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MODERNIZATIONAL IMPERATIVE OF THE DEVELOPMENT OF THE FOOD COMPLEX OF UKRAINE

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Abstract: *The article focuses on the principles of efficient utilization of the Ukrainian food complex modernizational potential in the context of ensuring food security in the country and supporting economic growth in order to improve wellbeing of the people. Presented is the organizational-economic mechanism for modernizational development of the food complex with determination of key blocks to support innovative processes in the food complex.*

Based on analysis of statistical data and recent developmental trends in the food complex and economy in general suggested are key principles and main directions for improvement of the situation with food production and efficient utilization of existing potential in the sector. Innovation-investment and knowledge generation efforts are stressed as key in obtaining and sustaining economic growth throughout the food complex and entire economy.

Key words: *modernization, innovation, food complex, agriculture, food safety, social-economic development, transformations, modernizational potential.*

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In the context of transformational changes in the Ukrainian economy, the social, economic and political significance of the regional territorial-production systems is constantly growing as relates to the efforts aimed at resolving the most pressing social-economic problems which require more active economic activities focused on sustainable economic growth. Among such comprehensive systems in the country the leading role is taken by the agro-industrial complex which importance derives from the fact that it concentrates one-third of production facilities, one quarter of economically active population, and produces close to 20% of the gross national product while generating up to 70% of the retail trade. In the heart of the agro-industrial complex of Ukraine lies the food complex as an integral complex regional system which structurally comprises agricultural production and food processing industry together with the food market. Food complex is explained as a combination of technologically inter-connected functionalities of several specific economic domains united by the common objective and focused on provision of food products to satisfy respective needs in the country. Its adequate level and equilibrium in functioning of its components stipulates the guarantee of the food security of the country.

The key objective of the food complex development as an integrated independent system is the timely provision of population in a region with food products in the amount and scope, assortment and quality which effectively correspond to the adequate consumption norms. Thus, the key tasks of the complex include: determining the needs of people in a region as relates to food products; identifying the sources of food products' supply to consumers within required timeframe; regulation of food production both in fresh and processed conditions within the boundaries of a regional food complex; development of regional food markets; establishment of food banks (funds) and reserves; ensuring easy access to food products at the markets to all social groups of the population.

The unique and powerful natural resources that Ukraine possesses allow for effective development of the food complex with specialization on food products development which is closely related to increase in the level of wellbeing of the people. However, at present the level of food complex development can not be recognized as satisfactory because of poor material-technical

support, outdated technical-technological base which does not meet modern requirements for market economy development, low productivity of the food sector, poor structure of the food market, insufficient investment-innovative activities of economic entities, low competitiveness of food products, excessive differentiation and disproportions that slow down efficient usage of available resource potential. Thus, quite pressing becomes the issue of developing conceptual principles and practical efforts aimed at substantiating the prospects for development of the food system in the country on the basis of comprehensive assessment of its key components, specific features and peculiarities of transformational processes as well as re-orienting major developmental trends into progressive modernizational direction.

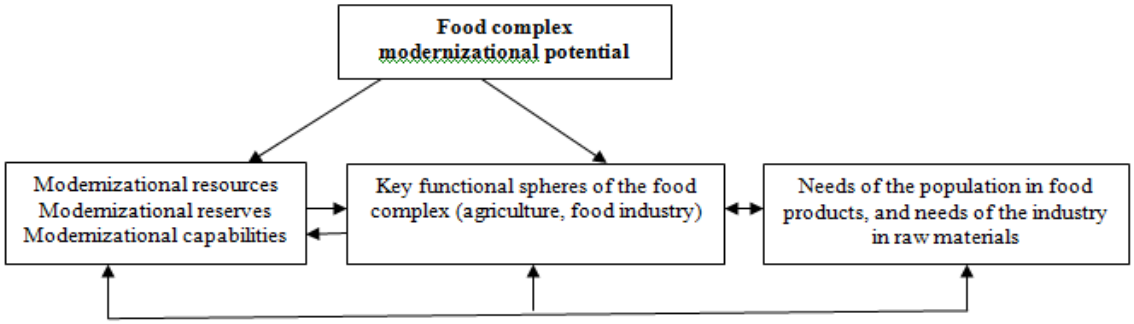
Achieving such goals in the context of ensuring viability and sustainability of the food complex for the future is closely connected with the need to outline main guiding targets which shall include the following aspects: modernization, investment activities, innovative advance, development of the scientific-technical progress, increased efficiency and competitiveness of food products with due consideration of modern challenges and risks. So, modernization presents renewal of the production based on modern requirements, transformation, reinvention, progressive changes, structural shifts in the economic system of the complex on the basis of more active and efficient investment-innovative activities. This is the process of quality changes in the food complex development under the influence of knowledge generation and large-scale application and implementation of innovations in key spheres of its functioning.

