KHARKIV PETRO VASYLENKO NATIONAL TECHNICAL UNIVERSITY OF AGRICULTURE

Anastasiia Mostova

STRATEGIC ENSURING OF FOOD SECURITY OF UKRAINE

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Рецензенти:

O.O. Krasnorutskyi, Doctor of Economic Science, Full Professor
Kharkiv Petro Vasylenko National Technical University of Agriculture
M.Y. Malik, Academician of the National Academy of Sciences of Ukraine, Doctor of Economic Science, Full Professor, Honored Worker in Science and Technology of Ukraine
National Scientific Centre "Institute of Agrarian Economics"
V.V. Rossokha, Doctor of Economic Science, Full Professor
National University of Kyiv-Mohyla Academy

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Anastasiia Mostova

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The monograph is dedicated to the study of the problems of strategic ensuring of food security of Ukraine in the context of the country's integration perspective. Scientific approaches to the formation and implementation of the state's food security strategy have been identified. Methodological principles of strategic analysis of food security have been developed. An assessment of the trends and prospects of Ukraine's food security is given. The strategic directions of ensuring food security are outlined.

For scientists dealing with issues of food security in Ukraine, graduate students, students, as well as employees of state authorities and local governments.

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Foreword

In the modern conditions of globalization of economic processes, the key strategic aspect of sustainable socio-economic development and ensuring the country's competitiveness at the national and global levels is the guarantee of food security. Factors such as a sufficiently developed agricultural sector of the economy, the provision of food resources due to the increase in the volume of agricultural production and the increase in the self-sufficiency of the country with food have a positive influence on the trends of food security in Ukraine. However, despite these favorable factors, the situation in country's food security still remains unsatisfactory.

The current crisis in the Ukrainian economy leads to the deepening of socio-economic problems, which in turn lead to the deterioration of the food supply of the population. The actual level of food consumption does not meet rational norms; there is an imbalance in the diet. Due to low purchasing power, citizens of Ukraine have to meet their nutritional needs with cheaper and lower quality food products. With a sufficient amount of food, the country's population cannot afford to consume vital food products at a medically sufficient level. The outlined range of problems is reinforced by an underdeveloped system of state control over the quality of food, the inconsistency of state regulatory instruments with market needs. The consequences are inhibition of the development of the export potential of Ukraine, a decrease in the competitiveness of agricultural products on the domestic and world markets.

Guaranteeing food security is a strategic priority of the government, which requires the implementation of a highly effective national foreign economic, agrarian, and financial policy. Ensuring socio-economic stability and economic growth, a high living standard of the population, investment attractiveness and international recognition of the country requires the development of mechanisms and tools aimed at providing citizens with high-quality food in sufficient quantities, the stability of the domestic food market, food independence.

Solving strategic problems related to ensuring food security requires

a detailed strategic plan coordinated with the strategic goals and resource potential of Ukrainian agricultural sector. To date, there are insufficiently developed approaches to justifying a comprehensive plan for strategic food security, as well as defining long-term goals and developing ways to implement them.

The issue of forming the state's food security strategy requires systematicity and modern strategic management tools aimed at establishing the dependence between individual strategic goals. An effective government strategy has strategic goals that are closely related to each other, and therefore the success of the strategy depends on their interaction.

Identification and analysis of cause-and-effect relationships between individual strategic goals is an effective and efficient tool of strategic management. Studies of foreign scientists, confirmed by practice, show the effectiveness of using the strategic management methodology, which will allow to interconnect and reconcile separate, fragmented strategic goals of implementing food security, partially disclosed in the main state program and goal documents, to establish the presence of cause-and-effect relationships between separate goals, and to harmonize different ideas about directions of strategy implementation in the form of a system.

In today's conditions of globalization of economic processes, increasing instability of the market situation, guaranteeing Ukraine's food security is significantly complicated. The stability of food security depends on dynamic, interdependent and mutually determined factors that can and must be timely identified, controlled and counteracted in the process of developing and implementing the food security strategy. A complete, justified and reliable assessment of food security at the national level ensures a timely response to possible threats and challenges that affect the level of economic development of Ukraine. At the same time, methodological and methodical assessment of the food security trends should be a reliable and objective basis for the formation of a food security strategy as an integral component of economic and national security.

Food security requires special attention in the modern conditions of Ukrainian foreign economic policy, aimed at maintaining the openness of domestic markets in the context of Ukraine's integration into the system of multilateral regulation in the WTO, which contributes to the emergence of new threats to the country's food security and certain pressure from

foreign trading partners. Therefore, the formation and implementation of the food security strategy increases the relevance of the research of these issues under the influence of modern globalization processes and the integration of Ukraine into the world economic system.

The priority strategic tasks of food security are stable and reliable provision of safe and high-quality food products to the Ukrainians. The most important strategic goals of guaranteeing food security are to support the sufficiency of own production and import of high-quality food products, the stability of the supply of food products in the country, the availability of food for citizens, and providing the opportunity to maintain a rational consumption structure. The leading role in this task is assigned to maintaining food independence and self-sufficiency, which are implemented through strategic management methods and mechanisms. Ensuring food security in the conditions of economic integration into the world economy needs directions and tools for supporting the agricultural sector, guaranteeing the quality and safety of food and its availability for the population. The outlined range of tasks is solved in the presented scientific work.

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Chapter 1

THEORETICAL PRINCIPLES OF STRATEGIC ENSURING OF FOOD SECURITY OF THE STATE

1.1. Economic development strategies and their role in ensuring the economic security of the state

Modern conditions for the development of socio-economic relations, the formation of a single economic space and globalization processes require Ukraine to form economic development strategies aimed at achieving strategic priorities, goals and objectives. The availability of effective economic strategies allows managing socio-economic processes at the state level, taking into account external and internal environmental factors. The presence of stable and predictable economic, legal, and institutional conditions will allow creating a reliable basis for comprehensive and effective strategic planning and control of the results of state economic policy in all sectors of the national economy. In turn, this will contribute to the formation of strong state institutions, a system of measures and mechanisms of effective state policy.

The formation and implementation of a comprehensive strategy of economic development will contribute to the acceleration of economic and social transformations, increasing the competitiveness of the national economy, and the integration of Ukraine into the modern world economy. The urgent need to transform the economic strategy from a formal document to a set of management tools and mechanisms requires the development of scientific approaches to economic strategy as a separate object of research, which has its own specific laws of formation and implementation, which are unique to the national economy.

Theoretical, methodological and practical approaches to the study of strategy as a social phenomenon are revealed in the scientific works of specialists in various fields. The origin of this term is related to military affairs (translated from the Greek “stratus” - army, “ago” - lead) and means a key aspect of military art related to the preparation, planning and conduct of military operations that affect the outcome of the war [171].

According to the Russian scientist V. Dahl, strategy is “the doctrine of the optimal placement and use of available resources and military

forces" [182]. The concept of strategy was initially associated with the specifics of the implementation of military operations. However, despite the mostly "military" approach to strategy definition by some scientists [70; 86; 126], the universality of this concept became more and more obvious and promising in civil spheres.

In modern scientific research, strategy is most often understood as a plan of action in the long-term period of implementation. Given the fact that the course of military operations is affected by factors that are difficult to predict, for example, the unpredictability of the enemy's actions, military experts needed an adequate management lever that would adjust the actions of the military forces in accordance with the set goals and objectives. Therefore, strategy should not be seen as a rigid and unchanging plan of action, but rather as a flexible system of measures that can and should adapt to the behavior of the adversary. For example, the Prussian general G. Moltke considered strategy "the evolution of the primary management idea in accordance with dynamic external circumstances" [53, p. 36].

The strategic principles of the development of non-military spheres are connected, first of all, with the study of the patterns of behavior of the object of strategic planning and the design of possible options for further development and the selection of optimal management tools and mechanisms. The priority in this case should be the aspects of maximum consideration of the laws of the development of the object, the formation of relations based on partnership, predictability, openness [53, p. 14].

The transformation of the concept of "strategy" is connected with the development of management as a science, which adapted it to the specifics of the functioning of business entities in the market environment. It is expedient to emphasize the mandatory definition of objectives (missions, goals, tasks), the achievement of which the strategy should be aimed at. According to A. Chandler's definition, strategy is a system of the organization's main long-term goals and objectives, necessary measures and actions, as well as resources for achieving goals [222, p. thirteen]. Therefore, setting goals is the starting point of strategic planning.

The American scientist J. Quinn interprets the strategy as a plan that allows the integration of the main goals of the organization, its policies and actions into a single, coordinated, managed system. According to the scientist, the plan is not an unchanging list of the organization's actions, they must be mutually consistent with external factors that change. To

achieve this, J. Quinn uses tactics, under which he proposes to understand a system of short-term, adaptive, flexible actions that are used to achieve strategic goals [90, p. 23-24].

H. Mintzberg in the study of strategy as a scientific category presented it according to the principle of "five "Ps": "plan", "ploy", "pattern of behavior", "position in respect to others", "perspective" [90, p. 11].

The purpose of the strategy is to ensure the achievement of the organization's goals, despite such intervention, which requires objective consideration of possible directions of external influence and prediction of possible reactions to it in the program of strategic actions [15, p. 63; 187, p. 64]. In the case of complete predictability of such impacts, the strategy could be transformed into a functional plan from a sequence of predetermined actions. This is possible when the organization functions in stable and unchanged conditions, for example, in a developed market economy. H. Mintzberg defines the strategy of the organization as a unified, comprehensive, integral plan to ensure the fulfillment of the main tasks [91, p. 35].

Scientist V. Manov considers strategy a generator of development opportunities, the main function of which is to create prerequisites for achieving set goals [86, p. 297].

If the formation of tactical goals is based on the structure of the entity that will achieve them, then the strategy should provide for the structural modification of this entity. Methodologically important in such an approach is the focus on variability in the strategic perspective of structural features (coefficients or independent variables) of models that are considered unchanged in the short term.

A similar position is expressed by G. Pocheptsov, who considers it necessary to strengthen the role of strategy during the transition between different conditions of the system, when traditional processes go beyond the natural boundaries of the system, and therefore, the ability of strategy to structure the environment and activity [142, p. 4-5].

It is the flexibility of the system of necessary tools and the ability to adapt that is the main criterion and functional characteristic of tactics. The key task of the strategy is to determine the limits of adaptation to external factors and create a concept that is stable and flexible enough for the organization to achieve its goals, despite the influence of the external environment [90, p. 31].

The considered versions of the definition of the term "strategy" are

close to the behavioral approach to strategy formation. In particular, in game theory, strategy is interpreted as a complex plan, which involves the selection of alternatives taking into account any possible options for the development of the situation [90, p. 34]. At the same time, significant attention is paid to the possibility of timely response of the organization to the intervention of external forces or factors.

A planned approach to the interpretation of the essence of the strategy is followed by the scientist S. Yerokhin, who considers the economic strategy a comprehensive plan to achieve a long-term goal, which includes the directions, tasks and priorities of the subject's economic development and a set of relevant measures, actions and decisions [212, p. 18].

The above-mentioned approaches to the interpretation of strategy are impractical in the case when the organization introduces innovative technologies, develops new market niches, products, etc. In this case, the influence of environmental factors is so unpredictable that it does not allow to fully take into account all possible reactions and actions of the firm to these factors. Therefore, it is necessary to determine the general approaches used by the organization to solve the strategic tasks. According to B. Budzan, strategy is a set of rules that are guided by management decisions to ensure the implementation of the mission and achievement of the organization's goals [21, p. 71].

The strategy as an economic development plan is aimed at overcoming the crisis and improving the welfare of the population. The initial stage of strategy formation should be an assessment of the real state of the system and the components of its functioning, compliance with modern trends in global economic development, and compliance with the set goals. The level of sustainable development of the subject is ultimately determined by the economic conditions, the efficiency of production, and the quality of population's life. The main tasks of economic development planning are the modernization of the production structure, the development of entrepreneurship, infrastructure, and the creation of new jobs. The cycle of strategic planning of economic development is represented by the following stages (Fig. 1.1).

The basis of the economic development strategy should be a clearly formed system of goals that meet the standard requirements of measurability, reachability, orientation in time and non-contradiction. General and specific goals and objectives are distinguished. General goals characterize the desired point of development of the subject for a defined

period and are quite clear. These serve as a criterion for development, a guideline for actions and allow determining the necessary measures to achieve them. The general goals are detailed into more specific ones that complement the quantitative benchmarks and reflect the evaluation criteria that can be used to monitor and control the level of socio-economic development.

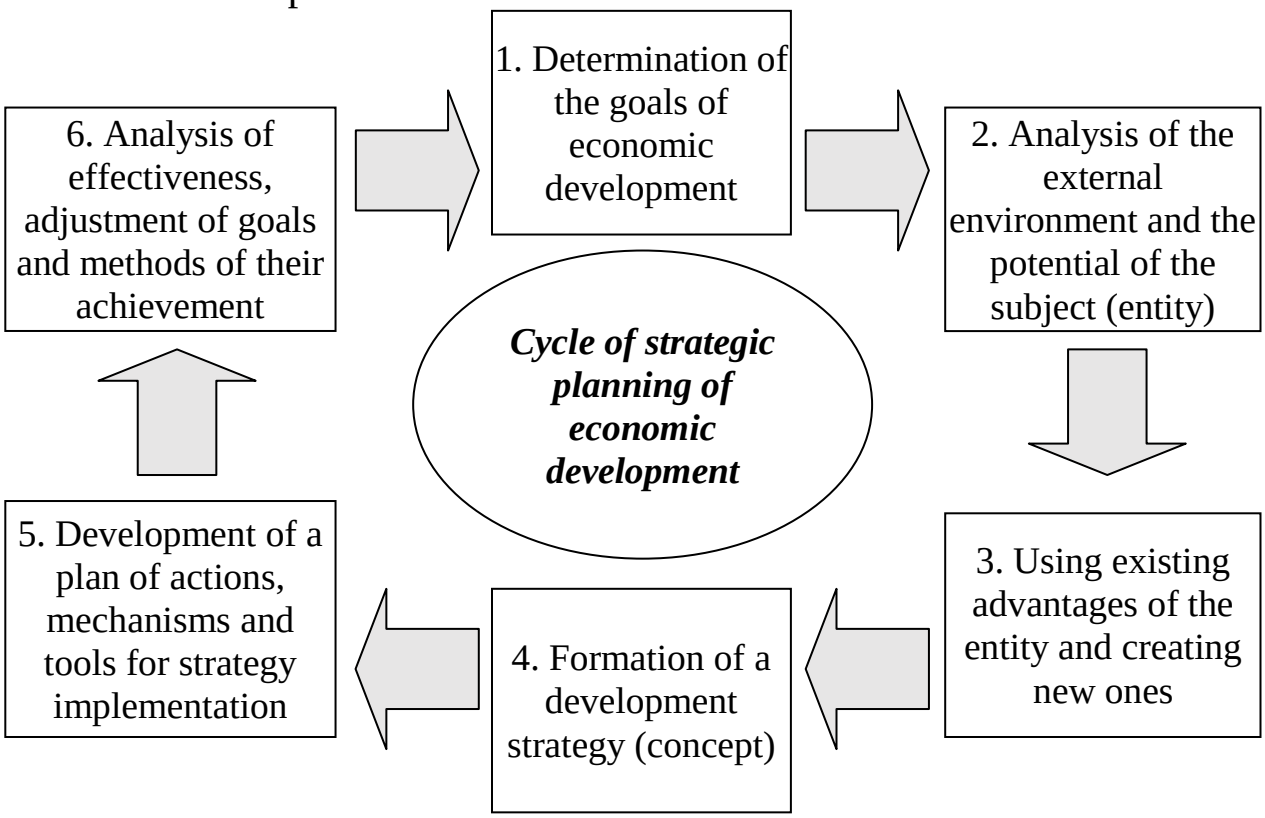


Fig. 1.1 – Cycle of strategic planning of economic development
Source: summarized by the author based on [6; 52; 53; 187; 203].

At the stage of analyzing the subject's external environment, favorable and unfavorable development factors are identified, and a systematic analysis of external economic opportunities and threats is conducted. Quantitative and qualitative analysis of economic, social, ecological and institutional factors of the external environment evaluates the resources that can be used as drivers of economic development, substantiates the key socio-economic parameters of the external environment, analyzes the influence of global factors of economic development and identifies its external factors. Evaluating the subject's strengths and weaknesses bases on the results of the implementation of previous strategies of socio-economic development, and determines the reasons for success and failure. An analysis of the subject's internal strengths and weaknesses determines the current stage of development.

The development of the strategy substantiates the final goals of

economic development, its implementation factors and mechanisms, as well as management methods and tools. The strategy takes into account features and current trends of economic development of the subject. The basis of the strategy is the development of alternative development scenarios, their economic evaluation, identification of priority areas of development and competitive advantages of the entity. Development of plan of specific actions bases on the economic development strategy, which includes tasks, terms of their solution, responsible persons, expected results, amount and sources of financing, methods of intermediate control and feedback, expected results, possible consequences of the implementation of plans and programs.

Adjusting the goals and methods of their achievement, an evaluation of functioning action programs, constant monitoring of the economic condition of the subject, comparison with development goals and criteria, analysis of the efficiency and effectiveness of strategic measures take place at the stage of analyzing the efficiency of the considered implementation of the strategy. The correspondence of the strategy to the available resources, information support for the implementation of the strategy and its overall effectiveness are substantiated.

Therefore, the subject of economic strategy is any subject (organization, state, association of states, etc.) capable of influencing the processes of its own reproduction. The level of its formation can be determined based on the subject of the strategy. In further research, the concept of "state economic strategy" should be used.

The subject of economic strategy is the state. The strategic goal is to ensure long-term comprehensive progress of the subject of the strategy and to take into account the peculiarities of its functioning and patterns of development. Therefore, the goal of the state economic strategy is the harmonious development and well-being of society, the achievement of social and economic stability. The state as a subject of strategy is inextricably linked with society, since the existence of the state as an element of the social system is determined by the stability and comprehensive development of it [53, p. 56].

The object of economic strategy is the resources available to the subject of the strategy, own or engaged, on which he can influence directly or indirectly. Therefore, the potential availability of resources requires taking into account such a specific object of strategy as the decisions of other strategic subjects of the same level, which the subject can also influence in different ways. In this context, the strategy is

considered as a system of actions aimed at attracting additional reproductive resources.

The object of the state's economic strategy consists of enterprises and the population, which occupy a decisive place in its formation and implementation. However, the objects of the strategy must be supplemented with directions, tasks and priorities necessary for the application of methodological and methodical tools of strategic planning, which will objectively reflect the level of provision of resources and the efficiency of their use.

The scientist V. Solovyov defines strategy as a general direction of movement for the gradual achievement of set goals, a fundamental line of step-by-step goal achievement [172, p. 67]. A similar definition is contained in the economic dictionary edited by S. Mocherny, where economic strategy is a long-term course of economic policy aimed at comprehensively solving important economic and social problems [49, p. 88].

World practice has generally developed an understanding of strategy that boils down to three main approaches. According to the first approach, the strategy is interpreted as an abstract norm of activity, abstract in content, but takes into account the processes of achieving goals. The concept of strategy is close to the concept of strategic vision, and it is understood as an idea of the desired state of the organization [6, p. 192]. Representatives of the second approach equate strategy with a strategic action plan. They predict a possible shift in emphasis and focus on the program component (action plan), due to which the strategy can become a set of loosely connected actions in different directions [91, p. 296]. According to the third approach, strategic planning is understood as a process aimed at developing and implementing a strategy for the development of the environment in which an organization, community, country exists, as well as adaptation to these changes. Strategic planning characterizes not only the main path of system development, but also allows it to be modified or, if necessary, adjusted, taking into account changes in the environment [90, p. 315].

Specialists of the Ministry of Economy and European Integration and experts of the UN Development Program in 2003 developed a joint research project "Strategic Documents of Socio-Economic Development", which includes the following options for defining the strategy: "a long-term generalized complex of interconnected and interdependent decisions, that determine the priority areas of development of the economy,

industry, region, etc.”; “system of conceptual goals and tools for their achievement”; “something that combines tactical short-term actions into a system that ensures strategic results”; “long-term generalized management plan for an object, sphere or system” [53, p. 18].

In fig. 1.2 presents a generalized systematization of scientific approaches to defining strategies.

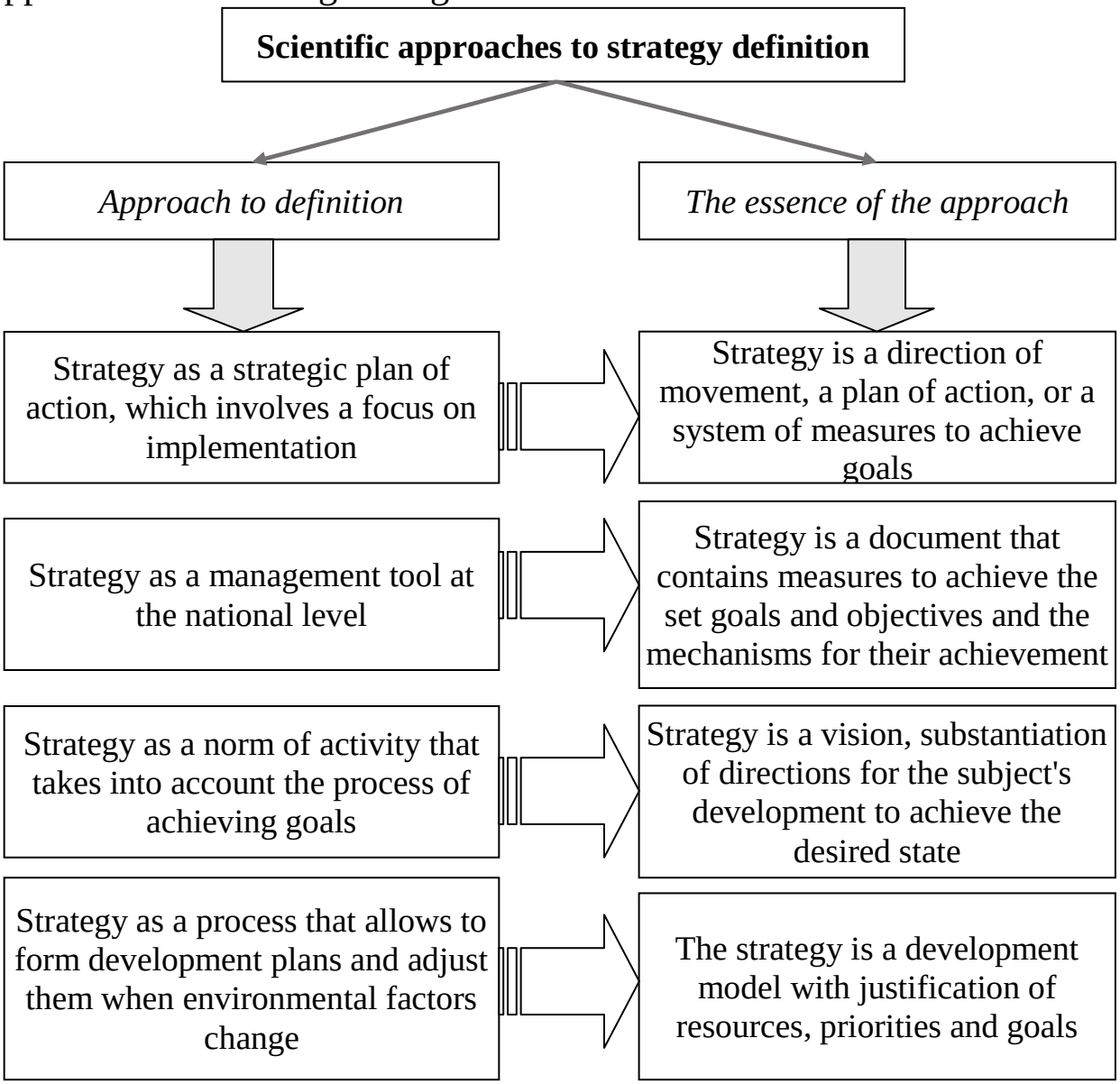


Fig. 1.2 – Scientific approaches to strategy definition

Source: developed by the author based on [6; 15; 53; 63; 90; 91].

The study of economic strategy was also conducted by domestic scientists. In particular, L. Shvayka defines a strategy as a generalized model of the future state of the economy and planned actions to achieve it. Strategy establishes the main directions, goals and priorities of activity, determines critical resources and necessary innovations, contains means of implementing priorities and indicators of achieving the planned result

[203, p. 112, 123].

J. Zhalilo defines economic strategy as a comprehensive plan aimed at achieving a long-term goal, which includes directions, tasks and priorities of economic development of the subject and a set of relevant measures, actions and decisions [52, p. 19]. According to V. Tertychka and V. Vakulenko, strategy is a conscious process aimed at determining the direction of development of an organization, region or territorial community in the conditions of a changing environment [187, p. 63]. Therefore, the concept of strategy forms the basis of the theory of strategic planning and management. The strategy combines goals, internal potential and conditions of the external environment.

According to the scientist O. Shubin, strategy is the direction of the organization's activities, which encompasses resources and competencies and provides for obtaining competitive advantages in the market [209, p. 470]. Scientists O. Goncharenko and E. Lysytsyn, who studied national security, define strategy as a category that allows establishing the relationship between policy goals and tools for their achievement [38, p. 26]. However, the given definitions currently do not fully reveal the nature and regularities of the formation of economic strategies.

It can be concluded that today the management content of the economic strategy at the national level consists in its definition as a generalized model of the future state of the economy and a set of planned actions for its achievement. It establishes the main directions, goals and priorities of activity, determines critical resources and necessary innovations, and contains means of implementing priorities and indicators of achieving the planned result.

In public administration, a strategy is most often understood as a specific document that contains goals, tasks, criteria for achieving goals, tools, as well as a specific subject of its implementation, in particular, state authorities for a state strategy. O. Goncharenko and E. Lysytsyn define the strategy as a specific basic pragmatic document, which defines target orientations for the future, and outlines the main directions of ensuring the vital interests of the country [38, p. 27].

In recent years, the executive authorities of Ukraine have developed a set of strategic documents containing strategic goals, directions and tools for the development of the main areas of the national economy, in particular:

- Strategy for Sustainable Development "Ukraine – 2020" (Decree of the President of Ukraine dated 12.01.2015 No. 5/2015);

- Strategy of development for the agrarian sector of economy for the period till 2020 (Order of the Cabinet of Ministers of Ukraine dated 17.10.2013 No. 806-r);

- Strategy for the development of export of agricultural products, food and processed food products of Ukraine for the period up to 2026 (Order of the Cabinet of Ministers of Ukraine dated 10.07.2019 No. 588-r);

- Strategy of innovative development of economy of Ukraine till 2030 (Order of the Cabinet of Ministers of Ukraine dated 10.07.2019 No. 526-r);

- Strategy for promoting attraction of private investments in agriculture for the period up to 2023 (Order of the Cabinet of Ministers of Ukraine dated 05.07.2019 No. 595-r);

- About the basic principles (strategy) of the state environmental policy of Ukraine for the period till 2030 (Order of the Cabinet of Ministers of Ukraine dated 28.02.2019 No. 2697-VIII);

- Export strategy of ukraine (strategic trade development road map) 2017-2021 (Decree of the Cabinet of Ministers of Ukraine dated 27.12.2017 No. 1017-r);

- State regional development strategy for the period up to 2020 (Order of the Cabinet of Ministers of Ukraine dated 06.08.2014 No. 385) and others.

The study of strategic documents in various spheres of the national economy is important for establishing laws and mechanisms of state administration, development processes and management decision-making. Unfortunately, it does not allow giving reasonable answers to fundamental questions regarding the methodology of setting strategic goals and objectives, the choice of tools for their implementation in accordance with the existing system of industrial relations and economic processes of the state.

For the formation of a strategy, regardless of its level, the primary aspects are the reasonable formulation of goals and the reliable and objective determination of the subject’s capabilities. It is natural that even at the level of an organization that functions in the conditions of the modern national and world economy, not to mention the economy of the state as a whole. It is impossible to define these aspects exclusively within the boundaries of management science. As D. Teece points out, strategic managers often disagree with economists due to significant differences in the justification of initial (starting) assumptions. According to the

specialist's opinion, strategic management does not take into account the possibility of economic analysis [263, p. 87]. The concentration of strategic planning only on management tasks relieves managers of responsibility for not taking into account objective limitations. The result is the inconsistency of goals with opportunities and the inability to develop strategic plans focused on a long-term perspective.

The above argues the need for integration of managerial and economic knowledge. According to a number of American scientists (D. Besanko, D. Dranove and M. Shanley), the understanding of economic processes allows for the development of more effective and transparent strategies due to the clear establishment of the relationship between strategic goals and priorities and the obtained result [215, p. 79]. Managers who use economic knowledge and research should objectively take into account most factors, which limits the space for management maneuver, but significantly increases the effectiveness of management. Therefore, the integration of strategy and economic processes allows to create an effective economic strategy.

The interpretation of the concept of "economic strategy" should take into account the mandatory scientifically based target criterion – an integral characteristic of the strategy. This criterion should be established as a result of the action of objective patterns of development of the subject of the strategy. The economic strategy should be based on the regularities of the strategic behavior of the subject of the strategy and the development of the socio-economic system, which will allow creating a reliable foundation for the effectiveness of economic strategies. At the same time, the main purpose of the operation of the subject of the strategy from an economic point of view is to ensure the continuity and integrity of its existence as a system. In the economy, such existence ensures the constant reproduction of the subject of strategy in the system of production relations. However, system integrity as a key goal of the strategy should also provide for the possibility of systemic transformation of the subject of the strategy. Such modification is a necessary condition for adaptation to external conditions and further reproduction of the subject. From another point of view, system transformation requires a clear strategy, because when the nature of internal system interrelationships changes, the strategy cannot be implemented without mechanisms for its adjustment.

On the basis of the researched approaches to the definition of the concept of "strategy", it is advisable to formulate an economic strategy as

a whole system of actions of the subject, aimed at realizing the goal, tasks and priorities of its economic reproduction. This category takes into account the complex of influences of external and internal factors in the long-term period. Economic tactics are a form of implementation of economic strategy, which includes a set of measures to adapt the subject and influence individual economic processes in order to achieve the objectives of the economic strategy.

Strategic directions determine the ways to achieve the goal depending on the system characteristics of the subject of the strategy. Strategic directions at the state level should be considered the assessment of the existing potential and conditions of development in the context of world trends in the functioning of the economy, the definition of the main components of the model of sustainable development and the requirements for their interaction, the assessment of the available resources and the socio-economic potential of the state, as well as the justification of financial and economic and socio-political mechanisms for ensuring sustainable development [179, p. 5].

Strategic tasks are specific long-term goals that implement strategic directions, based on the characteristics of the object of the strategy. The tasks of the state economic strategy of Ukraine are determined by the current state of economy and market instability. They represent a flexible set of goals achieved by the strategic economic policy of the state:

- creation of conditions for ensuring sustainable balanced economic growth;
- maintaining the stability of the monetary and financial system;
- allocation of resources and restructuring of the structure of production potential in accordance with the requirements necessary for the formation of a modern developed market economy;
- effective integration of the national economy into the world economic system;
- growth of employment and improvement of social stability;
- formation of an institutional basis, a system of state authorities adequate to modern requirements and needs of economic growth and sustainable development;
- ensuring the economic and legal environment in the conditions of globalization.

Strategic priorities determine the importance of individual strategic tasks in the formation of the state’s economic strategy. The priorities of the economic development strategy are set depending on the specific state

of economy. An unstable economy is characterized by dynamism in the structure of subjects and objects of the state's economic strategy, which is due to the potential danger of the process of implementing the strategic tasks lagging behind the real dynamics of the national economic system.

The goals of the state's economic strategy are to reproduce both the state itself and the socio-economic system as a whole. At the same time, there is a confrontation between different subjects with different interests. Economic entities are focused on their own reproduction and development and creation of economic strategies based on these interests, and the state represents the interests of the development of society. Therefore, the peculiarities of subject-object relations and the important role of the subject are the reason for the emergence of a number of interrelated problems in determining the priorities of the economic strategy of the state and the subject that forms and implements them in practice. Identified specific disagreements can cause inconsistency between strategic directions and tasks, which will ultimately reduce the effectiveness of the state's economic strategy.

The specificity of economic systems is their goal orientation. Therefore, the goal of the strategy is the desired state of the economic system, which is determined by a limited period of existence. Incorrect choice of goals when forming the strategy of economic development of the system leads to the solution of secondary problems in the future, which is just as critical as the use of ineffective tools to achieve goals. In the formation of the development goals of any researched system, it should be taken into account that its goal may completely coincide or be part of the development goal of a higher system and strictly correspond to the objective needs of development. The process of determining goals includes the stages of analyzing the external environment, evaluating the capabilities of the system under study, and justifying the goals.

In the process of setting development goals, economic systems are characterized by conservatism and inertia of behavior. Often, a strategic goal is defined abstractly as the final state of change of an economic object or process under investigation. At the same time, it is important to determine, what the goal is and what its alternatives are. From the positions of different subjects, the goal and alternatives may not match, so the interaction of goals and alternatives is illustrated using the goal tree method. Systems of goals and means of achieving them are similar in structure and mutually determined, since first-level goals are alternatives to achieving the main goal, but in relation to second-level goals, they are

higher goals [90, p. 232].

For the optimal definition of the goal of economic development, it is important to clearly formulate strategic goals and objectives, rank goals and determine advantages based on the use of system analysis and modeling. The basis of the analysis is a retrospective study of the state of the problem with the help of dynamic series of indicators characterizing the level of achievement of goals and objectives in previous years, the resources spent on achieving these goals and objectives, the state of productive forces, and the identification of stable trends in the change of these indicators and characteristics.

A special characteristic of a strategy is its integrity, which is the more important the more complex the strategic entity is. The main goal of the state economic strategy is to guarantee stable reproduction and socio-economic development. From this point of view, the state as a subject of strategy is the personification of society, since the functioning of the state as an element of society is a consequence of its stable and harmonious development.

The economic strategy of the state should be aimed at forming mechanisms for monitoring and managing the development of elements of the socio-economic system, conditions for the implementation of strategic goals and ensuring social reproduction. The economic strategy is interconnected with other development strategies of the state, which are combined into a single development strategy. It also covers the strategies of subjects at different levels.

The tasks of the state's economic strategy are established in accordance with the features of the socio-economic system and are actually a system of flexible long-term economic policy goals aimed at managing the development of economic entities of various levels. Market conditions of business leave an imprint on the specifics of these goals, which are mainly focused on guaranteeing stable, balanced economic growth, high employment of the population, rational structure of production and resource allocation, fair distribution of income and property, stability of the financial and credit system, foreign economic balance, transparent economic and legal environment [53, p. 17]. The priorities of the state economic strategy are established in accordance with the actual conditions of the functioning of the socio-economic system.

Economic tactics focuses on the implementation of strategic measures, predicting the object's possible response to the measures taken,

monitoring and evaluating their effectiveness, adjusting and developing methods and means of influencing the object of management. Subjects of economic tactics can be state bodies and institutions, as well as non-state institutions that take on separate functions of tactical management. The object is the activity of economic entities, the management of whose development is carried out through indirect influence on economic indicators and performance results, or direct influence directly on their activity. Obviously, the subject and object of economic tactics specify the subject and object of the state's economic strategy.

The management tool for achieving the defined strategic goals at the tactical level is a comprehensive program of economic development of individual industries, regions. It determines the scale, pace, proportions and main directions of the economic development of the region, its individual structural and functional subsystems, and substantiates the system of measures to increase the efficiency of production management, growth in the level and quality of life of the population. The strategy or program for the development of the region or separate industries of the national economy should organically fit into the strategy of economic development of the state and be its integral component.

Sections of the program project are developed in a sequential-parallel way. Therefore, the development of each subsequent section begins before the completion of the development of the previous one, while corrections are made to the content of the previous section if necessary to harmonize it with the following sections. In general, the logical sequence of the program is observed, from the goal to the mechanisms and tools of its achievement, the justification of the necessary resources, means and sources of their acquisition. The structure of the complex program of economic development of the region or a separate industry contains a list of sections that reflect the substantive and functional characteristics of the program project accepted for implementation.

State strategy and tactics are constantly faced with the problems of conflicting interests of various economic entities. Solving these problems is possible by adjusting both economic tactics and economic strategy. Strategy in combination with tactics ensure state management of the functioning and development of the economic system. The formation of the strategy is due to the significant influence of institutional factors, while the tactics are relatively independent, as they directly depend on the specifics of the economic system. In the absence of integration of the

strategy with specific institutional factors of the functioning of the system, the tactics lose their effectiveness together with the economic strategy. Therefore, the economic strategy needs to take into account the objective laws of the development of society, and is limited to economic tactics. On the other hand, the specification of the subject of economic tactics contributes to the incoherence of the actions of individual institutions of state power, when these institutions begin to shift their emphasis to their own interests due to undefined strategic tasks. Therefore, the effective interaction of the state's economic strategy and tactics depends on a transparent institutional and legal framework for the functioning of the economic system.

Economic strategy in connection with economic tactics form the economic policy of the state, which should be understood as the activity of state authorities and management in determining strategic goals, priorities, tasks, tools of economic tactics for their achievement, as well as the application of these tools [53, p. 19]. The directions of the economic policy are closely related to the general directions of the state policy, ensuring the adjustment of the economic strategies of subjects of lower levels when adjusting the goals, priorities, tasks of the state's economic strategy.

The foreign experience of strategic planning at the macroeconomic level involves the formation of strategies for the sustainable development of the national economies of the EU countries and North America. These strategies involve the diagnosis of existing trends in the development of a particular country and planning, which includes the development of an action program, implementation and evaluation of the obtained results, and adjustment of strategies. For example, the national strategy of sustainable socio-economic development of the Republic of Belarus is aimed at:

- assessment of the starting conditions of development in the context of global economic development trends, determination of the main components of the model of sustainable development and requirements for their functioning and interaction, assessment of national resources and socio-economic potential of the country;

- justification of strategic goals, stages and scenarios of the country's transition to sustainable development, determination of the most important directions of the transition of the national economy to sustainable development from its main components;

- definition of a set of financial, economic and socio-political

mechanisms for ensuring sustainable development [123].

Taking into account the world experience, the formation and implementation of the strategy of sustainable economic and social development of Ukraine should include a complex of the following actions:

- analysis of global trends in the socio-economic development of the country;
- formulation of strategic goals and priorities;
- analysis of the country's economic potential;
- development of development strategies in separate socio-economic directions.

According to the Methodological recommendations for drafting strategic plans by public sector enterprises, strategic planning should be understood as a continuous process consisting of four main stages: planning (including strategy development), implementation, evaluation of results and consequences (analysis of the reasons for achieving or not achieving results) and clarification strategy in order to maintain its relevance. The specified model of the strategic cycle can be applied at the national level as well [89].

The analysis of the considered theoretical and methodological approaches to the formation of the national strategy of economic and social development gives reasons to assert that:

- the formation of strategies has a similar methodical basis: at the first stage, a general analysis of development opportunities and threats is carried out, which is the basis for formulating the mission, goals and tasks of development; at the next stages, the mechanisms and tools for the implementation of the defined goals and tasks are specified; the monitoring system for the implementation of the strategy is determined;
- methodological approaches to the formation of sustainable development strategies are often based on the corresponding methodological approaches to the formation of economic and social development strategies, taking into account the relevant factors;
- the absence of a development planning and forecasting system, clearly measurable goals, threats, opportunities, a system of indicators (models) and indicators, ignoring the limitations and needs of development at the final stage leads to the formation of strategies that are rather declarative in nature. Such shortcomings, in particular, are characteristic of Ukrainian development strategies.

Based on the generalization of the existing theoretical approaches to

the formulation of the essence of the strategy, it should be agreed that the majority of scientists characterize it as the main tool for determining the direction of movement of an economic entity towards a certain goal, which combines the assessment of external factors and internal potential. However, the interpretation of the strategy in modern conditions must be complemented by the need to monitor and evaluate the results of the strategy and refine the strategy for the future period.

1.2. Food security as an object of strategic macroeconomic planning

The transformation of socio-economic relations requires the state to formulate and implement an economic development strategy. During the last ten years, the world has been forming a single economic space, the highest point of development of which is the process of globalization. Ukraine's integration into the global economy requires continuous development of its economic potential. A special role in this process is played by the economic strategy, which should be based on food security mechanisms.

Food security occupies a leading place in the economic strategies of the developed countries of the world. At the current stage of development, all world countries with a market economy have a system of guaranteeing food security, which is implemented at a strategic level.

The food security strategy of the state is connected with the corresponding economic strategy and agrarian policy as a set of tools and means of its implementation. The strategy determines the course for the distribution of limited resources to achieve the set goals and objectives. The state policy is the general guidelines for actions and decision-making that ensures the achievement of the goals.

Unlike economically developed countries, Ukraine didn't approve strategic plan or course of action at the legislative level till now, which would guarantee an adequate level of food supply for the population. The legislative and institutional framework for regulating the food market, supporting domestic producers and competitiveness of products is insufficient. The regulatory functions of state authorities in ensuring food security are limited in nature.

The formation of the state's food security strategy must be

connected with the corresponding strategy for the development of the agrarian sector, which should organically fit into the process of forming the model of socio-economic development of Ukraine and be implemented within its economic development strategy and the strategy for the development of the agrarian sector of the economy.

The scientific category "food security" in global practice reflects the state of the world food market, food security of a state or a union of states. The introduction of the "food security" concept into international practice was caused by the problem of food supply associated with the grain crisis in the world in 1972-1973. In 1974, the UN General Assembly officially declared the term "world food security", which meant guaranteeing stability in food markets and availability of basic food products for all countries of the world [210, p. 175-176]. Later, in the 80s of the XX century, food security was reduced not only to ensuring the affordability and stable availability of food in the world, but also the sufficiency of food to enable people to lead an active and healthy lifestyle.

The World Food Council under the United Nations has established a modern approach to defining national food security, which is understood as the policy of the state aimed at achieving the maximum level of self-sufficiency in food by increasing the volume of its production, improving the supply of food products, ensuring the consumption of products by the population, eliminating malnutrition and of hunger [193, p. 269].

According to the materials published by the Food and Agricultural Organization of the United Nations (FAO), food security is the provision of guaranteed access to the population of the world, country, region to food products at any time and in quantities sufficient to maintain an active and healthy lifestyle, due to own production and import of food, the production of which is impossible due to internal resources [220]. The FAO materials contain the most complete and comprehensive definition of food security among international legal acts.

Food security of Ukraine, according to the Law of Ukraine 1877-IV dated 24.06.2004 "On State Support of the Agriculture of Ukraine", is the protection of vital human interests through the state's guarantee of free economic access to food for the purpose of maintaining life.

According to the Draft Law of Ukraine 8370-1 dated 28.04.2011 "On Food Security of Ukraine", food security is the socio-economic and ecological state of the state, in which all its citizens are stably and guaranteed to be provided with food of appropriate quality in the required

quantity and assortment [147].

However, the definitions established by the legislative documents do not mention the possibility of strategic ensuring of the country's food security in the long term, taking into account foreign economic factors.

In the studies of foreign economists, the problem of food security is often considered only at the international level, without taking into account national or regional aspects [136, p. 23]. Food security is defined as the state of the economy, which ensures the achievement of guaranteed access of all residents and at any time to food in the amount necessary for an active healthy life [224, p. 52]. Scientists consider food security as the dependence of the consumption of a person, family, social group on what they can buy to meet their nutritional needs [258, p. 131]. The issues of the essence of food security as an object of strategic planning and ways of solving the problem of its unsatisfactory state have not been fully revealed by foreign specialists. It is explained by the approach to studying this phenomenon at the global level and the failure to take into account the specifics of the formation of strategies for economic development and national agricultural production of separate countries. Therefore, foreign scientists mainly study the issues of food security and food availability on a global scale, focusing mostly on its condition, rather than on the dynamics and influencing factors, and leaving open the issues of national food security and its strategic provision.

Ukrainian scientists tend to characterize food security as the state's ability to guarantee the satisfaction of citizens' food needs under any conditions. In particular, I. Mykhasyuk, A. Melnyk, M. Krupka, Z. Zaloga believe that food security must be guaranteed and sufficiently provide the country's residents with high-quality food products, determines the stability and quality of the nation's gene pool. Food security is determined by such factors as the level of development of Ukrainian agricultural sector and its governmental support, the state of land legislation, forms of ownership and management, as well as the population's ability to pay [91, p. 89].

Food security in the studies of scientists V. Humenny, P. Muzika is interpreted as the degree of provision of the country's population with ecologically clean and healthy food products of domestic production according to scientifically based norms and affordable prices while preserving and improving the living environment [42, p. 134].

Food security is one of the important components of the state economic policy and is manifested in the guaranteed satisfaction of the

last paying demand for food at a level sufficient to ensure the normal physiological and intellectual level of life of the population. The level of food security is considered sufficient if all citizens at any time are provided with physical and economic access to safe and nutritious food products to meet their own food needs for a healthy and active lifestyle [164, p. 254].

Therefore, the works of foreign and domestic scientists quite fully and objectively reflect the essence of food security. The studies disclose its components, trends and features of the current state, approaches to evaluation. Food security is understood as the ability of the agrarian sector of the economy to produce and supply to the domestic market and to the state reserve food products and resources in the necessary assortment, in sufficient quantity and of appropriate quality, taking into account the social structure of the population and its ability to pay, which guarantees the physical and economic availability of food and food independence. At the same time, as noted in the economic literature, for the normal life activity and reproduction of the population, it is necessary to consume high-quality food products, which ensures the necessary level and quality of life. Physical availability means that the country must have food products that are sufficient in terms of their quantitative and qualitative characteristics to meet the paying demand of the population. Economic affordability is related to the level of income and consists in the ability to purchase quality food products in the required quantity. Existing differences in the level of income affect the quality of food, which in turn depends on the purchasing power of the population.

