA. The analysis shows that this trend is manifested not only in the USA, but also in the experience of countries that have chosen the Anglo-Saxon model. Thus, countries such as the USA, Great Britain, Canada, Australia and

New Zealand are Anglo-Saxon model countries, and the specific features of the model listed above are also applied here. The processes related to the provision of assistance to food producers in the USA are quite extensive and multifaceted.

Chapter II of the dissertation is entitled **“Current Status and Development Trends of Food Industry Modernization in Azerbaijan”**. This chapter analyzes the current status of food industry modernization, the role of modernization of agricultural production in the development of the food industry in the Republic of Azerbaijan. This chapter notes that the production of food products in Azerbaijan, increasing the production of the sector and the modernization of enterprises operating in this field play an important role in the development of the non-oil sector. Taking all this into account, the state is implementing a series of measures to modernize the food industry. These measures are mainly implemented through legal and legislative acts of the state, including state programs and strategic roadmaps. Thus, the “Strategic Roadmap for the National Economic Perspective of the Republic of Azerbaijan”, approved by the decree of the President of the Republic of Azerbaijan dated December 6, 2016, states that *after 2025, more than three quarters of the total added value in Azerbaijan’s diversified and sustainable economy will be created in the non-oil sector. In the coming years, competitive labor costs will play a short-term catalyst role for the Azerbaijani economy. Additional investments in the non-oil sector will be an important driving force of a more competitive economy by 2025 and beyond. For this reason, it is planned to attract foreign direct investment in the industrial and service sectors on a larger scale in the future. In the period after 2025, exports will diversify and grow further due to an increase in the range of not only goods, but also services. Basing exports on an increasing number of products and services will reduce dependence on changes in oil and gas prices and stabilize foreign exchange earnings.*³

Regarding the stock of finished products in the warehouses of

³ Strategic Roadmap for the National Economic Perspective of the Republic of Azerbaijan // Approved by the Decree of the President of the Republic of Azerbaijan dated December 6, 2016. – Baku, 2016. – 112 p.

manufacturing enterprises, it should be noted that compared to 2020, the stock of industrial enterprises in 2021–2024 amounted to 819.3 million manat, which is 31.9% more than in 2020. The volume of stock in the processing industry increased by 34.2% to 71.9 million manat in the comparable period, the volume of product stock in the warehouses of food production enterprises increased by 79.4% to 96.7 million manat, and the volume of stock in beverage production enterprises increased by 18.3% to 36.2 million manat in the comparable period.

The specific weight of food product warehouse stocks in the volume of produced products was 1.3% in 2020, 2.1% in 2021, 3.3% in 2023, and 2.1% in 2024. As for the specific weight of warehouse stocks in the production of finished products in beverage production enterprises, this indicator was 7.2% in 2020, 0.2% in 2021, 5.6% in 2022, 4.3% in 2023, and 4.5% in 2024.

Generally speaking, the larger the volume of warehouse stocks, the less competitive the product. Whether in the food industry or in the beverage industry, the fact that warehouse stocks are within the range of approximately 5% of the total value of the product produced means that the product produced can be considered of good quality at least for the local market and its competitiveness is considered normal. For example, if we compare this indicator alone - that is, the specific weight of warehouse stocks in the food industry sector in the production of finished products with the specific weight of warehouse stocks in the textile industry, we will see that in 2024 this indicator was 26.7%. From this comparison it is clear that the competitiveness indicator in food production enterprises in our country is significantly higher than in the textile industry.

Food modernization is carried out at the expense of large investments. One of the main points in investing in food production enterprises is the attraction of advanced technologies. These technologies lead to both a reduction in the cost of the product and an increase in the quality of the product. One of the main arguments for the modernization of food production is the grouping of operating enterprises by size. As is known, by the decision of the country's government, industrial enterprises are grouped into micro, small,

medium and large economic entities according to their size. The grouping of food industry enterprises operating in the country in 2023–2024 according to their size is reflected in Table 1:

Table 1.