Despite its importance, the innovative activities and modernizational processes in the complex (same true for the entire economy) have not yet achieved necessary positive dynamics, although some successful shifts can be still observed. This is confirmed by the world ratings of evaluating innovation potential and technological and innovative competitiveness, namely calculations made within the global competitiveness index, global innovation index, European innovation index, where Ukraine is given quite a good place. According to the data from the World Economic Forum on global competitiveness for 2015-2016 Ukraine takes the 79th place among 140 researched countries with the following specific ratings based on: market capacity - 45th place; higher, school and professional education - 34th place; medical care - 45th place. However, deterioration of the situation is observed in Ukraine based on such criteria as: macroeconomic environment; financial market development; infrastructure development and technological readiness (3).

As regards the innovation activities, according to the global innovation index, which in 2015 covered 141 countries and used 79 indicators throughout a whole spectrum of innovative activity parameters, Ukraine moved to the 64th place by improving its positions in the following areas: required institutions, human capital, business expertise, creativity, market indicators (previous market indicators placed Ukraine in the 89th place (4)). However, the level of investment-innovative activities in the country as a whole, and in its food complex specifically, is far from satisfying modern requirements and corresponding to existing available reserves and capabilities. Obviously, general indicators and indexes for the country as a whole vividly reflect the situation in the food complex as well.

The key driver for strengthening the country's standing in the world and improving its territorial-production complexes shall be the rapid social-economic development on the modernizational basis, accumulation and consolidation of modernizational potential, notably in food complex. Based on existing, though insufficient, scientific works on the substance and definition of modernization potential, and taking into consideration some corrections and adjustments, the following explanation can be produced to determine the modernizational potential of the food complex: it is the combination of available and potential resources and reserves of production renewal and improvement through advancing and further development of knowledge and science-intensive technologies aimed at creation of new products and services as well as organizational mechanism of their implementation. This is such part of investment sphere which includes target functionalities of several domains as a combination of scientific-technical, production-social, personnel-intellectual, financial-economic and cultural-educational capabilities required to effect transformational-modernizational development of the country and its regional systems.

In very general terms, the chart of the food complex modernizational potential interconnection with results of its performance can be presented in the following way:



The establishment of the innovation model of economic development in the country depends on the extent of fullness and efficiency of its modernizational potential usage as well as potential of its regional structures, namely: amount of financing channeled into scientific and scientific-technical activities; level of innovative-modernizational development of industrial enterprises; dynamics of new products development and production; existence of solvent demand for modernizational products; substance and scale of transformational-structural changes and their effectiveness.

All aspects of investment and investment-modernizational character of the food complex development grow in importance in the context of existing steady negative trend of its functioning, especially its raw material component (table 1). Although dynamic characteristics of the food complex development and volumes of food production in general enjoy small growth tendency (from 2015 until 2016 - by 1,7%), the raw material component has been on a downward trend since 2014 with continuous fall of agricultural production volumes on a yearly basis (compared to the previous year): in 2014 - by 5,6%; in 2015 - by 4,7%; in 2016 - by 1,7% (1). In the processing component of the complex, against the general positive dynamics of relative food industry growth, in 2014-2015 the production fall has been observed as regards such important products as: sugar - by 29,6%; sunflower oil - by 7,3%; sausage products - by 9,7%; milk - by 1,3% (2). So, sugar production per capita, for instance, fell from 47,7 to 34,1 kg, and the general level of food products consumption, as the resulting indicator of the food complex development, has been on a downward trend of significant and steady decline in key groups of products due to the entrenched deterioration of production efficiency indicators. Thus, meat consumption per person per year fell to 51 kg in 2015 (from 56 kg in 2013), milk - from 221 to 210 kg, sunflower oil - from 13,3 to 12,3 liters, fish - from 14,6 to 9 kg (2), which is a vivid indication of struggling situation in the complex and the need to effect improvement measures on the basis of, first of all, more active investment-innovation activities.