However, to date, there is no definition of food security as an object of strategic planning. It would allow defining directions, justifying long-term goals and developing ways of their implementation, as well as a system for monitoring and evaluating the results of the strategy. To date, there are no approaches and mechanisms for substantiating a comprehensive plan for ensuring food security as a strategic object, as well as defining long-term goals and developing ways to implement them.

Therefore, from the point of view of strategic planning, it is possible to define food security as the location of food production, the organization of market relations and public food reserves in accordance with the existing relative strategic advantages of the country and the formation of such socio-economic relations, under which the whole population of the country will get guaranteed access to food products in quantity and quality that correspond to scientifically based parameters and

medical standards. It is obvious that the strategic planning of food security should be based on a system of indicators and criteria that will allow to form a comprehensive view of the current trends, existing threats, bottlenecks and possible strategic directions for strengthening the food security of the state.

The study of threats to food security is necessary for the further justification of methodical approaches to their assessment and the development of recommendations for minimizing or eliminating their negative impact on maintaining the state food security.

Scientists who researched general theoretical security issues distinguish several degrees of risks and threats that can be taken as a basis for developing scientific and methodical approaches to their assessment when forming a food security strategy:

- the probability of the occurrence of a situation capable of creating danger (appearance of a risk zone);
- provocative actions or means of pressure (challenge);
- the real possibility of a negative development of events, the occurrence of damage (danger);
- intent to cause harm or unintentional dangerous coincidence (threat) [128, p. 156].

Threats to food security can be defined as any negative changes in the factors of the external and internal environment that reduce the level of food security [34, p. 92]. K. Golikova defines threats to food security as a set of factors and conditions of various origins that create a danger to the vital interests of the population and lower the standard of living, disrupt the process of reproduction, cause increased social tension in society and negatively affect the country's global image [36, p. 78].

The classification of threats is the basis for the further formation of a food security strategy and the determination of priority strategic goals and tasks, directions of state support, target programs. They must be reviewed and changed depending on the importance of threats, duration and strength of their impact on food security, which can be detected with reliable and a thorough threat assessment and monitoring system.

According to the Draft Law of Ukraine "On Food Security of Ukraine", the list of main threats to food security include:

- growth of shadowing of the economy, illegal population migration;
- imperfection of organizational and financial provision of state procurement of food and its inefficient use;

- the growth of consumer prices for food at a faster rate than the income of the population;

- critical dependence of the national economy on external market conditions and other factors;

- irrational use of agricultural land;

- significant anthropogenic disturbance and technogenic predominance of the territory of Ukraine, increasing risks of emergency situations, man-made and natural disasters, negative social and ecological consequences of the Chernobyl disaster;

- low control over the import into Ukraine of environmentally hazardous technologies, substances, materials and genetically modified organisms;

- insufficient prevention of the appearance on the territory of the state of animals, plants, microorganisms dangerous for humans, medically and ecologically unjustified use of genetically modified organisms and food products produced with their use [147].

Authors O. Varaksin, I. Ternavska, L. Parkhomenko, I. Manziy, K. Golikova, G. Pruntseva provide a similar and sufficiently diverse classification of threats to food security, according to which they are grouped by classification features [27, p. 43; 36, p. 50; 85, p. 27; 186, p. 82; 154, p. 48].

According to the levels of the hierarchy (economic system), there are external threats, which are caused by the strengthening of globalization processes and their consequences, in particular, the excessive openness of the economy and the imperfection of the state's foreign economic policy and, accordingly, insufficient control of foreign trade in agri-food products. The result of an unfavorable market situation is the growth of exports of agricultural products and food, the increase in saturation of the domestic market with low-quality imported goods and the loss of food independence [186, p. 83; 210, p. 175]. The result of the influence of internal threats is the inability of the state to provide its population with food under any conditions [186, p. 84].

According to the period of action, threats to food security can be one-time, which appear from time to time, discrete, which are characterized by interruptions, and permanent, which exist constantly [36, p. 90].

According to the sphere of occurrence, threats are classified as political, economic, social, legal, military, ecological, informational, criminogenic, and scientific and technical. These threats require

comprehensive research and analysis, as they have a systemic impact on food security [36, p. 91]. The most complete justification of these threats is given in the work of I. Ternavska, L. Parkhomenko [186, p. 84]. Therefore, threats in the economic sphere are manifested in a decrease in the competitiveness of domestic products, the lack of prospects for living and working in rural regions, a decrease in the volume of investments in the agricultural sector, an increase in consumer prices, a reduction in the purchasing power of the population and the volume of food consumption. Social threats consist in the deterioration of the standard of living of the population, the demographic situation, social security, and the growth of social tensions. Political and legal threats are caused by the imperfection of the legislative, legal and regulatory framework of food security, the taxation system, which prevents the development of food production and consumption. Information threats consist of information disproportions, violation of the integrity of the information space, lack of complete and high-quality information on the food security trends. Scientific and technological threats are related to the reduction of governmental funding of innovations and scientific and technological developments, the lagging behind the level of Ukrainian science and technology compared to the developed countries of the world, a decrease in the technological level of agricultural production, a low specific weight of innovations, and the lack of a mechanism for stimulating their development and implementation. Environmental threats are associated with the destruction of the natural environment, agricultural land, non-compliance with the requirements of legislation in the environmental sphere, food safety and quality. Threats in the military sphere arise when the state is involved in international armed conflicts and internal armed clashes [186, p. 85].

Threats according to the probability of realization can be real, which can be realized at any moment, and potential, which can be realized under certain conditions with a certain probability.

Actual threats exist objectively at a given time period or may arise in subsequent time periods. It is possible to warn of such threats only in subsequent periods relative to the reporting period. Potential threats, on the contrary, are determined by the presence of actual threats and can be eliminated in the reporting period [36, p. 96].

According to the level of management, threats are divided into managed, which can be directly influenced by the state, regional authorities, enterprises, citizens, etc., and unmanaged, which cannot be directly affected [36, p. 99].

According to human activity, there are objective threats that do not depend on human activity (natural cataclysms, natural disasters), and subjective threats (for example, inefficient management decisions).

By the possibility of predictability, threats are classified as predictable, which can be predicted and preventive measures can be taken (at the level of the state and supranational associations of states) and unpredictable, for example, caused by adverse weather conditions that require long-term neutralization of the consequences.

By consequences, threats can be general, characteristic of the entire territory of the state, and local.

In terms of the magnitude of the inflicted (expected) damage, the threats are catastrophic, significant, causing difficulties. According to the level of influence threats are weak, moderate and heavy [36, p. 97]. According to the degree of negative impact, they are imbalanced and destructive. By field of manifestation, threats can appear in the field of food supply, in the field of production of agricultural products and food, in the field of economic availability of food, competitiveness of products in terms of price and quality.

According to the level of development of consumption culture, threats are characterized by insufficient, sufficient and high level of development of consumption culture [36, p. 99].

The classification of threats according to external and internal influencing factors is most often used. At the national level, the authors refer to external factors of food security [36, p. 72; 27, p. 43]:

- decrease in the level of development of the agrarian sector of the economy and the food industry;
- insufficient use of innovative technologies;
- low efficiency and investment attractiveness of agricultural enterprises, insufficient financing and material and technical support;
- unfavorable socio-economic situation in the country, the level of purchasing power of the population;
- reduction of the country’s self-sufficiency potential and increase in import dependence;
- underdevelopment of trade and transport infrastructure in the country, national food market;
- adverse environmental situation in the country;
- imperfection of the national economic policy and state regulation, financing of the agricultural sector, tax policy;
- the country’s participation in international food exchange.

External factors of food security include [36, p. 74; 27, p. 44]:

- unfavorable situation in the world food market;
- strengthening of globalization and political instability in the world;
- deterioration of situation in the world agriculture;
- unfavorable environmental situation in the world;
- underdevelopment of the global trade and transport infrastructure;
- insufficiently effective supranational economic policy and regulation.

Food security is formed under the influence of threats. The authors O. Cherevko and O. Yakovenko propose to classify these threats depending on the degree of influence on it at the long-term (strategic) and short-term (tactical) levels. Long-term threats include:

- the growth of population poverty and the number of people who do not have the income to purchase a minimum set of food products;
- the presence of territories whose food supply is impossible through market mechanisms due to external factors;
- nutritional imbalance in terms of individual components, which threatens the health of the nation or individual population groups;
- low food security control;
- inefficient use of the natural, material, technical, financial, scientific and technological potential of the agricultural sector, which leads to a decrease in the level of food supply [201, p. 68].

Short-term threats to food security:

- high dependence of agricultural production on natural disasters, which worsens the food security of the population in the case of their occurrence;
- dependence of the country's food supply with individual food products on imports;
- unstable situation of world food markets;
- excessive openness of the economy and the national market, dependence on currency exchange rate fluctuations;
- unstable foreign economic condition of the country and position in the foreign trade balance in the world, which has negative economic consequences for the agricultural sector and food security [195, p. 69].

N. Stezhko considers the following threats to food security to be the most significant:

- growth in property differentiation of the population and the level of poverty;

- the deformation of the structure of the Ukrainian economy and the increase in imported food on the domestic market;

- strengthening of the unevenness of socio-economic development of the regions. An increase in property differentiation leads to a decrease in the solvent demand for food, and, accordingly, a decrease in its consumption by the population. The import of food and raw materials for its production harms domestic agricultural producers. Irregularity of socio-economic development of Ukrainian regions disrupts the country's single food market, its infrastructure, reduces the reliability of food supply to the population and causes price increases due to excessive logistics costs [177, p. 289].

A group of authors (L. Deyneko, E. Sheludko, O. Zagnii, A. Kovalenko, M. Sychevskyi, I. Romanyuk, T. Kachala) determine the state of food security in the country by a list of existing external and internal threats [178, p. 123]. External threats include:

- loss of traditional sales markets for agricultural raw materials and food products;
- increased dependence on food imports;
- excessive openness of the economy and uncontrolled import of a significant amount of certain types of food;
- entry of Ukraine into international trade and economic zones (organizations);
- increasing the share of imports in the total volume of food resources;
- purposeful policy of individual states to weaken Ukraine's position on the world food market;
- the standard of living in Ukraine significantly lags behind the corresponding indicators in developed countries, which, in particular, negatively affects the nature of export-import operations of economic entities of the food complex of Ukraine;
- low level of use of international standards for product quality assessment in Ukraine.

Internal threats to food security, according to the named authors, include:

- inconsistency and lack of system in the implementation of agrarian reforms;
- instability or lack of legislative and regulatory conditions;
- a significant decrease in agricultural and food industry production volumes;

- the imperfect structure of the foreign economic activity of the country's agrarian sector, focused on the export of raw materials and the import of finished products;
- poorly developed infrastructure of the food complex;
- ineffectiveness of investment processes, payment crisis and ineffectiveness of financial regulation;
- unsatisfactory material and technical base, technical, technological and logical backwardness of the production process in agriculture;
- lack of price parity for agricultural and industrial products;
- insufficient level of subsidization of domestic producers;
- unfavorable natural and climatic conditions;
- low level of knowledge and management experience of the majority of managers of business entities of the food complex regarding the application of international rules of food trade and the legislation of other countries;
- lack of well-established mechanisms of state regulation of food production, distribution and consumption;
- deepening property stratification, lowering the standard of living and solvency demand of the vast majority of the population and certain social groups [178, p. 125].

A number of other authors (O. Chechel, V. Shoyko, V. Kovalyuk, Yu. Vitkovsky and others) provide classifications of threats to food security based on external threats, in particular, related to the growth of economic instability in the world and its consequences, and internal, related to the resource provision of agricultural commodity producers and the state support system. Among the most threats, the authors name the destruction of the economic mechanism. It means the breakdown of the sphere of production and money circulation, the weakening of the credit and banking system, the collapse of the stock market, investment activity, a sharp decrease in the solvent demand of the population and enterprises, the weakening of the tax and budget system, and others. These threats primarily affect the level of food security [28, p. 7; 72; 202, p. 12; 207, p. 115].

The main drawback of the approaches to the classification of threats considered above is the difficulty of their assessment in practice on the basis of relevant information and further monitoring. It happens due to the inconsistency of the system of evaluation indicators with the named possible threats, and insufficient adaptability to the development of a food

security strategy, the formation of strategic goals, tasks and mechanisms state agrarian policy. In view of the conducted research, we will present the systematization of threats to food security in fig. 1.3.

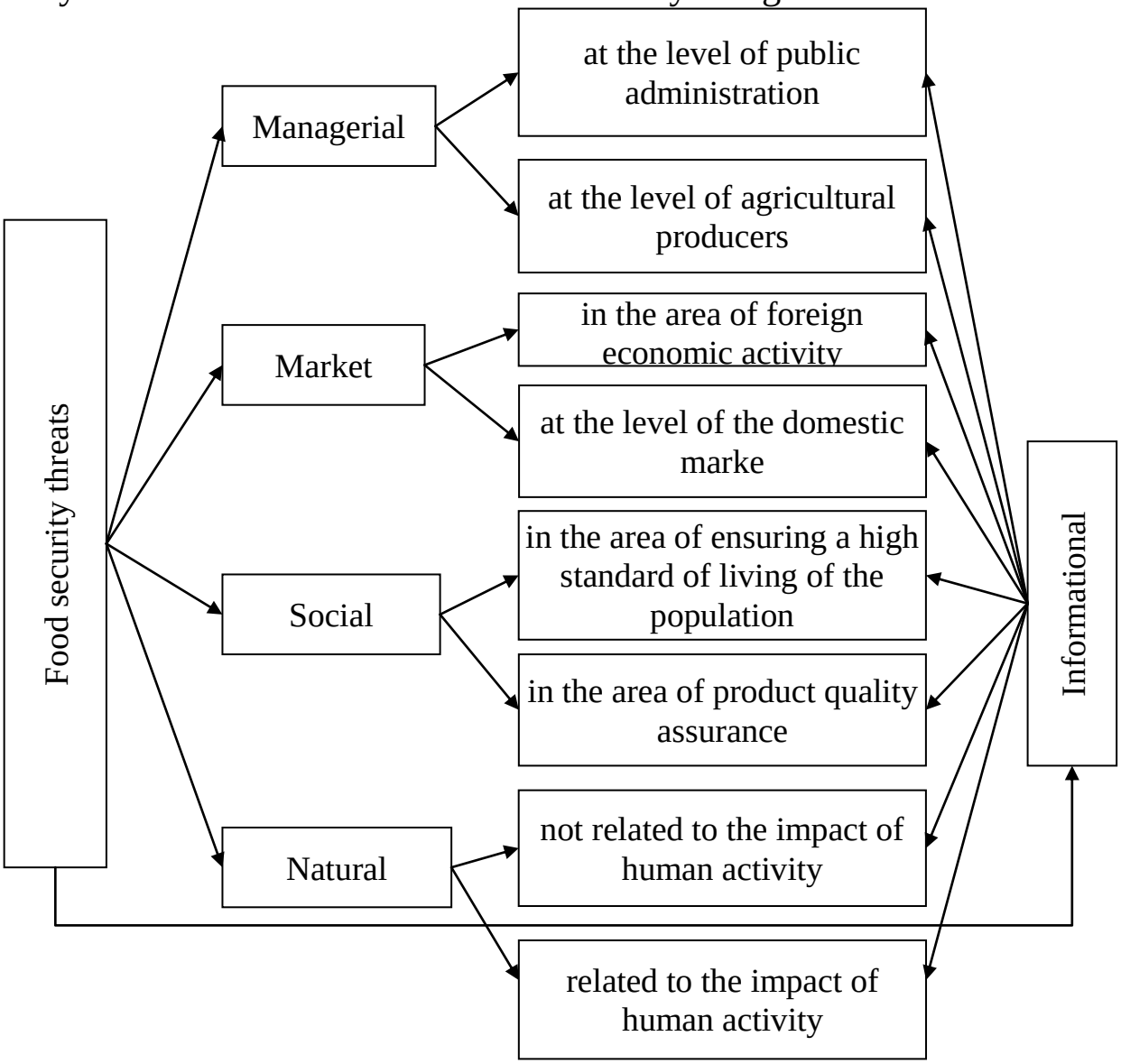


Fig. 1.3 – Threats to food security

Source: developed by the author.

Therefore, according to the developed classification of threats, the most influential management risks of deterioration of food security at the level of public administration include [41, c. 150]:

- lack of governmental methods and mechanisms, principles and approaches of strategic planning and forecasting the development of the food market and food security;

- the instability of state financing of the agricultural sector, the incompleteness of agrarian reforms, the imperfect agrarian policy of the authorities and related inefficient investment processes and financial-budgetary and price regulation;

- the country's dependence on the political and economic stability of importing and exporting countries due to ineffective foreign economic policy;

- low effectiveness of credit and monetary, tax, and customs policies and lack of opportunities for the state to use effective tools for regulating the food market.

The most influential managerial threats to food security at the level of agricultural producers include [41, p. 150]:

- decrease in the level of competitiveness of agricultural products on the domestic and foreign markets due to unsatisfactory material and technical base and technical and technological backwardness of agricultural production;

- instability of the supply of stocks of necessary resources for production, raw materials and food in case of a change in the situation on the foreign and domestic markets;

- increase in costs for labor protection and environmental protection activities due to harmful working conditions, exceeding permissible levels of emissions due to imperfection of equipment or technology, lack of devices, protective structures;

- an increase in the cost of production of products due to an increase in defects due to violations of raw material processing technology, physical and moral wear and tear of equipment, additional payments for urgent work, incomplete use of production capacities and failure to use the effect of the scale of production.

The most influential market threats to food security at the level of foreign economic activity of the country:

- the deterioration of the global price situation for certain Ukrainian export products and the increase in prices for imported food products;

- the imperfect structure of the foreign economic activity of the country's agricultural sector, focused on the export of raw materials and the import of finished products;

- the loss of separate markets for the sale of agricultural raw materials and food, increased dependence on food imports at the interstate level from the member states of the European Community and the growth of food imports;

- excessive openness of the economy and a low level of restriction and control of the import of certain types of food through the customs of Ukraine;

- entry into international trade and economic zones (organizations);

- ineffective governmental agrarian and foreign economic policy, which leads to the weakening of Ukraine's position on the world food market.

The most influential market threats to food security at the level of the domestic market:

- poorly developed infrastructure of the food complex and market infrastructure;
- saturation of the national food market with imported goods and displacement of domestic producers;
- price disparity for food and agricultural raw materials, means of production and services for the agricultural sector;
- lack of an effective pricing mechanism and price control for resources and food;
- imperfect legal framework in the field of regulation of foreign economic activity of agrarian enterprises.

The most influential social threats to food security are concentrated in the area of ensuring a high standard of living of the population:

- the growth of unemployment, the discrepancy between the growth of food prices and the income of the population and, as a result, the low plateau-able demand of the majority of the population and certain social groups for food products;
- a significant lag in the standard of living of the population from the corresponding indicators in the developed countries of the world, which negatively affects the nature of the export-import operations of economic entities of the food complex;
- a significant gap between the standard of living in the village and in the city, unsatisfactory standard of living of the population of rural regions.

The most influential social threats to food security in the area of product quality assurance:

- production of low-quality products by domestic manufacturers due to physical and moral wear and tear of equipment, technology violations, outdated technologies;
- low quality of food products due to insufficient use of international standards of quality assessment at all stages of food supply;
- import of low-quality products due to non-compliance with international quality systems and corruption.

Natural threats to food security not related to the impact of human activity:

- natural threats that involve the possibility of undesirable consequences (soil destruction, loss of crops) from dangerous natural processes and phenomena.

Natural threats to food security related to the influence of human activity:

- man-made threats include the probability of negative consequences from dangerous man-made phenomena, as well as deterioration of the state of the surrounding natural environment due to industrial emissions in the course of economic activity; at the same time, the latter is the field of environmental safety; the reasons may be: force majeure circumstances, physical wear and tear of the equipment, non-compliance of the equipment with the technologies used, violations of technologies;

- agro-ecological threats consist in the probability of irrational distribution of soils, excessive load on a certain part of them, their depletion and loss of fertility due to degradation and, as a result, the impossibility of obtaining high and stable harvests.

Information threats consist in extremely low information provision of market subjects and lack of systematic monitoring of food security in general, lack of an analytical base for threat assessment, insufficiently efficient organization of information interaction of participants in the process of guaranteeing food security. Among the most influential information threats at the level of state administration are: a weak information base, which does not make it possible to identify reserves of raw materials and food production in a timely manner and use them effectively; insufficient level of innovation, lack of an effective mechanism for the introduction of innovations.

At the level of agricultural enterprises, informational threats are the lack of clear accounting and control over the use of resources, raw materials and food, production factors; insufficient information provision regarding the state and dynamics of the market situation and others.

At the level of the state’s foreign economic activity, information threats include the lack of complete, reliable and timely information on the export-import activities of agricultural enterprises. At the level of the domestic market, agricultural producers are not sufficiently provided with information on market infrastructure, price trends, and production volumes.

Among the most important informational threats in the social sphere can be considered insufficient awareness of the population regarding the

range and quality of food, a low level of food consumption culture. Informational threats related to natural threats consist in the lack of information about modern agro-ecological technologies that allow improving the condition of soils, increasing plant productivity, animal productivity with minimal negative impact on food quality.

The conducted research showed that the theoretical foundations of strategic planning of food security do not correspond to the current situation in Ukraine, which is in the conditions of economic transformations and increased external risks. The existing methodological approaches to the formation of a food security strategy do not sufficiently take into account the state and trends of changes in the geo-economic situation in the world, the impact of global globalization processes on the Ukrainian agricultural market, the possibilities of realizing national interests, the country's real and expected reserves in order to minimize the negative impact of threats, challenges and dangers on the national food market. The existing theories, adapted for the conditions of stable economically developed countries and intended mainly for application at the level of enterprises, do not sufficiently take into account the specifics of strategic planning to ensure food security of Ukraine.

The process of strategic planning of food security requires the formation and implementation of an appropriate strategy, which has an important political and social role. Deterioration of the food security of the population leads to the deformation of the processes of political and economic transformations and the creation of threats to the internal security of the country in the conditions of global globalization processes.

1.3. Theoretical foundations of the formation and implementation of the state food security strategy

Nowadays, "Strategy of development for the agrarian sector of economy for the period till 2020" is the main legislative document, which certifies the guarantee of food security of Ukraine as a strategic goal of the development of the agrarian sector and defines the strategic directions of ensuring food security [153]:

- formation of strategic state food reserves;
- increasing the production volumes of domestic agricultural products, taking into account the requirements for ensuring the food

security of Ukraine and the possibility of realizing its export potential;

- ensuring the quality and safety of food products, compliance with the requirements for their production as a result of the improvement of the production certification and standardization system, the implementation of food quality and safety management systems at all processing and food industry enterprises, the creation of a network of laboratories for determining the quality level of agricultural products, delegation to self-regulatory associations on the basis of mutual responsibility of part of the powers to control the compliance of agricultural products with national standards;

- creation of a logistics system, slaughterhouses for livestock and poultry, other components of the market infrastructure for personal peasant and medium-sized farms;

- monitoring and forecasting of the market of agricultural products, responding to market risks.

The need to develop and adopt a national food security strategy, as well as relevant regional strategies, is indicated by the Draft Law of Ukraine dated April 28, 2011 No. 8370-1 “On Food Security of Ukraine” [147]. This legislative act establishes a list of basic principles and tasks in the field of food security formation. However, solving strategic problems related to guaranteeing food security requires a detailed plan, coordinated with the strategic goals and strategic potential of the country. To date, in Ukraine there are no approaches and mechanisms for substantiating a comprehensive plan for ensuring food security as a strategic object, as well as defining long-term goals and developing ways to implement them.

The generalization of studies of foreign experience in the formation of the country’s food security strategy allows us to highlight the following components [126, p. 103]:

- production of a sufficient amount of food;

- programs to support agricultural producers (farmers) through governmental price support programs, crop insurance, loans to agricultural producers;

- purchase of surplus agricultural products from agricultural producers to maintain purchase prices and guarantee the profitability of agricultural producers;

- support of the most vulnerable segments of the population by providing food assistance to pensioners, the unemployed, free meals in schools, etc.;

- focus on quality: creation of a system of food quality and safety

control, adoption of the Law "On Food Security of Ukraine", intensification of efforts not to respond to cases of non-compliance of the quality of food products with regulations, but to prevent them (supervision of imported products, training of officials responsible for product safety nutrition, strengthening the potential of laboratories and implementation of programs that ensure the safety of food products).

In Ukraine, the draft strategy as a whole as a planning governmental document contains the following sections [138]:

- an introduction with a brief justification of the purpose and reasons for developing the document, information about the working group that prepared the draft of the document;
- analytical part;
- a description of the comparative advantages, challenges and risks of the prospective development of the country's food security (based on a SWOT analysis);
- strategic vision-reflection (generalization) of the most general and lasting ideas about the better future of the country's development and the life of its population;
- strategic goals, operational goals and objectives;
- a general description of the strategy implementation mechanisms (a detailed plan of measures for the implementation of the regional strategy for the medium-term period is developed separately, after the approval of the regional strategy);
- compliance of the food security strategy with the "Strategy of development for the agrarian sector of economy";
- a system of monitoring and evaluating the effectiveness of the implementation of the regional development strategy;
- others, selected by the developers, important for the strategy of the position.

This structure of the strategy sufficiently fully reflects the main stages of strategy formation, as well as the mechanisms of its implementation. However, the analysis of researches and publications by specialists on the selected topic has proven that nowadays there are no theoretical and methodological approaches to the formation and implementation of the food security strategy of Ukraine. Strategic food security measures need to be systematized in accordance with those components of the national economy that require their implementation [181, p. 180-182]. The formation and implementation of the food security strategy should be related to strategic priorities, which should be grouped

according to separate directions and strategic goals and objectives (Fig. 1.4).

The national food security strategy should provide for the definition of long-term goals and the development of ways of their implementation. The strategy is developed taking into account the terms and stages of its implementation and includes a set of goals, tasks, principles, measures to achieve the main strategic goal, the necessary means for this [181, p. 185]. The food security strategy is a rationally constructed general direction of the development of the food security system, aimed at achieving certain long-term goals. As a component of the economic development strategy of the state, the food security strategy should [94, p. 92]:

- to determine the characteristics of external and internal threats to food security as a set of conditions and factors that pose a danger to the interests of the individual and the situation in the food sphere;
- determine the criteria and parameters of the trends in the agrarian sector of the economy, which meet the requirements of food security and ensure the protection of the viability of the country and an individual;
- to cover the mechanism of ensuring the country's food security, protection of its livelihood based on the application of economic, legal and administrative measures of influence by state authorities.

In Ukraine, the food security strategy should provide solutions to the issues of increasing the volume of food production, improving the quality of food products and the competitiveness of domestic products, raising the standard of living of the population and sustainable social development of rural areas. Since the problem of food security is complex due to unstable agrarian policy and population income policy, low development of food infrastructure, unbalanced investment priorities, etc., the strategy should reflect the systemic nature of the problem and be the basis for the formation of effective state policy in accordance with the current economic situation in the country and the world [120, p. 130-135].

The process of strategic planning for ensuring food security as a macroeconomic process should be reflected in the form of successive stages: development, implementation and monitoring and evaluation of the effectiveness of results. In practice, it is quite difficult to separate them, because they are closely interconnected, represent different levels of analysis and synthesis, and each of them uses different methodological principles and approaches.

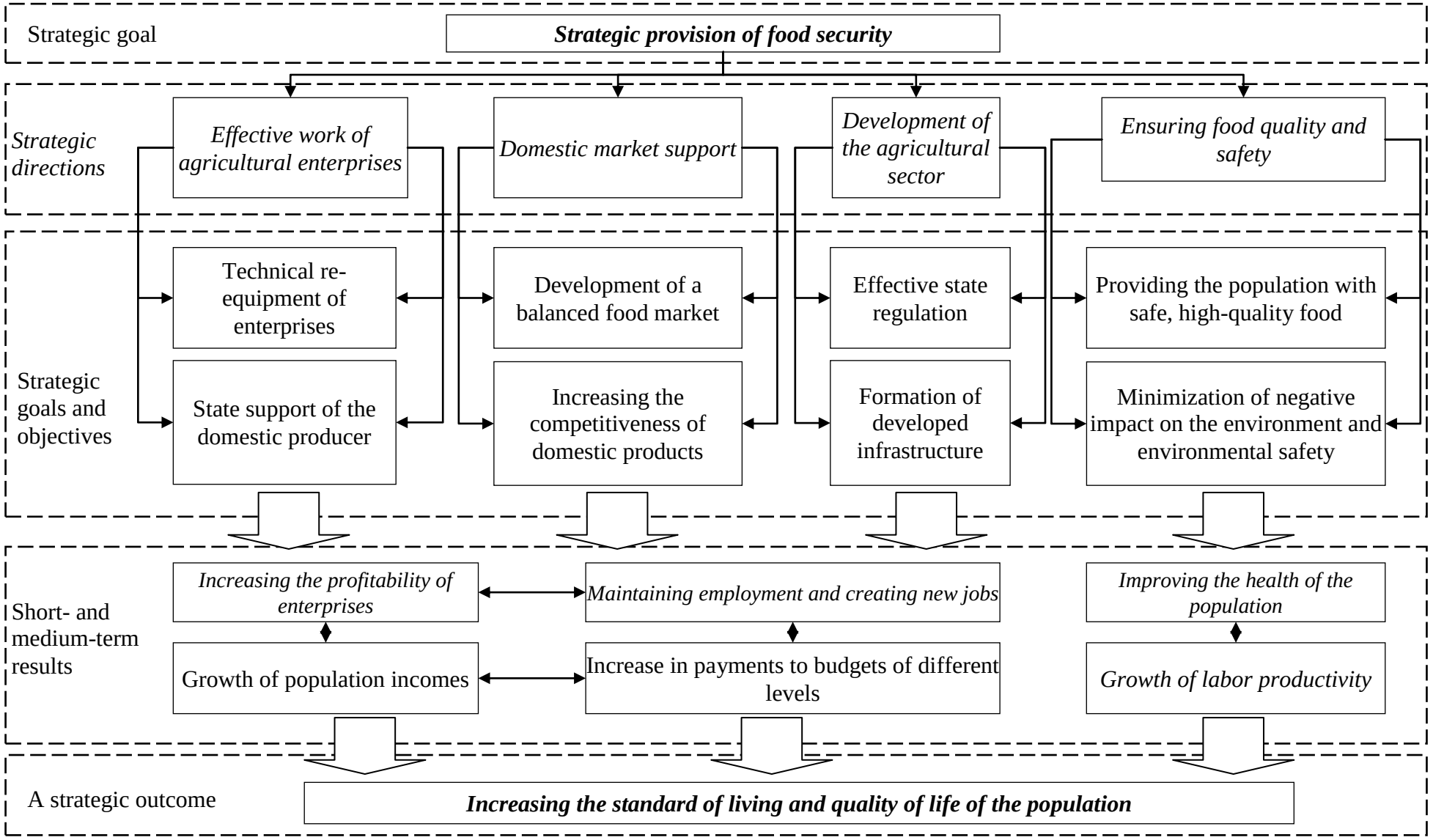


Fig. 1.4 – Interrelation of directions, goals and results of the food security strategy

Source: developed by the author taking into account [93, c. 93; 120, c. 140].

The strategy development stage involves the creation of a general algorithm for achieving strategic goals and objectives. At the next stage, it is refined to a level that adequately specifies the set goals and objectives and substantiates the mechanisms and means of their achievement. The assessment of the effectiveness of the food security strategy involves the analysis and comparison of the obtained results in accordance with the actual strategic alternatives and allows a conclusion to be drawn regarding their suitability for achieving the set goals and objectives [120, p. 137-140].

The goals and objectives of the food security strategy are defined in accordance with the purpose of the food security system, specified according to its qualitative and quantitative criteria for a given period of time and include the development of a balanced food market, increasing the competitiveness of domestic products and supporting the domestic market. Strategic directions for improving the efficiency of agricultural enterprises should ensure their technical re-equipment, an effective system of state support for the domestic producer [89]. Ensuring environmental security, minimizing the negative impact on the environment, and providing high-quality food are important goals and objectives for achieving the required level of food quality and safety for the population.

The development of the agricultural sector of the economy requires effective state regulation and the formation of a developed infrastructure. The planning of goals and objectives involves the formation of policies, programs and projects, regulatory and legal, organizational and coordination planning design to achieve their balance and ensure comprehensive development [181, p. 184]. Short-, medium-, and long-term goals should be determined according to the stages of achieving the main strategic goal of ensuring food security. A prerequisite for strategic planning is the principle of combining goals with different deadlines for the implementation of the corresponding plans, when the achievement of the short-term plan is the beginning of the medium-term plan, and the latter is the basis for the achievement of long-term goals. This principle requires a legally established procedure for determining socio-economic priorities [6, p. 203].

The principle of combining strategic plans with different implementation dates should take into account the specifics of ensuring food security. Thus, short-term goals should be aimed at reproducing the consumption of basic food products at the level of minimum (threshold)

consumption norms, improving the efficiency of enterprises, increasing labor productivity, employment of the population, and improving health. The medium-term goal should be to provide the population with safe, high-quality food, as well as the consumption of basic food products at the level of rational standards. The long-term goals envisage an increase in the level of income of the population and payments to the budget, a decrease in the level of morbidity and an increase in work capacity, the formation of the structure of the state food complex in accordance with the requirements of rational nutrition of citizens, and the realization of the potential of Ukraine as a leading country in the foreign food market. Since the requirements for the level of national food security are increasing in the conditions of globalization, its strategy should ensure the competitiveness of the domestic economy.

The implementation of the food security strategy in practice should be carried out taking into account the assessment of the state of food security on the basis of qualitative indicators and quantitative indicators that are taken into account when developing a system of specific measures and mechanisms. Such a system forms the basis and content of the Ukrainian agrarian policy. The state's food security strategy is interconnected with the corresponding agrarian policy as a means of its implementation. The strategy itself determines the course for the allocation of limited resources to achieve the set goals and objectives, and the policy defines general guidelines for actions and decision-making that facilitate the achievement of goals [181, p. 185]. The formation of the state food security strategy must be interconnected with the strategy for the development of the agrarian sector, which must be consistent with the process of forming a model of socio-economic development of Ukraine and be implemented within its development strategy.

In the period of transition to market relations, the importance of strategic planning and the desire to use its methods at the national level are increasingly being realized. The wide application of strategic planning in the domestic practice of developing strategies for the development of the state economy is restrained by the insufficient level of knowledge about the methods and means of developing strategic plans and their insufficient adaptability to the conditions of the national market and traditional methods of management. This problem also concerns the country's food security.

The generalization of the scientific development in this field of research allows to define the country's food security strategy as a plan to

achieve the level of development of the national economy and the agricultural sector, provided with the necessary resources and potential, in which the population will be guaranteed a stable supply of food in quantity and quality that meet scientifically based parameters and created socio-economic conditions for maintaining consumption in accordance with medical standards, regardless of unfavorable factors in international relations and unfavorable conditions of the global agro-food market.

The need to develop and adopt a national food security strategy, as well as relevant regional strategies, is indicated by the Draft Law of Ukraine dated April 28, 2011 No. 8370-1 "On Food Security of Ukraine" [147]. This legislative act establishes a list of basic principles and tasks in the field of food security formation.

On September 15, 2017, the Government of Ukraine presented the National Report "Sustainable Development Goals: Ukraine", which defines the basic indicators for achieving the Sustainable Development Goals (SDGs). The report presents the results of adaptation of 17 global SDGs taking into account the specifics of national development. According to the mentioned document, guaranteeing food security at the strategic level ensures "Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture" [122].

According to the Procedure for developing regional development strategies and action plans for their implementation, the draft strategy as a planning state document in Ukraine usually contains the main components (Fig. 1.5) [138].

The given list of components is quite comprehensive and can be applied when developing a food security strategy at the state level. However, to date, theoretical and methodological approaches to the formation and implementation of Ukraine's food security strategy do not sufficiently take into account the specifics of the research problem.

In view of the above, it is advisable to propose the components of food security strategies, which should be coordinated with the components of the planning document and formulated in accordance with the most important characteristics of the investigated problems. The proposed structure of the food security strategy is given in the table. 1.1.

The food security strategy should be based on interconnected structural elements: production, internal market, resource potential, and food safety and quality. The use of the specified strategic components will allow to systematize the directions, goals and tasks of the strategy, to conduct an objective assessment of the state of the problem under study,

to identify threats and comparative advantages of the country in the field of food security. All this will make it possible to develop measures to increase the effectiveness of strategic planning, aimed at solving food and related problems, which will subsequently provide an opportunity to increase the effectiveness of the implementation of the strategy and its control.

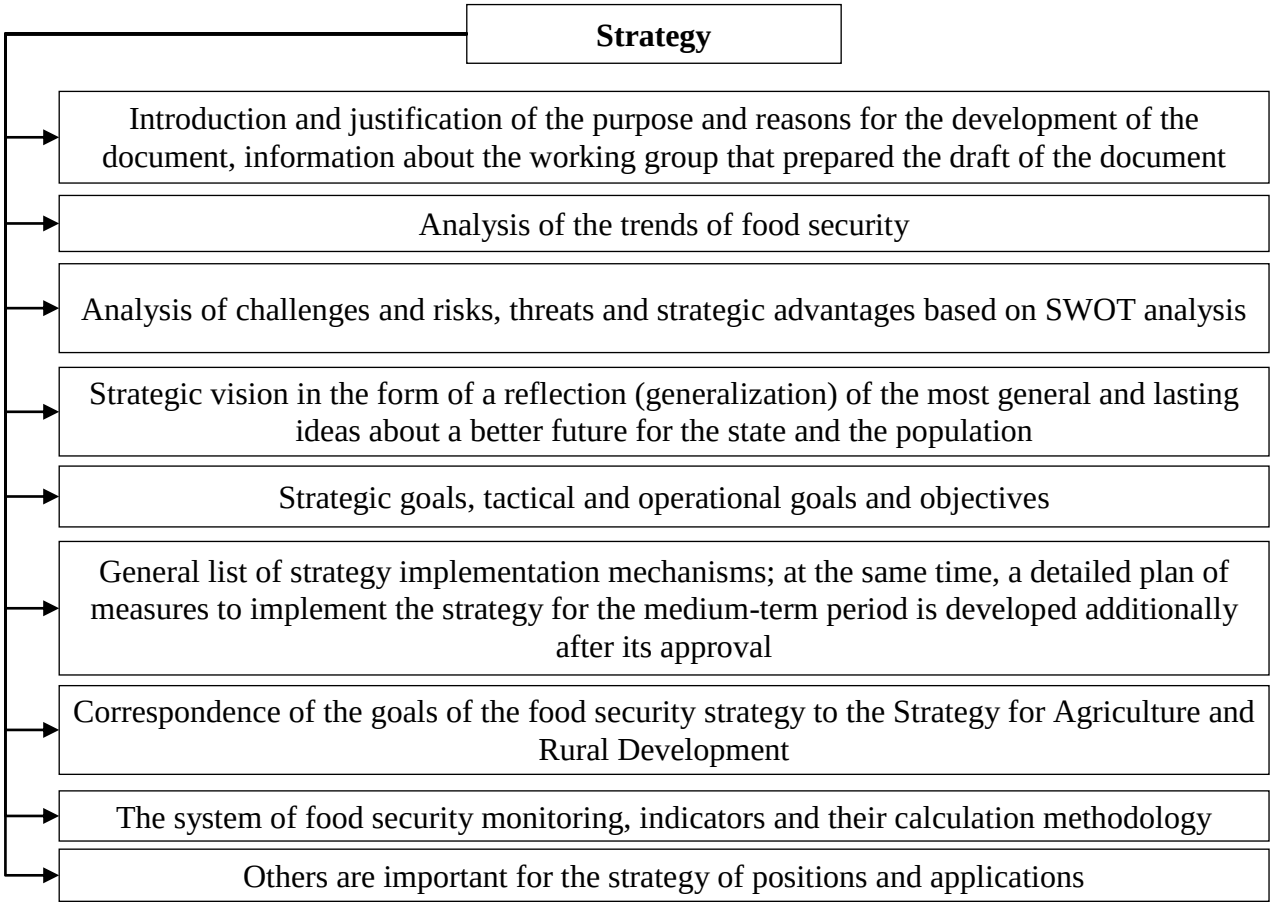


Fig. 1.5 – Components of strategy as a planned governmental document

Source: summarized by the author based on [138].

Therefore, the food security strategy should be based on interconnected structural elements: production, internal market, resource potential, and food safety and quality. The use of the specified strategic components will allow to systematize the directions, goals and tasks of the strategy, to conduct an objective assessment of the trends and problems, to identify threats and comparative advantages of the country in the field of food security. All this will make it possible to develop measures to increase the effectiveness of strategic planning, aimed at solving food and related problems, which will subsequently provide an opportunity to increase the effectiveness of the implementation of the strategy and its control.

Table 1.1 – The structure of the state food security strategy

	Components of strategy as a planning document	Components of food security strategies			
		production	***internal market***	***resource potential***	***food safety and quality***
Food security strategy	*justification of goal and grounds for development*	achieving stability in the work of agricultural enterprises	effective development of internal and external food and raw material trade relations	ensuring food independence	sufficient level of high-quality and balanced nutrition of the country's population
	analytical part	assessment of production and its compliance with internal needs	assessment of dependence of food supply on imports	assessment of the ratio of production and consumption	assessment of food availability, nutritional balance
	comparative advantages (strengths)	land resources	advantage of exports over imports	land resources	regulatory framework for food quality assurance
	challenges (threats)	unsatisfactory condition of machinery and equipment	decrease in the competitiveness of domestic products	unsatisfactory condition of machinery and equipment	weak social policy, increasing poverty
	risks	technological, technogenic risks	political, macroeconomic, trade and economic risks	natural, agroecological risks	technological, social risks
	strategic directions	production, import, storage and sale of food products to the consumer in the volumes necessary to meet the regulatory needs of all social groups of the population	adaptability of the national food system to the fluctuations of the global market situation; balanced development of the national market in the mode of extended reproduction	stable supply of food to the population of all regions of the country is not subject to the influence of natural and climatic conditions	equality of social groups in the ability to purchase products for the formation of a balanced diet of high quality
	strategic goals, medium-term goals and objectives	competitiveness of products; investment attractiveness of agriculture	formation of a stable balance of production and competitive redistribution of food	increasing the efficiency of public procurement, use of the state reserve	food safety and quality; environmental and resource conservation technologies; preservation of the habitat
	mechanisms of strategy implementation	Selection of strategic alternatives (SWOT analysis, PEST analysis, scenario analysis and other methods). Forecasting (forecasts of food consumption and production, forecasts of socio-economic development). Regulatory and legal support (institutions, laws, methodological recommendations). Formation of agrarian policy			
	system of monitoring and evaluating the effectiveness of strategy implementation	Efficiency of production, preservation of the main areas of agricultural specialization and inter-branch proportions	Optimization of the sectoral structure taking into account the conjuncture of world and regional markets	Self-sufficiency in food and raw materials, rational use of resources	Effective satisfaction of the population's needs for food, and production – for raw materials

Source: developed by the author taking into account [15, p. 63; 89; 123].

The goal of the food security strategy for production is to achieve the stability of the work of enterprises in the agrarian sector of the economy. This strategic goal can be conditionally divided into two stages; at the first stage, it is necessary to achieve the required level of food security, at the second stage, the state must maintain the achieved level.

The food security strategy should take into account directions related to the formation of the internal market. The effective development of foreign trade food and raw materials ties is aimed at creating such economic conditions under which the population is guaranteed a stable supply of food regardless of unfavorable conditions in international relations or unfavorable world market trends. This, in turn, involves eliminating dependence on imports and protecting the interests of product manufacturers. Ensuring food independence, which is the main goal of the strategy as a component of the country's resource potential, involves stable domestic production of food products in volumes not less than the established threshold values of their share in the commodity resources of the domestic market.

One of the components of the food security strategy is the safety and quality of food, which should be aimed at achieving a sufficient level of high-quality and balanced nutrition of the country's population.

When forming a food security strategy, the analytical part is of key importance, which is based on the analysis of indicators characterizing each of the components of the proposed structure of the strategy. It is possible to take as a basis the methodology developed by FAO, according to which strategic and tactical approaches to solving the food problem use a special methodological base, which includes food security assessment indicators [226]:

- in the component of the country's resource potential: the ratio of grain stocks to consumption, which allows to determine the levels of food security and guarantees in case of extraordinary circumstances in percentage; the ratio of the volume of temporary stocks of food and fodder grain for the exporting country to domestic consumption in percentage;
- in the production component: growth rates of grain production in percentage compared to the previous year for the period;
- in the internal market component: the ratio of the supply of the exporting country to the total need for grain in percentage; changes in grain production for the importing country; average annual export prices by types of grain.

This methodology should be supplemented with a group of indicators for assessing the availability of food, nutritional balance, which correspond to the component of food security and quality of the population, as well as indicators for other components necessary for the strategic assessment of the level of food security.

An objective assessment of production as a strategic component should take into account production trends and its compliance with internal needs. The assessment of the formation of the internal market should be carried out using a group of indicators of the dependence of the country's food supply and resource provision of the agricultural sector on imported supplies. A group of indicators for assessing the ratio of production and consumption will help to reflect the sufficiency of the country's resource potential for strategic food security.

When developing a strategy, it is advisable to take into account the comparative advantages (strengths) and challenges (threats) of food security identified for each of the components.

Comparative advantages in the production and resource potential of the country include land resources, in the formation of the domestic market – the advantage of exports over imports, in the safety and quality of food – the regulatory and legal framework for ensuring the quality of food, which still needs improvement, but today it is formed at a sufficient level according to existing requirements.

The most significant challenges (threats) for the production and resource potential of the country and its agrarian sector are the unsatisfactory state of technology and equipment, for the formation of the domestic market – a decrease in the competitiveness of domestic products. Weak social policy and growing poverty are obstacles to ensuring the safety and quality of food.