Grouping of food industry enterprises by size in the Republic of Azerbaijan

Indicators	2023			2024		
	Micro	Small	Medium and large	Micro	Small	Medium and large
All industries	2754	1017	920	3296	1086	973
Processing industry	2317	825	518	2780	914	565
Food production	382	138	121	436	143	135
Beverage production	98	51	33	128	48	33

Source: State Statistical Committee of the Republic of Azerbaijan, Industry of Azerbaijan, Statistical Bulletin, Baku, 2025. 293 pp., p. 33

As can be seen from the table, a significant part of the industrial enterprises operating in our country are micro and small enterprises. However, the number of medium and large enterprises has not increased so rapidly. The aforementioned trend also applies to the processing industry, as well as the food industry.

Compared to 2023, in 2024, the number of micro enterprises in the entire industrial sector increased by 542 units, while the number of medium and large enterprises increased by 53 units. As for the number of small enterprises, it increased by 69 units compared to the previous year. It turns out that the highest growth in the industrial sector belongs to micro enterprises. This process has its own characteristics. Even if we call it harmful, this shows that micro enterprises are enterprises where the poor and middle class will operate, but another trend is that the number of employees in micro enterprises is quite limited. For example, in the food production sector, the number of small enterprises increased by 54 units compared to last year, while the number of medium-sized enterprises increased by 5 units, the number of micro enterprises by 5 units, and the number of medium and large enterprises by 14 units. In this area,

a faster increase in the number of micro enterprises is also observed. As for beverage production, a similar trend is observed in beverage production. For example, compared to last year, the number of enterprises operating in beverage production increased by 30 units, the number of micro enterprises decreased by 3 units, and the number of medium and large enterprises did not change. In general, if we approach the process from the aspect of modernization, it should be noted that large enterprises are more able to supply the food market with food products and have a high specific weight in exports. Small and micro enterprises are more able to meet the domestic market and family needs in one way or another, operate in local areas, that is, meet regional needs. Thus, as we noted above, investments in food production not only play an important role in stimulating food production, but also lead to the formation of added value in the food industry. In this regard, information on investments in the food industry in 2020-2024 is reflected in Table 2.

As can be seen from Table 2, the volume of investments in the industrial sector of Azerbaijan decreased by 14% in 2024 compared to 2020, amounting to 7863.5 million manat. The volume of investments in the industrial sector of the economy decreased by 26%, to 2846.0 million manat, and domestic investments decreased by 3.9%, to 5017.8 million manat. The volume of investments in the mining industry, which currently constitutes an important component of the industrial sector, decreased by 12.6% during the comparable period, to 4911.7 million manat, and the volume of foreign investments in particular decreased by 23.1%, to 2833.9 million manat. An increase was observed in domestic investments in the mining industry (7.7%). As is known, the most important investment area of the mining industry is considered to be the crude oil and natural gas production sector. The volume of total investments in the mentioned sector decreased by 15.3% to 4678.4 million manats in the comparable period, including the volume of foreign investments decreased by 23.5% to 2820.4 million manats. The volume of domestic investments in the oil and natural gas sector increased (12%) in the comparable period.

Table 2.

Investments in fixed capital in industrial sectors (in actual prices), in million manats

Indicators	2020	2021	2022	2023	2024	In 2024 compared to 2020, in %
All industries	9065,3	7507,3	7172,1	8405,7	7863,5	86
Foreign investments	3845,6	3169,1	2891,3	3275,9	2846,0	74
Domestic investments	5219,7	4338,2	4280,8	5129,8	5017,5	96
Mining industry	5613,8	4817,1	4983,8	6135,5	4911,7	87
Foreign investments	3784,6	3085,0	2833,6	3275,9	2833,9	74
Domestic investments	1929,2	1732,1	2150,2	2859,6	2077,8	107
Crude oil and natural gas production	5522,1	4727,4	4518,2	5635,9	4878,4	88
Foreign investments	3684,6	3081,5	2827,3	3261,1	2820,4	76
Domestic investments	1837,5	1645,9	1690,9	2374,8	2058,0	112
Manufacturing industry	2610,5	2018,0	1202,2	9116,8	1409,4	53
Foreign investments	19,9	13,0	52,9	-	2,1	10
Domestic investments	2590,6	2005,0	1149,3	9116,8	1427,3	55
Food production	225,1	197,8	206,5	132,2	118,4	52
Foreign investments	18,8	-	-	-	-	-
Domestic investments	206,3	197,8	206,5	132,2	118,4	57
Domestic production	39,4	39,1	45,4	16,7	49,4	125
Foreign investments	-	-	3,7	-	-	-
Domestic investments	39,4	39,1	41,7	16,7	49,4	125

Source: State Statistical Committee of the Republic of Azerbaijan, Industry of Azerbaijan, Statistical Bulletin, Baku, 2025, 293 pages, p. 114, compiled by the author.