Table 1. Food complex and its components' production dynamics (billion Hrn.)[1]

Years	Products			Dynamics in % compared to the previous year		
	Agriculture	Food industry	Food complex	Agriculture	Food industry	Food complex
2010	194,7	193,0	387,9	-	-	-
2011	233,7	222,4	456,1	120,7	115,2	117,6
2012	223,2	257,6	480,8	95,5	115,8	105,4
2013	252,9	261,7	516,4	113,3	101,6	197,4
2014	251,4	302,4	553,8	99,4	115,5	107,2
2015	239,5	390,6	630,1	95,3	129,2	108,9
2016*	235,4	403,1	641,5	98,3	103,2	101,7

[1] Source (1, 2)
* "Uryadoviy kurjer", № 68, 2017

The investment activities and its dynamics in the food complex in general, as an indicator of economic efficiency, have not yet been able to improve efficiency of such process. With regard to capital investments, which overall size for the economy in 2015 was only 98,5% of the 2014 level, there has been observed a decreasing trend in the food complex which resulted in significant reduction of cattle facilities put into operation and scaling back of bread, sunflower oil and meat production

capacities (2). Lack of necessary reproduction resulted in increased wear and tear of key production means with its critical threshold long past 50%. Therefore, further development of the food complex aimed at ensuring increased volumes of food production, elimination of disproportions in functioning of its major components and with the key objective of stabilization and gradual economic growth requires serious transformational-modernizational changes in order to successfully resolve the issues of its sustainability and viability.

Transformational-modernization advance of the Ukrainian food complex is strongly dependent on its comprehensive systemic changes and shifts as well as component elements of these processes, namely the efforts on restructuring, re-organization, reforming, reconstruction, re-engineering, re-investments as key and effective drivers of changes and reinvention of the various spheres of economic activities. It has to be stressed though that in the core of these processes lies the very modernizational drive associated with renewal and re-invigoration of respective components of the food complex structure.

Modernizational activities, same as innovation activities, represent a single-function process aimed at renewal of the main spheres of economic activities, although they have some significant differences. Thus, if the main objective of innovation activities is the improvement of production processes through development and implementation of new or extensively modernized machinery, technology or products, enhancing of already existing products manufactured earlier as well as scientific-technical research based on the existing knowledge, the modernizational activities, in its turn and in response to the challenges of modern times, relates to comprehensive reconstruction of the organization and management of production, while its resulting products are not simply of an improved character but rather of a completely new nature and produced on the basis of the knowledge economy, notably information and communication technologies, biotechnology and nanotechnologies. The target objectives of the modernization and its key tasks shall include the following: increased efficiency, competitiveness, and ultimately the food security of the country and its regions; optimizing transformational processes that should be based on the scientific-technical progress achievements and knowledge generation; expansion of the scale of implementation of new machinery and technologies as well as new product types; enhancing investment activities as important components of the new stage of economic reforms.

Modernization, as the process of re-invention and renewal and as an integral system prompting the improvement of existing realities, presents a very complex and sometimes controversial phenomenon which impacts and changes not just main directions of the economic development and territorial-production complexes, but also produces an important influence on the society in general. Such activities, as a process of changing quantitative parameters of specific system, functions and substance of some spheres as well as optimization of conditions of such transformations, and also as the process of development and accumulation of positive changes, produces vast impact on the social processes. Such impact produced by the food complex modernization is well observed in macroeconomic dynamics, production structure, development of scientific-technical progress, institutional mechanisms, management activities, environment, and social stability.