The formation and implementation of a food security strategy is associated with risks. To the risks of ensuring the country's food security for those listed in the table. 1.1 strategic components can be attributed [41, c. 150]:

in production:

- technological risks include the risk of an increase in the cost of production of products in connection with an increase in shortages due to violations of raw material processing technology, physical and moral wear and tear of equipment, additional costs for payment of urgent work, irrational exploitation of production capacities and insufficient use of the effect of the scale of production;

- man-made risks, covering the probability of negative consequences due to dangerous man-made phenomena, as well as the deterioration of the natural environment due to industrial emissions in the course of economic activity. At the same time, the latter is the field of environmental safety. The reasons may be: force majeure circumstances, physical wear and tear of equipment, non-compliance of equipment with the technologies used, violations of technologies;

in the formation of the internal market:

- trade and economic risks, which are caused by adverse changes in the country's economic activity, market conditions, levels of government, etc., and also include resource risk, which is caused by the lack of stocks of raw materials, food and necessary resources for production in the event of changes in supply and demand on foreign and domestic markets;

- political risks associated with the instability of the political system, the activities of the authorities, imperfect agrarian policy, regional problems, the polarization of the interests of social groups, etc., and also include the risk of the country's dependence on the political and economic stability of other importing countries and countries- exporters;

- macroeconomic risks caused by the deterioration of the situation on the world market, a decrease in the prices of certain Ukrainian export products and an increase in the prices of imported food products;

in resource potential:

- natural risks, which predict the probability of undesirable consequences, such as soil destruction, crop loss due to dangerous natural processes and phenomena;

in the field of food safety and quality:

- technological risks, which include the risk of production of low-quality products due to significant physical and moral wear and tear of equipment, violations of technologies and their obsolescence; the risk of increased costs for labor protection and environmental protection activities due to harmful working conditions, exceeding permissible levels of emissions due to imperfection of equipment or technology, lack of devices, protective structures;

- agro-ecological risks, which consist in the probability of irrational distribution of soils, excessive load on them, which can cause the threat of depletion and loss of fertility due to degradation and, as a result, the impossibility of obtaining high and stable harvests;

- social risks caused by the gap between the standard of living in the countryside and in the city.

The strategic directions of food security in production provide for the provision of agricultural sector enterprises with the ability to produce, import, provide storage and sale of food products to consumers in the quantities necessary to meet the regulatory needs of all social groups of the population. For this, it is necessary to implement the following strategic goals in the production component [39, p. 52]:

- stimulation of growth rates of expanded reproduction, as well as investment attractiveness and introduction of innovations in agriculture by optimizing inter-branch economic relations;
- development and implementation of state programs for the development of new technologies, as well as technological modernization, which will contribute to increasing labor productivity and resource conservation;
- stimulating the development of integration and cooperation in the spheres of production, processing and sale of agricultural products;
- improvement of the lending support process to ensure the availability of short-term and long-term loans for the majority of commodity producers.

Strategic directions in the formation of the domestic market should be aimed at increasing the adaptability of the national food system to the fluctuations of the global market situation, balanced development of the national market in the mode of extended reproduction. For this, the following strategic goals must be achieved as part of the formation of the internal market:

- stabilization and formation of pricing mechanisms and pricing policy based on indicative prices for essential goods;
- formation of the necessary measures to realize the resource potential of agricultural enterprises;
- promoting the acceleration of the development of the infrastructure of the internal market;
- formation of measures aimed at creating an efficient food market and a single goods transport network;
- development of measures to regulate the markets of agricultural products, raw materials and food, including purchases for the needs of the state, improvement of the state trade policy, which will contribute to the expansion of demand for domestically produced products.

The main strategic direction of ensuring food security as component of the country’s resource potential is sustainable food supply to the population of all regions, independent of the influence of natural and

climatic conditions. Within this direction, the priority strategic goals are to increase the efficiency of public procurement, use of the state food reserve to maintain food independence.

The strategic direction of the food safety and quality component should take into account the equality of social groups in the ability to purchase products for the formation of a balanced diet of high quality. The creation of socio-economic conditions for increasing access to raw materials and food for each group of the population of our country should include the following strategic goals [39, p. 53]:

- formation of measures to provide targeted assistance to population groups whose income level does not allow them to provide themselves with adequate nutrition;
- development and approval of a system of measures to ensure the safety of food products, including those made from materials and raw materials obtained with the use of genetically modified organisms;
- formation of special requirements for food industry enterprises, as well as the transition to a comprehensive food security system.

Strategy implementation mechanisms for all strategic components involve the selection of strategic alternatives using strategic planning tools, such as SWOT analysis, PEST analysis, scenario analysis, and other methods. When formulating and implementing a strategy, it is worth forecasting, in particular, developing forecasts of food consumption and production, forecasts of socio-economic development. The food security strategy should take into account the forecast of supply and demand for food and agricultural raw materials. Forecasting of supply and demand is carried out on the basis of the annual formation of the balance of demand and supply of agricultural products and food, which includes changes in stocks, own production, imports, exports and domestic consumption. In addition, a necessary prerequisite for the effective implementation of the food security strategy at the strategic level is the improvement of the legal framework for the functioning of agricultural sector enterprises, the formation of agrarian policy, and the creation of the necessary state information resources [39, p. 54].

During the implementation of the food security strategy, it is necessary to carry out a real assessment of the stability of Ukrainian economy to changes in the global markets of food raw materials, as well as to changes of a natural and climatic nature; regularly assess the sustainability of the food security of regions and cities that depend on external food supplies.

Chapter 2

METHODOLOGICAL BASIS OF FORMATION AND IMPLEMENTATION OF STRATEGIES FOR ENSURING FOOD SECURITY OF THE STATE

2.1. Methodical approaches to assessing the level of food security of the state

Solving the issue of food security is a priority of the main tasks of the state. The strategic goal of food security is to reliably provide the country's population with safe and high-quality products. The main strategic goals of ensuring food security are food sufficiency through domestic production and minor imports; stability of food supply throughout the country; availability of food products for all segments of the population; proper quality of food products; rational structure of consumption. At the same time, despite the special role of food security in the socio-economic development of Ukraine, only the level of food self-sufficiency of the country and its regions is taken into account when evaluating it. The existing methods of assessment and analysis do not take into account a number of indicators that reflect the market, economic and social aspects of food policy implementation. The formation of the country's food security strategy should be based on an objective analytical base, the basis of which is methodical support. Therefore, improving information provision and methodical approaches to food security assessment is an urgent task.

The main methods of food security assessment are governmental developments (Methodological recommendations for calculating the level of economic security of Ukraine dated 29.10.2013 No. 1277, Methodology for determining the main indicators of food security dated 05.12.2007 No. 1379 "Some issues of food security", Draft Law of Ukraine dated 28.04.2011 "On Food Security of Ukraine" No. 8370-1), and some individual author's methods [29; 35; 66]. An information base for calculating the main indicators of the food security trends are relevant data from state statistics, in particular, the sale of agricultural products by enterprises and households, indicators of the state of crop and animal

husbandry, receipt of agricultural products at processing enterprises, income and expenses of households, consumption of food products in households, etc.; information of the Ministry of Economic Development, Trade and Agriculture, analytical and consulting agencies, in particular, balances of demand and supply of agricultural products and food, prices and other information.

General methodological approaches to the analysis of the food security trends as one of the components of economic security are outlined in the Methodological recommendations for calculating the level of economic security of Ukraine dated 29.10.2013 No. 1277 (hereinafter – "Methodological recommendations No. 1277"). The assessment of the level of food security in accordance with the specified document is carried out using a system of indicators:

- daily caloric content of food, thousand kcal.;
- the ratio of production and consumption of the main groups of food products, %;
- grain production per person, tons;
- the level of grain stocks at the end of the period, % before consumption;
- the share of sales of imported food products through the trade network of enterprises, % [88].

"Methodological recommendations No. 1277" present the algorithm for calculating indicators and sources of input information. The above indicators do not make it possible to effectively assess the level of food security due to the lack of important components of the economic availability of food for citizens.

The assessment of the food security level is carried out in the Methodology for determining the main indicators of food security dated 05.12.2007 No. 1379 "Some issues of food security" (hereinafter – the "Methodology No. 1379"), which contains the following indicators and their threshold values:

1) the daily energy value of the ration, which is equal to the sum of the products of the mass of products consumed by a person per day, and their energy value. The minimum limit value is 2500 kcal per day, while the daily diet should contain 55% of animal products;

2) adequacy of consumption in terms of the main types of food products, which is calculated as the ratio between the actual consumption of an individual product and its rational norm from a medical point of view;

3) the adequacy of the state food reserves of grain, which is calculated as the ratio between the volumes of the state reserve of grain and the volumes of bread and bread products consumed by the population in terms of grain. According to Art. 9 of the Law of Ukraine "On State Support of Agriculture in Ukraine", the Agrarian Fund creates a state intervention fund to ensure food security, which must exceed 20% of the annual domestic consumption of the product for the previous marketing period. The limit criterion for grain is set at 17%, which corresponds to 60 days of consumption;

4) economic availability of food, which is equal to the share of total food costs in the structure of total household costs. The maximum limit value of the indicator is 60%;

5) differentiation of the cost of food by social groups, which is defined as the ratio of food costs of 20% of households with the highest incomes to food costs of 20% of households with the lowest;

6) the capacity of the domestic market, which is calculated in natural terms by foods and is equal to the multiplication of food product consumption and the average annual population;

7) food independence by foods, which is equal to the ratio of the volume of imports and the capacity of the domestic market in natural terms. The limit maximum criterion is set at the level of 30% [87].

The "Methodology No. 1379" also obliges to conduct an annual assessment of the trends of food security of Ukraine according to the relevant indicators.

However, the considered system of indicators does not allow to objectively assess the real situation in food security in Ukraine, since the indicators of agricultural production and its efficiency are not included in the methodology. There is also no assessment of resource provision of the agricultural sector and import dependence of the country's food supply, which is extremely important for strategic planning. In addition, the sufficiency of the consumption of basic food products is assessed only by compliance with rational norms and energy value, while the balanced diet by types of food origin, which is the basis of a full-fledged diet, is not taken into account. Also, indicators of quality and safety of food products are not provided, which is especially relevant in modern conditions.

The draft Law of Ukraine "On Food Security of Ukraine" No. 8370-1 (hereinafter – Law No. 8370-1) provides a list of eight indicators characterizing the absence or presence of a threat to Ukraine's food security when the actual values of the indicators do not correspond to the

established limit values [147]. Draft Law No. 8370-1 proposes limit values for only three of the eight indicators.

On the basis of a comparative analysis of the indicators presented in the two considered regulatory documents, it can be concluded that only one of them – the indicator of economic availability of foods – is included in both lists in the same wording. The indicator of the level of consumption of foods by the population provided for by Draft Law No. 8370-1 consists of two main indicators given in the Methodology: provision of the diet with the main types of products (minimum permissible criterion – 17 %) and daily energy value of the diet (minimum permissible criterion – 2500 kcal.).

Draft Law No. 8370-1 lacks the main target social indicators of food security (differentiation of the cost of food by social groups and the capacity of the domestic market), which are included in the "Methodology No. 1379". However, the system of indicators of the Draft Law has been expanded with new ones:

- physical availability of food products;
- stability of the food market;
- safety and quality of food products;
- the level of development of the agricultural sector;
- efficiency of use of natural resource potential.

Therefore, one can observe a transition from an emphasis on individual food security (of an individual person) to general (availability of the resource as a whole). According to Draft Law No. 8370-1, in the system of food security indicators of Ukraine, when assessing its threats, special attention is paid to the level of independence of the food market, which is determined by the following indicators:

- food independence of foods (the share of imports in the overall structure of their sale);
- the level of self-sufficiency in foods (sufficiency of their stocks);
- the amount of state food stocks;
- the balance of foreign trade in foods.

The analysis of the food market independence is key in Ukraine's foreign trade in food, because it is based on its criteria, as an exception, that legal restrictions on export and import or other restrictions on ensuring food security are introduced without violating the international legal obligations of the state, in particular WTO norms.

Therefore, on the basis of a critical analysis of Draft Law No. 8370-1, it can be concluded that taking into account the indicators of the food

market and state food reserves are extremely important for the formation of an effective food security strategy. But the list of indicators of the Draft Law No. 8370-1 does not include those that reflect the efficiency of food production and its provision of the country's internal needs. The considered regulatory documents contain methodical approaches to the calculation of indicators and their information sources, which are not sufficiently perfect and require clarification, thorough research and reasoned recommendations.

Scientists hold a somewhat different point of view regarding the determination of indicators of food security and diagnosis of its state in Ukraine.

In the works of a number of domestic scientists, the concept of food security is focused on the definition of a system of criteria and indicators that make it possible to comprehensively characterize its current state, dynamics and trends of change.

When assessing food security, O. Kardash singles out the following blocks of indicators: sufficiency, availability, independence, stability, safety and quality, physical availability, economic availability. The author also suggests distributing the formed set of indicators by each of the indicator blocks [66, p. 194].

Other researchers (V. Vlasov, V. Sabluk, M. Lysak) propose to take into account the following factors to diagnose the trends of food security:

- level and structure of final food consumption;
- the food potential of the agricultural sector and natural resources for agricultural purposes;
- volumes and structure of food export-import in the region, which characterize the interregional aspect of reproduction;
- food quality and safety [29, p. 44].

The conducted research allows us to conclude that the existing methodical approaches to the analysis of the food security in Ukraine are represented by a set of regulatory and legal acts that are not sufficiently coordinated among themselves. Threshold values are not set for all the considered indicators, and there are not even recommended threshold values. The adopted system of indicators does not allow an objective and comprehensive assessment of the state and dynamics of food security, taking into account the tasks of strategic planning and making informed strategic decisions, and therefore cannot be an effective methodical basis for developing a food security strategy. Today, economic science and the legislative framework do not have a single approach to the analysis of the

state of food security. There is also a lack of a system of indicators that would take into account all components of food security: production, market, resources and social aspect.

Therefore, domestic and foreign specialists and lawmakers have made a significant contribution to the formation of methodological foundations for the analysis of the state of food security. However, most of the considered methods in regulatory and legal acts and author's methods leave aside the need for further strategy development based on the analytical base based on existing indicators and indicators.

As a result, the assessment of food security is carried out fragmentarily, it is quite difficult to single out problematic components and outline the priority vectors of strategic planning. Therefore, it is necessary to develop a methodology for analyzing the trends of food security, which will take into account the components of food security strategies and will allow establishing directions of strategic planning that require increased attention, and directions that will form a reliable basis for strengthening the country's food security.

A critical analysis of the existing assessment methods for ensuring the country's food security allows us to provide an author's interpretation of it. According to the developed structure of the food security strategy, it is proposed to systematize the indicators of the strategic level of food security according to four groups (Fig. 2.1).

The first group includes the indicators of the assessment of production trends and its compliance with internal needs, which include:

- food production sufficiency index – the ratio of production volumes to food consumption volumes on average per person;
- optimality index of the food production profitability – the ratio of the actual value of the level of profitability, which is equal to the ratio of the net profit (loss) and costs of the enterprise from the production of a certain food product, to the generally known value of the level of profitability for reproduced production for agriculture (30%);
- labor productivity growth rate in agricultural enterprises – the ratio of the labor productivity indicator in the current and previous year, which is calculated as the ratio of the gross output of agriculture (plant production, animal production) at constant prices in 2010 to the average number of employees employed in agricultural production.

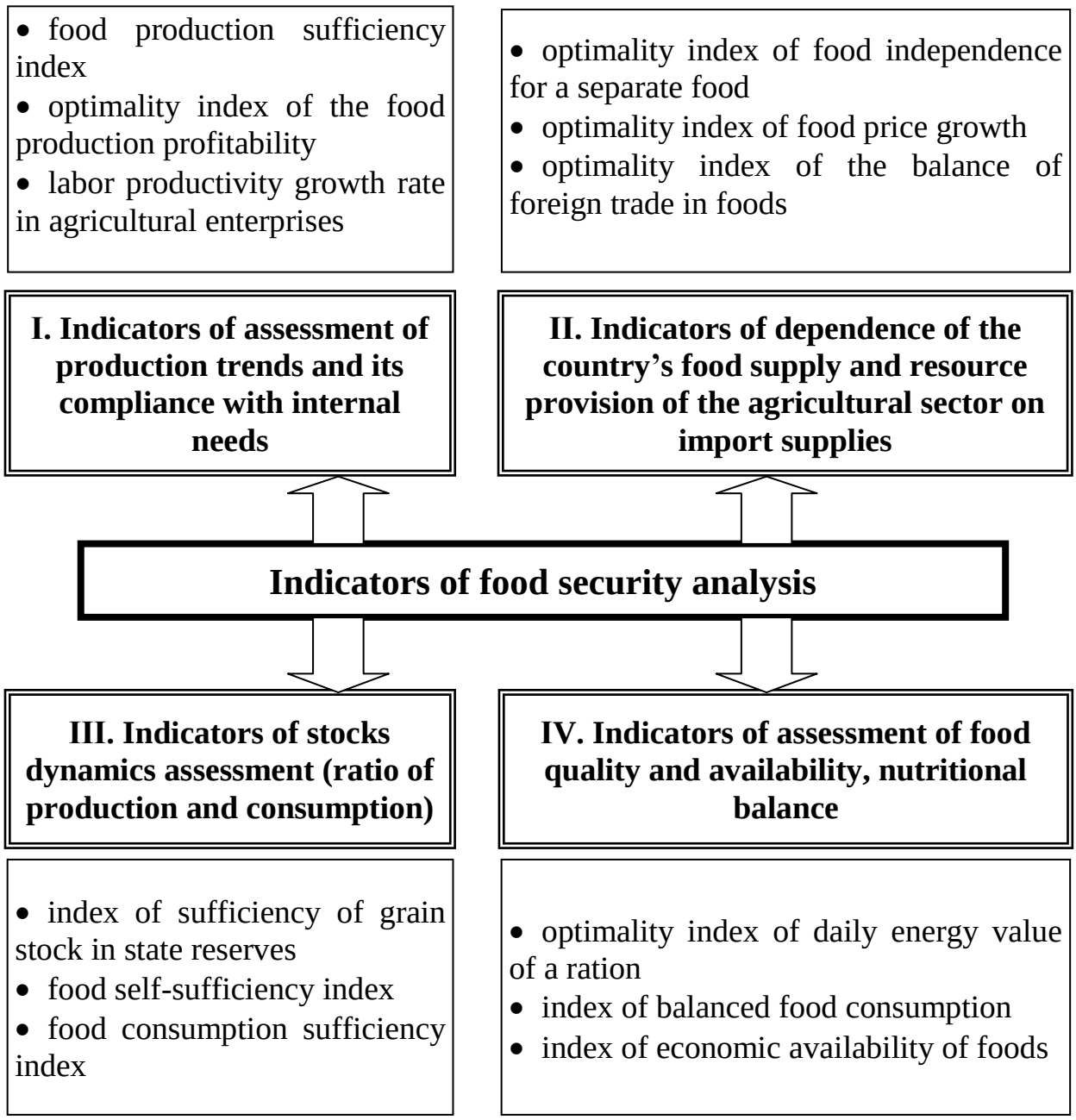
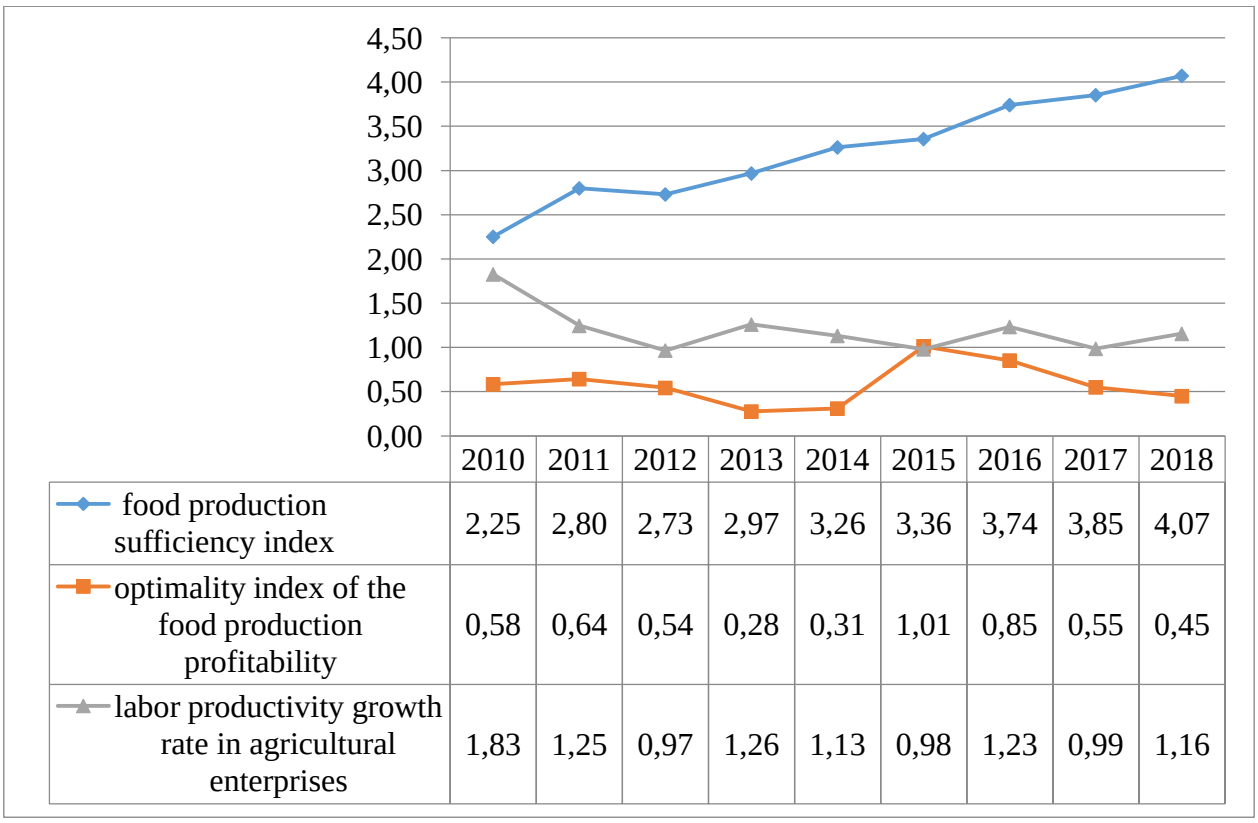


Fig. 2.1 – Indicators of food security analysis

Source: developed by the author taking into account [29; 34; 35; 66; 87; 88; 89].

The food production sufficiency index and the optimality index of the food production profitability are calculated separately for each food, then the arithmetic mean value is calculated for all foods in each period. The growth rate of labor productivity in agricultural enterprises is determined as a whole for the period without distribution by individual foods due to limited analytical information.

In fig. 2.2 illustrates the indicators of assessing the level of food security based on the indicators of the assessment of production trends and its compliance with internal needs.



	2010	2011	2012	2013	2014	2015	2016	2017	2018
food production sufficiency index	2,25	2,80	2,73	2,97	3,26	3,36	3,74	3,85	4,07
optimality index of the food production profitability	0,58	0,64	0,54	0,28	0,31	1,01	0,85	0,55	0,45
labor productivity growth rate in agricultural enterprises	1,83	1,25	0,97	1,26	1,13	0,98	1,23	0,99	1,16

Fig. 2.2 – Results of assessment of the food security level in Ukraine according to indicators of assessment of production trends and its compliance with internal needs

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The second group consists of indicators of the dependence of the country's food supply and resource provision of the agricultural sector on import supplies, which are presented:

- optimality index of food independence for a separate food – the ratio of the limit level of this indicator according to the "Methodology No. 1379" (30%) to the actual value, which is equal to the ratio of imports to the capacity of the domestic market, %;

- optimality index of food price growth – the ratio of the generally accepted normal rate of inflation (no more than 10% per year [61, p. 115]) to its actual value for each product, which is equal to the ratio of the average sales prices of individual products in the current period (years) to similar prices in the previous period;

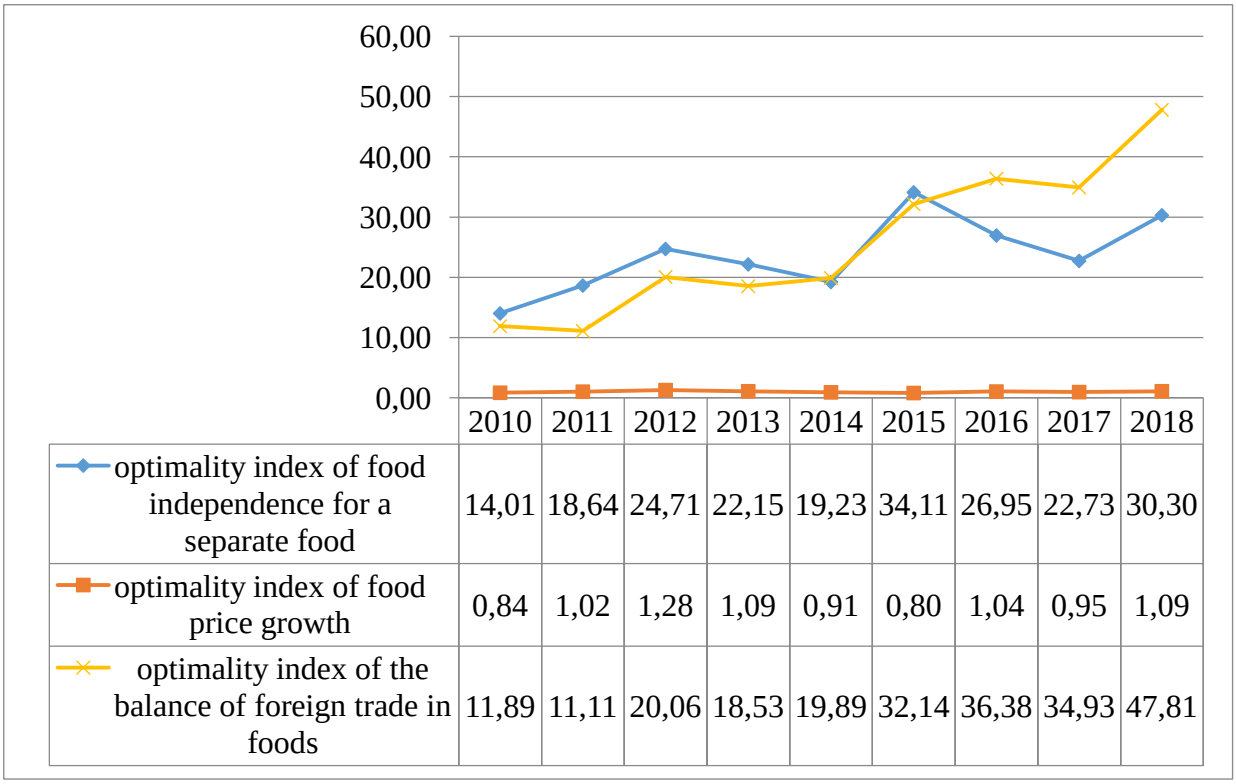
- optimality index of the balance of foreign trade in foods – the ratio of the volume of export to the volume of import of foods to Ukraine, %.

All indices that belong to the considered group are calculated separately for each food product, then the arithmetic mean value for all food products in each period is calculated.

Fig. 2.3 illustrates the indicators of assessing the level of food security based on indicators of the dependence of the country's food supply and resource provision of the agricultural sector on imported supplies.

The third group is indicators of stock dynamics assessment (ratio of production and consumption), which include:

- index of sufficiency of grain stock in state reserves – the ratio of the actual value of the indicator of the adequacy of grain reserves, calculated according to the "Methodology No. 1379", which is equal to the ratio between the amount of food grain in the state reserve and the amount of domestic consumption of bread and bread products by the population in terms of grain, to the legislative fixed amount of the state intervention fund (20%), %;
- food self-sufficiency index – the ratio of production volumes to domestic consumption in the territory of Ukraine, %;
- food consumption sufficiency index – the ratio of the actual level of consumption to scientifically based norms [139; 138] by main groups of foods.



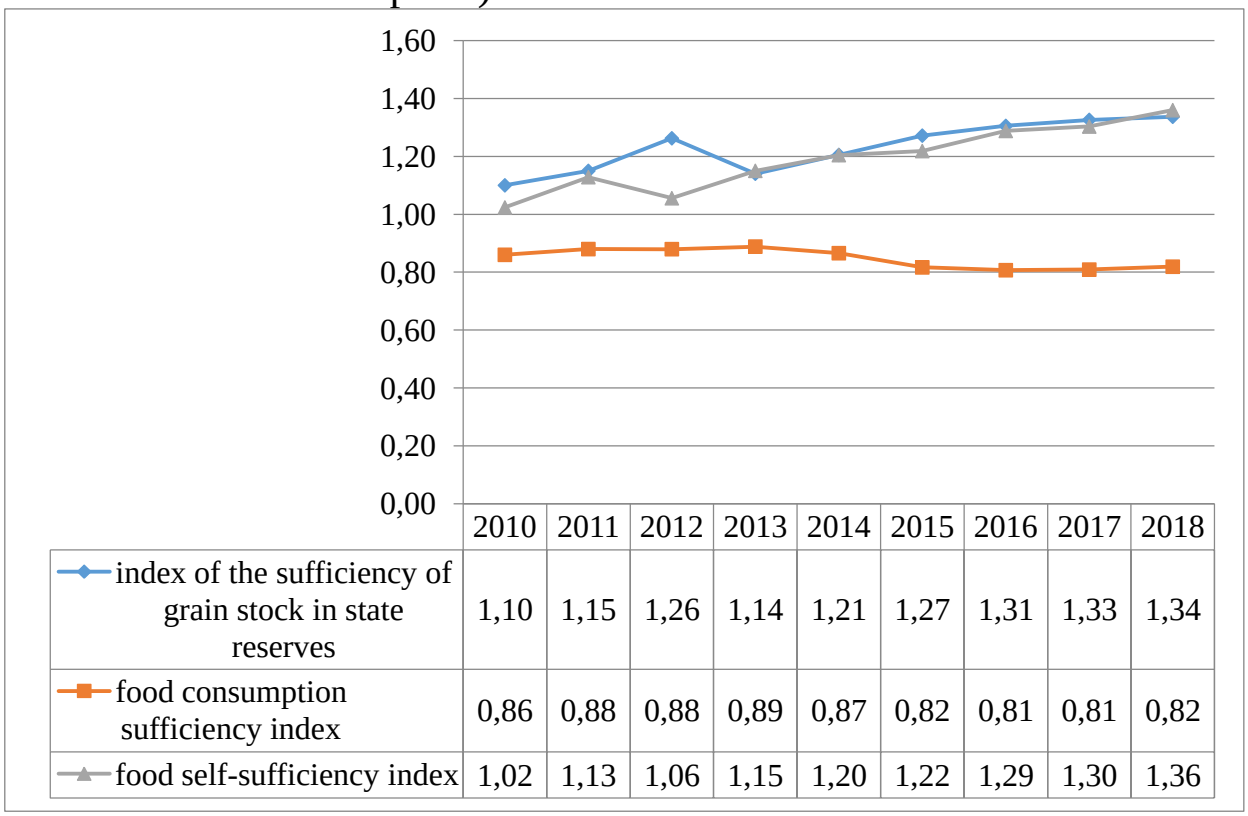
	2010	2011	2012	2013	2014	2015	2016	2017	2018
optimality index of food independence for a separate food	14,01	18,64	24,71	22,15	19,23	34,11	26,95	22,73	30,30
optimality index of food price growth	0,84	1,02	1,28	1,09	0,91	0,80	1,04	0,95	1,09
optimality index of the balance of foreign trade in foods	11,89	11,11	20,06	18,53	19,89	32,14	36,38	34,93	47,81

Fig. 2.3 – Results of assessment of the food security level in Ukraine according to indicators of dependence of the country's food supply and resource provision of the agricultural sector from imported supplies

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The food consumption sufficiency index is calculated separately for each food, then the arithmetic mean value for all foods in each period is determined. The index of sufficiency of grain stock in state reserves is determined as a whole for the period according to the method of calculating this indicator adopted in Ukraine.

In fig. 2.4 illustrates the indicators for assessing the level of food security based on the indicators for stocks dynamics assessment (ratio of production and consumption).



	2010	2011	2012	2013	2014	2015	2016	2017	2018
index of the sufficiency of grain stock in state reserves	1,10	1,15	1,26	1,14	1,21	1,27	1,31	1,33	1,34
food consumption sufficiency index	0,86	0,88	0,88	0,89	0,87	0,82	0,81	0,81	0,82
food self-sufficiency index	1,02	1,13	1,06	1,15	1,20	1,22	1,29	1,30	1,36

Fig. 2.4 – Results of assessment of the food security level in Ukraine according to indicators of stock dynamics assessment (ratio of production and consumption)

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The fourth group includes indicators of assessment of food quality and availability, nutritional balance:

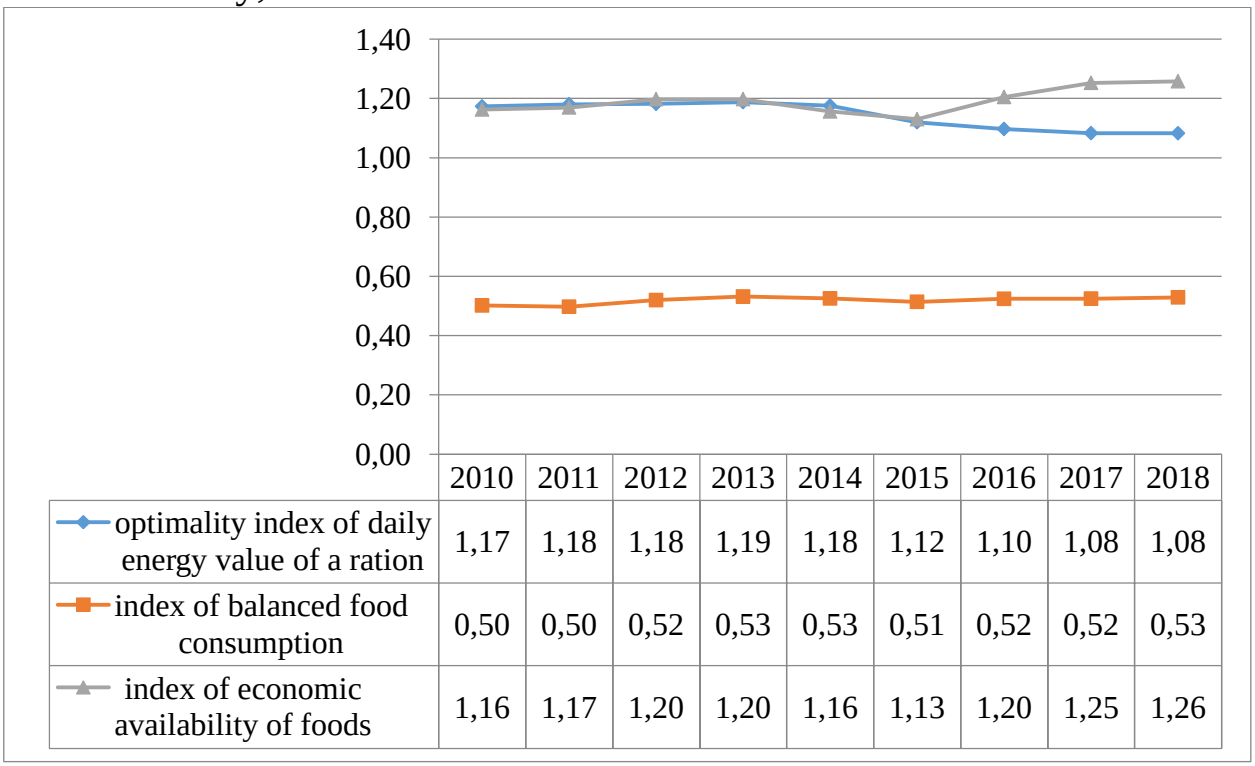
- optimality index of daily energy value of a ration – the ratio of the limit level of this indicator according to the "Methodology No. 1379" (2500 kcal) to the actual value of the indicator according to the "Methodology No. 1379", which is equal to the sum of multiplications of a unit of mass of individual foods consumed by a person during the day, and their energy value;
- index of balanced food consumption – the ratio of the actual value of the share of foods of animal origin in the human diet to the established

normative level of this indicator according to the "Methodology No. 1379" (55%);

- index of economic availability of foods – the ratio of the limit level of this indicator according to the "Methodology No. 1379" (60%) to the actual value, which is equal to the share of the total costs of food in the total amount of the population's costs.

The indices included in this group are calculated as a whole for the period without distribution by separate foods, which is explained by the specifics of their calculation and the existing methodical recommendations.

In fig. 2.5 illustrates the indicators of assessing the level of food security based on the considered indicators of assessment of food quality and availability, nutritional balance.



	2010	2011	2012	2013	2014	2015	2016	2017	2018
optimality index of daily energy value of a ration	1,17	1,18	1,18	1,19	1,18	1,12	1,10	1,08	1,08
index of balanced food consumption	0,50	0,50	0,52	0,53	0,53	0,51	0,52	0,52	0,53
index of economic availability of foods	1,16	1,17	1,20	1,20	1,16	1,13	1,20	1,25	1,26

Fig. 2.5 – Results of assessment of the food security level in Ukraine according to indicators of assessment of food quality and availability, nutritional balance

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The grouping of indicators of the analysis of the state of food security must be carried out for the further localization of identified problems and the concentration of governmental resources in the necessary direction, which will allow to improve the methodological and methodical apparatus of strategy development and increase the effectiveness of its implementation.

It is advisable to present all indicators in the form of a system of relative values (indices) for an objective assessment of food security trends in comparison with their normative values or favorable according to certain criteria. They should have the same dimension for their comparison not only with the optimal or normative value, but also with each other. It is obvious that the value of the indicator equal to or greater than 1 is considered a positive trend, and less than 1 is, accordingly, a negative trend.

We propose to calculate the integral index of the country's food security as the arithmetic mean of the sum of the partial integral indices of each of the four groups of indicators:

$$I = \frac{I_1 + I_2 + I_3 + I_4}{4}, \quad (1)$$

where I – integral index of food security; I_1 – integral index of production trends and its compliance with internal needs; I_2 – integral index of dependence of the country's food supply and resource provision of the agricultural sector on import supplies; I_3 – integral index of stocks dynamics assessment (ratio of production and consumption); I_4 – integral index of food quality and availability, nutritional balance.

Partial integral indices I_1, I_2, I_3, I_4 accordingly, we will calculate it as the average arithmetic value of all indicators of the group. The results of evaluating the level of food security according to the author's methodology are presented in table. 2.1.

The first group includes the indicators of assessment of production trends and its compliance with internal needs. The given calculations indicate that agricultural production in the country is able to ensure solvent consumption (at its current level) at least twice as much. It is worth noting the increase in the level of profitability of production in 2015, which is associated with the increase in prices for agricultural products. However, according to the results of research by scientists of the Institute of Agrarian Economics, the statistical indicators of the level of profitability of agriculture are overestimated by about a third due to the lack of revaluation of the fixed assets of agricultural enterprises, and by another 20% due to the assessment of unfinished production in prices of previous years (2010-2015). That is, the level of profitability is approximately twice the actual level, which takes into account the mentioned factors of underestimation of costs and low cost [81].

Table 2.1 – Level of food security of Ukraine

Indicator	2010	2011	2012	2013	2014	2015	2016	2017	2018	2018 to 2010
I. Indicators of assessment of production trends and its compliance with internal needs										
food production sufficiency index	2,25	2,80	2,73	2,97	3,26	3,36	3,74	3,85	4,04	1,80
optimality index of the food production profitability	0,58	0,64	0,54	0,28	0,31	1,01	0,85	0,55	0,45	0,77
labor productivity growth rate in agricultural enterprises	1,83	1,25	0,97	1,26	1,13	0,98	1,23	0,99	1,16	0,63
Integral index I_1	**1,55**	**1,56**	**1,41**	**1,50**	**1,57**	**1,78**	**1,94**	**1,80**	**1,88**	**1,21**
II. Indicators of dependence of the country's food supply and resource provision of the agricultural sector on import supplies										
optimality index of food independence for a separate food	14,01	18,64	24,71	22,15	20,05	34,07	26,91	22,69	28,11	2,01
optimality index of food price growth	0,84	1,02	1,28	1,09	0,91	0,80	1,04	0,95	1,09	1,29
optimality index of the balance of foreign trade in foods	11,89	11,11	20,06	18,53	19,89	32,14	36,38	34,93	47,81	4,02
Integral index I_2	**8,92**	**10,26**	**15,35**	**13,92**	**13,62**	**22,33**	**21,44**	**19,52**	**25,67**	**2,88**
III. Indicators of stocks dynamics assessment (ratio of production and consumption)										
index of the sufficiency of grain stock in state reserves	1,10	1,15	1,26	1,14	1,21	1,27	1,31	1,33	1,34	1,22
food self-sufficiency index	1,02	1,13	1,06	1,15	1,20	1,22	1,29	1,30	1,36	1,33
food consumption sufficiency index	0,86	0,88	0,88	0,89	0,87	0,82	0,81	0,81	0,80	0,93
Integral index I_3	**0,99**	**1,05**	**1,07**	**1,06**	**1,09**	**1,10**	**1,13**	**1,15**	**1,16**	**1,17**
IV. Indicators of assessment of food quality and availability, nutritional balance										
optimality index of daily energy value of a ration	1,17	1,18	1,18	1,19	1,18	1,12	1,10	1,08	1,08	0,92
index of balanced food consumption	0,50	0,50	0,52	0,53	0,53	0,51	0,52	0,52	0,53	1,05
index of economic availability of foods	1,16	1,17	1,20	1,20	1,16	1,13	1,20	1,25	1,26	1,08
Integral index I_4	**0,95**	**0,95**	**0,97**	**0,97**	**0,95**	**0,92**	**0,94**	**0,95**	**0,96**	**1,01**
Integral index of food security I	**3,10**	**3,45**	**4,70**	**4,36**	**4,31**	**6,54**	**6,37**	**5,85**	**7,42**	**2,39**

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Evidence of the deepening of crisis phenomena in the economy in general and in the agricultural sector is the drop in the level of profitability in 2016-2018. Labor productivity, which is low compared to other sectors of the economy and lower than the average in Ukraine, the level of wages in agricultural enterprises does not allow to realize their production potential and develop the industry in a strategic perspective, which negatively affects the state of food security.

The second group consists of indicators of dependence of the country's food supply and resource provision of the agricultural sector on imported supplies. Analysis of indicators from table 2.1 shows that high inflation is a problem for Ukraine, which affects the cost of food. However, a positive trend is shown by food independence by individual product and the balance of foreign trade in food products, which significantly exceed the normative values.

Therefore, the international criterion for food independence is a 20% level, exceeding which is considered a threat to Ukrainian food security [15, p. 26]. According to the "Methodology No. 1379", its 30% level is considered the maximum threshold criterion for food independence for a single product [87]. The actual value of this indicator in Ukraine in 2018 was 11.74% in the average for the main groups of food products. However, more than 90% of the domestic market is supplied with domestic products. The balance of foreign trade in food products is considered positive when exports exceed imports. In Ukraine, this excess was approximately 48 times in 2018. Therefore, when forming a food security strategy, it is necessary to take into account the strengths of the country's food market.

The assessment of the dynamics of stocks (ratio of production and consumption) according to the indicators of the third group proves the insufficient level of consumption of food products by Ukrainian population, which does not meet medical standards of nutrition. At the same time, the country's food self-sufficiency and the amount of the state food reserve are sufficient to maintain the normal nutrition of the population. The development of the state's food security strategy should also include reforming the governmental social policy, ensuring the availability of food products and a balanced food basket for all segments of the population.

The fourth group contains indicators for assessing the quality and availability of food, nutritional balance. According to the calculations, the most critical is the balanced index of food consumption, according to

which the population of Ukraine has an irrational food structure. Since the established trend worsens during the analyzed period, and the integral index I_4 has a value less than 1, strategic priorities should be directed at solving the problems of food quality and availability, balanced nutrition of the country's population.

Fig. 2.6 shows the dynamics of the integral index of the state of food security of Ukraine. The integrated index of food security (I) for 2010-2018 increased approximately 2 times (from 3.10 to 7.42), which is generally a positive trend. These changes occurred mainly due to the growth of the integral index I_2 and indicators from its composition, in particular, the optimality of the balance of foreign trade in food products by almost 3 times.

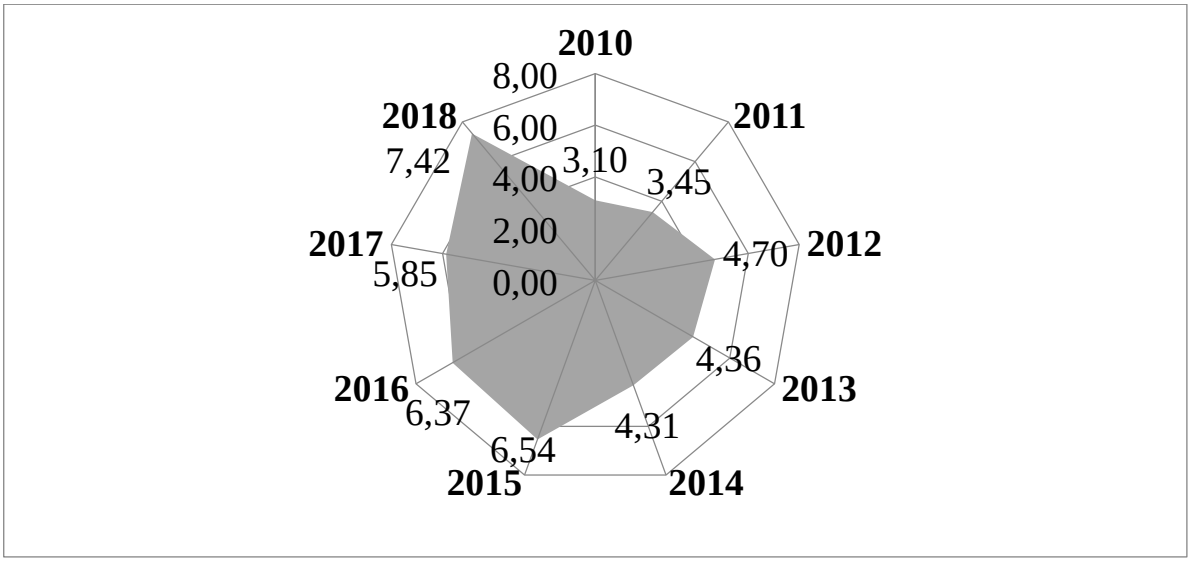


Fig. 2.6 – Dynamics of the integral index of food security of Ukraine

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

However, not all partial integral indices have an upward trend. The integral index I_4, which characterizes the quality and availability of food, nutritional balance, decreased by 3% in the reporting period. Having analyzed separate partial indices for each group of indicators of the proposed methodology, in further studies it is necessary to identify weaknesses in the formation of Ukraine's food security, which require the development of priority strategic tasks.