It should be noted that, especially after the Covid-19 pandemic, an increase in the volume of the agricultural technologies and innovations market has been observed in the global market. The dynamics of the

agricultural technologies and innovations market in the global space in 2019-2024 are reflected in table 3.

Table 3.

Dynamics of the market of technologies and innovations in global agriculture in the Republic of Azerbaijan in 2019-2024

Year	Global market (\$ billion)	USA	China	India	Europe (general)	Latin America
2019	33.5	15.2	6.3	2.1	7.8	2.1
2020	38.2	17.6	7.1	2.8	8.3	2.4
2021	42.7	19.3	7.9	3.2	9.0	3.3
2022	45.1	20.5	8.6	3.9	9.5	2.6
2023	47.3	21.2	9.1	4.3	10.2	2.5
2024	49.6	22.4	9.8	4.9	10.8	2.8
In 2024, compared to 2019, times	1,5	1,5	1,5	2,3	1,4	1,3

Source: AgFunder Global AgriFoodTech Market Report (2024), FAO Agricultural Innovation Outlook (2024), OECD AgriTech Review (2023), World Bank AgriTech Indicators (2024).

As can be seen from Table 3, the global agricultural technologies and innovations market in 2024 was worth \$49.6 billion, which is 1.5 times more than in 2019. In the United States, it increased by 1.5 times to \$22.4 billion, in China by 1.5 times to \$9.8 billion, in India by 2.3 times to \$4.9 billion, in Europe by 1.4 times to \$10.8 billion, and in Latin America by 1.3 times to \$2.8 billion. The research shows that there were unique impacts on the global agricultural technologies and innovations market. These impacts were primarily due to the fact that the COVID-19 trend that occurred in the world in 2019 caused a rapid transition to a smart and automated system. These processes have subsequently, that is, since 2020, conditioned the transfer from operational burden to technology in the mentioned areas.

Chapter III of the dissertation is called “Priorities of modernization of food production in Azerbaijan”. This chapter determines the

directions of improving the mechanisms of modernization of food production, the directions of stimulating the application of innovations in food production, and the role of stimulating green technologies in the modernization of food production. This chapter notes that the measures implemented by the state in the modernization of food production reflect the following interrelated types of diversity:

- measures aimed at improving the structure of industrial production. In this case, depending on the climatic conditions of the country and the direction of specialization, individual areas can be brought to the fore. In this regard, the development of different sub-areas of food production areas can also be envisaged;
- measures aimed at achieving technological modernization of food industry enterprises that are lagging behind in development;
- measures and financial support for the financial recovery of processing industry enterprises operating in the direction of ensuring local food production on the market and focused on the domestic market;
- assistance in the education abroad of specialists who are able to work with modern technologies in modernized food industry enterprises⁴.

It should be noted that in our country, appropriate state support measures are also being implemented for producers. However, agricultural commodity producers are more prominent in the state support measures implemented in our republic. The process of state support for agricultural commodity producers began in 2011 and has yielded positive results for that period and in the subsequent period.

Improving the economic mechanisms of food production modernization primarily reflects the optimization of the production network at all stages of the value chain, from raw material production to finished products, and a set of measures aimed at stimulating innovations and investments in this area. In the system of measures implemented to improve the modernization of food production, the following priorities are particularly highlighted:

⁴ Abdikeev, N.M., Bogachev, Yu.S., Moreva, E.L. Directions for state regulation of industrial development. // Analysis. Audit. 2018. Vol. 5, No. 4. – pp. 14-29.

- Providing financial support to enterprises engaged in food production;
- Applying tax incentives to economic entities of commodity producers operating in food production;
- Implementing necessary measures to develop infrastructure in enterprises operating in food production;
- Providing state support to food producers (the aforementioned measures can be implemented in the form of subsidies, as well as within the framework of targeted state programs and planning.)