The basis of formation and development of the modernizational potential of the food complex comprises investment and innovation potentials whose successful realization dictates the scale, structure and operation of the modernizational potential. The integral elements of the target component-functionalities of systemic organization of the food complex modernizational potential include: scientific base (fundamental and applied research); pace of the scientific-technical progress (new machinery and new technologies), knowledge generation and development of the knowledge-based economy; human capital potential (highly-qualified personnel, intellectual and creative capacity); management sphere and institutional environment; financial basis; development of infrastructure; institutional and legal support; informational resources. Framework of such components, through their interconnection, synergy and consistency, should guarantee efficient operation of the food complex on the basis of modernization.

It is quite difficult to identify and detail all functional components of the modernizational potential with detecting their exact scale, character and peculiarities of dynamic development because of the huge amount of data as well as the lack of significant part of statistical information. However,

taking into consideration that the results of scientific-technical activities and innovation technologies based on introduction of new knowledge present one of the main resources that determines the pace of development and guidelines for the food complex economic growth, the generalized evaluation of the received results is possible with the help of the following spectrum of indicators: assessment of scientific organizations and available personnel for the scientific sector of the country; assessment of performed and in progress scientific and scientific-technical research works; assessment of creation and introduction of scientific and scientific-technical products; financial support for the scientific sphere. In this context it is worth paying attention to the volume of scientific and scientific-technical works performed by organizations based on their specialization; number of specialists involved in such works; general number of scientific organizations; number of industrial enterprises that have been involved in innovation activities; number of implemented innovations at industrial enterprises, including those new to the market, and new only for specific enterprises; general number of all enterprises that implemented innovations, including waste-reducing and resource-saving ones; number of implemented new technological processes at enterprises; assortment of realized innovative types of products.

Regrettably, almost all indicators of innovation activities suffered downward trend. So, generally in the country the number of organizations performing scientific and scientific-technical research works has been steadily decreasing with average yearly fall of 2-3% (1303 in 2010, and 978 in 2015). The same proved to be true for the number of personnel at scientific institutions: fall from 141 thousand individuals in 2010 to 101 thousand in 2015. Ever more difficult situation is observed in the food sector: in one of agro-industrial macro-regions of the country - Polissya (Vinnytsya, Ternopil and Khmelnytsk regions) the number of innovatively active enterprises in the food industry decreased from 67 to 18, with implementation of new technologies falling from 28 to 13, and assortment of new products being reduced from 75 to 57. This, obviously, led to significant fall in the volumes of sold innovative products (based on the data from oblast statistical departments).

Analysis of the innovation-modernizational progress in the food complex components demonstrates that based on many indicators there exists serious lack of active investment efforts. Also poor looks dynamics of such important indicators as the number of innovatively active enterprises, organizations performing research and development activities, people employed in scientific-research and design works, volume of implemented new technological processes and creation of new types of innovative products. Based on statistical data the portion of enterprises producing food products that introduced innovations in 2015 was just 16,8% of the total number of all enterprises, including those that implemented innovative processes - 8,1%. Among them enterprises that introduced waste-reducing and resource-saving techniques were only 2,0%, and produced innovative types of products - 9,5%; which reflects quite negative general situation in this sphere (2, 5).

Introduction of new technological processes at the enterprises producing food products in 2014 occurred at 231 facilities, and in 2015 - only in 116 facilities (fall of 30,7%), and moreover only at 41 such facilities those were waste-reducing and resource-saving technologies, a number which in previous year was 44. As relates to enterprises that implemented new innovative types of products in 2015, in the food industry there were 455 such facilities (in 2014 - 723), with 63 (113) products intended for the market and 387 (610) products for enterprises which demonstrates significant slowdown in general innovation processes (2). Concerning specifics and character of other innovative processes in the food complex it has to be said that they have also experienced negative dynamics and falling indicators over the recent years.