Assessment of food security according to the indicated groups of indicators is an analytical component of strategy formation. The approval of the normative values of indicators of all groups in the strategy and the development of an appropriate plan for its implementation can be considered the initial stage in achieving food security. It is clear that the implementation of the food security strategy will require additional state

support for the production of foods, which will additionally benefit the enterprises of the agrarian sector of the economy.

The implementation of an information system for monitoring food security will allow to provide state authorities with comprehensive, relevant, timely, objective information about the food security trends in the country, as well as trends in the development of the agricultural sector, quality control systems and food security, to form a methodological basis for a comprehensive formation and analysis of indicators of resource provision and economic activity of economic entities, market intermediaries, food supply of the population, develop a forecast and strategy of food security.

2.2. Theoretical and methodological principles of strategic analysis of the state food security

The period of transition to market relations calls for ever-growing realization of the importance of strategic planning with a search for applying its methods at the national level. Widespread use of strategic planning, employed nationally when devising strategies for the development of state economy management, is hindered by inadequate level of knowledge about the methods and tools for the development of strategic plans, as well as their limited adaptability to the conditions of national market. A given problem also applies to the country's food security.

Theoretical and methodological aspects of strategic planning were addressed in numerous scientific studies. The works by Ukrainian and foreign authors in the field of strategic planning and strategic management, which in detail highlight regularities of formation, the features of methodology, and the logic of evolution of strategic planning and management, include studies by R. L. Ackoff, H. Mintzberg, P. Doyle, A. Thompson, A. J. Strickland, and others. However, methodological approaches and the implementation of strategy of the country's food security require further research and improvement.

At present, there are a large number of scientific approaches to defining a methodology for strategic planning, and this very term refers to a set of specialized methods, principles and rules for making management decisions aimed at achieving long-term goals of the examined object,

improving its competitiveness, creating the base for successful and persistent development [79, p. 432–434].

The methods and tools for strategic planning of food security are advisable to group according to such stages as the analysis of environment, definition of the mission and goals, the choice of strategy and basic scenarios, development of strategy, implementation of the strategy, evaluation and control over the implementation of the strategy. When substantiating the application of a method or a tool, one should take into consideration the specificity of food security, which is characterized by the dependence on a number of factors.

One of the most important stages in the formation of a food security strategy is considered to be a strategic analysis of the external and internal environment, since its methodical substantiation affects the efficiency of further strategic, tactical and operational measures and managerial activities.

At the stage of strategic analysis of the environment, the most common method is the SWOT-analysis, which is a classic tool for strategic planning of development of enterprises and makes it possible to determine the cause of efficient or inefficient activity of the examined object and establish appropriate directions in strategy depending on the results of analysis.

SWOT-analysis has been recently successfully applied at the national level. It is a brief analysis of external information, based on which a conclusion is drawn about the direction in which the examined object must evolve, and resources are allocated for the areas of activity. The result of the analysis is the development of a strategy or a hypothesis for further verification. The classic SWOT analysis implies determining the strengths and weaknesses of the object's activity, potential external threats and favorable opportunities, as well as their evaluation relative to strategically important goals and objectives [190, p. 96]. The result of planning is a SWOT-matrix, the matrix of opportunities and the matrix of threats.

Investigating the possibilities of applying a SWOT analysis as a strategic management tool at the general economic level, at the level of agricultural sector of the economy, including an analysis of the state of food security, was addressed in the scientific work of national experts.

In particular, the study by S. Khalatur reveals the state of the agri-industrial complex of Ukraine under conditions of a global food problem, and reports the SWOT analysis conducted in order to specify potential

internal advantages, internal shortcomings, potential external opportunities, and potential external threats [199, p. 115]. The author provided general recommendations on further development of the agri-food industry sector in Ukraine. However, methodological and analytical capabilities of the tool of a SWOT-analysis for the evaluation of country's food security and for the development of strategic directions regarding its implementation require deeper research.

In the paper of O. Varaksina, the SWOT-analysis of the food security in Ukraine was conducted using a classic algorithm of a given technique [23, p. 167]. The author identified the strengths and weaknesses, threats and opportunities of food security, however, given the results of the analysis, he failed to construct the matrix of strategies and appropriate strategic directions for strengthening food security through the substantiation of strategic planning.

O. Skidan, in a study on the creation of regional agricultural policy of food security, performed a SWOT-analysis of the current state of food security in the region [169, p. 5]. The scientist, however, while substantiating the practical aspects of running a SWOT-analysis of food security, did not take into consideration strategic directions for ensuring a high level of food security at the national level based on the results of the strategic analysis.

Therefore, it should be noted that SWOT analysis as a tool of strategic analysis and planning of food security is of interest to scientists who study a given problem. There are no, however, at present any substantiated scientific approaches to the strategic analysis of food security using a SWOT-analysis, which would be based on the quantitative evaluation of strengths and weaknesses, threats and opportunities by employing a system of characteristics and indicators and would account for their changes in dynamic, and which would make it possible to form appropriate strategies taking into consideration the results of the conducted analysis in order to establish optimal strategic priorities and further effective allocation of resources when creating and implementing the strategies of food security.

We shall proceed to the consideration of the developed procedure of SWOT-analysis of the country's food security (fig. 2.7).

Therefore, the first stage of the algorithm implies conducting a strategic analysis.

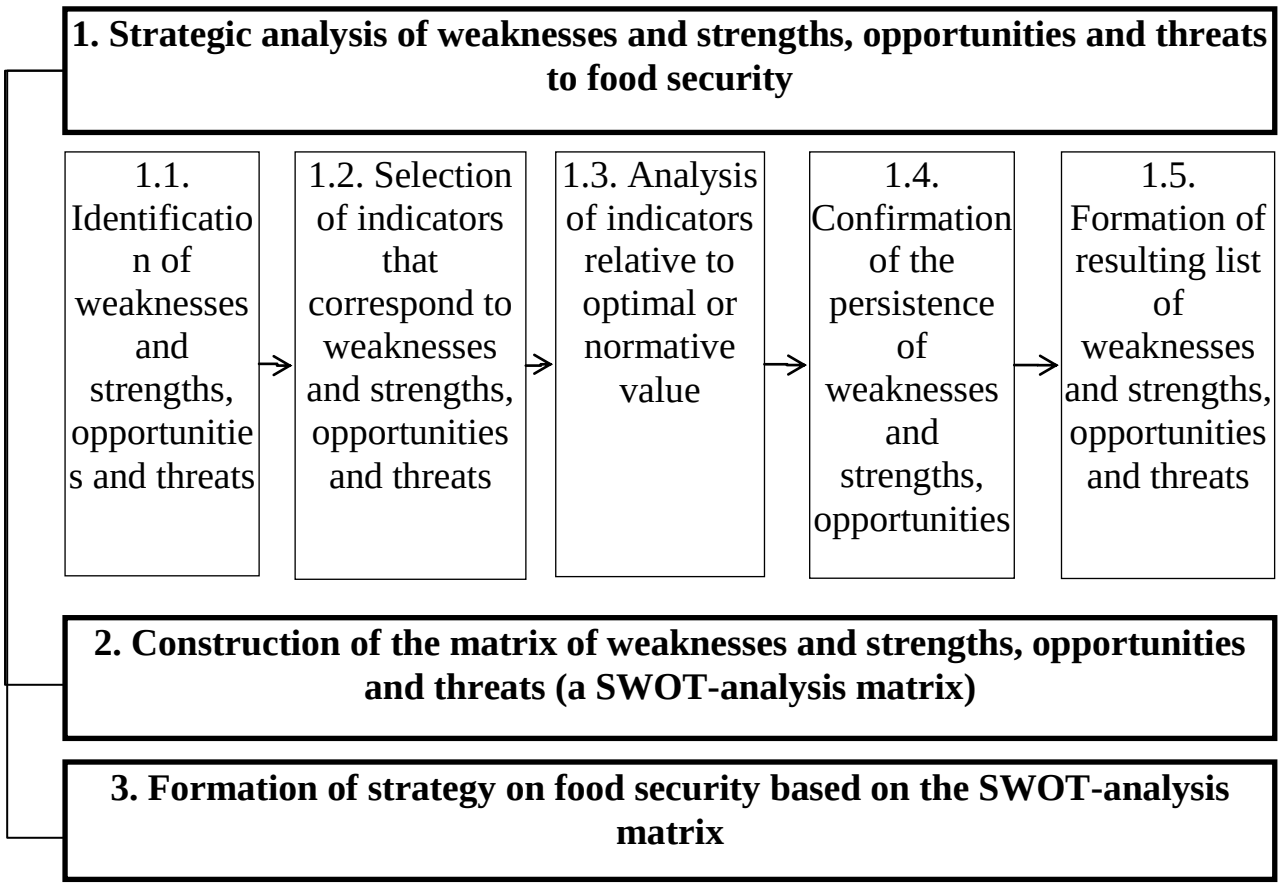


Fig. 2.7 – Algorithm for SWOT analysis of food security

Source: developed by the author taking into account [6; 17; 24; 27; 44; 181; 204].

We shall start by making up a list of characteristics for the strategic analysis of food security in order to subsequently relate the specified characteristics to strengths or weaknesses, threats and opportunities. The characteristics will be matched with specific indicators whose estimation will be based on the open analytical information [45]. Characteristics with the indicators are advisable to categorize in groups [94, p. 97]:

1. A group of indicators of strategic analysis of agricultural production. This group will include those characteristics that are associated with the analysis of trends in production, production capacity of the sector, and its prospects for investment, for example:

- Sufficient production of food products (production sufficiency index);
- Profitability of agriculture (profitability level optimality index);
- Productivity at agricultural enterprises (rate of growth in labor productivity in agriculture).

2. A group of indicators of the strategic analysis of the agricultural market characterizes the conditions under which the country's food supply occurs, trends in foreign trade in food products and their impact on the state of the agricultural sector:

- Food independence (food independence optimality index);
- Rise in prices for agricultural products (price rise optimality index);
- Balance of foreign trade in food commodities (trade balance optimality index).

3. A group of indicators of strategic analysis of agricultural sector resources. This group is to include those characteristics that make it possible to estimate food supplies, and to provide the agricultural sector with means of production, labor and other resources, such as

- Sufficient grain reserve in the state resources (index of stock sufficiency);
- Self-sufficiency of food products (food self-reliance index);
- Sufficiency of food product consumption (consumption sufficiency index).

4. Group of indicators of strategic analysis of food consumption. This group might include those characteristics that indicate the availability of food and its quality, balanced nutrition, labor wages in the country, the state of land use, in particular:

- Economic affordability of food products (index of economic affordability of food products)
- Balanced food consumption (consumption balance index);
- Daily nutritional energy value (daily nutritional energy value optimality index).

Those strategic groups of indicators that can be attributed to external opportunities or threats are advisable to categorize as follows.

1. Groups of indicators of strategic analysis of agricultural production:

- Investment attractiveness of the agrarian sector of economy (the level of profitability of investments into agricultural production, the growth rate of capital investment, the growth rate of foreign direct investment, etc.);
- Attractiveness of the agricultural sector for employees (the ratio of wage in agriculture to the total average monthly salary in the country);
- Production of staple food products (the mean arithmetic growth rate of the volume of food production);
- The volume of production in agriculture (growth rate of production output);
- Production potential of the agricultural industry (the mean arithmetic growth rate of yield, livestock productivity, etc.).

2. Groups of indicators of strategic analysis of the agricultural market:

- Foreign trade in food products (the mean arithmetic growth rate of import and export of products).

3. Groups of indicators of strategic analysis of agricultural sector resources:

- Availability of basic means of agricultural production (the mean arithmetic growth of availability of agricultural machines per 10 thousand hectares, new capacities, quantity of livestock, sown areas);
- Production costs of agricultural products (optimality index of production costs of agricultural products);
- Availability of employees in agriculture (the growth rate of the number of employees in agriculture).

4. Groups of indicators of strategic analysis of food consumption:

- Environmental consequences of land use (the mean arithmetic growth rate of fertilization, re-cultivated soil);
- The structure of land use (land use balance index);
- The unemployment rate in the country (optimality index of the rate of unemployment growth)
- The level of labor remuneration (index of real wages in the country, the ratio of wages in agriculture to the total average monthly salary in the country, and other).

There will be conducted a comparative analysis for each indicator against the optimal or normative value. As a result, indicators will be presented in the form of a system of relative magnitudes in order to obtain an objective assessment of trends in food security in comparison with the regulatory values or those favorable by certain criteria. All indicators will be of the same dimensionality to ensure that they can be compared not only with the optimal or normative values, but also against each other.

Therefore, the value of the indicator for the last year of the examined period that is equal to or greater than 1, reflects the positive trend and will be attributed to strengths, and that less than 1, accordingly, negative, and thereby will be attributed to weaknesses. As a result, based on the obtained information, we shall construct a matrix of strengths and weaknesses, threats and opportunities.

To increase the effectiveness of strategic analysis, it is necessary not only to establish strengths and weaknesses at the time of conducting the analysis, but also to examine trends of the mentioned aspects in dynamics. For this purpose, it is proposed to verify the persistence of the identified

strengths and weaknesses, based on which, the persistent strengths and weaknesses will include only those that will be characterized, accordingly, by retaining a positive and a negative trend in a change in the indicator over the examined period. Similarly confirmed is the persistence of the specified threats and opportunities.

Figure 2.8 shows a structure of the improved matrix of SWOT-analysis on food security.

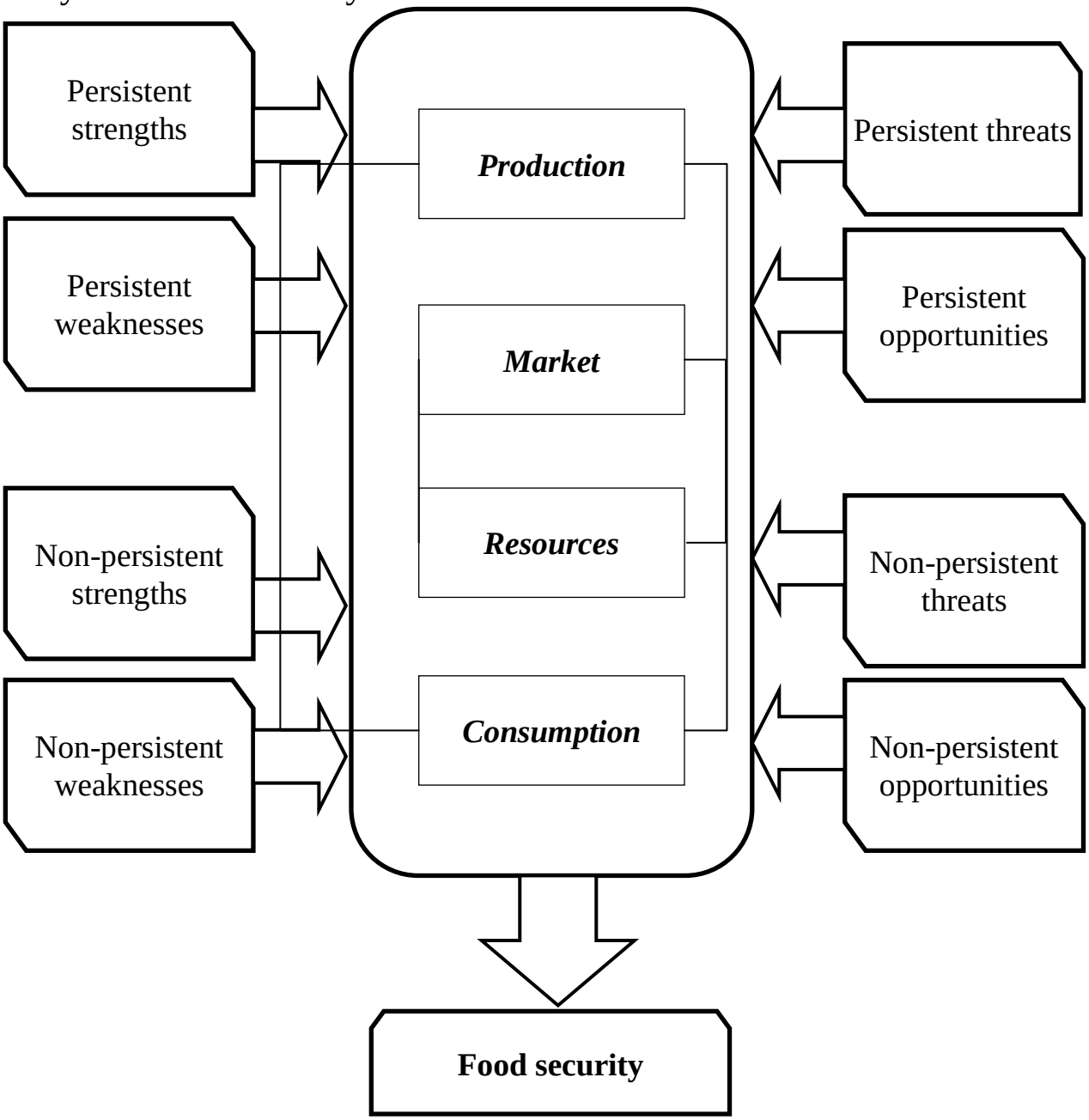


Fig. 2.8 – Logical structure of the improved food security SWOT analysis matrix

Source: developed by the author taking into account [89; 90].

Distinguishing between persistent and non-persistent strengths and weaknesses is required in order to set strategic priorities and further effective resource allocation when developing a strategy. Persistent

strengths will form the main strategic advantages that will support weaknesses and eliminate threats.

Persistent weaknesses require priority strategic measures aimed at their eradication, that is, to start with converting them into the non-persistent weaknesses, and subsequently – into the non-persistent strengths.

Non-persistent strengths must be the focus of attention as supporting strategic advantages, which are subsequently necessary to stabilize and maintain at the persistent level.

Non-persistent weaknesses have to be transformed into non-persistent strengths provided the effective strategic measures are put in place.

Therefore, the block of strategic analysis of the internal environment of food security implies identifying the strengths and weaknesses and establishing their persistence. Maximum attention must be paid to persistent weaknesses, increased attention is to be paid to the non-persistent weaknesses, while non-persistent strengths will require supporting measures whose intensity will depend on specific strategic priorities of the state policy in the agrarian, trade and social fields. Persistent strengths should be used for the implementation of other measures in the strategy of food security.

Strategic analysis of the external environment of food security implies assessment of the threats and opportunities in order to establish their persistence. The specified components are external relative to food security, but at the level of the state they are to be managed. Persistent opportunities should be considered as the main factor that in the strategic perspective will exert a positive impact on supporting the level of food security at the appropriate level and will help prevent the threats. When developing a strategy, and in the course of strategic planning of food security, it is appropriate, in order to enhance its level, to utilize both persistent opportunities and persistent strengths.

Persistent threats require increased attention and maximum concentration of state resources to minimize their negative impact on the level of food security.

Non-persistent opportunities should be taken into consideration in the course of strategic planning with respect to the uncertainty of the external environment, by introducing to the strategy for food security separate measures that would strengthen the non-persistent opportunities.

Non-persistent threats under conditions of effective management

have to be converted into non-persistent opportunities, or form the basis for the development of a block of strategic measures in order to neutralize and protect food security and factors on which it directly depends.

It is possible to conclude that the block of strategic analysis of external environment of food security includes the assessment of threats and opportunities and establishes their persistence. Maximum attention should be paid to persistent threats and to developing measures to neutralize their impact, increased attention is to paid to the non-persistent threats. Persistent and non-persistent threats must be converted into opportunities for food security and become the source of its further strengthening. Non-persistent opportunities should be backed up by appropriate supporting strategic measures related to the state regulation of agricultural, foreign trade, social policy. Persistent opportunities require strategic measures aimed at their maximum implementation in the long term.

Next, it is necessary to construct an expanded matrix of weaknesses and strengths, opportunities and threats (matrix of SWOT-analysis of food security). A traditional matrix includes a resulting list of the strengths, weaknesses, opportunities and threats, which will additionally specify the indicated persistent strengths and weaknesses, as well as the opportunities and threats. In addition to the existing approach, the improved matrix of SWOT-analysis on food security implies the construction of the indicated main elements relative to the specified basic strategic groups: production, market, resources consumption.

We shall proceed to the consideration of practical aspects of the examined development. First, we shall demonstrate the implementation of the proposed procedure of strategic analysis of food security using the strengths and weaknesses as an example. Results of calculations are given in Table 2.2. Strategic analysis of the opportunities and threats to food security will be performed in a similar fashion (Table 2.3).

The next stage of strategic analysis is the assessment of dynamics of strengths, weaknesses, threats and opportunities of food security for the further confirmation of their persistence. For this purpose, based on the performed analysis (Table 2.2 and Table 2.3), we shall group separately the strengths and weaknesses with a positive and a negative dynamic over the examined period. Similarly analyzed are the detected threats and opportunities. Results of systematization are given in Table 2.4.

Table 2.2 – Indicators for the strategic analysis of food security and their further categorization into strengths or weaknesses

Strategic groups	Indicators	2011	2012	2013	2014	2015	2016	2017	2018
Production	Production sufficiency index	2.799	2.731	2.968	3.262	3.357	3.741	3.853	4.043
	Profitability level optimality index	0.643	0.543	0.277	0.310	1.013	0.853	0.550	0.450
	Rate of growth in labor productivity in agriculture	1.245	0.966	1.260	1.132	0.980	1.233	0.986	1.155
Market	Food independence optimality index	18.638	24.715	22.150	20.053	34.067	26.908	22.690	28.110
	Price rise optimality index	1.018	1.282	1.087	0.910	0.797	1.043	0.947	1.089
	Trade balance optimality index	11.111	20.060	18.528	19.892	32.137	36.382	34.931	47.815
Resources	Index of stock sufficiency	1.150	1.263	1.140	1.205	1.272	1.305	1.326	1.337
	Food self-sufficiency index	1.128	1.055	1.150	1.204	1.218	1.288	1.303	1.360
	Food self-reliance index	0.880	0.879	0.888	0.866	0.816	0.807	0.809	0.797
Consumption	Index of economic affordability of food products	1.170	1.198	1.198	1.156	1.130	1.205	1.253	1.258
	Consumption balance index	0.497	0.519	0.532	0.525	0.514	0.524	0.525	0.529
	Daily nutritional energy value optimality index	1.180	1.182	1.188	1.176	1.120	1.097	1.083	1.082

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Table 2.3 – Indicators for the strategic analysis of food security and their further categorization into opportunities and threats

Strategic groups	Indicators	2011	2012	2013	2014	2015	2016	2017	2018
Production	Level of profitability of investments into agricultural production	1.513	1.400	0.801	1.165	3.490	1.599	1.258	1.456
	Growth rate of capital investments	1.477	1.143	0.977	0.986	1.594	1.694	1.277	1.026
	Growth rate of direct foreign investments	1.074	1.008	0.990	1.066	0.794	0.814	1.167	1.061
	Ratio of wage in agriculture to the total average monthly salary in the country	0.680	0.670	0.695	0.711	0.749	1.222	1.021	0.034
	Mean arithmetic growth rate of the volume of production of foodstuffs	1.134	1.016	0.968	1.082	0.917	0.956	1.090	1.022
	Mean arithmetic growth rate of the volume of food production	1.339	1.033	1.173	1.209	1.466	1.257	1.354	1.457
	Mean arithmetic growth rate of crop yield	1.230	0.985	1.119	1.041	0.995	0.895	0.960	0.978
	Mean arithmetic growth rate of productivity	1.038	1.034	1.008	0.991	0.987	0.875	0.985	0.478
Market	Mean arithmetic growth rate of food products import	0.945	1.059	1.056	0.760	0.597	1.269	1.118	1.140
	Mean arithmetic growth rate of food products export	1.023	1.727	0.993	1.193	1.115	1.097	1.057	1.010
Resources	Mean arithmetic growth rate of availability of agricultural machines per 10 thousand hectares of soil	0.870	0.957	1.057	0.935	0.974	0.985	0.458	0.789
	Mean arithmetic growth rate of new capacities	1.457	19.861	1.331	1.770	0.396	0.458	0.859	0.745
	Mean arithmetic growth rate of livestock population	0.991	1.029	1.022	0.879	0.966	0.746	0.746	0.986
	Growth rate of sown areas	1.027	1.005	1.019	0.962	0.988	0.986	0.456	0.789
	Optimality index of production costs of agricultural products	0.887	0.950	1.044	0.706	0.719	0.697	0.458	0.488
	Growth rate of the number of employees in agriculture	0.980	0.984	0.932	0.912	0.929	0.987	0.893	0.945
Consumption	Mean arithmetic growth rate of fertilization	1.151	1.056	1.094	0.986	0.971	0.896	0.986	0.893
	Optimality index of the growth rate of unemployment	1.002	1.053	1.027	0.785	1.022	0.960	0.980	1.070
	Index of real wages in the country	1.087	1.144	1.082	0.935	0.798	0.458	0.890	0.788
	Ratio of wage in agriculture to the total average monthly salary in the country	0.680	0.670	0.695	0.711	0.749	0.786	0.983	0.743
	Mean arithmetic growth rate of the area of re-cultivated soil	1.235	1.475	1.173	0.492	0.833	0.695	0.789	0.865
	Land use balance index	0.615	0.614	0.613	0.613	0.612	0.697	0.589	0.650

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Table 2.4 – List of strengths and weaknesses, threats and opportunities of food security and the confirmation of their persistence

Strengths	**Strengths with a positive dynamic**
Sufficient production of food products Profitability of agriculture Food independence Self-sufficiency of food products Balance of foreign trade in food commodities Economic affordability of food products Daily nutritional energy value Sufficient grain reserves in the state resources	Sufficient production of food products Food independence Self-sufficiency of food products Balance of foreign trade in food commodities Sufficient grain reserves in the state resources
Weaknesses	**Weaknesses with a negative dynamic**
Balanced food consumption Price indices for agricultural products Sufficiency of food products consumption Labor productivity at agricultural enterprises	Balanced food consumption Sufficiency of food products consumption
Opportunities	**Opportunities with a positive dynamic**
Investment attractiveness of the agrarian sector of economy Volume of production in agriculture Unemployment rate in the country Foreign trade in food products	Volume of production in agriculture
Threats	**Threats with a negative dynamic**
Investment attractiveness of the agrarian sector of economy Attractiveness of the agricultural sector for workers Availability of employees in agriculture Production potential of the agricultural industry Availability of basic means of agricultural production Availability of livestock at agricultural production Sown areas of agricultural crops Production costs of agricultural products Production of staple food products Influence of fertilization on the condition of soil and product quality Level of labor remuneration in the country Level of labor remuneration in agriculture Environmental consequences of land use Structure of land use Foreign trade in food products	Attractiveness of the agricultural sector for workers Availability of employees in agriculture Level of labor remuneration in agriculture

Source: developed by the author.

Next, we shall construct the improved matrix of SWOT-analysis of food security, which will include the resulting list of strengths, weaknesses, opportunities and threats in the context of basic strategic

groups (production, market, resources, consumption) (Table 2.5, Table 2.6).

Table 2.5 – Improved matrix of SWOT-analysis of the country's food security (strategic analysis of strengths and weaknesses)

Groups of indicators	Production	Market	Resources	Consumption
Persistent strengths	Sufficient production of food products	Food independence. Balance of foreign trade in food commodities.	Self-sufficiency of food products. Sufficient grain reserves in the state resources.	
Persistent weaknesses				Balanced food consumption. Sufficiency of food products consumption.
Non-persistent strengths	Profitability of agriculture			Economic affordability of food products. Daily nutritional energy value.
Non-persistent weaknesses	Productivity at agricultural enterprises	Rise in prices for agricultural products		

Source: developed by the author

Strategic directions for improving the level of food security in accordance with the results of the analysis are advisable to develop in terms of strategic groups depending on the persistence of the identified strengths, weaknesses, opportunities and threats.

Therefore, based on the strategic analysis of the persistent strengths, we identified main competitive advantages that the country's food security has, and which should be strengthened at the national level. These include the sufficiency of food production, food independence, balance of foreign trade in foodstuffs, self-sufficiency with food products, the sufficiency of grain reserves in the state resources. Therefore, the main strategic directions that must become the foundation of the sustainable level of food security are the following: increasing the volume of production,

maintaining constant volumes of imported foodstuffs, control over foreign trade policy in order to keep the optimum ratio of export and import, improvement of market infrastructure, implementation of the effective policy for managing state reserves. It should be noted that, based on the data of analysis, the indicated characteristics require only supportive strategic measures and control, rather than fundamental changes.

Table 2.6 – Advanced matrix of SWOT-analysis of the country's food security (strategic analysis of opportunities and threats)

Groups of indicators	Production	Market	Resources	Consumption
Persistent strengths	Volume of production in agriculture			
Persistent weaknesses	Attractiveness of the agricultural sector for workers		Availability of workers in agriculture	Level of labor remuneration in agriculture
Non-persistent strengths	Investment attractiveness of the agrarian sector of economy	Foreign trade in food products		Unemployment rate in the country
Non-persistent weaknesses	Investment attractiveness of the agrarian sector of economy. Production potential of the agricultural industry. Production costs of agricultural products. Production of staple food products	Foreign trade in food products	Availability of basic means of agricultural production. Livestock population at agricultural enterprises. Sown areas of agricultural crops	Influence of fertilization on the condition of soil and product quality. Level of labor remuneration in the country. Environmental consequences of land use. Structure of land use

Source: developed by the author.

The non-persistent strengths of food security of Ukraine require more effective management in comparison with those persistent. An

increase in the proportion of food expenses in the budget of households leads to lower economic affordability of consumption. Enhancing the economic affordability of food products, as well as the daily nutritional energy value, should become strategic directions of the agricultural policy and reforms in the state's social policy. It is also advisable to develop an effective mechanism of state support for agricultural enterprises in order to increase the profitability of agriculture through the optimization of costs, which in turn will make it possible to keep food prices unchanged.

The top priority task at the strategic level must be the minimization of influence of persistent weaknesses on the level of food security, as well as the development of a plan of action for the elimination of weaknesses or converting weaknesses into strengths. As the performed analysis revealed, a weak link in food security is the balance and sufficiency of food products consumption. Therefore, it is necessary to plan strategic measures to reform social policy of the state and to create a system of state support of agricultural producers in cattle breeding.

The non-persistent weaknesses, which in terms of food security include labor productivity at agricultural enterprises and rise in prices for agricultural products, require improving the state regulation of food market and the development of measures to attract workers in the agricultural sector, and to motivate people to work at agricultural enterprises in the long term. The problem of mismatch between the rate of rise of food prices and wages of the population requires a comprehensive socio-economic policy aimed at improving the standards of life quality of people and their social protection.

The persistent opportunities in the food security of Ukraine include stable growth of the volume of production in agriculture. The agricultural sector of the national economy is capable of providing the required volume of food production in the country. In terms of strategic perspective, this factor must be focused on supporting the level of food security at the appropriate level and on eliminating the threats. This is feasible by improving the competitiveness of domestic goods, increasing export potential, through the diversification of production. In terms of strategic perspective, it will contribute to strengthening the country's food security.

The non-persistent opportunities for food security in Ukraine manifest themselves in the foreign trade in food products that has demonstrated a modest growth in export over recent years, in the improved investment attractiveness of agrarian sector of the economy, in

the growth in capital investments, with the level of unemployment in the country decreased in recent time. Strategic directions regarding the use of opportunities for strengthening food security in this case may include new investments to agricultural sector of the economy, improvement in the competitiveness of domestic products and access to foreign markets, increase in food security indicators that characterize the affordability of food and the quality of nutrition.

The persistent threats to food security in Ukraine, according to data of the conducted analysis, include permanent unattractiveness of agrarian sector for workers, insufficient number of people engaged in agriculture because of the low level of remuneration, lack of prestige to work in the agricultural sector. This in turn affects labor productivity and food security. The established persistent threats are the key obstacles that do not make it possible to effectively utilize the potential of the agricultural sector and threaten food security in general. Therefore, it is necessary to maximally concentrate state resources on minimizing the negative impact of persistent threats on food security, and, in a strategic perspective, to develop measures for eliminating them and for converting them into opportunities.

The non-persistent threats to food security include most of the identified characteristics:

- insufficient investment attractiveness of agrarian sector of the economy for foreign investors;
- ineffective implementation of the industrial potential of agricultural sector due to the fluctuations in yield and productivity of animals;
- the growth of production costs of agricultural products,
- fluctuations in the volume of food production, as well as import and export;
- insufficient availability of the basic means of production at agricultural enterprises and low level of technical equipment;
- the lack of stable growth in the sown areas and livestock population at agricultural enterprises;
- negative effect of fertilization on the condition of soil and product quality;
- the consequences of environmental problems of land use and failure to comply with the correct structure of land use;
- the low level of wages in the country, which does not allow people to have high quality food in sufficient quantity.

The identified non-persistent threats under conditions of effective management could be converted into non-persistent opportunities in a strategic perspective. The outlined circle of problems should be dealt with gradually, with the further development of strategic measures to neutralize them and protect food security and factors that affect it.

Therefore, improving the efficiency of developing a state food security strategy requires the use of modern methods and tools of strategic analysis. The proposed original procedure for performing a strategic analysis of food security based on the SWOT-analysis is aimed at improving the process of strategy development, and thus will make it possible to optimize the allocation of resources and the search for directions to implement state policy in the agrarian sector of national economy, to regulate the internal market, social policy, by setting the priority of strategic measures.

2.3. International experience of scientific support for the formation and implementation of state food security strategies

World experience does not have uniform approaches to state regulation in the field of ensuring food security. The food security strategy depends on the resources and state interests that take into account the set strategic tasks. Free food trade is supported by economically developed states with significant agricultural resources, natural and economic advantages in agricultural production [161, p. 64]. The state policy in the field of ensuring food security of such states is based on the creation of a system of free trade and ensuring the competitiveness of their own agricultural products. As a result, such a policy in the conditions of a market economy will contribute to the achievement of global food security due to the effective use of resources, the growth of incomes and employment of the population, and the stimulation of economic development. Other countries define their own mechanisms of state regulation in the field of ensuring food security, aimed at protecting the domestic producer, import-oriented trade policy to achieve sustainable development and food security [254, p. 73].

In developed countries, the problem of ensuring food security is solved by the state at the national level. In Ukraine, in the course of

reforming the economic system, the state mechanism for providing the population with food was reconstructed, but a single concept for solving this issue at the strategic level has not yet been formed [245, p. 319]. Therefore, the foreign experience of forming and implementing a food security strategy at the state level on the example of some developed countries of the world needs in-depth research and systematization in order to further develop recommendations for the strategic ensuring of food security in Ukraine. Recommendations for Ukraine should take into account the specifics of its natural, economic, and foreign political factors.

The formation of the mechanism of strategic state regulation of the US agri-food system began in the 1990s with a set of measures to finance state programs in the field of food security at the expense of budget funds, the share of which reached up to 4.5% of the state budget. Domestic state policy was aimed at stabilizing the domestic food market by supporting the agricultural sector. In 1997, the US Department of Agriculture first approved a strategic plan, the main goal of activities in the field of food security and key strategic priorities [221, p. 932].

The US food security strategy is based on a strong legislative framework. State regulation of food security is carried out in accordance with the laws "Food Security Act" (1985), "Food Security Improvements Act" (1986). Strategic principles of ensuring food security in the USA: providing the population with high-quality food, access to world food markets, development of agricultural production [18, p. 33; 82, p. 135].

Support for the development of the agricultural sector in the USA as a tool for ensuring food security is a consequence of a balanced financial and credit policy. An important direction of state regulation is the financing from the state budget of targeted programs at the national level. The main targeted programs are aimed at stabilizing farmers' incomes and scientific support. In the USA, there are more than 10 interdisciplinary targeted programs related to the agricultural sector and farmers at the state level. In particular, this includes the following programs: conservation and removal of land from cultivation, food aid to the population, marketing and inspection, social development of rural areas, and others. The allocation of budget funds for these programs in the amount of 80% is carried out by the U.S. Department of Agriculture through the Commodity Credit Corporation (CCC), and the rest is distributed by local authorities and management [135, p. 131].

The "Farm Income Stabilization Program" is applied, which

includes the “Price Support Program”, “Federal crop insurance program (FCIP)” and “Farm Loan” programs. The main support programs in 2014 farm bill are: the Price Loss Coverage (PLC), Agriculture Risk Coverage (ARC), and Marketing Assistance Loan (MAL) programs [200, p. 333]. The reform of farmer support programs in the country was aimed at stimulating the concentration of agricultural production and moving away from family farms. The basis of the competitiveness of the US agricultural sector both in the domestic and foreign food markets are large farms [18, p. 34]. Large enterprises are strategic in supporting the state food security, they have access to almost all existing forms of state support in the United States.

The credit program under the “Food Assistance Act” is intended to encourage importing countries to make long-term purchases of American food. Since 1986, the mechanism of state compensation to farmers for the sale of products for export in the form of an export compensation allowance has been applied – compensation for the difference between the sale price on world markets and the deposit rate. This tool allows, at the expense of state subsidies, to maintain the profitability of farmers and high volumes of food exports, regardless of market conditions. This led to the fact that the share of the USA in the world export of many types of agricultural products is from 40 to 60%.

State policy in the field of agricultural credit has the main goal of increasing the efficiency of the credit market, increasing competition between creditors, reducing the cost of credit, and improving information support for borrowers. The mechanism of state financing of the purchase of means of production for agriculture is used. In the USA, differentiated prices for diesel fuel are set for farmers [18, p. 35].

The financing mechanism of targeted programs in the field of agriculture and food security is aimed at regulation with the help of economic tools of food production and distribution [37, p. 31]. The use of such tools of state regulation as subsidies, prices, loans and subsidies allows to increase the efficiency of farm operations. The mechanism and scale of financing, their functional orientation depends on the economic situation on the domestic and global food markets.

The market aspect of ensuring food security in the USA aims at the strategic development of the agrarian sector of the economy at the expense of effective state policy [201, p. 120]. The main tool for regulating agricultural production in the USA is the system of direct payments – target (planned) prices, which have been used since 1973 with

the adoption of the “Food and Agriculture Act”. The mechanism of state support for farmers consists in the fact that when implementing the specified types of crops, producers receive the amount of compensation between the planned price and the market price in a specific period, depending on which of the prices is higher.

Initially, the planned prices were set on the basis of production costs and were adjusted according to the growth of costs. However, at the end of the 70s, this method of forming planned prices led to the growth of inflation and was canceled in 1981 [74, p. 101]. In the future, the government incorporated the expected rate of inflation into the method of setting planned prices, but the optimal method of forming planned prices that would exceed production costs has not been developed till now.

The social aspect of ensuring the strategy of food security in the USA is reduced to the implementation of a complex of state programs of food aid to the population, approved by Congress in the 1960s within the framework of the concept of creating a “Great Society” concept, but declarative in nature of influence. These programs became a priority strategic task in the 80s and 90s against the background of increasing social contradictions. The U.S. Department of Agriculture has developed a policy for their financing and implementation. The key strategic tasks are assigned to the Food and Consumer Service [170, p. 219].

Since 1989, 15 state food aid programs have been operating in the USA [10]. In particular, food assistance programs aimed not only at the rural population, but also at the entire low-income population of the United States [221, p. 932]. Programs include SNAP, TEFAP, CSFP, CACFP, NSLP, SBP, SFSP, WIC, the National School Lunch Program and more [170, p. 219].

In the USA, an effective system of food quality and safety control has been created. On December 21, 2010, Congress adopted the “Food Safety Modernization Act (FSMA)”, designed to ensure the safety of US food by revising the priorities. Since the adoption of the Act, the attention of federal regulatory authorities will be focused not so much on responding to cases of contamination of food products, but on preventing them. The law provides for strict supervision of food products imported into the United States (15% of food products are imported into the United States from abroad). According to the Act, it is allowed to provide grants for preparation, conducting inspections, strengthening the potential of laboratories and implementing programs that ensure the safety of food products [220, p. 47-48].

Therefore, the agricultural sector of the USA is a strategic resource of the state in the field of ensuring food security.

The food security strategy in Japan is based on the Government's measures to reduce agro-food imports as much as possible, adhering to strict protectionism in the agricultural sector. The state agricultural policy of Japan is aimed at reducing food import dependence [126, p. 103]. There are seven major laws in Japan governing food and agricultural products including imports: 1) the Food Safety Basic Act, 2) the Food Sanitation Act, 3) the Health Promotion Law, 4) the Japan Agricultural Standards Law, 5), the Plant Protection Law, 6) Act on Domestic Animal Infectious Diseases Control, and 7) the Food Labeling Law. According to the acts, measures for the strategic provision of food security are based on the recognition of public health protection as a priority task. In 1999, the "Basic Law on Food, Agriculture and Rural Areas" was adopted, the result of which was a decrease in the food self-sufficiency ratio [126, p. 104].

The next step was the liberalization from April 1992 of the import of 12 types of agricultural products, including beef, at the request of the GATT, and later – the gradual introduction of a tariff system for non-liberalized types of agricultural products over the next 6 years from 1995. Strategic measures in the field of food security in the 70s, the creation of joint agricultural enterprises abroad, mainly in the countries of Southeast Asia and Latin America, began to diversify the import base of the necessary food products, in particular, corn, bananas, soybeans, livestock products.

In 1995, the "Law For Stabilization Of Supply Demand And Price Of Staple Food" ("Staple Food Law") was adopted. It was aimed at maintaining the balance of supply and demand in the food market. The law provides for a program of providing subsidies to agricultural enterprises, financing projects for the implementation of innovative technologies in animal husbandry. The prices of products within the scope of public procurement should be comparable to market prices, the system of authorized organizations for the sale of food was abolished, and the system of registration and licensing was introduced.

Japan's food security strategy is based on the principles of domestic market protection. In 1999, the "Basic Act on Food, Agriculture and Rural Areas" was adopted in Japan, the main priorities are food as a strategic priority for ensuring the livelihood and health of the population. Agricultural production is the basis of the growth of Japan's economic

potential [217, p. 106].

The price regulation of the domestic food market is interconnected with the regulation of foreign trade, since in Japan food imports are limited to protect the domestic producer and high import barriers for food are established [166].

The strategy of food security in Japan is a component of the "Comprehensive security policy" of the country, adopted in 1980. According to it, the main threat to the country's food security is the lack of its own resources. The main strategic goal of providing the population with food is to regulate the ratio of the level of self-sufficiency and imports, to implement the policy of international cooperation and to optimize internal resources.

In Japan's food security strategy, a significant role is assigned to the formation of state food reserves. They increase and are supplemented by stocks of local self-government bodies, agricultural organizations, food industry companies and households.

An important component of the food security strategy is information provision by improving the work of the government service, which studies the demand and supply of food products on world markets [126, p. 104]. The state's strategic measures to ensure food security are aimed at developing its own agricultural sector and supporting stable food imports. Agriculture in Japan is a strategic industry and, at 2% of GDP, provides about 40% of the population's food needs [18, p. 33].

State support for the development of agriculture in Japan in the long term was carried out in stages. At the first stage (70-80s), state measures to support agriculture were applied, in particular, restrictions on the import of competitive products. At the second stage (from the end of the 80s), the state agricultural policy was focused on supporting large profitable commodity producers and creating conditions for their development, creating a system of competitive agricultural production against the background of liberalization of food imports.

At the end of 1986, the Agricultural Policy Advisory Committee (APAC) determined the main directions of agrarian policy regarding increasing labor productivity in agriculture and forming rational prices for agricultural products, as well as the basic principle of providing the country with basic food products at the expense of own production and improving its efficiency.

State support for the agricultural sector proved to be insufficiently effective in strategic food self-sufficiency, turning Japan into the world's

leading importer of agricultural products, fishery products, and marine fisheries. This was a consequence of insufficiently thought-out agrarian policy of the state, since the support for the development of the industry and the system of guaranteed prices for food did not lead to a decrease in farm costs.

In recent decades, Canada at the state level has paid considerable attention to the issue of ensuring food security. In 1996, at the World Food Summit in Rome, the Rome Declaration on World Food Security and the World Food Summit Plan of Action were presented, in which the principles of achieving food security at the level of the individual, household, region, country and the entire global community were approved [220, p. 52].

The practice of state financing of the purchase of means of production in the agricultural sector is quite common in developed countries. In Canada, tax incentives and subsidies provide farmers with a fuel price at the level of 56% of the retail price [221, p. 935].

The general concept of food security was approved in the "Canada's Action Plan for Food Security" developed in 1998. Despite the fact that Canada has been a country with a high level of food production in the last 50 years, the basis of the developed Plan is the idea of increasing food security as an important factor in raising the standard of living of the population.