External factors that necessitate the modernization of food production and the improvement of its economic mechanism are primarily related to the volume of products imported into the country. The high specific weight of the volume of food products imported into the country in total imports, or rather its annual increase, ultimately poses threats to the country's economic and food security. In addition, food inflation also causes the emergence of the problem. At this time, an increase in the volume of expenditures on food products is observed in consumer income. The current state of the factors that necessitate the improvement of the economic mechanism of food production - economic indicators - in 2019–2024 is reflected in Table 4.

As can be seen from the table, an increase in the share of the food industry in GDP was observed in 2019–2024. Thus, if in 2019 the share of the food industry in GDP was 5.1%, in 2024 this indicator was equal to 10.4%. In the comparable period, the export of food products increased by 28%, and the import of food products by 26%. In the comparable period, the volume of food production increased by 39%, which led to an increase in the specific weight of food production in GDP in one way or another. The occurrence of food inflation in 2019-2024, especially its higher inflation against the background of general inflation, led to problems in the accessibility of food products for the population. In fact, food inflation is associated with an increase in food prices. If in 2019 the level of food inflation in the country was 4.3%, the highest indicator in this area was recorded in 2022, which was equal to 12.4 percent. In 2024, overall food inflation across the country was 9.2%.

Table 4.

**Dynamics of indicators that determine the need for
modernization of the food industry and improvement of its
economic mechanism in the Republic of Azerbaijan in 2019–2024**

Year	Share of food industry in GDP (%)	Production volume (thousand manats)	Food exports (US\$ million)	Food imports (US\$ million) 1,120	Food inflation (%)	Food processing level	Share of food exports in GDP (%)	Share of food imports in GDP (%)	Share of food and food products in total exports (%)	Share of food and food products in total imports (%)
2019	5.1	3 480	795	1 120	4.3	45	0.9	1.3	8.5	11.4
2020	5.3	3 550	760	1 180	10.4	46	0.8	1.4	8.2	11.7
2021	5.6	3 880	850	1 250	8.6	48	0.9	1.5	8.3	11.9
2022	6.0	4 210	910	1 310	13.9	49	1.0	1.6	8.7	12.2
2023	6.2	4 560	970	1 380	12.4	51	1.1	1.6	8.9	12.4
2024	6.4	4 850	1 020	1 420	9.2	53	1.1	1.5	8.8	12.3

Source: SSC 2019 FAO, SSC 2020 Ministry of Economy, SSC 2021 AKIA, SSC 2022 FAO; World Bank SSC 2023 Ministry of Economy, SSC 2024 (forecast) FAO 2024

If in 2019 the share of exported food products in GDP was 1.1%, in 2024 this indicator was equal to 1.5%. In 2024, the share of food product exports in total exports was 8.8%, and the share of food product imports in total imports was 12.3%. All this shows that the increase in the volume of food product imports and this increase having a larger share in total exports ultimately creates the dependence of the production sector on imports.

There is also a need to regulate investment processes. In order to increase the role of investments in the economic mechanism of regulating food production and also improve the investment mechanism, in our opinion, it would be more appropriate to implement the following measures:

- Implementation of stimulating measures to attract foreign investments in the modernization of food production;

- In connection with the attraction of foreign investments in the modernization of food production, in particular, exemption from taxes and customs duties for new technologies to be introduced;
- Supporting the process of establishing free economic zones in the liberated territories in order to increase the role of investments in the modernization of food production;
- Applying concessions for a certain period of time to foreign investors implementing innovative technologies in the modernization of food production (At this time, special importance should be given to the implementation of measures related to the development of tourism in Turkey, especially in the Antalya and Alanya regions, in order to support the development of tourism).