Elimination of negative trends in the innovative-modernizational development of the food complex and improvement of operation and efficiency of its components requires re-orienting and profound changes in its activities. In the agrarian sphere of the food complex, according to the world trends, the key directions of the modern innovative-modernizational activities should be agro-biotechnologies (genetic modification, crops selection to withstand various negative factors, production of bio-fuel, development of bio-pesticides, bio-fertilizers, ferments, etc.). Also important should be the development of innovations in ecologically oriented systems of land-toiling, farming and agricultural techniques in order to preserve and increase level of efficiency in using agrarian resources. No less significant and necessary remain efforts on expanding already existing progressive agrarian

technologies, especially organic farming, soil protection systems, development of new seed kinds and hybrids, new farming techniques, new breeds of cattle, progressive cattle forage systems, usage of bio-fertilizers, introduction of efficient market technologies.

Among the priority directions of the innovative-modernizational development in agriculture, in the context of the general strategic priorities of the state, the following should be specifically outlined: development and implementation of technologies of adaptive soil-protective farming; technologies for production, conservation and processing of high quality vegetable products; technologies for production of diagnostics items to identify problems in plants and cattle as well as means of their protection; technological renovation of the production facilities in cattle breeding; development and implementation of modern biotechnologies in plant cultivation, cattle breeding and veterinarian activities.

Further efforts will be needed and should be intensified in scientific research of respective Ukrainian institutions in the following areas: farming, land reclamation and mechanization, plant cultivation, zoological machinery, veterinary medicine, agrarian economy and food production in order to ensure increased efficiency of the food complex development.

In the sphere of agricultural raw materials' processing and food production the key objective should be development of new technologies aimed at obtaining more healthy and safe food products, including both development and utilization of new equipment and technological lines presenting know-how as well as bio-technological and nano-technological production processes with proper control over their safety and quality parameters. Fundamental task for the food industry of the food complex is the creation and implementation of progressive processing technologies for food materials, food products conservation and transportation methods.

The food industry, as the final stage of the food complex development, is characterized by specific technologies of innovative-modernizational activities, especially resource-saving and low-waste technologies with minimum waste and maximum output; technological processes with reduced production cycles and minimal losses of quality characteristics of products; and also technologies for developing new packaging lines and boxing materials. The whole complex of technologies, as a system of conditions, forms, methods and means of resolving set tasks as per each main sphere of the food complex, and their development and utilization require formulation of a special organizational-economic mechanism which should ensure their modernizational advance and successful results (Chart 1).

Analysis and evaluation of the modernizational potential of the food complex and mechanism of its realization shall be based on the strong combination of statistical and dynamic approaches. Statistical approach determines the current state of the potential, influence of internal and external factors as well as performs retrospective and current analysis of the potential, processes of its utilization which creates necessary pre-conditions for identifying prospects of its development and build-up. Dynamic approach provides prospective analysis and prognosis evaluation of the potential on the basis of detecting changes already occurring within it and forecasting potential ones. The efficiency of the modernizational potential of the food complex can be presented as the ratio of the volumes of sold modernizational products to the general amount of modernizational expenditures. The result of analysis and evaluation of such potential shall be the adoption of measured and substantiated management decisions concerning its further functioning.

The basic principles of the food complex development in the context of modernization can be determined as following: increased efficiency of investment-innovative activities in order to enhance the ratio of prospective successful sectors; increased number of innovatively active enterprises which produce and implement innovative and modernizational products; renewal and replacement of production facilities with introduction of new equipment and machinery; gradual introduction of new comprehensive progressive technologies, especially resource-saving ones as well as nanotechnologies; enhancement of new product ranges of innovative-modernizational type, increase in volume of sold new products; formation of efficient system of implementation of scientific developments and inventions into practice; more extensive engagement of intellectual potential in order to establish modern network forms of production optimization; increase in the pace of innovative infrastructure development through creation of such structures as innovation and technology transfer centers,

scientific parks, clusters, strategic alliances, technological towns, business incubators, innovative-industrial groups; support development of small and medium sized innovative enterprises; informational support to the food complex development on the basis of modernizational principles.