The Canada's Action Plan for Food Security is a program of the Government of Canada, which declares the intentions and specific actions of government structures and public organizations in the activities of the world community to ensure food security. This Plan defines activities within the framework of the tasks of the 1996 World Summit. Government support to Canadian farmers is provided through programs at two levels – federal (central) and provincial. The list of federal level programs includes [231, p. 36]:

- Net Income Stabilization Account (NISA) is a kind of savings mechanism for farmers, which guarantees that even in an unfavorable year, the farmer's income level will not fall below the average of the last three years;

- price unification program through the Canadian Wheat Board (CWB). The mechanism of operation of the program provides that farmers sell grain to the Wheat Chamber at a time convenient for them and receive at the same time a set initial price, which is the same for all grain belonging to the same class;

- Advance Payments Program. The Canadian federal government provides cash to farmers for grain (wheat, barley) stored on the farm. As a rule, such an advance is granted in the fall. Such a program is regulated by a special legislative act called AMPA (Agricultural Marketing Programs Act);

- the program to support the agreed level of production means that special bodies authorized by the government sell quotas for the production of certain types of agricultural products to producers. This mainly concerns the production of milk and poultry products, that is, products that are sold exclusively within the country. Producers with quotas are guaranteed to sell their products at a price calculated according to domestic demand.

An example of a provincial government support program is the program implemented in the province of Alberta through the activities of the Agricultural Finance Services Corporation (AFSC). Through the AFSC, such farmer support programs as the income stabilization program, farmer loan programs, including the support program for beginning farmers, crop insurance programs, and the program for compensation for damage caused by wild animals are carried out [36, p. 180].

One of the priority directions of Canadian government policy is to support the food supply of the population living in the northern territories and the Arctic region of the country. In 2007, the Canadian government adopted a new five-year program (until 2012) called “Canada’s Northern Strategy” [36, p. 185]. This program is a logical continuation of the state support for food supplies to the northern regions “Food Mail Program”, which has been in effect since 1986. As part of this program, the state subsidized orders for food parcels for the population living in remote settlements points.

The foreign experience of guaranteeing food security in the EU countries at the supranational level involves the development of strategies that are aimed at diagnosing the existing situation regarding the situation in food security of one or another country and the planning process, which includes the development of an action program, implementation and evaluation of the obtained results, and adjustment of strategies [261, p. 180]. Food security strategies at the national level, as a priority of each country regardless of its socio-economic level of development, are carried out on the basis of the implementation of a set of methods, principles and measures of the state agro-food policy to guarantee food security.

Solving strategic issues of food supply by the countries of Western Europe had positive results after the creation of the European Economic Community in 1957. The Common Agricultural Policy, which ensures balanced regulation and support of the food market at the national and supranational levels, is aimed at maintaining a sufficient level of food security through an effective system of methods and mechanisms for protection against cheap imports, support for agricultural production and food exports. The strategic directions of state regulation of ensuring food security in the EU are [135, p. 132]:

- increasing the productivity of agricultural production due to the improvement of equipment and technologies and the sustainable development of the agriculture, as well as the optimal use of production factors;
- ensuring a high standard of living of the population and development of rural areas;
- stabilization of agricultural markets and organization of effective market infrastructure and food supply;
- regulation of pricing in the food market in order to protect consumers from uncontrolled growth of food prices.

The market aspect of the strategic provision of food security in the EU consists in the application of the mechanism of protection of internal markets and domestic production based on mechanisms of supranational price regulation: target prices, intervention prices, marginal (threshold) prices, variable import tariffs and export subsidies. The fundamental principles of the Common Agricultural Policy of the EU are: the unity of the market, the financing system and the system of preferences for the EU member countries [135, p. 134].

When purchasing agricultural products or selling stocks, the state is a direct participant in the market. The system of supranational regulation of the food market functions with the help of a rigid pricing mechanism by supranational bodies: the highest governing body of the EU – the European Commission, which sets prices and the percentage of nominal increase, and the Council of the European Union (or the Council of Ministers), which has the right to change prices and approve final prices for agricultural products.

Prices are fixed in euros according to the following criteria:

- target (recommended) prices, which can be indicative (grain, dairy products, sugar, sunflower), indicative (meat products);
- minimum import (threshold) prices, which in turn are marginal

(grain, sugar, dairy products), reference (fruits, vegetables, fish products), gateway (pork, eggs, poultry). The policy of protectionism is implemented by applying an additional customs fee in the form of the difference between the domestic price of food and the import price, as well as stimulating exports by EU countries by providing export subsidies to farmers;

- minimum (intervention) prices, which guarantee the farmer the established profitability of the business and differentiate procurement prices for different types of agricultural products in the regions [194, p. 332].

The intervention price, established by the EU governing bodies (European Commission, Council of Ministers), is mandatory for the purchase of food by purchasing organizations in the EU in the pre-established volume of mandatory purchases at the specified prices. Target prices ensure market flexibility by increasing the intervention price of agricultural products by 2 to 40% for their sale outside the production area at a higher price. The percentage increase is the market component of the price, which is desirable for the EU management bodies in the wholesale food markets of certain types of food [37, p. 32].

Price regulation of the food market in the system of strategic provision of food security in the EU countries does not do without import (threshold) prices, which determine the level of customs protection of domestic prices for agricultural products. At the same time, the target price exceeds the threshold, but taking into account the transport costs per product unit, the threshold price must exceed the target. The mechanism of regulating the food market using target and threshold prices is a strategic tool for achieving self-sufficiency for certain types of foods in the EU by establishing an upper price limit in the price protection system [201, p. 122].

Since maintaining high prices within the single EU food market is one of the most expensive tools for subsidizing farmers' incomes, decisions were subsequently made to slightly lower prices. A system of direct state payments to producers was introduced for not exceeding the level of food production achieved in the previous period due to unfavorable conditions. The amount of state payments depends on the area of land or the number of livestock [37, p. 33].

After achieving full self-sufficiency and food independence, the Common Agricultural Policy of the EU in recent decades provides for the application of restrictive measures: quotas for the production and sale of

food, elimination of the principle of guaranteeing prices for any number of food products sold on the market, as well as a gradual reduction of intervention prices. Quotas for purchase at guaranteed prices were established for milk, wheat, sugar, cotton, sunflower, rapeseed and some other agricultural products. Quotas as a strategic tool of state regulation of the food market are aimed at maintaining domestic prices at a high level, preventing overproduction and reducing costs from the EU budget through the price guarantee system. Guaranteed prices apply to purchases by purchasing organizations of only a specified amount of products, and excess products are purchased at a lower price. In the EU, the practice of determining the total marginal volume of production is used, which is then distributed among the EU member states. Therefore, farmers must adapt to market constraints while still being able to earn stable incomes.

The price mechanism is an effective means of financing agriculture at the expense of consumers. At the expense of domestic prices, which are higher compared to world prices, farmers are financed and producers with a lower production cost are prevented from entering the EU domestic market.

Crop insurance programs have been adopted in almost all EU countries, which affect the country's food security level. The system of providing compensatory payments from the state budget allows to insure agriculture against adverse weather conditions, floods, epidemics and other risks. In addition, budget subsidies are also applied at the regional level, thanks to which farmers conduct expanded agricultural production in regions with unfavorable natural conditions [74, p. 102].

In addition to the pricing mechanism, the strategic provision of food security in the EU is implemented through a unified system of norms and tools for the organization and regulation of agricultural and food markets at the international level. The indicated system of norms and tools includes control over the provision and targeted use of budget subsidies, as well as measures common to all EU countries to ensure farmers' incomes, support at the established level of retail prices, which allows for the standardization of conditions of competition in the production and sale of food.

Supranational governing bodies of the EU in the field of strategic ensuring of food security aim to develop and implement such means and measures to support the producer, which would give him approximately the same position in a separate country.

Priorities for budget financing are large, highly profitable

agricultural enterprises, food industry enterprises, and sales companies, which are more attractive to the state for investment. Implementation of state policy regarding budget financing is focused on the specifics of each separate industry, for example, prevention of overproduction of certain products in EU countries.

Subsidies and other types of non-refundable budget assistance in the EU countries in the implementation of food security strategies are provided to producers of certain industries (in particular, milk, citrus fruits, processing of potatoes into starch, etc.) according to the principles of the pan-European subsidy policy.

The principle of providing financial budget assistance is not applied, which creates "conditions of the greatest favor" for producers of goods in any individual EU country, for example, price interventions in the form of price surcharges, regulation of food production volumes, compensation payments to exporters for products. Within the framework of the strategic provision of food security, the governments of the countries are assigned the tasks of implementing measures to improve the quality of food, veterinary supervision, the introduction of scientific and technical developments and innovative technologies, environmental protection, supporting production in problem areas, supporting small farms to obtain a minimum level of profit.

Strategic instruments of state regulation of market pricing in EU countries are also programs of direct income support for farmers, in particular programs of compensation payments, flexible production contracts, and insurance. Compensations allow producers' incomes to be protected from adverse market fluctuations. Subsidization of commodity producers in the EU is aimed at supporting the production of high-quality wheat varieties by means of quotas on the area of grain cultivation; production of rice, barley, oats, corn and other grain crops; subsidies up to 50% of the price of milk produced within the established quotas [170, p. 220].

A tax policy aimed at stimulating the development of the agricultural sector is of strategic importance for guaranteeing food security. In most EU countries, the income of food producers is not subject to VAT. The principles of state regulation are that income from agricultural products should be taxed at the final stage of bringing the product to the consumer.

Analyzing the price policy for food in the EU, we will consider the price gap between world prices and prices in the EU for the main types of

food (Table 2.7).

Table 2.7 – Correlation between European and world food prices

Foods	2014	2015	2016	2017
Beef (Australia)	0.98	0.95	1.03	1.01
Beef (Brazil)	1.46	1.50	1.49	1.56
Pork (USA)	0.93	1.02	1.15	1.19
Pork (Brazil)	1.02	1.10	1.25	1.24
Bird	1.14	1.08	1.11	1.05
Wheat of soft varieties	1.02	0.94	0.99	1.04
Corn for grain	1.13	1.03	1.11	1.16
Barley	0.98	0.99	0.95	0.96
Sugar	1.62	1.24	0.99	1.23
Oil	1.23	1.06	1.09	1.07
Weighted average price level ratio	**1.11**	**1.08**	**1.11**	**1.13**

Source: compiled by the author based on the data [253; 259].

Therefore, in 2017, prices for agricultural products in the EU were on average 13% higher than world prices. Over the past ten years, the gap between global and global prices has decreased from 30-40% to around 10%. This became possible thanks to the successive reforms of the Common Agricultural Policy, the transition from price support to income, which brought EU prices closer to world prices, especially in the grain and dairy sectors (less so for the meat and sugar sectors). For beef, the gap between EU and world market prices is widening, as shown in the table. This applies to Australian prices, while the US has lost competitiveness due to rising beef prices in 2014-15. In contrast, Brazil's pricing policy allows products to remain more competitive. In the poultry sector, the EU is more competitive than the US. After falling in 2014-15, EU pork prices rose relatively more compared to the US and Brazil due to Chinese demand.

Financial aid can be provided from the budgets of EU member states and autonomous territories (autonomous regions of Italy, departments and regions of France) or federal states (German states) with local budgets. Therefore, the supranational policy in the agricultural sector in the EU regarding the strategic provision of food security is aimed at effective organization of the food market, support of the income of commodity producers, assistance in the sale of surplus products, etc.

The implementation of the food security strategy in the EU countries is effective thanks to the regulated system of food production

support. An important condition for the effective work of agricultural producers is an established credit system. In EU countries, price subsidies are used for the purchase of equipment, land reclamation, and modernization of farms [170, p. 221]. Under the investment incentive program in Germany, a farmer can get a long-term loan at a reduced interest rate of 4% (6% in economically weak regions). The program also makes it possible to provide a preferential state loan (1% per annum at the expense of repayment of 3.5% for capital construction) [170, p. 222]. Interest on mortgage loans to farmers in EU banks is 4.5-6.5%, in Holland – 5-7%, in Germany – 6-8.5% (concessional – 1%). In France, farmers are paid subsidies for improving technological equipment for agricultural production, removing arable land from cultivation, maintaining land fertility, compensation for work in areas with unfavorable natural conditions, etc. [170, p. 224]. The deepening of the market essence of state support for agriculture is manifested, in particular, in the provision of a certain minimum level of income, which allows commodity producers, thanks to the application of highly qualified management, to achieve incomes adequate to the incomes of non-agricultural entities on their own ("safety net" concept).

In the table 2.8 shows the costs of supporting the agricultural sector within the framework of the Common Agricultural Policy in the EU.

Therefore, 70.6% of the structure of EU expenditure on support of the agricultural sector was direct payments, 5.1% – market measures, 24.3% – measures to support the development of rural areas.

The state's strategic measures to ensure food security in EU countries are also aimed at improving technical progress in agriculture, stimulating the development of science and education, professional training, advanced training, and consulting support for farmers. Market regulation consists in the organization of governmental purchases, the functioning of state wholesale markets, technical and commercial support for food purchases, veterinary services and lending to producers.

Control and accounting functions of the country consist in conducting product quality control, veterinary inspection, statistical accounting, etc. Strategies for the development of the agrarian sector and food security in a number of EU countries contain special programs for the development of rural areas, mandatory measures for the social reconstruction of rural areas by liquidating small farms, retraining personnel displaced from agriculture for work in other industries [217, p. 107].

Table 2.8 – Volumes of financial support in the main directions of the Common Agrarian Policy in the EU

Support measures	2017, thousand euros	Structure, %	
Non-production direct aid amounts	35366166.0	60.1	85.1
Other direct aid payments	5759408.0	9.8	13.9
Additional amounts of assistance	3.0	0.0	0.0
Reimbursement of direct aid due to financial discipline	425580.0	0.7	1.0
Direct payments to support agricultural production	**41551156.0**	**70.6**	**100.0**
Olive oil	42770.0	0.1	1.4
Textile plants	6134.0	0.0	0.2
Fruits and vegetables	995421.0	1.7	33.2
Wine sector	1011750.0	1.7	33.7
Product promotion	122262.0	0.2	4.1
Other measures to support crop production	236857.0	0.4	7.9
Milk and dairy products	468019.0	0.8	15.6
Beef and veal	23649.0	0.0	0.8
Sheep breeding and goat meat	3505.0	0.0	0.1
Pork, eggs, poultry and others	90744.0	0.2	3.0
Market support measures	**3001112.0**	**5.1**	**100.0**
Rural development	**14337027.0**	**24.3**	×
Total	**58889295.0**	100.0	×

Source: compiled by the author based on the data [253; 259].

In the EU countries, the forms of ownership of farms are mainly family farms and partnerships. State regulation of partnership relations has a clear legislative basis. For example, in Great Britain, the legislative regulation of partnership relations in the agricultural sector provides for the conclusion of an agreement that determines the ownership and use of land, the distribution of authorized capital and a number of other important issues [135, p. 138]. Family farms are an effective practice of conducting agrarian business in the EU countries, and therefore have strategic importance at the level of state regulation. Qualified personnel and modern technologies are concentrated in them. For example, the French Law "Agricultural orientation law" defines the priority directions of the strategic state agricultural policy, in particular, state support and development of family farms, which are the basis of agricultural production [165, p. 58].

In the system of strategic ensuring of food security, the leading place belongs to the quality of food. In general, the modern European

quality system for agricultural and food products is based on the national quality systems of individual EU member states, in particular: the national quality assurance system for food products of Germany (QS Qualität und Sicherheit), the quality assurance system of the Netherlands – "Integrated Chain Monitoring" (Integrierte Kettenüberwachung, IKB); quality assurance system for pork production in Belgium – "Certus"; quality system for the production of food products in France – "Label Rouge" ("Red Label", INAO) and others, the task of which is full control, monitoring, as well as an independent system of sanctions at all stages of the technological chain from food production to retail trade [19, p. 56-57]. In Belgium, the Ministry of Agriculture is entrusted with the implementation of the strategic state agrarian policy, and the state food quality inspection is entrusted to the Federal Agency for the Safety of the Food Chain (FASFC). The strategic task of guaranteeing food safety in Belgium is to maintain the quality of food products and minimize risks to the health of consumers through standardization and control.

The state policy of France for the strategic provision of food security is carried out on the basis of the International Strategy for Food Security, Nutrition and Sustainable Agriculture. According to the Strategy, the French ministry for agriculture and food (Ministère de l'Agriculture et de la Souveraineté alimentaire) is responsible for maintaining a sufficient level of food security. The strategic directions of guaranteeing food security are state support for domestic food producers and protection of their interests in the fields of agriculture and food, fisheries and aquaculture, veterinary medicine, and plant protection. The implementation of the strategy requires scientific studies of food security issues conducted by development agencies and research centers. In France, the development and implementation of state agricultural policy is carried out in accordance with the law "On ensuring the stability of agricultural production". Strategic state measures consist in maintaining the competitiveness of the national producer, regulation of the domestic food market, implementation of the policy of protectionism in relation to agricultural products [159, p. 63].

Germany's food security strategy is a nationwide system of economic and legislative tools for guaranteeing food safety aimed at ensuring food safety and quality, guaranteeing consumer rights and a clear procedure for consumer rights protection [3, p. 183]. The strategy covers the following levels of food security authorities:

- pan-European (European Commission, European Food Safety

Agency, EU Food and Veterinary Office);

- federal (Federal Ministry of Food and Agriculture (BMEL), German Federal Institute for Risk Assessment, Federal Office of Consumer Protection and Food Safety (BVL));
- local (Federal Research Institutes, Ministries and Governments of the Federation Lands).

Both at the EU level and in Germany, three main goals of the food strategy are legislated:

- health protection (only safe food products are for sale);
- protection of consumers from deception;
- proper public information.

The strategy of ensuring food security in Germany was initiated as early as 1955 with the adoption of the "Agricultural Act", which provides for the state's obligation to solve the strategic problem of supplying the population with food by forming food funds without using the entire range of measures of economic stimulation and support and dependence food supply from third countries [165, p. 60]. The implementation of Germany's food security strategy has a strong legal basis (German food legislation includes more than 200 regulations, laws and decisions). Germany's strategic priorities for the issue under consideration in the pan-European space are to promote the development and implementation of the Common Agricultural Policy of the EU countries, one of the key goals of which is to guarantee food security [47, p. 139].

In the EU, the supranational mechanisms of strategic ensuring of food security are combined with state regulation on the part of the participating countries and the EU as a whole. Key elements of the mechanism of strategic regulation of food markets in the EU:

- the introduction by the governing bodies of the EU of a uniform integration price union throughout the territory to stimulate the development of the agricultural sector and optimal placement of production;
- setting purchase prices at a level lower than in the domestic market, in order to stimulate producers to sell food on the market, and not to the state.

In EU countries, the policy of strategic provision of food security is based on stimulating the development of own agriculture with high production costs for food in comparison with global ones. The legislative field of these countries takes into account the import and export capabilities of commodity producers, although the functioning of the

mechanism of strategic support for agriculture in each EU country depends significantly on its production and foreign economic conditions.

The policy of the EU countries in the field of ensuring food security consists in supporting the agricultural sector at the expense of existing mechanisms, stimulating exports, implementing a policy of admission to the EU market on preferential terms of products from the tropics. The Common Agricultural Policy of the EU is aimed at protecting domestic agricultural producers. For this, the EU countries apply programs to stabilize farm prices and incomes at the expense of the funds of the unified EU budget and national budgets. In the EU, there is a tendency towards protectionist protection of agricultural producers. Farmers are protected from competition from foreign producers and enjoy the advantages (mainly at the expense of consumers) of selling their products at prices above the world level. Within European countries with roughly the same level of income, exporting farmers have to pay more tax, meaning they are less protected than those competing with importers.

Therefore, we will systematize the main strategic tools in the field of state ensuring of food security in accordance with foreign experience (table 2.9).

The analysis of the strategic directions and tools of state regulation of ensuring food security allows us to systematize states according to the type of agro-food policy and the mechanisms of its guarantee:

1) States whose food security strategy is based on food import orientation. An example of such a state is Japan, whose government followed a policy of importing certain types of food;

2) States whose food security strategy is based on food export orientation. In particular, such countries include the USA and Canada, which managed to form a protected food complex by supporting the development of the agricultural sector, focused on domestic and foreign markets.

Economically developed countries have a highly effective food security strategy and an appropriate set of state measures, mechanisms, and tools to guarantee it. The analysis of food security strategies of foreign countries makes it possible to draw the following conclusions.

The level of protectionist protection of agricultural producers directly depends on the level of economic development of the country [201, p. 124].

Table 2.9 – Strategic tools of the state guarantee of food security in foreign countries

Country	Strategic directions of state regulation of food security			
	State support and development of the agricultural sector	**State regulation of market pricing**	**State social policy and social support of the population**	**State regulation of product quality assurance**
USA	- conservation and removal of land from circulation; - stimulation of exports by providing an export compensatory allowance to farmers; - stimulating the concentration of agricultural production; - subsidizing government programs to support the development of certain branches of the agricultural sector; - lending to agricultural producers against the collateral of agricultural products by providing compensatory payments	- purchase of surplus products from farmers; - application of planned (guaranteed) prices for certain types of food and their adjustment; - medium-term crediting of importing countries to motivate the purchase of American agricultural products	- programs of food assistance to low-income segments of the population	- control of imported food products; - training of personnel for food quality control; - financing of laboratories, state programs in the field of food safety
Canada	- state support of the agricultural industry: advance payments to farmers, price increases to ensure product profitability, increases to the volume of production costs in the form of credit support, interest compensation on loans, guarantees on loans; - tax benefits to support the profitability of agricultural production; - insurance of farmers' incomes and compensation of insurance payments by the government	- establishing a minimum selling price for agricultural products	- state support for food supplies to the northern regions; - participation in international food and humanitarian aid programs	- system of state standards of product quality and safety, monitoring and control
Japan	- structural programs for the development of the agricultural industry, the creation of agricultural enterprises abroad with the aim of diversifying imports, - measures to intensify production and increase the competitiveness of products; - special allocation program, providing subsidies to producers, financing projects for the introduction of the latest technologies in agriculture (animal husbandry)	- policy of protectionism, establishment of high import barriers for products whose imports can compete with domestic production; - state regulation of prices; - foreign trade regulation; - regulation of the food market	- food support for low-income population groups	- legislative regulation of the application of a set of safety measures and product quality control
EU Countries	- provision of compensatory payments from the state budget to insure the activities of farmers; - budget payments related to "regional support"; - stimulation of partnership relations in agriculture; - support of family agricultural and food business; - subsidy policy and provision of subsidies to agricultural producers; - provision of a minimum level of profit for small farms; - tax benefits for product manufacturers.	- application of target prices, intervention prices, marginal prices; - variable import tariff and export subsidies; - food production and import quotas	- food support for low-income population groups	- measures to improve the quality of products, ensuring veterinary supervision; - introduction of achievements of scientific and technical progress, environmental protection; - stimulation of production in problem areas; - control, monitoring, as well as an independent system of sanctions.

Source: systematized by author based on [2; 18; 37; 127; 135; 172; 194; 231].

In countries with low incomes, producers pay additional taxes and are forced to sell their products at prices below world prices. Developed countries protect farmers from competition from foreign producers and provide a number of advantages (mostly at the expense of consumers) that allow producers to sell their products at prices higher than world prices.

In the domestic market, agricultural enterprises that export products pay more taxes, that is, their level of protection is lower compared to enterprises that compete with importers.

In Ukraine, the mechanisms for ensuring food security are laid down in the Law of Ukraine "On State Support of Agriculture in Ukraine" of June 24, 2004. The complex of mechanisms of state regulation of food security includes state regulation of prices through agrarian intervention – sale or purchase of food to ensure stable prices. The mechanism of collateral purchases is used, when the Agrarian Fund, as a creditor, provides a budget loan to a producer against the pledge of grain, which is the object of state price regulation [166]. Mechanisms of financial support for agricultural enterprises include a mechanism for reducing the cost of loans and compensating leasing payments by subsidizing part of the fee (interest or leasing payments) for using loans provided by banks. Every year, the Cabinet of Ministers of Ukraine foresees an item of expenditure on providing subsidies to producers of livestock products [166].

Therefore, the regulatory framework in Ukraine is almost sufficient to support the sustainable functioning of the agricultural sector. At the same time, it is advisable to produce export-oriented products and redistribute income from their sale to import food, the production of which in the country is impossible or unprofitable [74, p. 101]. However, the country's food security and food independence must be guaranteed at the expense of its own production. Therefore, in Ukraine, regulation of export-import operations is carried out with the help of tariff quotas.

In Ukraine, the legal and institutional framework for the formation of a stable balance of food production and distribution has not yet been fully formed, which significantly limits the capabilities of state institutions in the field of market regulation. Perhaps the specified problem in Ukraine will be solved with the adoption of the Law "On Food Security", which will clearly outline the powers of state administration in the field of food security, measures to create and store strategic food reserves, etc.

It is necessary to substantiate proposals for improving measures to ensure food security of Ukraine, taking into account the successful

experience of European countries, taking into account the priorities of Ukrainian foreign economic policy and integration into the world economy. State regulation of the agricultural sector in the context of guaranteeing food security at the strategic level should be carried out with the help of the following tools:

- budgetary (financial support of agricultural producers, compensation of capital costs, subsidization of interest costs on loans, lending and leasing on preferential terms);
- fiscal (tax benefits, simplified taxation system for agricultural enterprises, deferment of tax payments);
- credit (seasonal, investment, mortgage and promissory note lending);
- price (market, control and protective prices, commodity and purchase interventions);
- regulation of population incomes (increasing the incomes of the rural population, state regulation of prices for certain categories of food);
- foreign economic (non-tariff regulation of imports and stimulation of export of agricultural products);
- social (increasing the standard of living of the population, development of agricultural education, medical and cultural provision of the rural population);
- scientific (ensuring the conduct of scientific research, supporting innovative programs for the development of the agrarian sector, training specialists).

Summarizing the foreign experience of the state agricultural policy in the food sector and taking into account the efforts of Ukraine's integration into the European economic space, it is important to take into account the advantages and risks for agriculture and to form the main strategic directions of the state policy aimed at reducing risks, neutralizing possible negative consequences and accelerating the obtaining of benefits from the liberalization of trade regimes:

- improvement of legislation in the field of regulation of the agricultural sector, tax, customs, financial and credit policy;
- export support for the purpose of expanding foreign sales markets for Ukrainian exporters;
- stimulation of domestic demand for food;
- increasing the competitiveness of agricultural producers on domestic and foreign markets due to the improvement of product safety and quality due to the implementation of international standards;

- support and development of the agricultural sector by restructuring unprofitable enterprises, state regulation of agri-food markets, use of effective mechanisms of state support;
- state stimulation of the development of service and sales cooperation of small producers and formation of market infrastructure for them;
- promoting the development of rural regions.

Foreign experience of state regulation of food security is relevant for Ukraine in modern conditions. Reimbursement of the costs of commodity producers for the main types of agricultural products will lead to a reduction in the cost price, which in turn will allow to increase the level of consumption of these products by the population and the competitiveness of domestic products.

The specified mechanisms of state support for commodity producers in Ukraine should be a component of both the state's agrarian policy and the food security strategy. Compensations to commodity producers, similar to those used in foreign countries, can be implemented simultaneously with granting the right to the Ministry of Economic Development, Trade and Agriculture to set recommended prices depending on the average cost of the main types of agricultural products, which would ensure a sufficient level of food security in the regions. For this purpose, it is necessary to create appropriate monitoring services and provide appropriate amounts of compensation in the structure of state budget expenditures. The food security of Ukraine and the sustainable development of the agricultural sector of the economy require a system of subsidies and compensations.

Mechanisms of state regulation should be flexible enough to protect domestic producers and simultaneously comply with WTO requirements, in particular when applying such protective measures as customs duties and import tariffs on food. It is also recommended to strengthen state control over monitoring the food balance to prevent losses from export restrictions.

The main tasks of state authorities should be strategic planning and timely detection of threats to food security, minimizing their negative consequences at the expense of strategic food stocks. It is necessary to develop and implement a comprehensive system of monitoring, collection, processing, systematization and analysis of information on production, stock management and food supply, quality and safety of food products, food consumption and nutrition of the population. Perhaps

these tasks should be entrusted to a state analytical agency or departments of Ministry of Economic Development, Trade and Agriculture.

A system of information resources on ensuring food security with the use of modern digital technologies is also needed. It is important to timely inform commodity producers and provide consulting services by state bodies and consulting services regarding state agricultural support programs and schemes for their implementation, mechanisms for regulating agro-food markets.

Chapter 3

STATE OF IMPLEMENTATION OF FOOD SECURITY STRATEGIES OF UKRAINE

3.1. Trends in ensuring food security of the country

An effective national food security strategy needs an objective analytical basis. Therefore, the assessment of modern trends in food security in Ukraine and the identification of key problems reinforces the need to assess modern trends and analyze the state of food security.

Assessment of the level of food security is most often carried out according to the Methodology for determining the main indicators of food security dated 05.12.2007 No. 1379 "Some issues of food security", which contains a number of indicators and their threshold values [87].

Table 3.1 presents data on the daily energy value of the diet and calculated the structure of the diet.

Table 3.1 – Daily energy value of the diet and its structure in Ukraine

Indicators	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Caloric content of the average daily diet of the population, kcal	2933	2951	2954	2969	2939	2799	2742	2707	2706
Including products of animal origin	809	807	844	868	849	791	790	781	787
products of plant origin	2124	2144	2110	2101	2090	2008	1952	1926	1919
The share of products of animal origin in the diet (regulatory value – 55 %),%	27.6	27.3	28.6	29.2	28.9	28.3	28.8	28.9	29.1

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Although the caloric content of the average daily diet of the population exceeds the recommended value of 2500 kcal, the excess is insignificant. In addition, the share of products of animal origin in the daily diet is only 29.1% against the norm of 55%. A low level of consumption of products of animal origin in the diet of the population is observed. Ukrainians consume the main part of calories together with products of vegetable origin.

One of the most acute problems of food security is the low quality

of food. Deterioration of the ecological situation simultaneously with a decrease in the quality of agricultural products and food products in Ukraine, a decrease in technological characteristics and nutritional value led to a deterioration in the quality and safety of agricultural products and food products, their non-compliance with established standards. The intensification of agricultural production and a rather loyal state control system led to overtime use of agrochemicals in the cultivation of agricultural crops and storage of products, and therefore to the deterioration of food quality.

In fig. 3.1 shows a comparison of the daily energy value of the diet in certain countries of the world and in Ukraine in 2018.

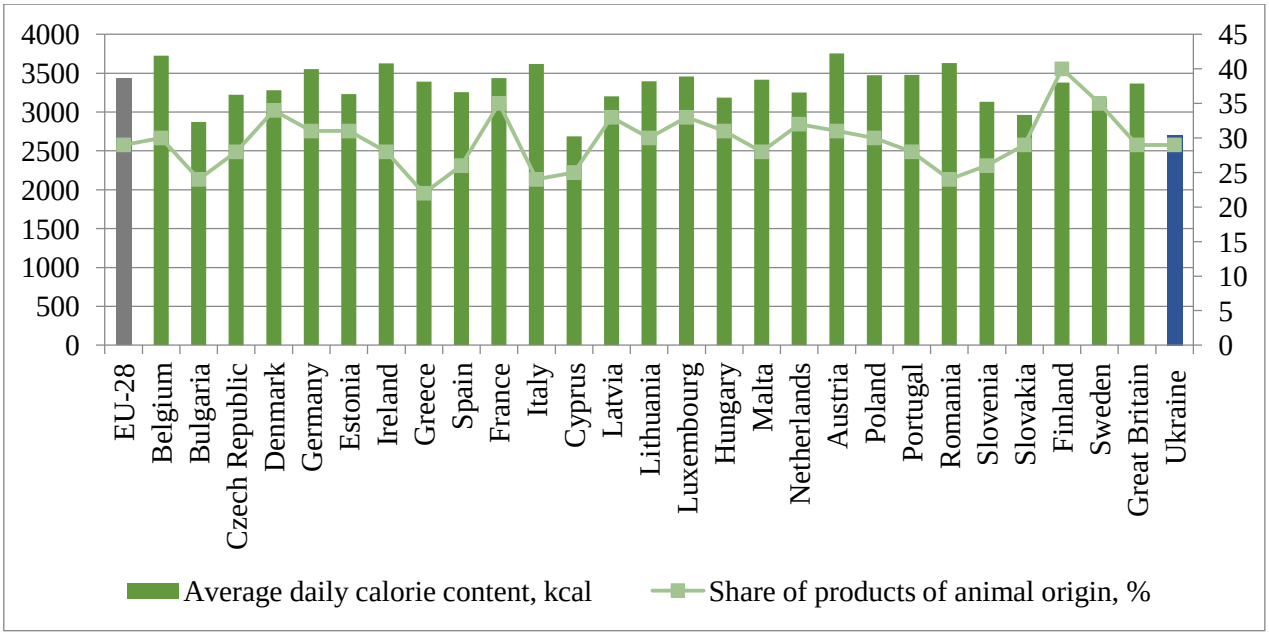


Fig. 3.1 – The daily energy value of the diet and the share of products of animal origin in certain countries of the world and Ukraine in 2018

Source: calculated by the author based on the data [148].

The calorie content of the diet in Ukraine is 21% lower compared to the EU-28, where it averages 3,432 kcal per day: from 2,686 kcal in Cyprus to 3,753 kcal in Austria. At the same time, the share of products of animal origin in the diet of the EU population is at the same level as in Ukraine, i.e. it is 29%.

Table 3.2 shows the average annual food consumption per person. Appendix B presents the rates of growth of average annual volumes of food consumption per person.

The analysis of the dynamics of food consumption by the population on average per person per year showed a significant deterioration of the food supply of the population in almost all types of food products. The most significant was the decrease in the consumption of eggs (by -

21.4%), sugar (by -12.7%), potatoes (by -41.3%), vegetables and melon crops (by -25.6%). Less drastic was the decrease in the consumption of fruits, berries and grapes (by -5.0%) and bread and bread products (by -10.5%). On the contrary, the consumption of meat and meat products increased (by 13.1%), milk and dairy products (by 11.0%), fish and fish products (by 15.9%), oil and other vegetable fats (by 21.6 %).

Table 3.2 – Food consumption in households of Ukraine on average per year per person, kg

Foods	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat and meat products	52.0	51.2	54.4	56.1	54.1	50.9	51.4	51.7	58.8
Milk and milk products	206.4	204.9	214.9	220.9	222.8	209.9	209.5	200.0	229.2
Eggs, pcs	290.0	310.0	307.0	309.0	310.0	280.0	267.0	273.0	228.0
Fish and fish products	14.5	13.4	13.6	14.6	11.1	8.6	9.6	10.8	16.8
Sugar	37.1	38.5	37.6	37.1	36.3	35.7	33.3	30.4	32.4
Oil	14.8	13.7	13.0	13.3	13.1	12.3	11.7	11.7	18.0
Potatoes	128.9	139.3	140.2	135.4	141.0	137.5	139.8	143.4	75.6
Vegetables, water-melons, melons and gourds	143.5	162.8	163.4	163.3	163.2	160.8	163.7	159.7	106.8
Fruits, berries and grapes	48.0	52.6	53.3	56.3	52.3	50.9	49.7	52.8	45.6
Bread products	111.3	110.4	109.4	108.4	108.5	103.2	101.0	100.8	99.6

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

It can be stated that the food security of the population has significantly deteriorated in recent years. The dynamics of consumption volumes for 2010-2018 allows us to make a conclusion about the reduction of food consumption volumes at a faster pace after 2014, which is associated with the economic situation in the country, the decrease in the purchasing power of the population and the deterioration of food security.

Analysis of annual average food consumption per person for 2010-2018 in comparison with rational consumption norm approved by the Ministry of Health of Ukraine “Approximate set of basic food raw materials and food products per capita in Ukraine for 2005-2015” indicates non-compliance with approved norms and significant malnutrition (Table 3.3).

Table 3.3 – Comparison of fact volumes and rational norms of consumption in Ukraine per capita per year, kg

Foods	Rational norm of consumption	The difference between fact and rational consumption, kg								
		2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat and meat products	80	-28.0	-28.8	-25.6	-23.9	-25.9	-29.1	-28.6	-28.3	-21.2
Milk and milk products	380	-173.6	-175.1	-165.1	-159.1	-157.2	-170.1	-170.5	-180.0	-150.8
Eggs, pcs	290	0.0	20.0	17.0	19.0	20.0	-10.0	-23.0	-17.0	-62.0
Fish and fish products	20	-5.5	-6.6	-6.4	-5.4	-8.9	-11.4	-10.4	-9.2	-3.2
Sugar	38	-0.9	0.5	-0.4	-0.9	-1.7	-2.3	-4.7	-7.6	-5.6
Oil	13	1.8	0.7	0.0	0.3	0.1	-0.7	-1.3	-1.3	5.0
Potatoes	124	4.9	15.3	16.2	11.4	17.0	13.5	15.8	19.4	-48.4
Vegetables, water-melons, melons and gourds	161	-17.5	1.8	2.4	2.3	2.2	-0.2	2.7	-1.3	-54.2
Fruits, berries and grapes	90	-42.0	-37.4	-36.7	-33.7	-37.7	-39.1	-40.3	-37.2	-44.4
Bread products	101	10.3	9.4	8.4	7.4	7.5	2.2	0.0	-0.2	-1.4

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The analysis of the consumption of basic food products per person per year shows that the agro-food market of Ukraine functions in conditions of low demand of the vast majority of the population for almost all food products.

An important indicator of the country's food security is the consumption sufficiency indicator, which is calculated as the ratio between the actual consumption of an individual product and its rational norm from a medical point of view in accordance with the Methodology No. 1379 (Table 3.4). The rational rate of consumption per person per year is taken on the basis of the Order of the Ministry of Health of Ukraine dated 14.01.2013 No. 16 "On the approval of the Guidelines for general practitioners – family medicine regarding counseling patients on the basic principles of healthy nutrition".

According to the results of the analysis of the sufficiency of food consumption, during the studied period, the biggest gap between the actual consumption and the rational consumption was observed for fruits,

berries and grapes (51% of the required norm in 2018), milk and dairy products (from 53% to 60% of the rational norms), meat and meat products (from 64% to 74%), fish and fish products (from 43% to 84%). At the same time, for certain food groups (eggs, oil, potatoes, bread and bread products), the actual consumption exceeded the rational norms until 2014, and from 2015 to the present, the sufficiency of consumption of even these food products is below the rational norms.

Table 3.4 – Indicators of sufficiency of food consumption per person

Foods	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat and meat products	0.65	0.64	0.68	0.70	0.68	0.64	0.64	0.65	0.74
Milk and milk products	0.54	0.54	0.57	0.58	0.59	0.55	0.55	0.53	0.60
Eggs, pcs	1.00	1.07	1.06	1.07	1.07	0.97	0.92	0.94	0.79
Fish and fish products	0.73	0.67	0.68	0.73	0.56	0.43	0.48	0.54	0.84
Sugar	0.98	1.01	0.99	0.98	0.96	0.94	0.88	0.80	0.85
Oil	1.14	1.05	1.00	1.02	1.01	0.95	0.90	0.90	1.38
Potatoes	1.04	1.12	1.13	1.09	1.14	1.11	1.13	1.16	0.61
Vegetables, water-melons, melons and gourds	0.89	1.01	1.01	1.01	1.01	1.00	1.02	0.99	0.66
Fruits, berries and grapes	0.53	0.58	0.59	0.63	0.58	0.57	0.55	0.59	0.51
Bread products	1.10	1.09	1.08	1.07	1.07	1.02	1.00	1.00	0.99

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The analysis of the data in the table allows us to conclude that the population of Ukraine does not have the possibility of sufficient nutrition in accordance with the needs of the body for almost all foods, except for oil and vegetable fats. This indicates negative trends and the approach of the level of food security according to this indicator to a critical level. The low level of food consumption is a consequence not so much of insufficient volumes of agricultural production, but of the low solvency of the population, especially certain social groups.

The level of consumption of most products during the analyzed period in the dynamics becomes lower than the recommended norms. The revealed facts testify to the imbalance of the food rations of the population of Ukraine, which tries to provide its own energy needs at the expense of cheap (economically available) food (primarily, bread products).

Therefore, the most stable insufficient consumption is observed in

such food products as meat and meat products, milk and dairy products, fish and fish products, fruits, berries and grapes, and in the last 5 years – eggs. It is obvious that Ukrainians do not consume the main nutrients contained in animal products and fruits, and is forced to form its diet at the expense of fats and carbohydrates, which negatively affects health and work capacity.

A significant decrease in the consumption of almost all food products during the analyzed period indicates a deep economic crisis in the country, when due to a significant increase in food prices, the population began to limit themselves in their consumption. Accordingly, the population began to consume more and more cheap bakery products, eggs, potatoes, and vegetables. That is, the country's population meets its own energy needs at the expense of cheaper (more affordable) products, which indicates an unbalanced diet of the population.

The consumption of such important products for the human body as meat, milk, fish, fruits and vegetables has decreased significantly. The calculation of the indicators of the sufficiency of the consumption of basic food products by the population of Ukraine by the ratio between the actual consumption and the rational norms of consumption proved that the actual levels of consumption by the population of the country during 2010-2018 for most types of food products were below the recommended indicators.

We will analyze the economic availability of food according to the data in Table 3.5.

Table 3.5 – Economic affordability of food

Indicators	Years								
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Cumulative expenses on average per month per household, UAH	3073	3458	3592	3820	4041	4952	5720	7139	8309
Cumulative expenses for food on average per month per household, UAH	1586	1774	1800	1914	2101	2630	2849	3420	3963
The share of expenditure on food products and non-alcoholic beverages in the structure of total household expenditure, %	51.6	51.3	50.1	50.1	51.9	53.1	49.8	47.9	47.7

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

According to the data in the table, it can be stated that in the structure of the population's expenses, food expenses are less than the normative value of 60%, while in economically developed countries this indicator is from 10 to 15%.

Despite the fact that the condition of ensuring food security is formally fulfilled, food expenses make up about half of the population's expenses, which indicates a low standard of living of the population and a threat to food security. The low purchasing power of Ukrainians is the most important factor in the low food security.

In the table 3.6 shows the dynamics of the differentiation of food costs by social group.

Therefore, the coefficient of differentiation of the cost of food by social group was 1.67 in 2018 against 1.50 in 2014. Households belonging to the first quintile in terms of average per capita equivalent income are practically on the verge of food insecurity, as the share of their consumer spending on food approaches the threshold criterion (60%) [147].

Table 3.6 – Analysis of the differentiation of the cost of food by social groups

Indicators	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Expenditures on foods of 10% of households with the lowest incomes, UAH/month.	1031	1081	1115	1162	1372	1654	1659	1988	2298
Expenditures on foods of 10% of households with the highest incomes, UAH/month.	1775	2041	2115	2382	2352	2822	3165	3915	4850
Differentiation of the cost of food by social groups, times	1.7	1.9	1.9	2.1	1.7	1.7	1.9	2.0	2.1

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The internal market capacity indicator is an important indicator for compiling supply and demand balances and determining food independence for a particular product. Table 3.7 shows the capacity of the domestic food market by main foods.

The analysis of the capacity of the food market showed that during the considered period the consumption of fruits, berries and grapes

increased (by 5.4% in 2018 compared to 2010) and bread and bread products (by 11.2% in 2018 compared to 2010 r.). Evidence of negative trends in food security is a decrease in the consumption of almost all types of food, while the drop in consumption for certain types of food products for 2010-2018 turned out to be significant. Therefore, there was a reduction in the capacity of the food market for sugar (by -25.1%), oil and other vegetable fats (by -25.8%), potatoes (by -26.1%) in 2018 compared to 2010. Less sharp, but there was still a significant reduction in food consumption of meat and meat products (by -6.2%), milk and dairy products (by -11.6%), eggs (by -12.4%), vegetables and melon food crops (by -0.1%) for the analyzed period.

Table 3.7 – Actual consumption funds (food market capacity) of the main foods by the population of Ukraine, thousand tons

Foods	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat and meat products	2381	2335	2473	2545	2325	2179	2195	2195	2232
Milk and milk products	9450	9343	9768	10023	9581	8995	8942	8496	8355
Eggs, pcs	767	818	810	813	771	694	659	670	671
Fish and fish products	664	611	618	662	479	367	410	460	497
Sugar	1699	1756	1709	1683	1559	1528	1420	1290	1260
Oil	678	625	591	603	561	525	497	497	501
Potatoes	5901	6352	6373	6143	6061	5892	5966	6091	5893
Vegetables, water-melons, melons and gourds	6570	7423	7427	7409	7019	6890	6984	6783	6927
Fruits, berries and grapes	2198	2398	2423	2554	2249	2179	2119	2242	2445
Bread products	5096	5034	4973	4918	4668	4423	4309	4285	4207

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Due to the decrease in the consumption of certain food products by the population, there is a decrease in the capacity of the domestic market for such types of food as potatoes, vegetables and melons, fruits, berries and grapes, bread and bread products, and eggs.

If we analyze the dynamics of the capacity of the food market, we can pay attention to the annual decrease in the consumption of milk and dairy products, oil and other vegetable fats, potatoes, the chain rate of growth of which consumption from year to year was negative in 2010-2018. The consequences of the identified trends are significant threats to the food security of Ukraine.

Food independence for certain types of food is equal to the ratio of

the volume of imports and the capacity of the domestic market in natural terms and has a maximum criterion at the level of 30% (Table 3.8).

Table 3.8 – Food independence by main foods in Ukraine, %

Foods	Years								
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Meat and meat products	15.88	10.45	17.11	13.04	8.21	7.26	8.31	10.63	11.42
Milk and milk products	2.89	2.75	4.20	5.47	3.54	0.87	1.18	1.56	1.86
Eggs	0.91	0.37	0.50	0.62	0.86	1.59	0.76	1.05	0.72
Sugar	5.30	2.73	0.59	0.65	0.43	0.26	0.35	0.54	0.22
Oil	47.08	39.86	39.09	49.05	37.62	30.42	43.95	48.19	34.13
Potatoes	0.51	0.65	0.36	0.37	0.63	0.29	0.45	0.39	0.88
Vegetables, water-melons, melons and gourds	4.73	3.84	2.87	3.20	3.05	1.38	1.95	1.91	4.18
Fruits, berries and grapes	51.42	48.49	48.34	45.88	36.17	27.02	34.59	36.60	45.68
Bread products	3.43	5.42	4.59	4.92	5.36	4.31	5.58	5.97	6.67
Food independence by all foods	**7.43**	**6.77**	**7.08**	**7.46**	**5.99**	**3.74**	**4.78**	**5.44**	**6.20**

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Analysis of the table allows us to conclude that food independence exceeds the 30% level for such food products as oil and other vegetable fats and fruits, berries and grapes. In general, it can be stated that in Ukraine, food independence has been ensured for almost all types of food at a high level in recent years. The population's needs for vital food products are met at the expense of domestic production.