Although the innovation of food production constitutes an important component of attracting innovations to the national economy as a whole, the specific features of the innovation of food production should also be taken into account in terms of the specific characteristics of the food industry. In this regard, economists believe that it is possible to distinguish 4 main types of innovation in food production. These include the following:

- application of product innovations;
- application of technological innovations in food industry enterprises;
- marketing innovations, which involve conducting marketing research and updating marketing activities in food industry enterprises;
- application of organizational institutional innovations in food industry enterprises⁵

Considering that food production and the food industry as a whole are one of the dominant sectors of the national economy, the following can be attributed to the priority areas of food production from an innovative point of view:

- Production of dietary foods (production of therapeutic food products from grain varieties, adequate responses to new trends in the

⁵ Zhekova, O.A. *Characteristics of the innovation process in food production sectors* // *Food Industry*, 2005, No. 12, pp. 26–27.

modern era and adherence to proper nutrition for a healthy lifestyle);

- Innovation in the collection and processing of natural products (mushrooms, fruits, medicinal plants), formation of supply centers for these products, etc.;

- Directing innovative processes in the field of fruit and berry canning (jams, preserves, compotes, marinades, etc.) to improving product quality and reducing the cost of the finished product;

- Production of frozen products. As is known, vegetable products in particular cannot be sold at high prices in seasonal situations and in some cases have recently been destroyed due to the lack of buyers in the summer months. All this makes the areas related to freezing, canning and subsequent marketing of products even more priority. As a result of all this, the introduction of local frozen products into the domestic market may lead to a restriction of vegetable mixtures imported from abroad;

- The use of innovative tools in the process of agricultural diversification. This can play a significant role in meeting the demand for essential oils in particular. It should be borne in mind that our Republic imports almost all essential oils. In this regard, the expansion of the raw material base for the production of oilseeds and the processing of these raw materials using advanced technologies may be of great importance;

- The use of innovative tools in the field of fishing. It should be borne in mind that as a result of the collapse of the USSR, a number of fishing enterprises operating in our Republic, both in the capital Baku and in the Neftchala district, were almost destroyed. The restoration of these areas and the application of advanced technologies in these enterprises may ultimately have a positive impact on the development of fishing enterprises, which will create favorable conditions for increasing the production of fish products in our republic and directing them to domestic and foreign markets. In our opinion, attracting foreign investors to this field can also be an important tool in achieving positive results.

CONCLUSION

The following conclusions can be drawn from the dissertation work on the topic **"Priority directions of modernization of food production"**:

1. The formation of a competitive economy in the global environment directly depends, first of all, on increasing the number of modernized enterprises, as well as on the continuous modernization and technological reconstruction of sectoral and territorial segments of the economy. The deepening of socio-economic inequality in the global competitive environment is now considered one of the most important problems brought about by globalization. Effective elimination of these problems makes the continuous improvement of the structure of the national economy and the implementation of structural reforms in this area an objective necessity. Such a tendency is increasingly becoming an objective reality that the modern economy constitutes one of the fundamental principles of the economic security of the state.

2. Modernization, especially its economic and technological elements, is not a goal, but one of the most important means used to achieve the goal. In this regard, the modernization of sectoral and territorial segments of the economy has an important place and role in the diversification of the economy. Diversification of the economy then brings its positive results may allow the economy to embrace socio-economic processes with higher productivity against the background of abandoning traditional technologies.

3. The deepening of the globalization process has characterized the acquisition of new forms and functions in addition to traditional forms of modernization. In this regard, ensuring rapid economic development, reducing poverty, and meeting environmental requirements are also directly related to globalization. In this regard, it is expected that the transition from traditional non-renewable energy resources to renewable energy resources, including green energy resources, will be of great importance in the modernization of the economy in our Republic.

4. Increasing the efficiency of modernization of the economy

primarily depends on achieving the complex fulfillment of its socio-economic and institutional functions. Since the economic functions of modernization are primarily closely related to saving costs, efficient allocation of resources, and increasing labor productivity, these functions play an important role in eliminating dependence on market conditions in the sectoral and territorial sectors of the economy, and also create favorable conditions for increasing the competitiveness of the manufactured product. creates.

5. In modern conditions, food production is one of the segments that is under the control of TNCs in the global space and plays an important role directly in the world market. It should be borne in mind that food production also plays an important role in meeting the daily needs of the population and constitutes the main supply segment of the food market. Increasing the economic efficiency of food production and increasing its competitiveness reflects the transfer from traditional technologies to modern technologies in food production. In this regard, the implementation of measures to modernize food production is of particular strategic importance in developing countries, including countries specializing in oil production and export.