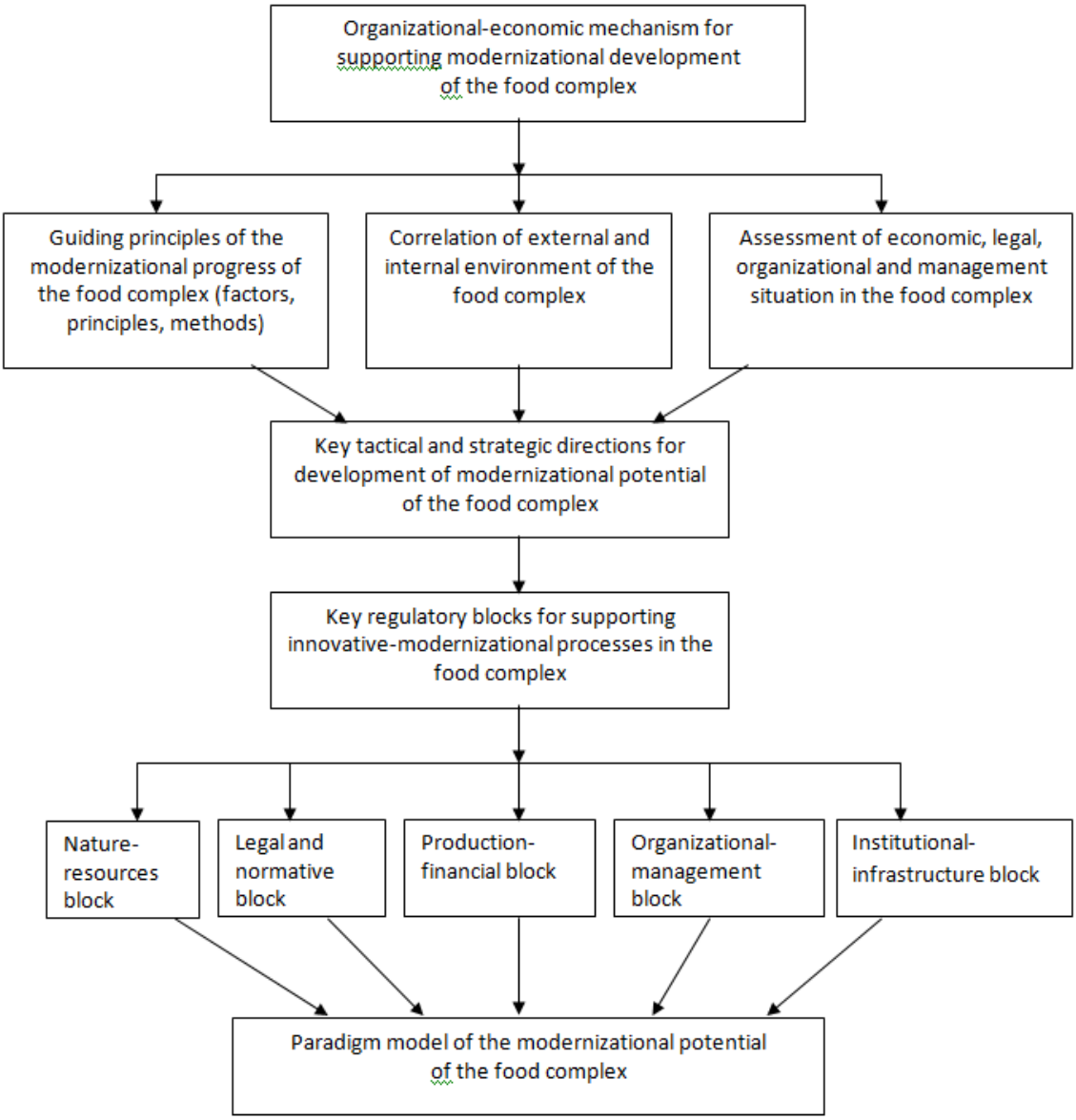


Chart 1. Generalized outline of the organizational-economic mechanism to support modernizational development of the food complex.

Core task of the food complex modernizational development remains the issue of resolving food security problems in the country which requires sustainable and steady growth in production output of quality food products, ensuring active functioning of regional food markets, adequate stockpiling of strategic types of food products, organization at food markets of effective marketing and price information systems, ensuring proper income for the population capable of purchasing staple food products, ensuring build-up and efficient utilization of the food complex modernizational potential, formation of necessary conditions to enter period of economic growth in all food complex components on the modernizational basis in order to establish adequate life and well-being conditions for the people.

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