Based on the analysis of the food security trends according to Methodology No. 1379, it is possible to draw a general conclusion that the considered system of indicators does not allow to objectively assess the situation in food security of Ukraine, since indicators of agricultural production and its efficiency are not included in the methodology. There is also no assessment of the resource provision of the agricultural sector and the import dependence of the country's food supply, which is extremely important for the formation of a food security strategy. In addition, the sufficiency of the consumption of basic food products is assessed only by compliance with rational standards and energy value, while the balanced diet by types of food origin, which is the basis of a full-fledged diet, is not taken into account. Indicators of food quality and safety are not provided, which is especially relevant in modern conditions.

The draft Law of Ukraine dated 28.04.2011 No. 8370-1 "On Food Security of Ukraine" provides a list of 8 indicators that characterize the level of threat to food security of Ukraine when the actual values of the indicators do not correspond to the established limit values. The draft law proposes limit values only for 3 out of 8 indicators.

Based on the comparative analysis of food security indicators in accordance with the considered normative documents, it can be concluded that only one of them – the indicator of economic availability of food products – is included in both lists in the same wording. The indicator of the level of consumption of food products by the population provided for by Law No. 8370-1 consists of two main indicators given in the "Methodology No. 1379": supply of the diet with the main types of products (minimum permissible criterion – 17%) and daily energy value of the diet (minimum permissible criterion – 2500 kcal).

Draft Law No. 8370-1 lacks the main targeted social indicators of food security (differentiation of the cost of food by social groups and the capacity of the domestic market), which are included in Methodology No. 1379. However, the system of indicators of the draft law has been expanded with new ones:

1) physical availability of food products, which includes an additional 7 indicators;

2) stability of the food market, which includes an additional 4 indicators;

3) food safety and quality, which includes an additional 3 indicators;

4) the level of development of the agro-food sector, which includes an additional 7 indicators;

5) characteristics of natural resource potential and efficiency of use, which includes an additional 3 indicators.

Therefore, it is possible to observe a transition from an emphasis on individual food security (of an individual person) to a general one (availability of the resource as a whole). According to the Draft Law No. 8370-1, the system of food security indicators of Ukraine pays special attention to the level of independence of the food market, which is determined by the following indicators for assessing food security threats:

1) food independence of food products (the share of imports in the overall structure of their sale);

2) the level of self-sufficiency in food products (sufficiency of their stocks);

3) the amount of state food reserves;

4) the balance of foreign trade in food products.

Based on the specifics of food security indicators according to the Draft Law of Ukraine No. 8370-1, we will supplement the analysis of the food security trends with an assessment of the price indices for agricultural products (Table 3.9), the level of profitability (Table 3.10) and the level of self-sufficiency in food products, which is calculated as the ratio of production volumes to the volumes of internal use on the territory of Ukraine (Table 3.11).

Table 3.9 – Price indices for agricultural products, up to the previous year, %

Foods	2014	2015	2016	2017	2018
Agricultural animals (in live weight)	122.9	138.6	100.4	140.1	104.4
Milk	106.5	120.8	126.1	131.0	104.6
Eggs	118.6	167.5	83.5	104.3	127.0
Factory sugar beets	122.1	160.5	105.9	98.1	89.5
Oil crops	124.9	182.8	114.2	104.2	102.9
Potato	112.3	79.9	104.9	127.1	108.7
Vegetable crops	137.6	142.7	108.4	112.4	104.3
Fruit and berry crops	116.6	163.7	99.1	134.4	72.5
Cereal and leguminous crops	132.8	156.6	119.0	109.2	116.2

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Therefore, a significant increase in the prices of basic food products leads to an increase in household expenses, a decrease in economic availability and a violation of the balanced structure of food and deterioration of its quality. The most rapid increase in prices for products of animal origin (meat and meat products, milk and dairy products) and fruits turned out to be the fastest.

In the table 3.10 shows the level of profitability of agricultural production in Ukraine.

According to the data in the table, it can be concluded that the production of meat and eggs is unprofitable in Ukraine, and the production of sugar beets, potatoes, and vegetable crops is unprofitable. This means that in order to fully feed the population with these types of food at affordable prices, measures of state support for commodity producers and price regulation are necessary.

Ensuring national food security is impossible without the state guaranteeing food independence and food self-sufficiency. At the same time, among the existing methodical approaches to assessing the state of food security, the definition of the limit value of food imports is used. The

criterion of a country's food self-sufficiency and independence in world practice (according to the FAO methodology) is the level of meeting food needs at the expense of domestic production of at least 70% and no more than 30% of imports [230].

Table 3.10 – The level of profitability of agricultural production in Ukraine, %

Foods	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
The level of profitability of agricultural production	17.5	19.3	16.3	8.3	9.3	30.4	25.6	16.5	13.5
Cereal and leguminous crops	14.2	26.1	15.8	2.4	25.7	42.6	37.8	25.0	24.7
Potato	57.5	18.6	-17.4	22.4	9.9	24.6	0.6	10.0	6.8
Vegetable crops	10.3	11.1	-0.6	7.5	14.5	32.0	15.3	9.9	13.3
Fruit and berry crops	15.0	14.9	9.6	127.5	65.8	58.3	25.0	35.4	6.4
Grape	90.0	56.7	71.5	99.0	57.5	92.9	71.4	51.6	22.6
Milk	17.8	18.4	1.8	13.1	11.1	12.7	18.6	26.9	16.1
Meat (average)	-18.0	-20.0	-15.4	-20.8	-21.1	-9.1	-13.9	-6.4	-5.4
Chicken eggs	52.0	49.5	52.6	47.6	58.8	60.9	0.5	-9.0	5.4
Sugar beets	16.5	35.8	15.9	3.1	17.8	27.7	24.6	12.4	-11.4
Sunflower	62.8	55.7	44.9	28.2	36.7	78.4	61.9	41.3	32.5

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Table 3.11 provides indicators of self-sufficiency in the main types of food, which is calculated as the ratio of production volumes to internal consumption in the territory of Ukraine.

Table 3.11 – The level of food self-sufficiency in Ukraine

Foods	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat and meat products	86.1	91.4	88.9	93.4	101.2	106.2	105.4	105.1	105.1
Milk and milk products	106.4	106.7	104.6	101.6	103.6	105.0	103.6	107.7	107.5
Eggs	108.5	109.5	108.3	109.7	116.5	113.9	114.0	119.8	123.9
Sugar	105.9	147.1	125.1	74.9	131.7	95.5	142.3	158.4	139.2
Oil	456.0	522.9	688.2	614.6	878.1	872.6	1088.3	1265.5	1246.1
Potatoes	97.7	110.0	98.4	97.2	105.5	96.3	101.6	101.7	101.5
Vegetables, water-melons, melons and gourds	100.0	105.3	105.8	101.2	103.4	100.3	101.6	102.9	103.4
Fruits, berries and grapes	73.7	74.0	71.8	81.0	82.0	92.3	84.9	82.9	91.3
Bread products	144.1	192.9	161.0	221.0	230.9	238.9	290.5	292.2	319.2

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

In Ukraine, the consumption of meat and meat products, milk and dairy products, bread and bakery products, eggs, vegetables and melons, potatoes, oil, sugar is fully ensured through the domestic production. The oilseeds and grain crops industries cover the domestic consumption in several times, and form a strong base of Ukrainian agricultural exports [56, c. 32].

The need to guarantee food security requires maintaining an appropriate level of food self-sufficiency, subject to the use of effective governmental support for domestic producers of agricultural products and import control to protect the domestic market from competition.

However, food self-sufficiency is not always an effective strategic direction for guaranteeing food security, since the threat to food security is often not so much the import of food as the risks of its reduction or cessation, as well as the lack of effective mechanisms for controlling the quality and safety of products. At a low level of self-sufficiency, food security decreases when it is impossible to finance food imports and the country's dependence on economic aid from other countries increases (for example, in the form of humanitarian aid, the provision of loans and benefits, etc.). Avoiding these threats requires a developed and highly efficient agricultural sector under the condition of an effective food security strategy, a strategy of economic development to ensure the economic potential of the country. It should also be taken into account that even with almost absolute self-sufficiency in basic food products, restrictions on imports and even entering international markets as a food exporter, the state may not be able to ensure national food security due to the low level of food consumption and malnutrition of a large part of the population. Conversely, the stability of the state's national economy and powerful export capabilities allow the country's population to guarantee an adequate level of food consumption while being self-sufficient in basic food products.

We will analyze the balance of foreign trade in food using indicators of the trade balance, which is defined as the difference in the value of exports and imports of food, and the coverage ratio of imports by exports (index of the state of the balance), which is determined by the ratio of the volumes of food exports to the volumes of imports [73, c. 120] (table. 3.12).

The analysis of the independence of the food market is key in Ukraine's foreign trade in food, because based on the results of the

calculations of its criteria, legal restrictions on the export and import of food or other restrictions on ensuring food security are introduced without violating the international legal obligations of the state, in particular WTO norms.

Table 3.12 – Analysis of the balance of foreign food trade

Foods	Trade balance, thousand tons					Coverage ratio of imports by exports				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Meat and meat products	17	87	121	118	116	1.1	1.6	1.7	1.5	1.4
Milk and milk products	170	386	329	703	627	1.5	5.9	4.1	6.3	4.5
Eggs	140	115	107	148	182	21.0	11.5	22.4	22.1	46.5
Sugar	33	149	500	610	591	5.7	38.3	101.0	88.1	198.0
Oil	4355	4093	4885	5749	5727	20.5	26.6	23.3	25.1	23.1
Potatoes	-23	-2	-22	-6	-6	0.4	0.9	0.2	0.8	0.8
Vegetables, water-melons, melons and gourds	69	117	88	315	246	1.3	2.2	1.6	3.4	2.3
Fruits, berries and grapes	-506	-264	-449	-528	-547	0.4	0.6	0.4	0.4	0.4
Bread products	33160	38148	41211	42244	42660	127.1	201.8	172.7	166.7	153.4

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

A critical analysis of the provisions of Draft Law No. 8370-1 allows us to conclude that taking into account the indicators of the food market and state food stocks is extremely important for the formation of an effective food security strategy.

The list of indicators of Draft Law No. 8370-1 does not include those that reflect the efficiency of food production and its provision of the country's internal needs. Normative documents contain methodical approaches to the calculation of indicators and their information sources, but they are not perfect enough and require clarification, thorough research and reasoned recommendations.

In the works of domestic scientists, the content of the concept of food security is reduced to the definition of a system of criteria and indicators that make it possible to comprehensively characterize its current state, dynamics and trends of change. When evaluating food security, the following blocks of indicators are distinguished: sufficiency,

availability, independence, sustainability, safety and quality, physical availability, economic availability. It is also proposed to distribute the formed set of indicators by each of the indicator blocks [9].

Other researchers suggest that the following factors should be taken into account when diagnosing food security:

- the level and structure of the final consumption of food products;
- the state of the food potential of the agricultural sector and natural resources for agricultural purposes;
- volumes and structure of food export-import in the region, which characterize the interregional aspect of reproduction;
- food quality and safety [29, p. 44].

The conducted research allows us to come to the conclusion that the existing methodical approaches to the analysis of the state of food security in Ukraine are represented by a set of regulatory and legal acts that are not sufficiently coordinated among themselves. The limit values are not set for all the considered indicators, and there are not even recommended threshold values.

The adopted system of indicators does not allow an objective and comprehensive assessment of the state and dynamics of food security, taking into account the tasks of strategic planning and making informed strategic decisions, and therefore cannot be an effective methodical basis for developing a food security strategy. Today, economic science and the legal framework do not have a single approach to the analysis of the state of food security of Ukraine. It is necessary to develop an analytical base for the formation of a food security strategy, which may include:

- development of an objective system of indicators that would take into account all the components on which food security depends, namely: production, market, resources and social aspect;
- development of a system of information support for assessment and prevention of threats to food security;
- development of an information system for the automation of food security monitoring;
- application of methodological approaches of strategic analysis, planning and management to improve the process of forming a food security strategy and its implementation.

3.2. The influence of globalization factors on the food security of the country

The problem of national food security is a strategic priority for ensuring the state's competitiveness in the global environment and sustainable socio-economic development. The strengthening of internal and external threats to food security, among which the most acute for Ukraine is the low level of income of the population, which causes low quality of nutrition, limited financing of the agricultural sector and inhibition of its development, imperfection of infrastructure support of the food complex, actualizes the need for systematic assessment and monitoring of the state of food security, especially in comparison with global trends using international methodological approaches. In addition, a well-founded and reliable analytical base is needed to assess food security both at the national and global levels for timely response to possible threats and challenges and the formation of the food security strategy of each country.

The relevance of the study of international food security assessment methods is explained by the need to harmonize Ukrainian legislation in the field of food security in accordance with international legal norms and assessment standards. The results of food security monitoring of Ukraine in accordance with international methodologies will allow to conduct a comparative analysis of trends at the global level and develop recommendations for identifying, assessing and forecasting threats in the food sector. A high level of food security according to international standards will provide Ukraine with a stable global position on the global market with a competitive food supply system.

The Food and Agriculture Organization of the United Nations (FAO) and the European research and analysis division of The Economist Intelligence Unit are the main subjects of food security assessment and monitoring at the global level [10, p. 94].

Regulation of issues of methodical provision of assessment of the state of food security of Ukraine according to the developed indicators is carried out by current legal acts and methodical recommendations, in particular: Methodological recommendations for calculating the level of economic security of Ukraine dated 29.10.2013 No. 1277, the draft Law of Ukraine "On Food Security of Ukraine" No. 8370-1 dated 28.04.2011, Methodology for determining the main indicators of food security,

approved by the Cabinet of Ministers of Ukraine Resolution No. 1379 dated 05.12.2007 “Some issues of food security”.

A significant regulatory and scientific basis for food security assessment and existing indicator systems allow comprehensive and reliable identification of existing threats and challenges, management of socio-economic processes that have an impact on food security trends. At the same time, the problems of inconsistency of methodological approaches and individual domestic indicators with international ones require deeper studies of the international experience of food security assessment.

International organizations FAO and EIU use methodological research approaches and indicators that differ among themselves. The common goal of assessing the state of food security is to identify potential threats to the physical and economic availability of food for the population, quality and safety.

Both in the EU and in each participating country, the so-called “seven basic principles of ensuring food security” apply: interaction between all links of the food chain, responsibility of the entrepreneur, traceability, independent scientific risk assessment, separation of powers between the areas of risk assessment and management risk, warning, transparent risk communication [156].

World practice in the food sector is represented by many methods that allow for the assessment and monitoring of existing trends. Modern methodical approaches involve the assessment of food security at the national level and at the level of households (individuals). State food security is assessed using: sector analysis; DHS (Demographic and Health Surveys); HES (Household Expenditure Survey); LSMS (Living Standards Measurement Study); SUA (Single Use Accounts) and FBS (Food Balance Sheet); FIMI (Food Insecurity Multidimensional Index); European methodology; Japanese methods and others [196, p. 106].

Food security at the household (individual) level is assessed using such methods as: food consumption research – research of individual diet; anthropometric studies; survey of household expenses; Alimentary basic research, etc. [84, p. 120]. The main methods of assessing household food security are divided into direct and indirect. The direct method involves assessing the adequacy of nutrition and its deficiency based on the study of the consumption of anthropometric data (the energy value of nutrition and the ratio of human weight and the growth of food consumption). The indirect method involves estimating the level of malnutrition based on

household income, since low income is the main obstacle to creating conditions for adequate nutrition of the population [196, p. 107].

The methodology of the FAO international food security assessment is based on the goal of monitoring threats to food security and their impact on the quality of life of the population. Its essence is that the achieved level and dynamics of basic indicators of food security are measured. The results of the assessment are obtained by calculating the world averages and the average value by region. The methodology allows analyzing the dynamics of food security indicators, and is most effective for states with insufficient self-sufficiency, for which it is important to monitor progress in the fight against hunger and malnutrition. The disadvantage of the methodology is the difficulty of adapting indicators for the internal assessment of security threats. Statistical information is provided independently by each country and national correspondents [230].

The assessment of the state of food security according to the methodology developed by the FAO is carried out using a system of indicators of 30 indicators in four groups [230].

The first group of indicators ("Food availability") includes the main characteristics of the population's diet and ensuring food security through domestic production. The availability of food is characterized by indicators of the caloric content of food, the average cost of food production, the average amount of protein consumption, the average amount of protein consumption of animal origin, the share of energy obtained from the consumption of cereals, root crops, and tubers. Food security is considered stable when all the mentioned indicators are growing.

As can be seen from the data in the table 3.13, the quality of food in economically developed countries by all indicators of the "Food availability" group exceeds the corresponding indicators for Ukraine. In comparison with the obtained indicators of neighboring countries, our state lags behind the most significantly in terms of the average amount of protein consumption, including animal origin, as well as the calorie content of food. At the same time, the average cost of food production in Ukraine is on a par with other countries, and even exceeds the corresponding indicators.

The second group of indicators ("Food access") includes the main characteristics of the economic availability of food for the population, as well as the state of the country's infrastructure. The availability of food,

according to the FAO methodology, is assessed by: the share of asphalted roads in the structure of the total length of roads, the density of highways, the density of railways, the level of GDP per capita, the index of consumer prices for food, the index of the spread of malnutrition, the specific weight of food costs among the poor, the level of food shortage.

Table 3.13 – The results of food security monitoring according to the FAO methodology according to the indicators of the "Food availability" group in an average of 3 years

Indicators	Country					
	Ukraine	Poland	Belarus	Hungary	Great Britain	USA
Average protein supply (g/capita/day)	87.7	101.3	96.7	79.8	102.7	108.7
Average supply of protein of animal origin (g/capita/day)	42	52	56	43	58	69
Average dietary energy supply adequacy (%)	119	138	133	126	135	148
Average value of food production (constant I$ per person)	398	325	380	355	170	469

Source: compiled by the author based on the data FAO [155].

According to the table 3.14, almost all values of indicators of the "Food access" group in Ukraine are at a lower level compared to other countries. In particular, GDP per capita for the considered period is several times lower than that of developed countries. At the same time, the percentage of people suffering from unsafe food and the prevalence of food insecurity significantly exceed the corresponding indicators of other countries.

The third group of indicators ("Economic and political stability") includes the most important characteristics of food independence and political stability of the state.

The stability of food supply is measured by the following indicators: the coefficient of dependence on grain imports, the percentage of arable land equipped for irrigation, the share of food imports in the total volume of food exports, political stability and the absence of violence or terrorism, the volatility of prices for domestic food products, the dynamics of food production per capita, dynamics of food availability per capita.

Table 3.14 – The results of food security monitoring according to the FAO methodology according to the indicators of the "Food access" group

Indicators	Country					
	Ukraine	Poland	Belarus	Hungary	Great Britain	USA
Gross domestic product per capita, PPP	7906.5	27346.3	17741.9	26860.6	39862.3	54470.8
Rail lines density (total route in km per 100 square km of land area)	3.6	5.9	2.6	7.8	6.7	1.5
Number of people undernourished (millions)	1.5	-	-	-	-	-
Prevalence of undernourishment, %	3.5	-	-	-	-	-
Number of people suffering from unsafe food, %	0.8	0.3	-	0.1	1.2	3.3
Prevalence of pronounced food insecurity in the total population, %	1.8	0.7	-	0.8	1.8	1.0

Source: compiled by the author based on the data FAO [155].

According to the data of the analysis, it can be concluded that with a fairly high volume of food production in monetary terms compared to other countries and a low percentage of imported food in relation to export volumes, the state cannot guarantee food security at the level of economically developed countries. The availability of food products per capita exceeds the indicators of other countries, however, taking into account the analysis of food quality indicators (Table 3.15), it is obvious that the population of Ukraine is not provided with food in sufficient quantity and quality. A critical level of political instability and corruption has a significant impact on the deterioration of food security.

The fourth group of indicators ("Food utilization") characterizes the level of access to water and sanitation facilities, the negative consequences of insufficient consumption of food and trace elements. Food use is assessed by the following indicators: access to improved water sources, access to improved sanitation, percentage of children under the age of 5 years who are stunted, percentage of children under the age of 5 years who are stunted, percentage of underweight children under the age of 5 years, percentage of underweight adults, prevalence of anemia among pregnant women, prevalence of anemia among children under 5

years of age, percentage of vitamin A deficiency among the population, percentage of school-aged children (6-12 years) with insufficient consumption of iodine.

Table 3.15 – The results of food security monitoring according to the FAO methodology according to the indicators of the "Economic and political stability" group

Indicators	Country					
	Ukraine	Poland	Belarus	Hungary	Great Britain	USA
Per capita food production variability, thousands USD	38.3	14.6	16.2	40.4	8.7	12.7
Value of food imports over total merchandise exports, %	7	6	5	3	9	4
Per capita food supply variability (kcal/capita/day)	68	30	64	38	16	42
Political stability and absence of violence/terrorism (index)	-1.89	0.52	0.03	0.81	0.26	0.30

Source: compiled by the author based on the data [155].

According to the analysis of the table. 3.16, it can be concluded that in Ukraine, compared to other countries, the percentage of children under 5 years of age with stunted growth, body weight and excess body weight is high, which indicates a violation of nutritional norms.

It should be noted that the considered group of indicators is more suitable for the analysis of developing countries, since it is precisely for these countries that the problems reflected by the considered group of indicators are characteristic. Thus, the state of food security of Ukraine according to the FAO methodology can be considered sufficient in comparison with world indicators. It should be concluded that the assessment of food security based on international methodological approaches is necessary to identify strategic problems in the food sector and to objectively analyze and compare food security trends with global trends.

The methodology of the international assessment of food security, developed by the Institute of Economic Research (The Economist Intelligence Unit, EIU), is aimed at analyzing and identifying the strengths and weaknesses of national food security systems. The essence of the methodology is the formation of a global model of food security and the construction of a rating of the countries of the world. The EIU's food security assessment methodology consists in determining an integral

index by country, group of countries by GDP per capita and global. The methodology allows to study the experience of the leading countries in terms of food security, taking into account the provided differentiated approaches, and compare countries by country groups according to the level of GDP per capita. The drawback of the method is the insufficient speed of updating statistical information by country, since the collection and processing of information is based on the analysis of published works [230].

Table 3.16 – The results of food security monitoring according to the FAO methodology according to the indicators of the "Food utilization" group

Indicators	Country					
	Ukraine	Poland	Belarus	Hungary	Great Britain	USA
Percentage of population using at least basic drinking water services, %	97.7	98.1	98.0	100.0	100.0	100.0
Percentage of population using at least basic sanitary services, %	95.9	97.9	94.3	98	99.1	99.2
Percentage of children under 5 years of age who are stunted, %	22.9	-	4.5	-	-	2.1
Percentage of children under 5 years of age affected by wasting, %	8.2	-	2.2	-	-	0.5
Percentage of children under 5 years of age who are overweight, %	26.5	-	9.7	-	-	6
Prevalence of anemia among women of reproductive age (15-49 years), %	23.5	25.7	22.6	25.8	15.3	13.3
Prevalence of obesity in the adult population (18 years and older), %	26.1	25.6	26.6	28.6	29.5	37.3

Source: compiled by the author based on the data FAO [155].

The Global Food Security Index (GFSI), developed by the Institute of Economic Research (The Economist Intelligence Unit) and international experts with the financial support of the American multinational company DuPont in 2012, makes it possible to construct a rating of food security from 113 countries of the world [232]. According to the GFSI, food security is a state in which the population at all times has physical, social and economic access to food (in sufficient quantity and with sufficient nutritional value) that meets their dietary needs for a

healthy and active life.

GFSI is a dynamic model, the analytical base of which includes more than 28 indicators, which allows to evaluate the factors of food security in developed countries of the world based on a system of indicators grouped into 3 groups: physical availability; economic availability; food quality and safety [232]. This model, in addition to assessing food security according to the groups of indicators indicated above, includes a group of criteria "natural resources and sustainability". These indicators measure the impact on the country of a changing climate; its susceptibility to natural resource risks, and how the country adapts to these risks. The use of this group of indicators is a corrective for assessing the food security of countries.

Generalizing indicators of the GFSI are the rating and the integrated index of food security, which is formed on the basis of such components as "Affordability", "Availability", and "Quality and Safety" of food products [232]. According to the data below, Ukraine, having a significant agricultural potential, lags behind both the rating and the components of the integral index both from the leaders of the rating and from the reference countries – the closest neighbors and competitors (Table 3.17).

Therefore, according to the GFSI, in 2018, Ukraine ranks 76th out of 133 countries in the world in terms of food security (in 2017, it was 63rd).

Table 3.17 – Positions of some countries according to the Global Food Security Index using the GFSI methodology in 2018

Rating	Country	Integral index	Affordability	Availability	Quality and Safety
1	Singapore	87.4	95.4	83.0	79.4
2	Ireland	84.0	90.5	76.8	87.7
3	USA	83.7	87.4	78.3	89.1
4	Switzerland	83.1	83.8	84.3	78.2
32	Czech Republic	73.1	82.6	66.3	68.1
24	Poland	75.6	81.1	69.3	79.5
34	Hungary	72.7	80.8	66.1	70.5
36	Belarus	70.9	76.0	62.9	80.2
76	Ukraine	57.1	63.9	50.0	59.6

Source: compiled by the author based on the data GFSI [232].

For comparison: Belarus – 36th place (in 2017 – 44th place),

Hungary – 34th place (in 2017 – 30th place), Poland – 24th place (in 2017 – 26th place), Czech Republic – 32nd place (in 2017 – 24th place) [232].

We will conduct a more detailed analysis to identify the reasons for this lag and possible strategic directions for strengthening food security. We present in the table. 3.18 results of evaluation of indicators of food security according to the GFSI methodology for the group of indicators of economic availability ("Affordability").

The economic availability of food depends on the income of the population to meet the needs for quality food products in sufficient quantity.

Table 3.18 – The results of food security monitoring according to the GFSI methodology according to the indicators of the economic availability («Affordability») in 2018

Indicators of the economic availability («Affordability»)	Value of the indicator in Ukraine	Value of the indicator in the world	Comparison of the value of indicator in Ukraine with the world, %
Change in average food costs, %	236.1	186.4	-1.9
Proportion of population under global poverty line, %	0.1	11.5	+16.4
Gross domestic product per capita, USD	9252.6	23099.5	-11
Agricultural import tariffs, %	9.2	15.4	+9.9
Food safety net programmes, quality assessment, points	2.0	3.0	-24.3
Market access and agricultural financial services, quality assessment, points	2.0	2.6	-13.9

Source: compiled by the author based on the data GFSI [226].

According to the monitoring results of the indicator of growth of household expenditure on food consumption, in 2018 Ukrainian households spent 236.1% more money on foods than in 2010, which exceeds the average value of the indicator in the world by 1.9%. It should be noted that this indicator was 117.9% in Poland, 126.2% in Hungary, and 487.8% in Belarus [232]. In fact, this indicator is an index of consumer prices for food, which characterizes the change in average food costs, that is, the change in the cost of an average food basket since 2010.

The share of the population below the global poverty line (%), that is, the population living on less than $3.20 per day, in Ukraine it was 0.1%, which is 16.4% less than in the world. However, according to the World Bank Report "Poverty and shared prosperity 2018", today 25% of the population is on the verge of poverty and the situation does not improve even with the provision of subsidies and other types of social

assistance to the poor population [252]. In modern conditions, in order to strengthen food security, it is necessary to use state-wide tools and mechanisms to increase the effectiveness of the state's social policy, balance the differentiation of the population's incomes and, as a result, food consumption.

Analyzing the gross domestic product per capita, which is a measure of individual income and characterizes the availability of food, according to the GFSI methodology, this indicator in Ukraine is 11% lower than the world value. In Ukraine in 2018, it amounted to 9,252.6 USD per person, while the world average is 23,099.5 USD per person [240].

The agricultural import tariff is the average tariff for all agricultural imports of the country. In Ukraine, this indicator is 9.2%, while the average customs duty in the world is 15.4%. Therefore, the protection of the domestic agricultural market of Ukraine is sufficiently protected, limiting the import of certain types of food. A higher level of protection is established for livestock and dairy products, as well as grain and sugar. The least protected are the markets of cotton, coffee and tea, beverages, oils and fats, as well as vegetables and fruits [232]. In the EU countries, in particular in Poland and Hungary, the average agricultural imports tariff for products is 12%, in Belarus – 11.3% [232; 240]. The reduction of trade barriers in Ukraine is due to the strengthening of integration processes, in particular, the signing of international agreements on free trade with 45 countries of the world, which provide for the abolition of trade restrictions and duties in mutual trade between countries, and preparation for the signing of similar agreements with Turkey, China, Israel.

The availability of food safety net programmes in Ukraine is 24.3% lower than the world average and is 2 points out of 4 possible. This result is due to the still insufficiently effective reform of national legislation and the formation of a state control system aimed at bringing the activities of Ukrainian food producers closer to the level of European standards in connection with the need for Ukraine to fulfill its obligations within the framework of the EU-Ukraine Association Agreement.

Ensuring food security at the strategic level depends on access to finance for farmers, which is rated GFSI 2 out of 4 points with a global average of 2.6 points [232]. The government has already implemented certain measures in this direction, in particular, the adoption of programs to support the development of farming, the activities of the Ukrainian State Farm Fund, which finances the purchase of machinery, equipment,

replenishment of working capital and other purposes [240].

The reason for insufficient effectiveness of state financial support for farmers in Ukraine is the non-use of part of the funds laid down in the state budget. According to the Annual Report on the Implementation of the State Budget of Ukraine for 2018 of the State Treasury Service of Ukraine, the amount of planned expenditures for the needs of the Ministry of Agrarian Policy and Food of Ukraine amounted to UAH 12,361.4 million, including 4,232 million UAH for programs to support the development of the agricultural industry including financial support for measures by reducing the price of loans – 266 million UAH; financial support for the development of farms – 210 million UAH; state support for the development and establishment of young gardens, vineyards and berry orchards – 400 million UAH; state support for the livestock industry – UAH 2401 million; financial support for agricultural producers – 955 million UAH) [10].

The actual use in 2018 was 98.5% of the budgeted funds (11,841.6 billion UAH), of which 2.57 billion UAH was allocated under the main programs to support the development of the agricultural sector (including financial support for activities in the agro-industrial complex by reducing the interest rates of loans – 265.9 million UAH; financial support for the development of farms – 203.3 million UAH; state support for the development, establishment of young gardens, vineyards and berry orchards –394.3 million UAH; state support for the livestock sector – 2389.8 million UAH; financial support of agricultural commodity producers – 4166.2 million UAH) [157]. The reason for the incomplete use of funds is the imperfection of the procedures for obtaining them, the limited access of farmers to information about the possibilities of state support.

Solving this problem requires information support in the field of implementation of state programs regarding farmers' access to financing.

Next, we will analyze the physical availability of food in Ukraine using the GFSI methodology. We present in the table. 3.19 results of evaluation of food security indicators according to the GFSI methodology for the group of indicators of physical availability ("Availability").

Indicators such as corruption (38.5% above the world average) and high political instability (32.9% above the world average), low the level of development of the infrastructure of the food complex (by 8.4% worse than the world average level).

Table 3.19 – The results of food security monitoring according to the GFSI methodology according to the indicators of the physical availability («Availability») in 2018

Indicators of the physical availability («Availability»)	Value of the indicator in Ukraine	Value of the indicator in the world	Comparison of the value of indicator in Ukraine with the world, %
Sufficiency of supply, %	57.1	62.9	-3.7
Agricultural research and development, % of public expenditure	0.13	1.3	-3.9
Agricultural infrastructure, %	40.7	62.9	-8.4
Volatility of agricultural production, standard deviation, units	0.1	0.1	-11.2
Political and social barriers to access, %	75.0	45.4	-32.9
Corruption, quality assessment, points	4.0	2.5	-38.5
The impact of urbanization (GDP growth rate, reduced by the growth rate of urban development), %	3.2	0.9	+8.1
Food loss, %	3.7	5.6	+5.5

Source: compiled by the author based on the data GFSI [232].

The adequacy of food supply (57.1%) is 3.7% lower than the world average. Compared to the reference group of countries, this indicator is lower than in Belarus (72.1%), Poland (77.3%) and Hungary (64.9%) [232].

The share of government spending on scientific research in agriculture is calculated as the ratio of the share of agriculture in government spending to the share of value-added agriculture in GDP. This indicator in 2018 in Ukraine is estimated at 0.13%, which is lower than the world average level by 3.9%. For example, in Poland and Hungary, this indicator was at the level of 0.59% and 0.37%, respectively, in 2018, in Belarus – 0.75% [232]. The low rating is due to the decrease in funding of science in Ukraine, the decrease in the number of organizations in the field of scientific research and development, the diversification of sources of funding of scientific research due to the more active participation of domestic scientists in international scientific projects. It should be noted that the financing of scientific research of the National Academy of Agrarian Sciences in 2018 is only 1,248 million UAH. According to the annual report on the implementation of the State Budget of Ukraine for 2018 of the State Treasury Service of Ukraine, expenditures on research, applied scientific and scientific and technical developments, implementation of works under state target programs and

state orders in the field of development of the agro-industrial complex, training of scientific personnel, scientific developments in the field of standardization and certification of agricultural products, research and experimental development in the field of agro-industrial complex in 2018 amounted to 185.7 million UAH (1.6% in the overall financing structure of the Ministry of Agriculture) [157].

The infrastructural support of the food complex of Ukraine is estimated at 40.7%, which is lower than the world average by 8.4% (warehouse infrastructure is 1 point out of 1 possible, road infrastructure is 1 point out of 4 possible, port infrastructure is 1 point out of 4 possible, air – 2 points out of 4 possible, railway – 2 points out of 4 possible, irrigation infrastructure, reflecting the percentage of cultivated agricultural areas equipped for irrigation, is 5.2% out of 100%). In the group of reference countries, the state of agricultural infrastructure is much higher: in Poland (64.4%), in Hungary (65.6%) [240]. In Belarus, infrastructure development is similar to Ukraine (40.6%). According to the Ministry of Infrastructure, due to limited funding, almost 90% of public roads have not been repaired for more than 30 years. The logistics cost of transporting goods is 40% higher than in EU countries [240]. The problems of port infrastructure development do not allow to fully use this resource in guaranteeing food security due to the low level of logistics development and inefficient interaction between different types of transport, which limits the use of food producers in most regions of the country [240].

The volatility of agricultural production at the level of 0.1 (70%) is lower than the world level by 11.2% and characterizes the standard deviation of the growth of agricultural production over the last twenty years. This indicator exceeds the value in Hungary (66.6%) and is lower than in Poland (82.9%) and Belarus (86.7%, respectively) [232].

Positive factors of food security are insignificant post-harvest food losses, which are estimated to be 5.5% lower than the world average and amount to 3.7%. This indicator is similar to neighboring countries: in Poland, the loss of agricultural raw materials after harvesting is also 3.7%, in Hungary - 2.7%, while in Belarus the lowest is 2.1% [232].

The urbanization impact indicator characterizes the state’s ability to finance the burden of urbanization and guarantee food security. In Ukraine, the food complex meets the food needs of the urban population at a sufficient level – 3.2% (higher than the world average by 8.1%) [232]. In modern conditions in the world, there is a tendency for food

security to worsen in cities, where the majority of underprivileged and malnourished people live.

Next, we will analyze the quality and safety of food. We present in the table 3.20 results of evaluation of food security indicators according to the GFSI methodology for the group of quality and safety indicators ("Quality and safety").

Table 3.20 – The results of food security monitoring according to the GFSI methodology according to the indicators of the quality and safety («Quality and safety») in 2018

Indicators of the quality and safety («Quality and safety»)	Value of the indicator in Ukraine	Value of the indicator in the world	Comparison of the value of indicator in Ukraine with the world, %
Dietary diversity, %	59.0	52.3	+11.4
Nutritional standards, %	0.0	62.9	-67.4
Protein quality, g	62.1	58.0	+6.3
Micronutrient availability, %	67.3	62.9	+7.0
Food safety	95.7	62.9	+13.2

Source: compiled by the author based on the data GFSI [232].

According to the indicators of the considered group, Ukraine exceeds the world average level, with the exception of the availability of food standards. The obtained monitoring results positively characterize the quality and safety of domestic food products.

Diversification of the diet, namely the share of products containing starch (except cereals, root crops and potatoes) in the total consumption of dietary energy is 59% (higher than the world average by 11.4%). The useful composition of Ukrainian food is high, as the availability of necessary trace elements in food products is 67.3% (7.0% higher than the world average). The lack of food standards and the subsequent commitment of the government to improve food standards in Ukraine negatively affects the level of food security of the country.

One of the indicators of the analyzed group is the safety of food products, which is estimated to be 95.7% in Ukraine, which is 13.2% higher than the world average.

Therefore, the main purpose of the GFSI calculation is to determine which countries are most and least vulnerable from a food security perspective in categories such as financial and physical availability, as well as food quality and safety. All relevant legal norms of the international and national levels are subject to the achievement of the specified goals.

It can be concluded that most of the methods for assessing the state of food security used in the world offer a sequence of calculating a limited set of indicators, the values of which are summarized in a certain way in an integral indicator of the state of food security. By comparing the values of these integral food security indices across regions or countries, conclusions are drawn regarding the dynamics of changes in the state of food security, weak and strong indicators, and the search for ways to increase the level of food security.

To find out how successfully a country solves internal food security problems, including in comparison with other countries of the world, it is advisable to use the Global Food Security Index, which allows to track the main problems of economic availability, physical availability and quality of food in 113 countries of the world [232]. According to this Index, Ukraine ranks 76th among other countries in 2018 (63rd in 2017), which is a negative trend. Therefore, it is necessary to develop a recommendation for strengthening food security in accordance with the results of the assessment.

Based on the analysis of the results of the assessment of food security of Ukraine with the help of methods and monitoring methodology by international entities, it is possible to research and put into practice effective global experience in identifying, assessing and forecasting threats in the food sector. In addition, the application of international approaches to the assessment of food security and the comparison of the obtained results with other countries will contribute to ensuring a stable international position of Ukraine in the global environment with an effective system of providing the population with food, which will improve the image and competitiveness of the country in the world.

3.3. Development of the agro-food sector of the economy and formation of solvent demand in the food security system

Guaranteeing food security at the state level is inextricably linked to the guarantee of food independence (self-sufficiency), as well as full satisfaction of the population’s food needs due to sufficient volumes of domestic agricultural production. The national food security system is based on the principles of self-sufficiency, independence, availability, and

quality. These principles should form the basis of the formation of a strategy and state policy for ensuring food security. The main strategic directions of ensuring food security should be: effective development of the agrarian sector of the economy, effective foreign economic activity in the agrarian sector, formation of solvent demand at the expense of the people's income, guaranteeing balanced and high-quality consumption.

Guaranteeing food security depends on the potential of the agricultural sector and sufficient production of basic food products in the country.

Table 3.21 shows that in the studied period, the production volumes of certain food products, in particular, meat and meat products, increased by 14.4% in 2018 compared to 2010, oil and other vegetable fats by 101.3%, potatoes – by 20.3%, vegetables and melon crops – by 12%, fruits, berries and grapes – by 41.1%, bread and bread products – by 78.4% (Appendix A). At the same time, the production of milk and dairy products decreased by 10.5%, eggs by 2.4%, and sugar by 2.8% in 2018 compared to 2010.

Table 3.21 – Dynamics of production of the main foods in Ukraine

Foods	Production volume, thousand tons								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat and meat products	2059	2144	2210	2389	2360	2323	2324	2318	2355
Milk and milk products	11249	11086	11378	11488	11133	10615	10382	10281	10064
Eggs	985	1079	1104	1133	1131	969	872	896	932
Sugar	1805	2586	2143	1263	2053	1459	2021	2043	1754
Oil	3101	3268	4067	3712	4926	4581	5409	6277	6243
Potatoes	18705	24248	23250	22259	23693	20839	21751	22208	22504
Vegetables, water-melons, melons and gourds	8873	10562	10815	10668	10323	9792	9998	9721	9940
Fruits, berries and grapes	2154	2418	2465	2871	2435	2539	2385	2458	3039
Bread products	39271	56747	46216	63051	63859	60126	66088	61917	70057

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Analyzing the rate of increase in production volume each year relative to the previous year, it can be seen that the dynamics of the production of meat and meat products, milk and dairy products, as well as

vegetables and melon food crops was relatively stable during 2010-2018. However, there were sharp fluctuations in the production of eggs, sugar, oil and other vegetable fats, potatoes, fruits, berries and grapes, and bread and bread products, in particular in 2014-2015.

The growth of food production is a positive trend, which indicates the adequacy of food supply to the population and is a factor in guaranteeing Ukraine's food security. Threats to food security are the instability of production volumes, especially in the case when the consumption of food products, the domestic production of which is reduced, also decreases, and there is a need to compensate for the lack of food on the market at the expense of imports. The presence of a powerful and highly efficient agricultural sector of the economy is a strategic aspect of food security. For an objective assessment of the development of the agricultural sector and the stability of the food market in the context of ensuring the food security of Ukraine, an analysis of the level of consumer prices for food products and purchase prices for agricultural products should be carried out, taking into account the profitability of their production (Table 3.22).

The conducted analysis showed that the food security of Ukraine is influenced by the stability of the food market, which in turn depends on the level of consumer prices for food and costs for agricultural products, taking into account the profitability of their production.

Table 3.22 – Comparative analysis of growth rates of consumer prices, levels of production profitability, production costs and rates of increase in food production volumes, % compared to the previous year

Indicators	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cumulative index of production costs of agricultural products	116.9	117.0	106.8	101.0	117.9	150.9	113.5	121.8	113.9
Indices of agricultural products sales prices	130.0	113.6	106.8	97.1	124.3	154.5	109.0	111.5	109.3
Indices of plant production prices	139.8	115.7	105.6	91.8	129.2	167.2	116.3	107.3	109.8
Indices of prices for the sale of livestock products	114.3	109.2	108.0	102.4	119.1	141.3	101.7	130.7	108.6
Consumer price index for food products	110.9	106.4	97.9	97.8	112.2	145.9	109.0	112.9	111.1
The level of profitability of the activity	17.5	19.3	16.3	8.3	9.3	30.4	25.6	16.5	13.5

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

In 2010-2018, costs for the production of agricultural products grew at a higher rate compared to the sales prices of agricultural products, including crop and livestock products. At the same time, food prices grew at a lower rate compared to production costs, which leads to a decrease in the level of profitability of agricultural enterprises. This is evidenced by the negative dynamics of the level of profitability in 2015-2018, from 30.4% to 13.5%, respectively (Table 3.10).

Fig. 3.2 illustrates the dynamics of levels of profitability of agricultural production, output of agricultural products and net profit in Ukraine in recent years.

The fall in the level of profitability in the agricultural sector took place against the background of a decrease in the sale prices of agricultural products at the same time a high rate of growth of production costs and a reduction in the amount of net profit, which is a natural phenomenon. A decrease in the economic efficiency of the functioning of the agrarian sector of the economy may lead to a reduction in the volume of production of agricultural and food products, which will create a threat to the food security of Ukraine.

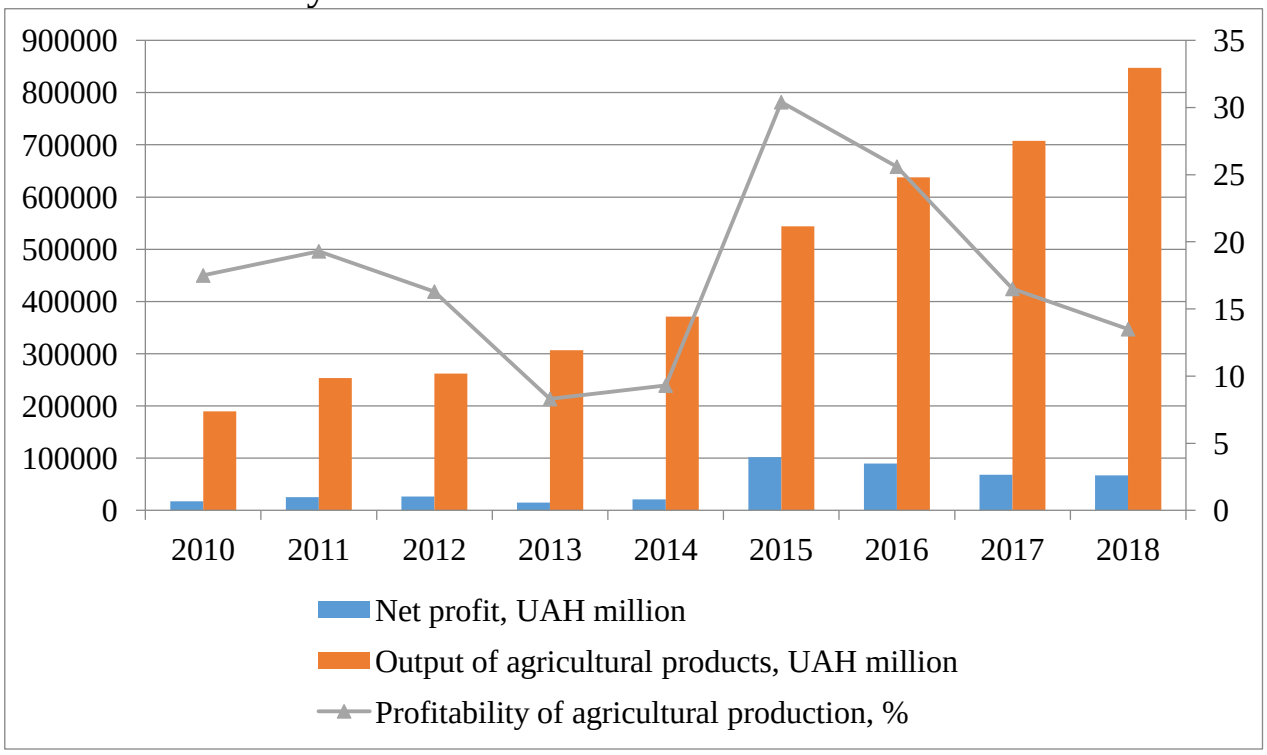


Fig. 3.2 – The level of profitability of agricultural production, output and net profit

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

In general, it can be concluded that the low prices of agricultural products, the high cost of production, the deepening of the price disparity

for agricultural and industrial products do not allow agricultural enterprises to ensure the profitable production of most types of food.