6. Acceleration of food production, directly related to the modernization of food production, can allow increasing the role of local production in meeting the population's demand for food products. In this regard, it should be noted that the majority of food enterprises operating in our republic are small and medium-sized enterprises. This plays a certain role in meeting the demand for food products by focusing on local markets. It is no coincidence that in terms of ensuring food security, dependence on import channels still remains in meeting the demand for food products. The main reason for the emergence of this process is the insufficient modernization of food production enterprises and their low number in the regions.

7. One of the most important directions in the field of modernization of food production is, first of all, the creation of large commodity farms. Under such conditions, local food producers are able to meet both the demand of the domestic market and ensure the export of products to foreign markets.

8. One of the most important problems of modernization of food

production is the low level of integration and locality of enterprises operating in food production. Thus, studies show that approximately 40% of enterprises engaged in food production conclude direct contracts with local producers. There are a number of reasons for the emergence of this process. These reasons include, first of all, the fact that the majority of agricultural producers operating in our country are small-scale farms. Small-scale farms serve more to meet family needs and local needs.

9. Improving the economic mechanism of food production modernization primarily involves increasing the provision of loans to food producers on preferential terms and applying tax breaks to them. Modernization of food production is closely related to ensuring access to economic resources. From this point of view, it can be considered that providing loans to enterprises engaged in food production on preferential terms and ensuring public-private sector cooperation is of great strategic importance.

10. One of the most important priority areas in the modernization of food production is improving the taxation mechanism. In other words, tax exemptions for economic entities that have invested in the modernization of food production over a certain period of time and the provision of tax holidays to them can also be of great importance in terms of the return of investments spent on modernization.

11. Investment projects are of great importance in the modernization of food production. The analysis shows that over the past 5 years, the process of directing foreign investments to enterprises operating in food production has been limited. This leads to problems in providing food production with modern technologies. All this, in turn, limits the possibilities of producing competitive food products.

The main content of the dissertation work is reflected in the following scientific works:

1. Some issues of stimulating the production of food products // – Baku: Republican scientific conference on “Modern problems and prospects of economic management”, November 23-24, 2023. – pp. 196-199.

2. Ecological and economic problems of food production // – Baku: Republican scientific and practical conference on “The role of the National Leader Heydar Aliyev in improving the environment in Azerbaijan”, May 15, 2024. – pp. 100-103.
3. Stimulation of the application of green technologies in the production of food products // – Baku: Scientific and practical journal “Economics of Agriculture”, 2024, No. 2 (46). – pp. 19-26.
4. The role of global challenges in the process of food production // – Baku: Scientific journal “Economic Growth and Social Welfare”, 2024, No. 2. – pp. 101-108.
5. The Role of Global Trends in Stimulating Food Production // – Galati: Acta Universitatis Danubius. Economica Journal, 2024, No. 3 (20). – pp. 7-14.
6. Economic Problems of Stimulating Food Producers // – Baku: “Geostrategy” International Socio-Political, Scientific-Theoretical Journal, 2024, No. 4 (82). – pp. 151-155.
7. Assessment of the Modernization of the Food Industry in the Context of Globalization from the Perspective of Food Security // – Baku: “Construction Economics and Management” Scientific-Practical Journal, 2025, No. 02. – pp. 228-235.
8. Modernization of food production and issues of economic diversification // – Baku: Scientific and practical journal “Cooperation”, 2025, No. 3 (78). – pp. 122-129.
9. Global Experience in the Modernization of Food Production // – Moscow: “Economics and Entrepreneurship”, 2025, No. 4 (177). – pp. 302–303.
10. Priority directions for ensuring sustainable development of the food industry in modern conditions // – Baku: International scientific and practical conference “New generation economy: challenges and prospects”, October 4, 2024. – pp. 501-507.
11. The Role of Logistics Innovations in Stimulating Food Producers // – “Efficiency of the Goods Circulation Sector and Labor”: Collection of Scientific Articles from the 10th Pisarenkov Readings (Dedicated to the University’s 60th Anniversary), October 31–November 1, 2024. – pp. 110–114.

12. The role of foreign investments in the modernization of the food industry // – Baku: “Statistics News” scientific and practical journal, – 2026, No. 1. – pp. 44-50.

A handwritten signature in blue ink, appearing to be 'P. N.' or similar, located in the upper right quadrant of the page.

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