The destructive effect of the disproportion of inter-industry relations on agricultural production is manifested in the fact that production enterprises must purchase the necessary material and technical resources for production annually at higher prices, while they cannot sell the produced products on favorable terms, since the price of resources purchased at inflated prices increases production cost. Among the reasons that explain the growing discrepancy between prices for agricultural products and material and technical resources in the agricultural sector, high inflation rates, dependence on the exchange rate of foreign currencies, a high level of monopolization of adjacent industries, inelasticity of the supply of agricultural products and demand for them, inconsistency of development should be highlighted scientific and technical progress in the agricultural sector and the growth of demand for products, high immobility of agricultural resources, uneven speed of capital circulation in various industries, lack of an effective mechanism of state regulation of prices.

The specified factors lead to the fact that agricultural producers sell their products at prices that are formed in conditions of unevenness and instability of the market.

Summarizing the above, it is possible to assert the uneven economic development of various sectors of the agriculture and service industries. In addition, statistical data indicate that the prices of products of the agricultural sector always grow at a lower rate compared to the prices of products of other sectors of the economy of Ukraine, which leads to the instability of the income of agricultural producers. Persistent price disparity for agricultural and industrial products leads to low profitability and unprofitability of agricultural production and poses a significant threat to the country’s food security.

The emergence of price disparities for agricultural and industrial products due to a number of factors, such as world prices, natural conditions, seasonal fluctuations in prices and volumes of sales, is exacerbated by a high level of monopolization in the market for the supply of material and technical resources for the needs of the agricultural sector, which deepens the price disparity between them. Inefficient state policy, which does not allow stabilizing the incomes of agricultural enterprises and realizing the potential of the agricultural sector, endangers the food security of Ukraine. This can be especially observed when

studying trends in the consumption of food products by the population of Ukraine.

We present in the table 3.23 the potential of the food market, provided that the population consumes food at the level of the recommended norms, approved by the Ministry of Health of Ukraine "Approximate set of basic food raw materials and food products per capita in Ukraine for 2005-2015".

Table 3.23 – The food market capacity in the conditions of the rational consumption, thousand tons

Foods	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat and meat products	3663	3648	3636	3630	3620	3421	3407	3391	3372
Milk and milk products	17397	17327	17272	17242	17193	16249	16182	16107	16018
Eggs, pcs	916	912	909	907	905	855	852	848	843
Fish and fish products	916	912	909	907	905	855	852	848	843
Sugar	1740	1733	1727	1724	1719	1625	1618	1611	1602
Oil	595	593	591	590	588	556	554	551	548
Potatoes	5677	5654	5636	5626	5610	5302	5280	5256	5227
Vegetables, water-melons, melons and gourds	7371	7341	7318	7305	7285	6884	6856	6824	6787
Fruits, berries and grapes	4120	4104	4091	4084	4072	3848	3833	3815	3794
Bread products	4624	4605	4591	4583	4570	4319	4301	4281	4257

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

As can be concluded, the capacity of the food market with rational consumption is much higher than with actual consumption. Table 3.24 shows the ratio of the actual capacity of the food market and the capacity of the food market with rational consumption. Therefore, the potential of the agricultural sector cannot be fully realized due to the low solvent demand of the population.

The rate of increase in consumption volumes is presented in Appendix A. Fig. 3.3 shows the growth rates of production of the main types of food in Ukraine compared to the growth rates of their consumption.

It can be noted that in Ukraine, the consumption fund does not depend on production volumes, despite the fact that the potential of the Ukrainian agricultural sector contributes to the formation of solvent demand. Therefore, it is necessary to study the factors related to the

purchasing power of the population in the food security system. Since the capacity of the food market depends not only on the amount of consumption, but also on the number of the population, it should be more objective to estimate the amount of food consumption per person on average.

Table 3.24 – The ratio of the actual food market capacity and the market capacity with rational consumption

Foods	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat and meat products	0.65	0.64	0.68	0.70	0.64	0.64	0.64	0.65	0.66
Milk and milk products	0.54	0.54	0.57	0.58	0.56	0.55	0.55	0.53	0.52
Eggs, pcs	1.00	1.07	1.06	1.07	1.02	0.97	0.92	0.94	0.95
Fish and fish products	0.73	0.67	0.68	0.73	0.53	0.43	0.48	0.54	0.59
Sugar	0.98	1.01	0.99	0.98	0.91	0.94	0.88	0.80	0.79
Oil	1.14	1.05	1.00	1.02	0.95	0.94	0.90	0.90	0.91
Potatoes	1.04	1.12	1.13	1.09	1.08	1.11	1.13	1.16	1.13
Vegetables, water-melons, melons and gourds	0.89	1.01	1.01	1.01	0.96	1.00	1.02	0.99	1.02
Fruits, berries and grapes	0.53	0.58	0.59	0.63	0.55	0.57	0.55	0.59	0.64
Bread products	1.10	1.09	1.08	1.07	1.02	1.02	1.00	1.00	0.99

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Despite the fact that the volume of food consumption by Ukrainians is lower compared to the developed countries of the world, they are also lower than rational nutritional norms. International statistics (FAO) uses two quantitative threshold criteria that determine the minimum level of food security. Firstly, the energy value of the daily shower ration is not lower than 2500 kcal. Second, food expenses should not exceed 60% of the household (family) budget.

This approach to ensuring food security in accordance with international norms characterizes the goals of food security for poor countries as providing a minimum ration for survival, since the population of such countries spends most of their income on food. Economically developed countries are forming food security strategies, the goals of which include the satisfaction of various food consumer preferences at relatively low costs compared to income.

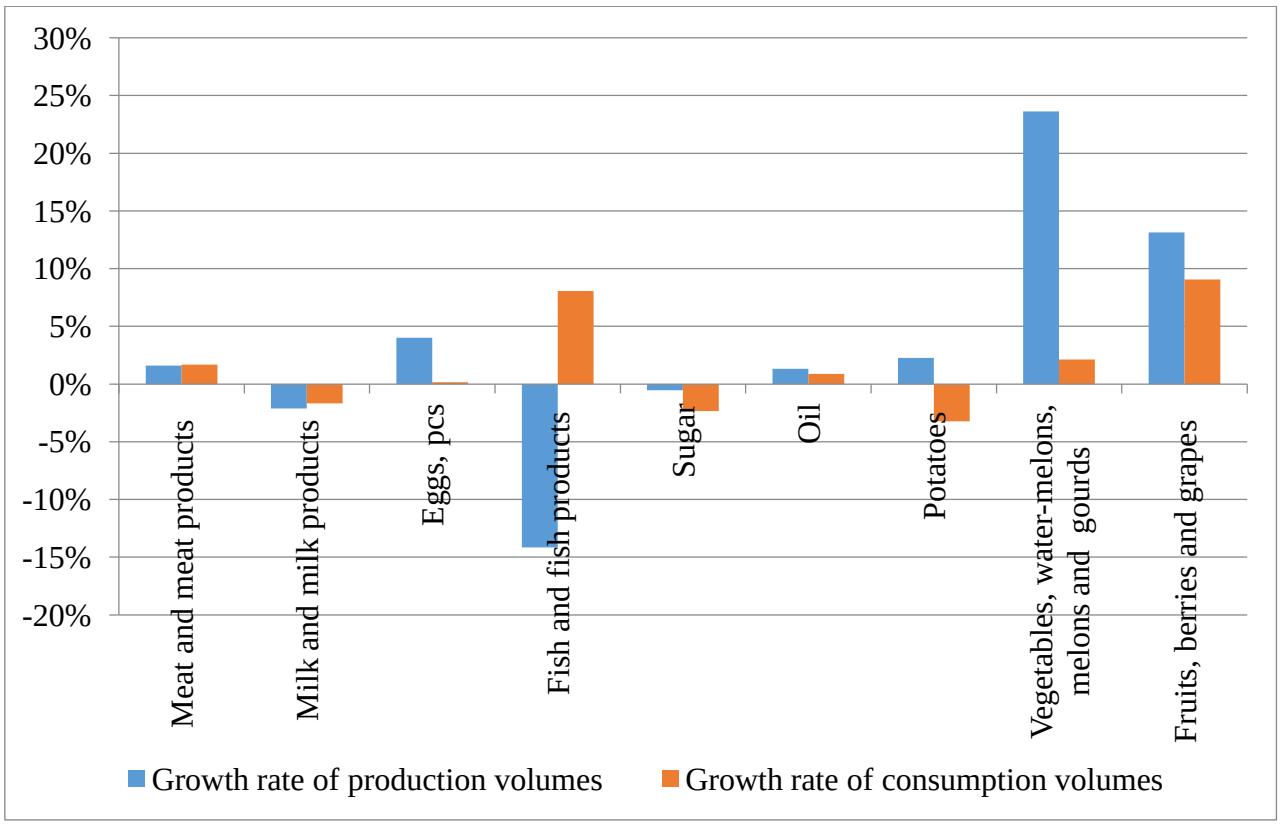


Fig. 3.3 – Growth rates of production and consumption in 2018, %

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Taking into account the above, it is advisable to conduct an analysis of food price indices in comparison with the population income growth index and proceed to the analysis of the economic availability of food (Table 3.25).

Table 3.25 – Dynamics of nominal and real wages, consumer price indices in Ukraine

Indicators	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Nominal salary, UAH	2250	2648	3041	3282	3480	4195	5183	7104	8865
Nominal wage index	117.6	117.7	114.8	107.9	106.0	120.5	123.6	137.1	124.8
Index of real wages	110.2	108.7	114.4	108.2	93.5	79.8	109.0	119.1	112.5
Consumer price index	109.4	108.0	100.6	99.7	112.1	148.7	113.9	114.4	110.9
Consumer price index for foods	110.9	106.4	97.9	97.8	112.2	145.9	109.0	112.9	111.1

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

One of the most significant threats to food security is the deepening of the economic crisis in the country, which causes a decrease in the income and purchasing power of the population. As a result, against the background of rising food prices, the food security of the population is deteriorating.

Fig. 3.4 shows a comparative analysis of the dynamics of price indices and wages of the population for 2010-2018.

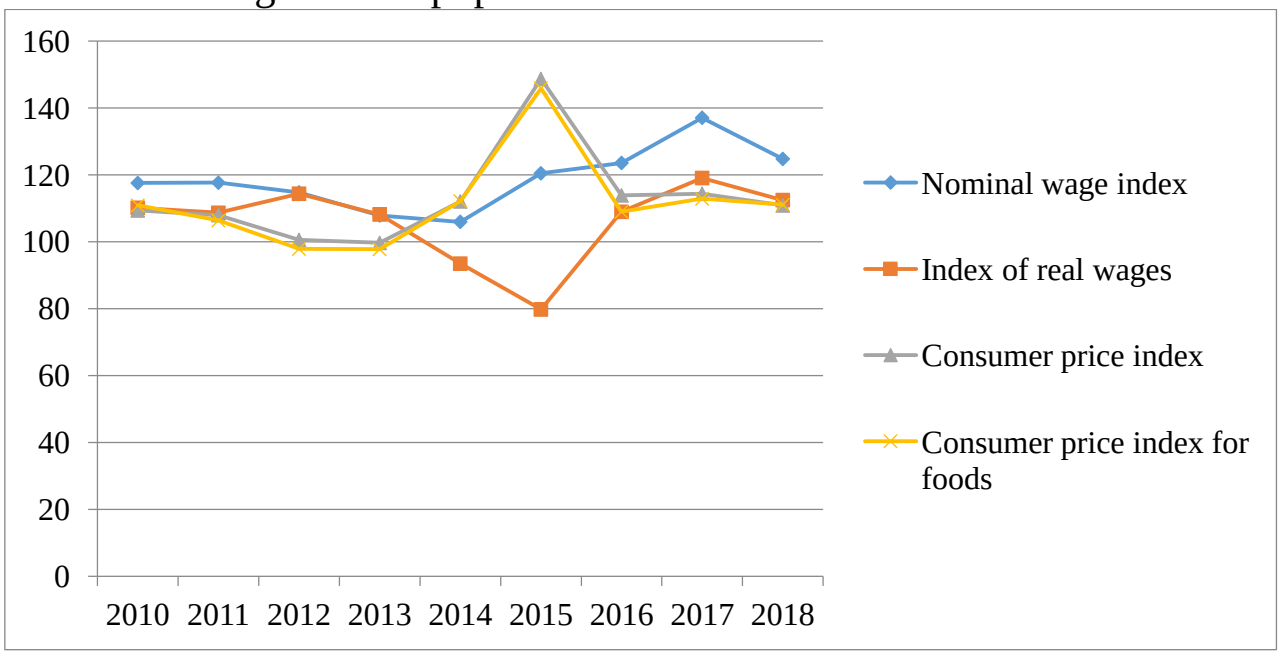


Fig 3.4 – Dynamics of wage and consumer price indices in Ukraine in 2010–2018

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

As the data of the analysis show, the cost of food products during the period grew mainly at lower rates compared to the rates of growth of real wages (Table 3.26). It should be noted that consumer price indices in the country were higher compared to food price indices. The exception is the period of 2014-2015, when the rate of growth of food prices significantly exceeded the rate of growth of real wages of citizens.

The increase in the cost of various types of food products occurred at different rates.

Prices for eggs, bread and bread products grew at a faster pace than real wages in 2018. At the same time, the rate of growth of prices for other food products was moderate relative to real wages. However, the situation in previous years (especially 2014-2015) was worse. Therefore, the prices of bread, meat, and vegetables increased during the research period, and real wages decreased by 6.5 and 20.2% in 2014-2015, respectively. The prices of the most nutritionally valuable products (meat, poultry, fish, fruits) increased in particular, which led to a significant decrease in the consumption of these food products by the population.

The change in consumer prices for socially significant food products in October 2019 to September 2019 is shown in Fig. 3.5.

Table 3.26 – The dynamics of food price indices and growth rates of incomes of the population of Ukraine

Foods	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat and meat products	104.2	110.8	111.6	95.4	122.9	138.6	100.4	140.1	104.4
Milk and milk products	155.5	103.4	86.7	125.0	106.5	120.8	126.1	131	104.6
Eggs	116.3	110.2	117.4	104.8	118.6	167.5	83.5	104.3	127.0
Sugar	115.4	107.7	82.4	92.1	122.1	160.5	105.9	98.1	89.5
Oil	142.6	112.2	107.5	90.8	124.9	182.8	114.2	104.2	102.9
Potatoes	164.3	95.5	47.6	146.4	112.3	79.9	104.9	127.1	108.7
Vegetables, water-melons, melons and gourds	143.0	90.9	74.1	92.8	137.6	142.7	108.4	112.4	104.3
Fruits, berries and grapes	118.0	131.7	92.9	96.0	116.6	163.7	99.1	134.4	72.5
Bread products	140.3	121.4	109.1	90.8	132.8	156.6	119	109.2	116.2
The growth rate of real wages	110,2	108,7	114,4	108,2	93,5	79,8	109,0	119,1	112,5

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

According to the monitoring data of the Economic Discussion Club, from the list, which includes 23 types of socially important food products, in October 2019, consumer prices increased by 11 items; decreased by 10 positions; did not change by 2 positions [148]. The leadership in price increase in October was retained by buckwheat groats, which increased in price by 27.6% or by UAH 5.74. per kilogram

The reason for the rapid price growth is a significant reduction in the supply of buckwheat grain on the market (almost 40% less than in the previous marketing season), which occurred as a result of a decrease in the area under sowing of this crop.

The next position in terms of the rate of price increase, among socially significant food products, was occupied by eggs, the price of which increased by 9.4%, or UAH 1.75 per dozen. At the same time, their current average price is 18% lower than a year earlier.

Unfavorable weather conditions of the current year were the reason for the deterioration of the quality and quantity indicators of the potato harvest, which caused an increase in its price, which during October increased by another 4.5% and exceeded its last year's level by 2.3 times.

The seasonal factor strengthened the tendency to reduce milk production due to the systemic crisis in the dairy industry. The reaction of the consumer market to the reduction in the supply of dairy products is

the increase in the price of all types of dairy products, which in October amounted to: milk by 1.7%, soft cheese by 1.6%, sour cream by 1.3%, butter by 1.0%. In the "meat products" product group, price trends were mixed: pork, poultry and cooked sausages fell in price by 0.2% - 0.4%. At the same time, beef and lard increased in price by 0.8% and 0.9%, respectively.

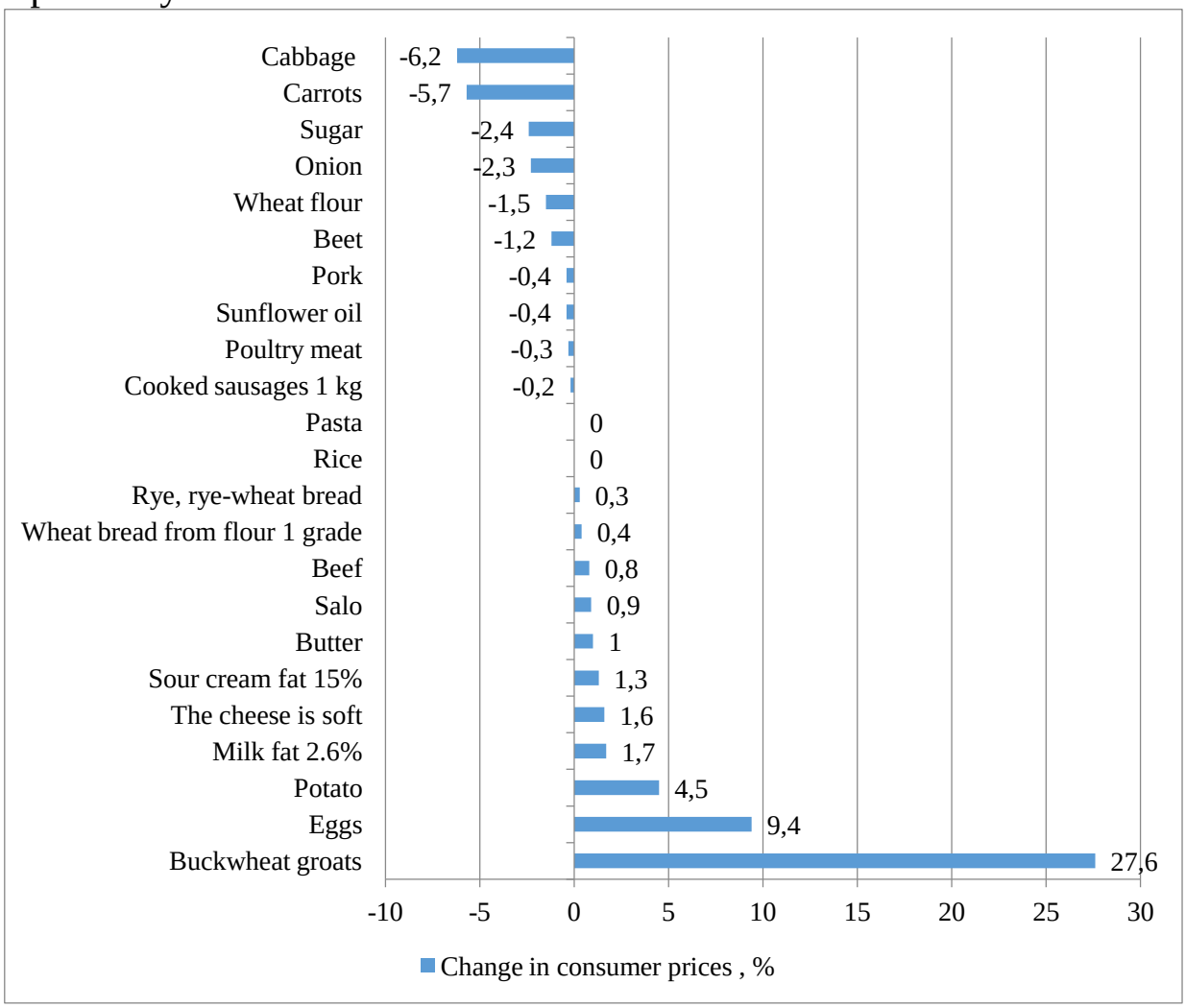


Fig. 3.5 – Change in consumer prices for socially significant food products in October 2019 to September 2019, %

Source: calculated by the author based on the data [148].

Despite the decrease in the prices of food wheat for harvest of 2019 year, the long-term trend of rising bread prices persists. In September 2019, prices increased for: bread made from wheat flour of the 1st grade - by 0.4% (+0.07 UAH per kilogram); rye-wheat bread - by 0.3% (+0.06 UAH per kilogram). Therefore, since the beginning of 2019, bread of mass varieties has become more expensive by 10.5-12.9%, and during the year its prices have increased by 17-18%. At the same time, the price of flour fell by 1.5%, and the prices of rice and pasta did not change during the month.

Among all socially significant types of food, the price of borscht vegetables fell most noticeably last month: cabbage – by 6.2% (by 0.49 UAH per kilogram), carrots – by 5.7% (by 0.47 UAH), onions – by 2.3% (by 0.21 UAH), beets - by 1.2% (by 0.09 UAH).

The seasonal increase in the supply of sugar caused a decrease in consumer prices for it by 2.4%, or by 0.36 UAH per kilogram. The high gross harvest of sunflower seeds causes a decrease in sunflower oil prices, which decreased by 0.4% over the month.

The monthly dynamics of the average cost of a set of 23 socially significant food products in 2017-2019 is shown in Fig. 3.6.

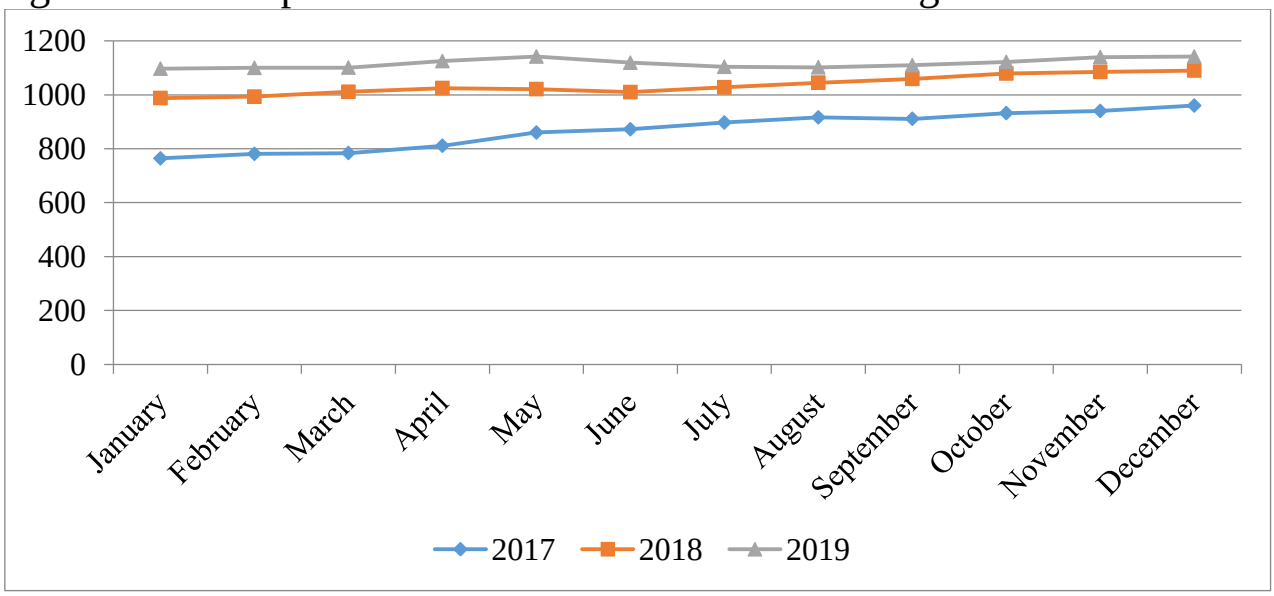


Fig. 3.6 – Monthly dynamics of the average cost of a set of 23 socially significant food products in 2017-2019, UAH

Source: calculated by the author based on the data [148].

In general, in October 2019, the total cost of a set of 23 socially significant food products compared to the previous month increased by 1.1%, or by 12 UAH (the consumer price index for food products in October was 100.7%). Compared to October 2018, the price of the set increased by 77 UAH, or by 7.4%. On average in Ukraine, its cost was 1,122 YAH (Table 3.27).

Food prices during the studied period of 2010-2018 grew on average at higher rates than the wages of workers and employees. It can be argued that among the main sources of threats to Ukraine's food security in the current conditions is a long-term decrease in the purchasing power of the population, or the level of economic availability of food (Table 3.28).

According to the current monitoring data, consumer prices in Ukraine (equivalent to the euro) for the vast majority of basic food products remain lower compared to the EU and CIS countries.

Table 3.27 – Change in the average levels of consumer prices for socially significant food products in October 2019

Foods	Consumer price, UAH/unit	Price change:			
		within a month		since the beginning of the current year, %	during the year, %
		%	UAH		
Wheat bread from flour 1 grade	19.31	0.4	0.07	10.5	16.7
Rye, rye-wheat bread	20.6	0.3	0.06	12.9	18.1
Wheat flour	11.47	-1.5	-0.18	1.1	3.3
Rice	23.11	0.0	0.01	-2.7	-3.8
Pasta	18.29	0.0	0.00	5.5	10.2
Buckwheat groats	26.53	27.6	5.74	62.5	56.6
Beef	132.2	0.8	1.08	3.2	4.2
Pork	122.31	-0.4	-0.47	6.0	3.5
Poultry meat	67.07	-0.3	-0.20	7.3	5.8
Salo	73.7	0.9	0.64	-3.4	0.3
Boiled sausages 1 variety	97.68	-0.2	-0.19	4.8	7.1
Eggs	20.45	9.4	1.75	-16.7	-18.0
Milk with a fat content of 2.6%	25.14	1.7	0.41	5.9	10.0
Sour cream with a fat content of 15%	60.49	1.3	0.77	6.8	11.3
Butter	209.2	1.0	2.00	7.4	12.7
The cheese is soft	103.17	1.6	1.67	5.5	11.2
Sugar	14.85	-2.4	-0.36	5.4	2.5
Sunflower oil	34.84	-0.4	-0.13	-0.5	0.0
Potato	15.29	4.5	0.66	91.4	134.5
Cabbage	7.45	-6.2	-0.49	-15.9	3.5
Carrots	7.75	-5.7	-0.47	-35.1	-35.9
Beet	7.18	-1.2	-0.09	-34.4	-6.0
Onion	8.73	-2.3	-0.21	-48.1	-16.9

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

At the same time, over the past three months, the total number of food items, for which Ukrainian prices exceed prices in countries covered by EDC monitoring, has increased, namely:

- Poland – 9 items (wheat bread, rice, milk, butter, pork, poultry, oil, potatoes, apples);
- Hungary – 4 positions (wheat bread, milk, poultry meat, oil);
- Spain – 6 items (wheat bread, flour, rice, milk, oil, salt);
- Belarus – 4 positions (milk, butter, poultry, potatoes);
- Russia – 5 items (milk, poultry, sugar, potatoes, salt).

In most of the countries we monitor, consumer prices for milk and poultry meat are lower than in Ukraine.

Table 3.28 – Consumer prices for certain foods in Ukraine and countries around the world, September 2019

Foods	Unit	Ukraine	Poland		Hungary		Spain		Belarus		Russia	
		Price per unit, euro	Price per unit, euro	in % to the price in Ukraine	Price per unit, euro	in % to the price in Ukraine	Price per unit, euro	in % to the price in Ukraine	Price per unit, euro	in % to the price in Ukraine	Price per unit, euro	in % to the price in Ukraine
Wheat bread	kg	0.84	0.67	79.8	0.73	86.9	0.77	91.67	1.22	145.2	1.08	128,6
Wheat flour	kg	0.42	0.49	116.7	0.48	114.3	0.37	88.1	0.56	133.3	0.51	121,4
Rice	kg	0.83	0.77	92.8	0.85	102.4	0.7	84.34	1.08	130.1	0.99	119,3
Pasta	kg	0.65	0.69	106.2	0.91	140.0	0.72	110.8	1.00	153.8	1.04	160,0
Milk	liters	0.88	0.46	52.3	0.56	63.64	0.55	62.5	0.63	71.59	0.79	89,77
Butter	kg	7.46	5	67.0	7.52	100.8	7.69	103.1	7.14	95.71	8.31	111,4
Beef	kg	4.69	6.06	129.2	7.59	161.8	7.9	168.4	5.97	127.3	6.84	145,8
Pork	kg	4.39	4.11	93.6	4.46	101.6	4.45	101.4	4.63	105.5	5.12	116,6
Poultry (chicken carcass)	kg	2.23	1.63	73.1	1.61	72.2	2.43	109	1.88	84.3	2.06	92,38
Chicken eggs	10 pcs.	0.67	0.86	128.4	1.27	189.6	1.00	149.3	0.89	132.8	0.81	120,9
Sunflower oil	liters	1.25	1.05	84.0	1.03	82.4	0.91	72.8	1.26	100.8	1.39	111,2
Sugar	kg	0.54	0.55	101.9	0.6	111.1	0.66	122.2	0.66	122.2	0.53	98,15
Potato	kg	0.52	0.49	94.2	0.76	146.2	0.93	178.8	0.3	57.69	0.31	59,62
White cabbage	kg	0.28	0.82	292.9	0.85	303.6	0.99	353.6	0.3	107.1	0.32	114,3
Carrots	kg	0.29	0.82	282.8	0.76	262.1	0.66	227.6	0.34	117.2	0.41	141,4
Onion	kg	0.32	0.93	290.6	0.85	265.6	0.49	153.1	0.41	128.1	0.36	112,5
Apples	kg	0.61	0.54	88.5	0.76	124.6	0.65	106.6	0.82	134.4	1.35	221,3
Salt	kg	0.22	0.23	104.5	0.75	340.9	0.21	95.45	0.25	113.6	0.19	86,36
Total cost		27,09	26.17	96.6	32.34	119.4	32.08	118.4	29.34	108.3	32.41	119.6

Source: calculated by the author based on the data [148].

The cost of the minimum food set in Ukraine and EU countries, calculated according to the monitoring data of the Economic Discussion Club, is shown in the table 3.29 [148].

Table 3.29 – The cost of the minimum food set in Ukraine and EU countries in 2018

Indicators	Ukraine	Poland	Hungary	Spain	Belarus	Russia
The cost of a set of 18 food products, EUR	27.11	26.17	31.98	32.40	29.35	32.43
Average monthly salary, EUR	382	1188	1132	1992	488	694
The number of food sets that can be purchased with a salary	14.1	45.4	35.4	61.5	16.6	21.4
Ratio between salaries in other countries and in Ukraine, times	-	3.1	3.0	5.2	1.3	1.8

Source: calculated by the author based on the data [148].

In general, the total cost of a set of 18 socially sensitive food products, for which EDC carries out price monitoring, is lower in Ukraine than in: Belarus – by 8% (in the summer this indicator was 13%); Russia – by 20% (25%); Hungary – by 25% (26%); Spain – in 20% (20%) [148].

However, in September 2019, the cost of the specified set of food products in Poland was 3.5% lower than in Ukraine.

For an average monthly salary, an average Belarusian can buy almost 17 such sets, a Russian – 21, a Hungarian – almost 35, a Pole – 45, a Spaniard – 62, while a Ukrainian can afford to buy a little more than 14 [148].

Next, we will compare the dynamics of consumer prices for food and goods and services in Ukraine and European countries (Fig. 3.7).

In the vast majority of European countries, as well as in Ukraine, the general inflationary dynamics was determined, first of all, by the growth of consumer prices for food. In annual terms (from July 2019 to July 2018), the consumer price index in Ukraine amounted to 109.1%, while consumer prices for foods increased by 10.3%.

The change in consumer prices for the main food groups in Ukraine and EU-28 (July 2019 to July 2018, %) is shown in fig. 3.8.

In the EU-28 countries, the annual inflation rate was much lower and was recorded at 1.4%, while the rate of food inflation was almost twice as high and amounted to 2.6%. Among the countries of the

European Union, food prices increased the most during the year in Poland (+7.5%), Hungary (+6.4%) and Romania (+6.4%). On the other hand, consumer prices for food decreased in 4 EU countries during the year: Ireland, Greece, Portugal and Cyprus.

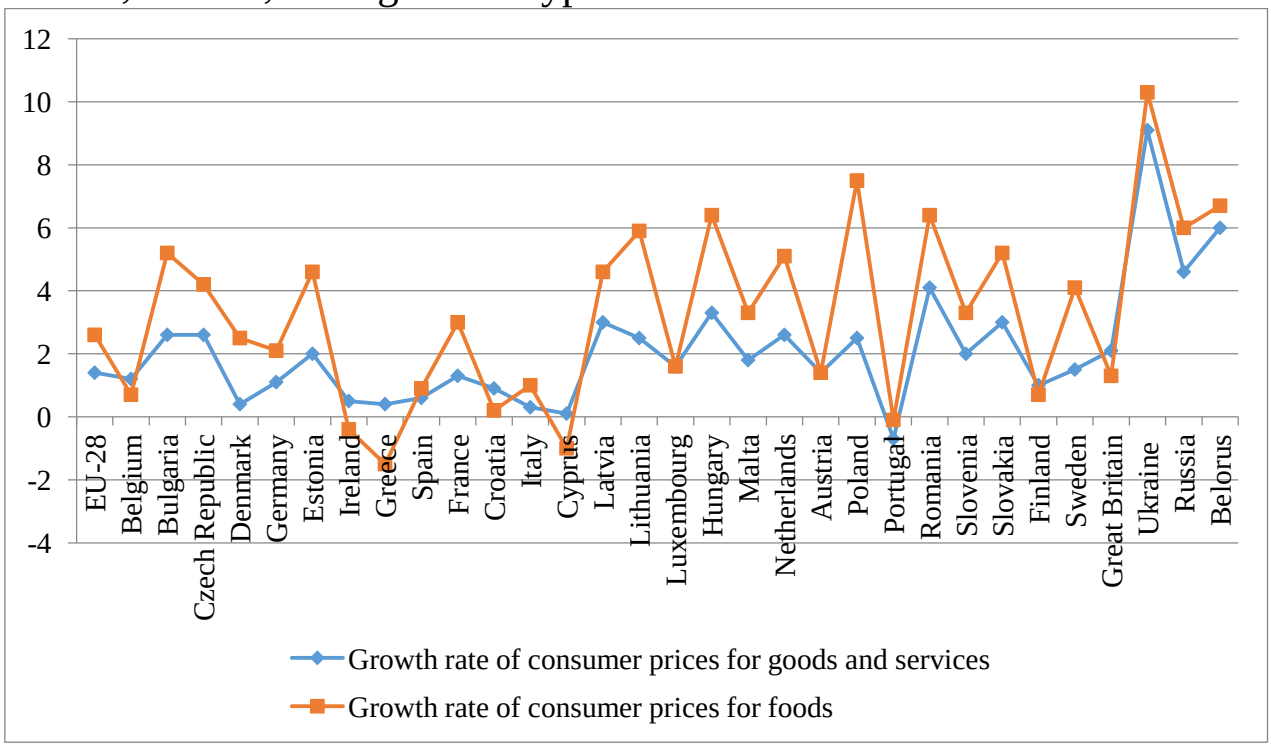


Fig. 3.7 – Dynamics of consumer prices for food and goods and services in Ukraine and the EU in 2019 compared to 2018, %

Source: calculated by the author based on the data [148].

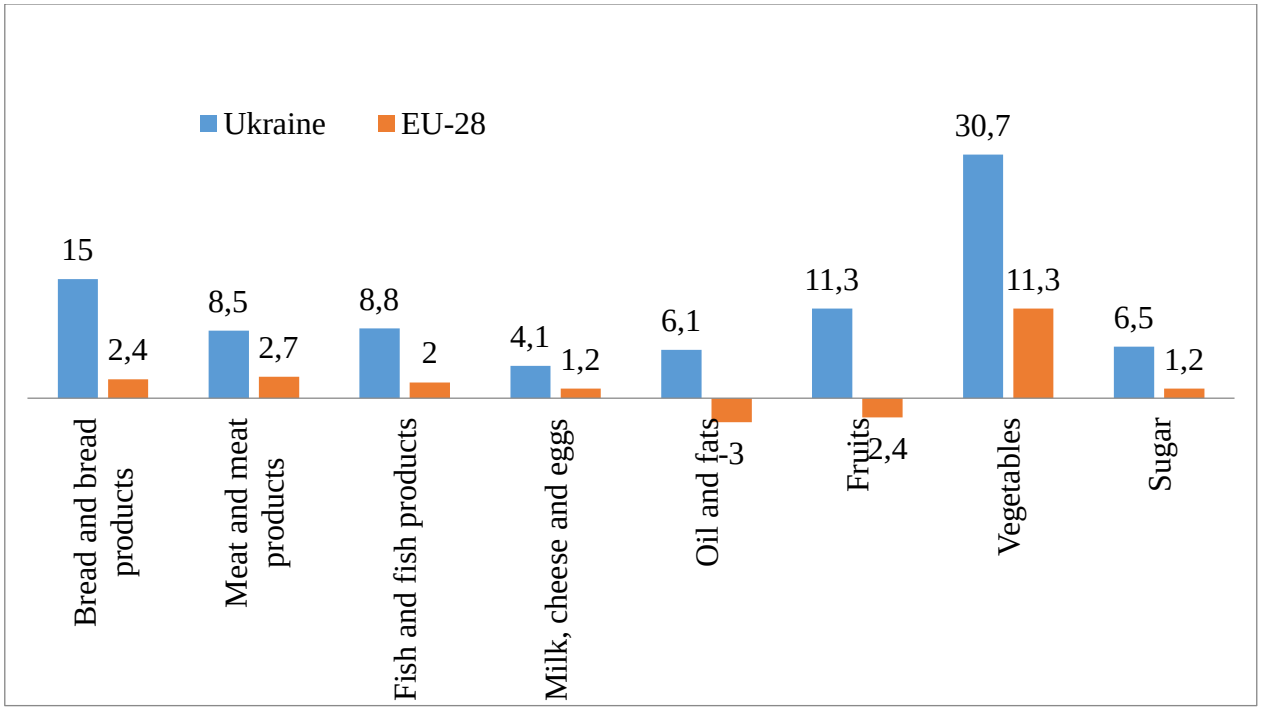


Fig. 3.8 – Dynamics of consumer prices for the main groups of food products in Ukraine and the EU (in 2019 to 2018), %

Source: calculated by the author based on the data [148].

In Ukraine, the growth of consumer prices covered all major food groups (Table 3.30).

Table 3.30 – Changes in consumer prices for the main food groups in EU countries (July 2019 to July 2018), %

Countries	Food	Bread and bread products	Meat	Fish and fish products	Milk, cheese and eggs	Oils and fats	Fruits	Vegetables	Sugar and sugar-containing products
EU-28	2,6	2,4	2,7	2,0	1,2	-3,0	-2,4	11,3	1,2
Belgium	0,7	1,2	1,3	-4,7	0,6	0,1	1,6	2,6	0,0
Bulgaria	5,2	10,5	6,8	2,8	0,7	-3,3	-3,9	10,4	3,2
Czech Republic	4,2	3,8	4,5	0,3	1,8	-5,9	-6,7	33,7	-1,2
Denmark	2,5	2,9	2,1	2,2	2,7	5,1	1,0	5,4	2,0
Germany	2,1	2,8	3,6	4,0	0,7	-8,7	-5,2	11,2	-0,4
Estonia	4,6	6,4	2,0	0,4	0,7	-3,3	-2,8	23,9	2,5
Ireland	-0,4	-0,8	-1,0	0,3	-0,5	-2,8	-0,7	3,9	-5,1
Greece	-1,5	-2,9	0,6	0,9	-2,1	-5,7	-6,1	4,7	-5,4
Spain	0,9	1,2	2,3	1,8	0,4	-13,0	-4,4	6,1	1,6
France	3,0	1,4	2,5	2,8	3,0	4,3	-0,4	10,5	1,4
Croatia	0,2	2,7	-1,6	1,6	0,7	0,0	-7,9	3,7	-0,5
Italy	1,0	0,6	0,8	0,7	0,7	-2,1	-1,5	5,3	-0,7
Cyprus	-1,0	0,1	1,1	-2,3	-1,3	-1,7	0,5	-5,6	-0,6
Latvia	4,6	7,3	4,1	2,0	1,3	-0,6	2,2	16,7	2,6
Lithuania	5,9	2,1	5,6	2,2	0,4	0,5	2,1	35,4	2,9
Luxembourg	1,6	2,3	2,0	2,2	0,6	1,3	-4,8	7,4	0,4
Hungary	6,4	6,6	6,2	6,0	0,7	2,5	0,4	31,2	2,0
Malta	3,3	5,7	1,7	-4,4	3,9	0,9	6,6	6,4	2,0
Netherlands	5,1	4,1	6,5	2,6	5,4	4,5	-3,0	10,6	2,7
Austria	1,4	1,9	2,0	7,3	2,0	-5,6	-6,2	5,2	1,1
Poland	7,5	7,0	6,6	4,4	0,7	-4,7	0,0	32,8	6,2
Portugal	-0,1	0,8	2,7	-0,3	-1,1	-5,4	-8,1	4,1	-0,8
Romania	6,4	4,8	4,4	3,5	2,8	1,4	-0,9	23,5	1,3
Slovenia	3,3	1,9	3,5	-0,3	1,5	-1,7	8,1	10,6	-1,7
Slovakia	5,2	6,5	5,9	4,7	2,7	-3,0	-4,4	25,2	1,1
Finland	0,7	2,4	5,3	-0,5	2,2	3,8	-4,5	-6,8	0,2
Sweden	4,1	5,3	3,2	6,7	1,8	3,8	-5,2	13,3	3,8
Great Britain	1,3	1,3	-0,6	4,0	-0,9	4,1	2,0	5,9	0,6
Ukraine	**10,3**	**15,0**	**8,5**	**8,8**	**4,1**	**6,1**	**11,3**	**30,7**	**6,5**

Source: calculated by the author based on the data [148].

The prices of vegetables (+30.7%), bread and bread products (+15.0%), and fruits (+11.3%) increased the most. The main driver of food inflation in the EU-28 was the increase in consumer prices for vegetables by 11.3%. At the same time, in Lithuania, Poland, Hungary

and the Czech Republic, the price of vegetables increased by more than a third. In contrast to Ukraine, in the European Union compared to last year, prices for fruits decreased by 2.4% and oil by 3.0%.

The economic availability of food as one of the indicators of food security characterizes the level of income of the population, which determines the real purchasing power of citizens to purchase food products. In 2010-2018, the growth of prices for food products in the country in relation to wages had a faster pace, which led to a steady decrease in the level of economic availability of food. However, the level of solvent demand does not fully depend on the growth rates of prices and incomes. This is evidenced by the ratio of food costs and income (Table 3.31).

Table 3.31 – Analysis of the economic availability of food in Ukraine

Indicators	Years								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cumulative expenses on average per month per household, UAH	3073,3	3458,0	3592,1	3820,3	4048,9	4952,0	5720,4	7139,4	8308,6
Cumulative expenses for food on average per month per household, UAH	1585,8	1774,0	1799,6	1914,0	2101,4	2629,5	2848,8	3419,8	3963,2
The share of expenditure on foods in the expenditure structure, %	51,6	51,3	50,1	50,1	51,9	53,1	49,8	47,9	47,7

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Table 3.31 allows us to draw a conclusion about a significant increase in the level and deterioration of the people's spending structure. The rate of growth of expenses on average per household amounted to 16.4% in 2018 relative to 2017 and 170.3% relative to 2010. Population spending on food in 2018 increased by 15.9% compared to the previous year and by 149.9% compared to 2010.

The structure of consumer food expenditures of Ukrainian households (Fig. 3.9) has not undergone significant changes compared to 2017. The first three positions are occupied by expenses for: meat and meat products – 25% (1008 UAH per household per month), bread and bread products – 14% (576 UAH), milk and dairy products – 14% (575 UAH).

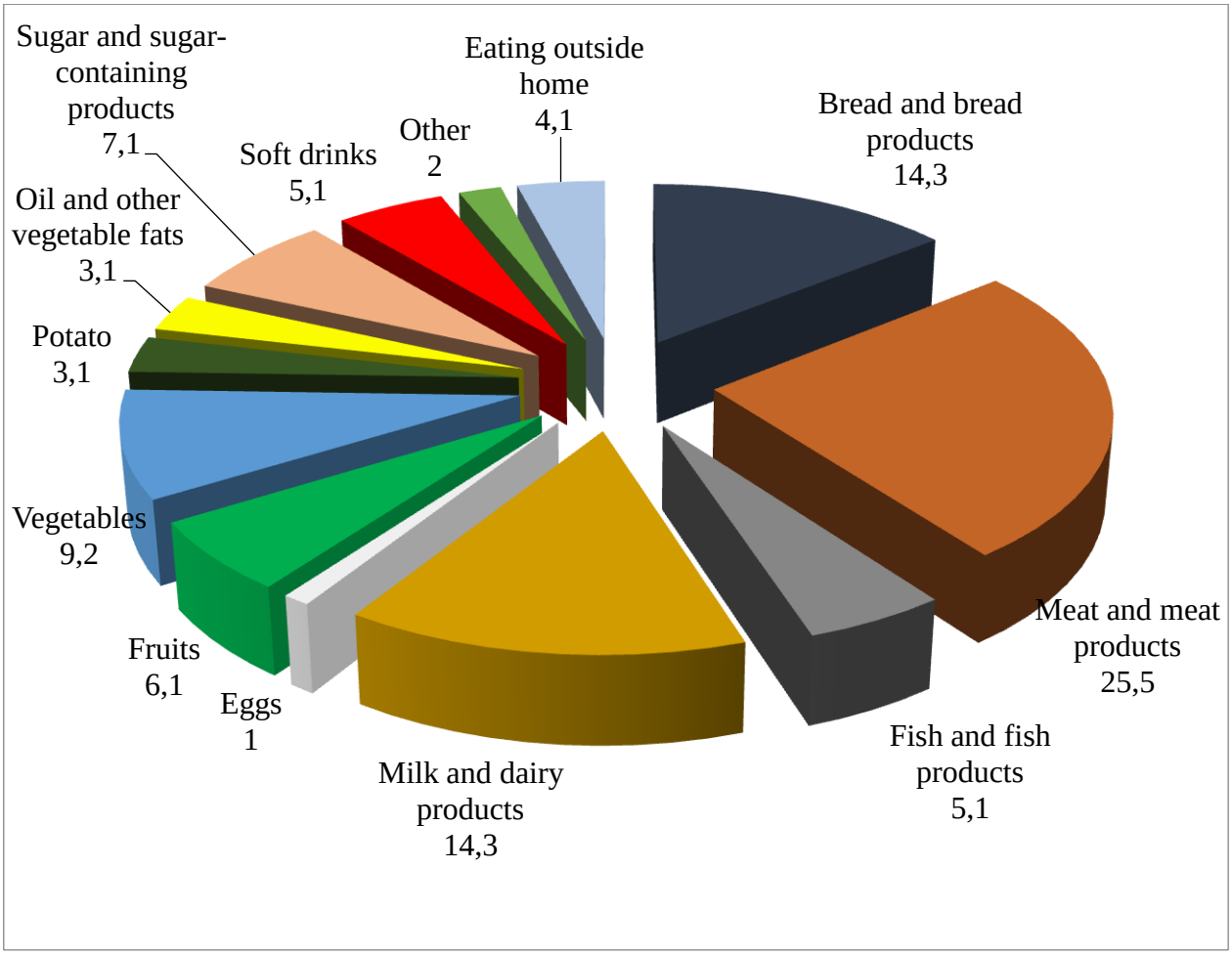


Fig. 3.9 – The structure of consumer spending on food products in Ukraine in 2018, %

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The share of expenses for the purchase of food products in the aggregate consumption expenses of households in the countries of the world in 2018 (excluding expenses for meals outside the home) is shown in Fig. 3.10.

The share of expenditure on the purchase of food products in Ukraine is 4.5 times higher than in the EU-28 countries, where it averages 12.2%: from 8.2% in Great Britain to 27.8% in Romania.

Almost 80% of the total family income is currently spent on food in Ukraine, while in the USA – 10%, EU-countries – 15%, Poland – 30%. However, even with such orientation of family budgets, in Ukraine per capita consumption is less than in the EU countries: 2 times less milk and eggs, 3 times more meat, 4 times more fish [148]. Exceeding the share of expenses for the purchase of food products above the 50% limit indicates a low standard of living of the population and is one of the indicators of poverty.

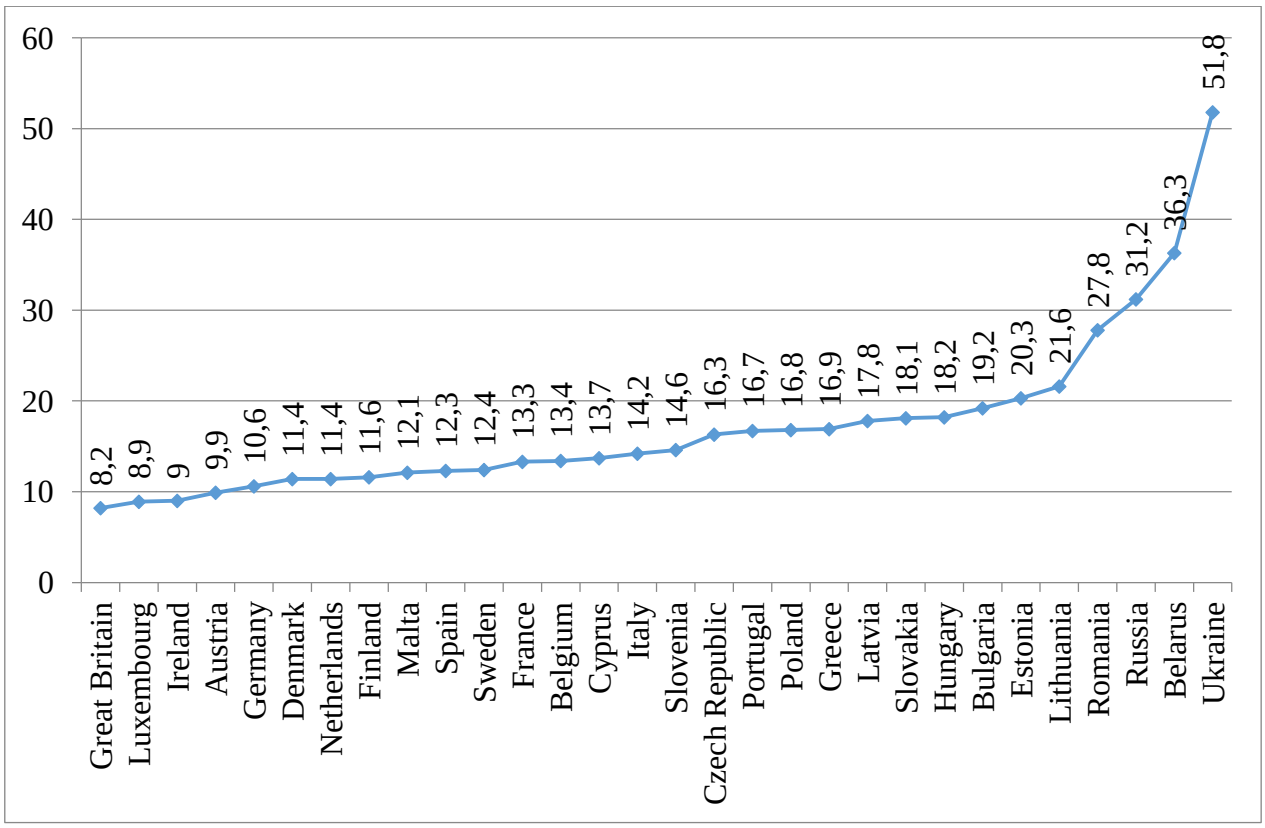


Fig. 3.10 – The share of expenditure on the purchase of food products in the aggregate consumer expenditure of households in the countries of the world in 2018 (excluding expenditure on meals outside home), %

Source: calculated by the author based on the data [148].

In food consumption, the differentiation between households of the least well-off first decile, households with average per capita gross monthly incomes below the subsistence minimum and the most affluent households, which make up the tenth decile, continued to persist. The latter spent 1.6 and 1.5 times less of all total expenses (43%) on food, compared to households of the least well-off first decile and households whose average per capita monthly total income is below the subsistence minimum, respectively, and the cost (17.4 UAH) of products consumed by one person per day was 3 and 2 times higher, respectively.

According to the conducted analysis, the food needs of the Ukrainian population were met mainly at the expense of cheap potatoes and bread products 5 years ago. However, even this opportunity has been lost in the last 5 years. The most significant problem of food security is the low purchasing power of the population. Ukrainians spend more of their income on food than residents of economically developed countries. Despite the full satisfaction of internal food needs at the expense of the agricultural sector and the absence of a food deficit, the consumption of

basic food products in Ukraine is at a level lower than rational standards. In addition, the reason for the insufficient consumption of high-quality food products is the decrease in the volume of production of livestock products, the increase in production costs of which leads to an increase in prices for it for the population. Food independence and self-sufficiency do not allow to guarantee food security due to the low paying demand of the population, which is the main condition for sufficient food consumption. The acuteness of food security is reinforced by the growth of food prices at higher rates compared to the growth of the population's income.

Therefore, the strategic direction of ensuring food security of Ukraine should be to achieve the level of food consumption by the population at the level of economically developed countries in terms of the quantity and quality of food, the economic availability of food in relation to the total income of households.

Chapter 4

ORGANIZATIONAL AND ECONOMIC PRINCIPLES OF THE FORMATION AND IMPLEMENTATION OF STATE FOOD SECURITY STRATEGY

4.1. Organizational and economic mechanism of formation and implementation of the state food security strategy

With the growing openness of the national economy, the problems of ensuring the food security of the state are becoming more and more urgent. In response to new global challenges, it is necessary to form a systematic approach to solving the complex tasks by substantiating the state's food security strategy. This requires a complex combination of efforts of responsible state authorities, agricultural enterprises, citizens and other institutions directly involved in ensuring a stable state of food security of the state.

The strategic priority of forming a competitive national economy is to guarantee food security as a necessary condition for ensuring the health and high standard of living of the population. The relevance of research and substantiation of scientific approaches to the development and implementation of a food security strategy is reinforced by the fact that in the conditions of economic globalization and the strengthening of crisis phenomena, global and national agricultural and food markets are not able to fully resist threats and risks without complex strategic approaches and mechanisms.

An effective food security strategy of the state will allow to create a reliable basis for the sustainable development of reproductive processes of agricultural enterprises and increase the level of food independence. At the same time, the implementation of the strategy and the monitoring of its effectiveness require the improvement of mechanisms, the formation of effective levers and tools for timely response to food security risks and the prevention of threats.

The organizational and economic mechanism of formation and

implementation of the state's food security strategy is proposed to be created in accordance with four blocks that correspond to the stages of development and implementation of the strategy and strategic tasks. Each block of the mechanism has its own information and analytical base, on the basis of which the assessment and analysis of current trends and the current situation is carried out in accordance with the tasks of the block, a system of interaction between participants in the process of ensuring food safety. For each block, the necessary measures to achieve the results are designed, the expected results from the implementation of the specified measures and the quantitative and qualitative indicators of their measurement are planned.

The mechanism of forming and implementing a food security strategy includes a block of strategic analysis, a block of strategy development, strategy implementation, a block of strategy monitoring and strategic measures adjustment (Fig. 4.1).

In the figure, the arrows show the information flows that accompany the process of providing the necessary data for conducting a strategic analysis of trends and the state of food security, the process of information interaction and coordination of actions and functions of participants in the mechanism of formation and implementation of the state's food security strategy.

The block of strategic analysis is preparatory in the development of a strategy. The main tasks of this block are the formation of an information and analytical base for the development of a food security strategy, in particular, an assessment of the trends of food security in accordance with the existing indicator systems, established in the official methodological recommendations of state authorities and management, as well as proposed by scientists. The tasks of strategic analysis also include the assessment of threats to food security based on the results of the assessment of indicators, the identification of opportunities in the external environment, as well as weaknesses and strengths. Solving the specified tasks is possible using the strategic planning methodology, in particular, strategic analysis, strategic maps, balanced scorecard, and others.

Input data for strategic analysis and further justification of the main strategic directions and priorities of ensuring food security are statistical indicators, which are the basis of the assessment of the state of food security.

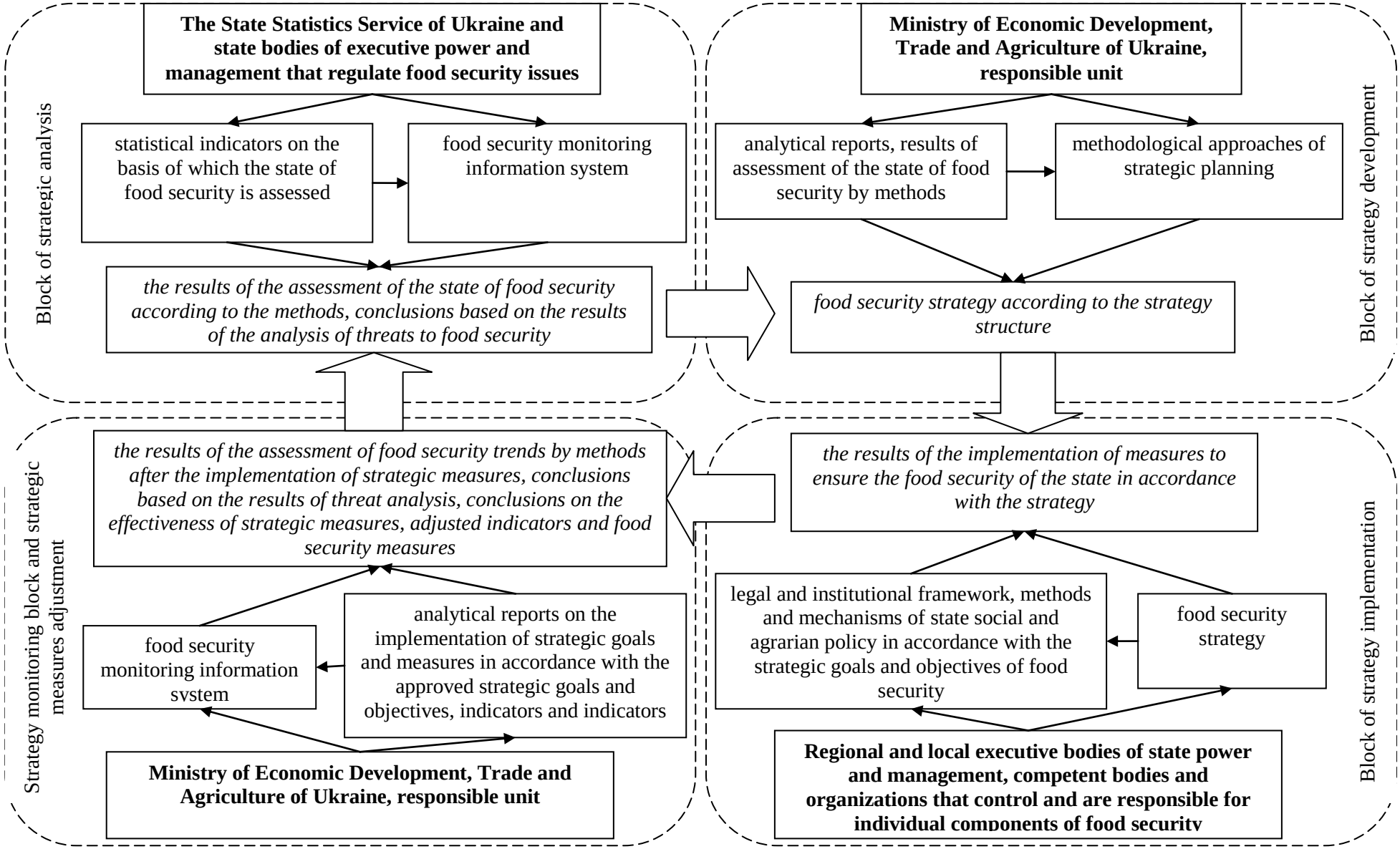


Fig. 4.1 – The mechanism of formation and implementation of the state's food security strategy

Source: developed by the author.

The tool for conducting strategic analysis can be the information system for monitoring food security (hereinafter – the information system), which will allow timely receipt of information for the analysis and assessment of the state of food security and possible threats, the formation of a system of indicators and analytical reports, as well as strategic plans and forecasts. The functions of the information system should be the collection and input of input data, analysis, generation of analytical reports, storage of results and provision of prompt access to information.

The information necessary for assessment and analysis must be provided by the state bodies of executive power and management that regulate issues of guaranteeing food security, as well as the State Statistics Service of Ukraine, upon the relevant requests of the Ministry of Economic Development, Trade and Agriculture of Ukraine (hereinafter – the Ministry).

As a result of the strategic analysis, an information and analytical base will be formed regarding the assessment of the food security trends, threats and opportunities, strengths and weaknesses, conclusions based on the results of the analysis regarding the indicators of food security of the population, resource security and the efficiency of the activities of commodity producers, market intermediaries, trends in the development of the agricultural sector, foreign economic activities in the food sector, quality control systems and food safety. Based on the information and analytical base, it is proposed to develop a forecast and strategy of food security.

The strategy development block provides for the formation of a draft strategy based on the results of strategic analysis in the form of analytical reports, a system of food security indicators, in accordance with the proposed structure. Strategy development tools according to the proposed mechanism are methodological and methodical approaches to strategic planning at the state level. According to the Procedure for developing regional development strategies and action plans for their implementation, the draft strategy as a planning state document in Ukraine usually contains the main components, the list of which is quite comprehensive and can be used as a basis for developing a food security strategy at the state level [138]. We present the structure of the state food security strategy as a governmental document in Fig. 4.2.

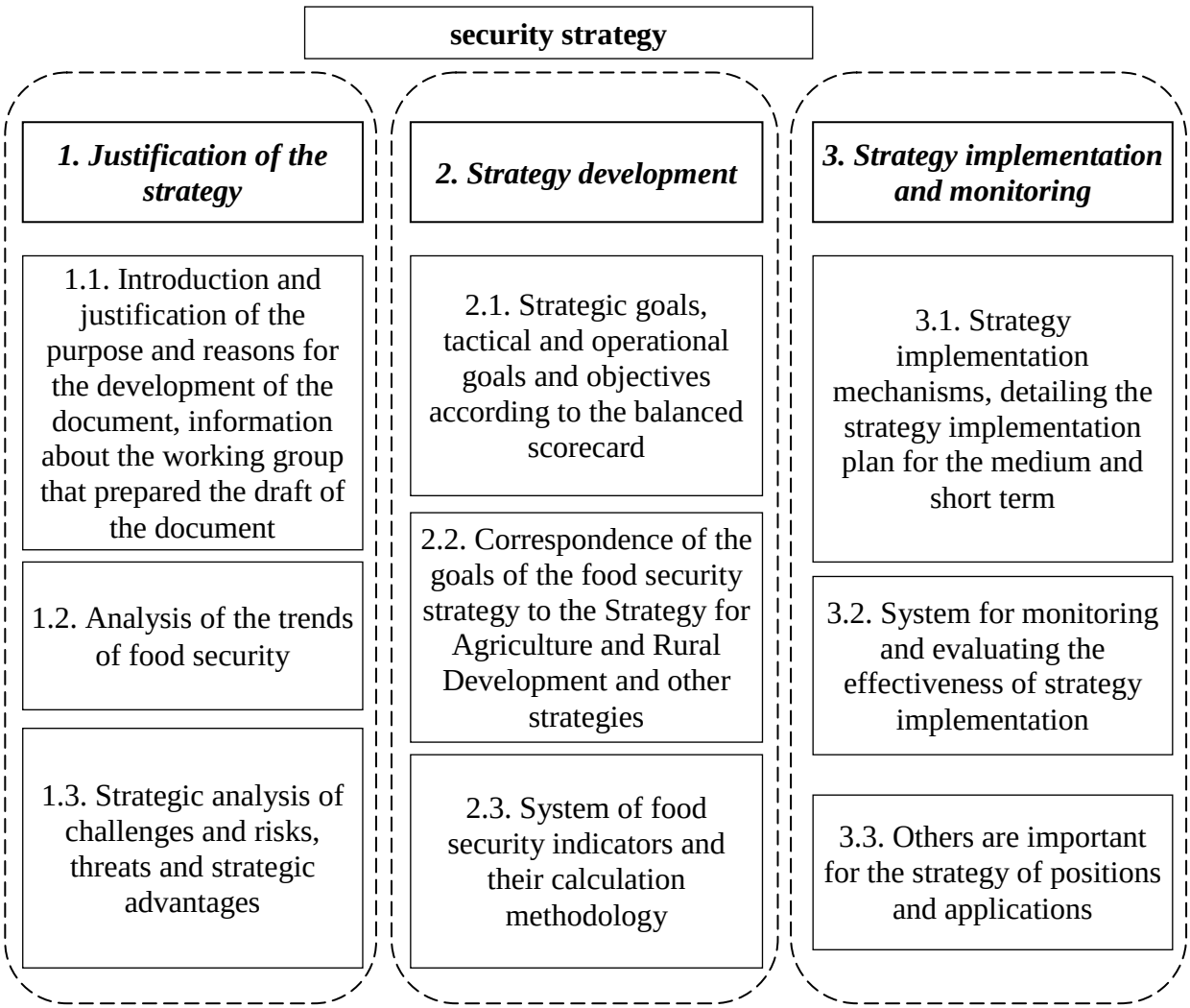


Fig. 4.2 – Structure of the state food security strategy

Source: developed by the author.

The justification of the strategy contains such main subdivisions as the introduction and justification of the purpose and reasons for the development of the document, information about the working group that prepared the draft of the document; analysis of the state and trends of food security; strategic analysis of challenges and risks, threats and strategic advantages.

The introduction includes the purpose and grounds for developing the state's food security strategy, the main terms and definitions, the drafters of the document, the responsible executors, and the deadlines for the implementation of the measures. This subsection also includes information on the regulatory framework for the development and implementation of the food security strategy.

The analysis of the state and trends of food security contains the main assessment results in accordance with the methods approved at the state level. In this section, there must be results regarding the state of the agricultural sector and its opportunities to meet the population's solvent

demand for food, the results of guaranteeing the quality and safety of food and agricultural raw materials, the main indicators and trends of international food trade, the situation in world food markets markets, volumes of export-import activity of Ukraine in the agricultural and food spheres. An important element of this section of the strategy should be the analysis of the solvent demand of the population, incomes and expenses, the quality of consumed food products, trends in the growth of consumer prices for food against the background of changes in the incomes of the population.

The strategic analysis of challenges and risks, threats and strategic advantages involves the identification of threats, strengths and weaknesses, as well as promising opportunities and directions for strengthening food security, based on the primary analysis of food security indicators,.

The development of the strategy includes such subdivisions as strategic goals, tactical and operational goals and objectives in accordance with the balanced system of indicators, compliance of the goals of the food security strategy with the strategy for the development of the agrarian sector of the economy and other strategies, the system of food security indicators and the methodology of their calculation.

Subsection 2.1 of the document substantiates the strategic goals of guaranteeing food security. The strategic goal is to form a set of scientifically based provisions, as well as mechanisms and measures for their practical implementation, aimed at strengthening food independence by creating a competitive global market and ecologically safe agricultural production.

In the field of guaranteeing food security at the strategic level, the following goals are important, in particular:

- ensuring a high level of physical and economic availability for the country’s population of safe and high-quality food products in the quantities and assortment necessary for an active and healthy lifestyle;
- creation of conditions for the saturation of the domestic food market with high-quality food products of domestic production (with an increase in the share of healthy food and organic food products to 20%);
- effective forecasting and prevention of internal and external threats to food security, minimization of their negative impact due to the formation of strategic reserves of agricultural raw materials and food, as well as operational monitoring of food vulnerability of certain categories of the population;

- increasing the competitiveness of domestic product manufacturers on the domestic, international and EU markets due to the optimization of the use of the potential of the agricultural sector, the introduction of waste-free and ecologically safe technologies with rational use of resources;

- formation of the image of Ukraine as a subject of the world economy with an effective food security system and a national food strategy in the field of improving the quality of nutrition and life of the population.

The tactical goals of food security are related to the financial support of agrarian policy; social security of the population; regulation and infrastructural provision of the internal market; state administration and resource provision of food security.

In the next subsection, the compliance of the indicated goals with state strategies related to ensuring food security, such as: Strategy for Sustainable Development "Ukraine – 2020", Strategy of development for the agrarian sector of economy for the period till 2020, Strategy for the development of export of agricultural products, food and processed food products of Ukraine for the period up to 2026, Strategy of Innovative Development of Economy of Ukraine till 2030, Strategy for promoting attraction of private investments in agriculture for the period up to 2023, Strategy of the state environmental policy of Ukraine for the period till 2030, Export Strategy of Ukraine (strategic trade development road map) 2017-2021, State regional development strategy for the period up to 2020, Decree of the President of Ukraine No. 722/2019 "On Sustainable Development Goals of Ukraine for the period till 2030", EU-Ukraine Association Agreement and others.

The system of food security indicators and the methodology of their calculation contains a list of indicators that will be used to evaluate the effectiveness of the implementation of the food security strategy and the degree of achievement of the set strategic goals.

Strategy implementation and monitoring includes such main subdivisions as strategy implementation mechanisms, detailing of the strategy implementation plan for the medium and short term; a system of monitoring and evaluating the effectiveness of strategy implementation; others are important for the strategy of positions and applications.

In particular, subsection 3.1 of the strategy defines the main directions of guaranteeing food security at the state and regional levels, state agricultural policy measures, as well as interrelated and mutually

coordinated measures:

- budgetary policy (financial support of agricultural producers, compensation of capital costs, subsidizing interest costs on loans, lending);
- tax policy (tax benefits, simplified taxation system for agricultural enterprises, deferment of tax payments);
- financial policy (leasing, lending to producers on preferential terms);
- price policy (market, control and protective prices, commodity and purchase interventions);
- social policy (regulating incomes of the population, supporting vulnerable sections of the population, increasing the incomes of the rural population, state regulation of prices for certain categories of food, raising the standard of living of the population, developing agricultural education, medical and cultural provision of the rural population);
- foreign economic policy (regulation of import and export of food and agricultural products);
- innovation policy (ensuring scientific research, supporting innovative programs for the development of the agrarian sector, training specialists).

Directions for strengthening food security are substantiated in the following areas:

- production of agricultural products and food;
- increasing the economic availability of food for all population groups;
- regulation of agricultural products and food markets;
- increasing the efficiency of production and sales of agricultural products and food, development of market infrastructure;
- cooperation and integration in the agricultural sector;
- development of scientific and innovative potential for strengthening national food security.

The mechanism for implementing the food security strategy must ensure the achievement of target criteria, be based on goals and objectives, take into account the organizational and economic conditions for their implementation, and include the following interrelated mechanisms:

- the mechanism of identification, assessment and prevention of threats to food security, which functions on the basis of institutional, methodological and information support at the national and regional

levels;

- the mechanism of regulatory and legal support of national food security, which does not contradict international requirements and ensures the successful and profitable integration of Ukraine into the world economic system;

- the mechanism of management and regulation of food security and sustainable development of the agrarian sector of the economy, which ensures the fulfillment of strategic goals and criteria at the national and regional levels.

The system of monitoring and evaluating the effectiveness of the implementation of the strategy provides for the justification of the software and technical means for the development and implementation of the food security strategy, the procedure and terms of monitoring and the list of responsible actors and their tasks.

Other provisions and appendices important for the strategy contain, in particular, forms of reporting documents, calendar plans, etc.

It is expedient to appoint the Ministry of Economic Development, Trade and Agriculture of Ukraine as the main responsible state body of the executive power and the coordinator of the development process of food security strategy. In its structure, it is proposed to create a department of the development and implementation of food security strategy.

In the process of developing a food security strategy, other structural subdivisions of state authorities and management, regional and local administrations should be involved (Fig. 4.3). Strategic goals, indicators and measures must be agreed at the stage of strategy development with the Directorates of food safety and quality, strategic planning and European integration, and rural development of the Ministry.

In order to regulate the interaction of participants in the process of developing a food security strategy, coordination of actions and measures, compliance with deadlines, it is recommended to approve at the legislative level the Procedure for developing a food security strategy, mechanisms for its implementation, tactical and operational measures to ensure food security, monitoring and evaluation of the effectiveness of the strategy implementation.

Departments of agro-industrial development of regional state administrations, in accordance with the specified Procedure, develop regional food security programs based on the state’s food security

strategy. Functions for the development of these programs and mechanisms for monitoring and controlling their implementation should be provided in the Regulations on the Departments of Agricultural Development of each regional state administration.

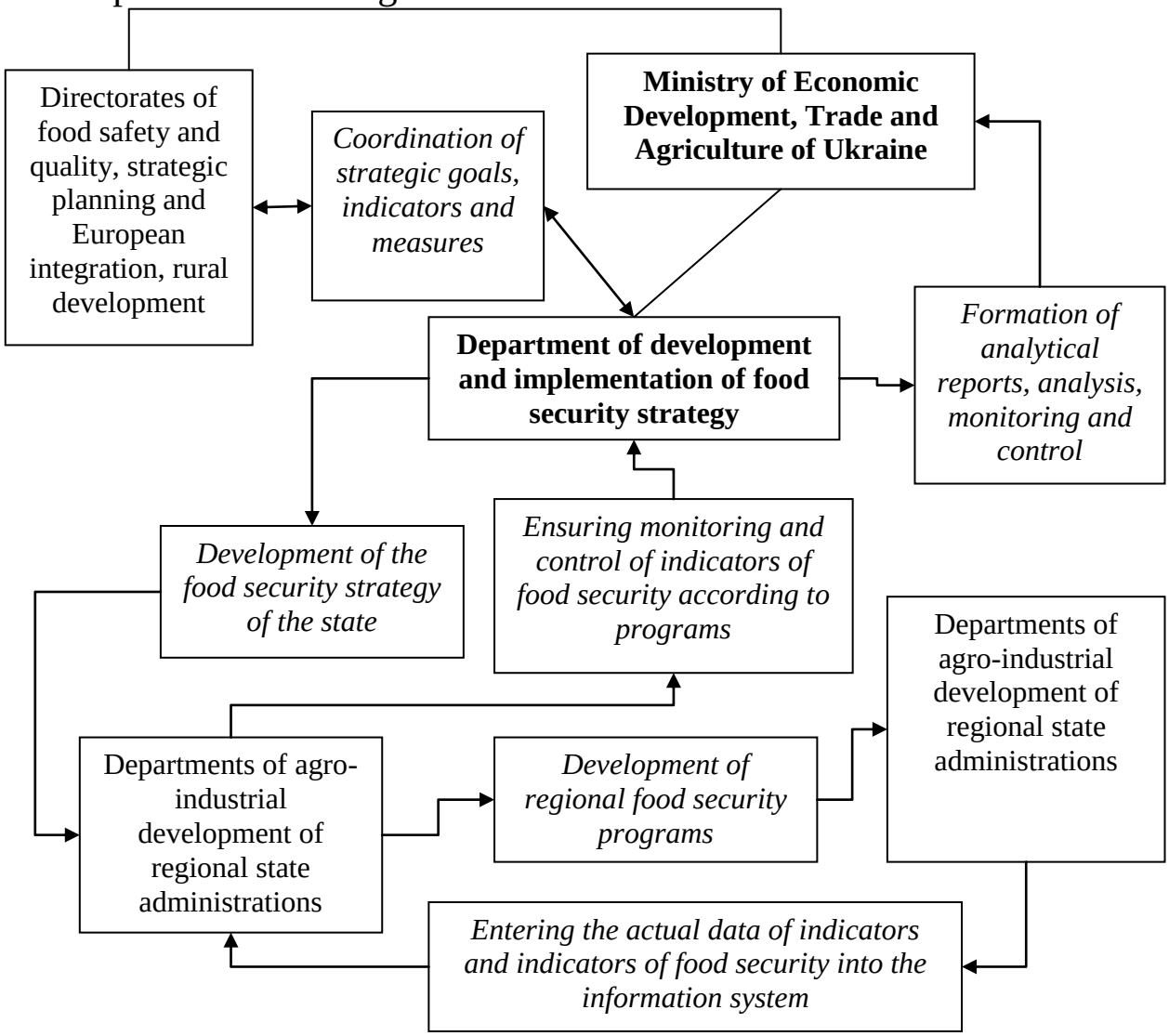


Fig. 4.3 – Scheme of interaction of state, regional and local executive authorities, the Ministry of Economic Development, Trade and Agriculture of Ukraine to ensure the formation and implementation of the state food security strategy

Source: developed by the author.

Certain Ukrainian regions have food security programs, for example, Zaporizhzhia and Poltava. Today, some program documents at the level of regions contain only fragmentary tasks of guaranteeing food security, in particular, regional programs for the agricultural development and its sectors, programs for the development of rural areas, land relations, land use and protection, programs for social development, programs for supporting farmers, development infrastructure. For example, the Program for supporting the agro-industrial complex of the

Dnipropetrovsk region in 2017-2021 (from 02.12.2016 No. 120-7/VII, from 19.10.2018 No. 376-14/VII), developed by the Department of Agro-Industrial Development of Regional State Administration. The Program includes the task of guaranteeing the food security of the region, the availability of food products for the population that meet the requirements of quality standards, in volumes not lower than the rational consumption standards necessary for an active, healthy lifestyle.

Regional food security programs should be aimed at the formation and implementation of a regional food security policy, stimulation of the increase in food production volumes by regional enterprises, measures to support local producers, the creation of regional food funds and their rational use, the implementation of social programs for the support of vulnerable segments of the population, the resolution of local problems, related to the development of food supply infrastructure, achieving self-sufficiency of the region with food resources.

On the basis of regional food security programs, the relevant regional state administrations form a set of measures to ensure food security at the local level, and the responsible structural units ensure that the actual data of food security indicators and indicators are entered into the information system for their further consolidation.

The results of monitoring indicators and indicators of the current state of food security in the regions must be entered into the information system in an operational mode in accordance with the developed calendar plan-schedule of monitoring works, which must be placed in the appendix to the state food security strategy.

Departments of agro-industrial development of regional state administrations ensure monitoring and control of indicators and indicators of food security in accordance with regional programs. The department of development and implementation of food security strategy of the Ministry adjusts strategic measures at the state level based on the monitoring results.

Next, we will consider the food security strategy implementation block. Its main tasks are to ensure the implementation of the goals and tasks specified in the strategy by responsible competent bodies and organizations that control and are responsible for individual components of food security guarantees at the state and regional levels. These include, in particular, PJSC “Agrarian Fund”, PJSC “State Food and Grain Corporation of Ukraine”, the State Food Reserve, regional food reserves, the State Service of Ukraine on Food Safety and Consumer Protection

and others. The main subject of the implementation of the food security strategy at the state level is the Ministry. The main subjects at the regional and local levels are the relevant structural units of regional and district state administrations, which are responsible for the implementation of strategic tasks, the development of regional development programs in accordance with the specifics and strategic priorities of each region, and as well as monitoring and controlling the implementation of measures and fixing results, as well as targets and indicators.

The tools for implementing the strategy are the legal and institutional basis for the formation and implementation of the food security strategy, the methods and mechanisms of the state social and agrarian policy in accordance with the strategic goals and objectives of food security. The result of this block is the implementation of measures to ensure food security of the state in accordance with the strategy.

The final block is the strategy monitoring and adjustment of strategic measures block. Its information support for the performance of tasks is analytical reports on the implementation of strategic goals and measures in accordance with the approved strategic goals and objectives, indicators. The tool for ensuring the fulfillment of the tasks of this block is the food security monitoring information system, which will allow for operational analysis and assessment of the food security trends and timely identification of threats. Based on the system of indicators and analytical reports, adjustments to the food security strategy, goals, objectives and strategic measures should be provided.

In accordance with the developed mechanism for the formation and implementation of the state food security strategy, monitoring is entrusted to the department of the development and implementation of food security strategy of the Ministry of Economic Development, Trade and Agriculture of Ukraine. It forms appropriate conclusions regarding the effectiveness of strategic measures and proposals for adjusting the food security strategy based on the analytical data of the information system in operational mode.

The results of the block of strategy monitoring and adjustment of strategic measures are reports on the trends of food security according to methods after the implementation of strategic measures, conclusions based on the results of analysis of threats to food security, conclusions on the effectiveness of strategic measures to ensure food security. Based on the specified monitoring results, adjusted food safety indicators and

measures should be substantiated.

4.2. Institutional support and architecture of the information system for food security monitoring

Guaranteeing of Ukraine's food security is a strategic priority of the state socio-economic policy and important task, the level and quality of population's life depends on its comprehensive solution. The effective development and implementation of the food security strategy needs the coordination, effective organizational and informational interaction between the participants of the food security system (state authorities and management, responsible institutions and organizations, agricultural and food enterprises, market intermediaries, the population). Assessment of the trends of food security, effectiveness of strategic measures and tools for its ensuring, as well as timely response to challenges and threats requires monitoring.

Scientists such as Z.K. Bondar [8], M.M. Babich [16] studied scientific approaches to information and analytical support for assessing threats to food security. The need for the functioning of the regional food security monitoring system is substantiated in his research by V.F. Proskura [148, p. 64].

According to the Draft Law of Ukraine "On Food Security of Ukraine" dated April 28, 2011 No. 8370-1, monitoring and information support of food security are foreseen [1]. According to the specified Draft Law, food security monitoring is a complex system of observation, collection, processing, systematization and analysis of information on production, stock management and food supply, quality and safety of food products, food consumption and nutrition of the population [147].

The main tasks of food security monitoring are:

- provision of operational assessment of the current trends of food security;
- identification of problems in the field of food security;
- assessment of existing and projected risks and threats to food security;
- forecasting the state of food security;
- informational and analytical support for food security measures.

Monitoring is carried out at the national and regional level

according to the specified indicators of food security.

Monitoring of food security is carried out by ministries and other central bodies of executive power within their powers. The Ministry of Economic Development, Trade and Agriculture of Ukraine, which forms and ensures the implementation of the state agrarian policy and guarantees the state food security, summarizes the monitoring results and publishes them in the mass media every year.

Food security monitoring of Ukraine has a sufficiently formed methodological and statistical base at the legislative level. In particular, state bodies have developed the main indicators of food security and methods of their assessment, and state statistics bodies provide information on further assessment of indicators and further interpretation of results [87; 86; 144].

Modern legal acts and fundamental scientific works contain indicators, coefficients, methodical recommendations for their calculation and interpretation. However, the study of food security monitoring needs further research, methodical and practical developments. It is necessary to use modern information technologies for the collection, analysis of information and the formation of relevant analytical reports, forecasts and recommendations regarding the development of the food security strategy of the country and its implementation.

It is necessary to systematize the efforts and information resources of all participants in the system of providing the population with food, which will allow not only to objectively assess the trends in food security in the reporting period, but also to develop strategic plans and forecasts and implement preventive measures due to timely response to possible deviations in all factors affecting food security. Therefore, improving the information security of food security monitoring is an important task.

The regulation of information provision of state policy on food security is outlined in the Draft Law of Ukraine “On Food Security of Ukraine”. According to the legal act, complete and reliable information is a condition for making timely and well-founded decisions on ensuring food safety [147]. Such information includes data regarding:

- state and industry standards, norms, regulations, including indicators regarding food security;
- indicators of the volumes of production and sale at the national and regional levels of vital food products;
- the level and dynamics of prices for vital food products;
- the level of consumption of vital food products as a whole and in

terms of social groups of the population, the dynamics of changes in this level to identify trends;

- the state and trends of the development of internal and external markets of agricultural raw materials and food and their individual product sectors;

- implementation of state and regional programs on food security, as well as measures on food security in general.

The Cabinet of Ministers of Ukraine establishes the procedure for preparing and providing information on ensuring food security.

Let's define the main subjects of information support for food security monitoring and consider the blocks of information that they provide to users and receive from other participants in the state's food security system (Fig. 4.4).

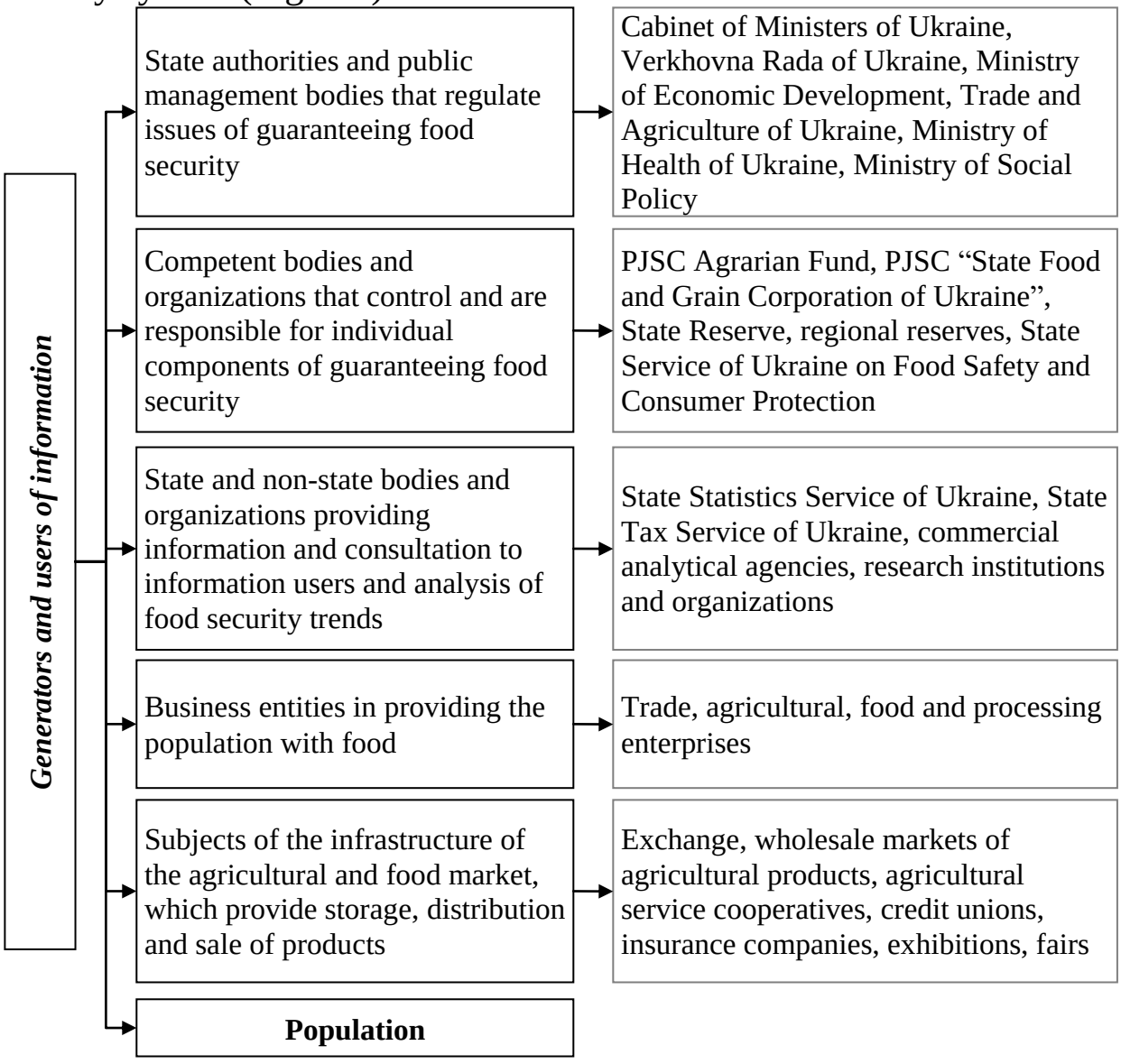


Fig. 4.4 – Subjects of information provision of food security monitoring

Source: developed by the author.

The key role in the formation of information regarding the analysis and monitoring of food security is played by state authorities and management bodies that regulate issues of guaranteeing food security. The main legislative and legal acts, which contain provisions on the strategic directions of the development of the agricultural market, agricultural production, processing and food industry, etc., were developed by the Cabinet of Ministers, the Verkhovna Rada of Ukraine. The assessment of the level of food security is carried out in accordance with the methods and recommendations developed by the Cabinet of Ministers, the Ministry of Economic Development. The norms of consumption of basic food products, on the basis of which a conclusion is made regarding the food security of the population, are provided by the Ministry of Health of Ukraine. The Ministry of Social Policy provides information to the population about the availability of food aid programs and the conditions for its provision, and in turn reports to other state authorities and statistical bodies about expenditures from the state budget for financing food programs for the population.

In particular, according to Cabinet of Ministers' Resolution No. 459 dated 20.08.2014, "Issues of the Ministry of Economic Development, Trade and Agriculture", in the field of information support for food security monitoring, the Ministry of Economic Development, Trade and Agriculture carries out:

- consolidation of information on the situation in crop and livestock industries and its official publication on its own website;
- maintaining a register of producers of plant and animal husbandry products;
- monitoring of prices for resources for the production of agricultural products (fuel, fertilizers, seeds, etc.),
- monitoring of resource availability of agricultural commodity producers;
- ensuring monitoring of national and international agricultural and food markets;
- informing about the operation of modern food safety and quality control systems, including at the international level;
- providing up-to-date information on measures and programs to support farms, agricultural cooperatives, important legal and methodical information on regulating their activities;
- informing about the state of agricultural education and science, directions of scientific research in the agricultural sphere, development of

rural areas;

- creation and support of the permanent functioning of the information support system for the activity of wholesale markets of agricultural products;

- informing about priority measures of financial policy in the agricultural sector (budget process, financing from the State budget, agricultural insurance, lending, taxation and other important issues), technical policy, regulatory policy, technical regulation;

- regulation of directions of international cooperation relevant for participants in foreign economic activity, in particular the order of cooperation with international organizations, including financial ones, cooperation with the WTO, European integration, bilateral cooperation, receiving international technical assistance;

- provision of information on current strategies and programs in the agrarian sector, agrarian reforms;

- provision of administrative services and work with appeals;

- provision of information regarding state-owned objects and enterprises;

- receiving from ministries, other central and local executive bodies, local self-government bodies the necessary information, documents and materials, in particular from statistical bodies – statistical data on the situation in the agricultural sector and trends in its development, financing, food supply of the population, export and import of agricultural products and food.

The Ministry publishes in official sources of information legal acts in the sphere of regulation of state agrarian policy, state policy in the spheres of agriculture and issues of state food security, protection of rights to plant varieties, animal husbandry.

Competent bodies and organizations that control and are responsible for certain tasks of guaranteeing food security in the field of ensuring state food reserves, in particular, PJSC “Agrarian Fund”, PJSC “State Food and Grain Corporation of Ukraine”, provide information on programs, conditions and volumes of state purchases of agricultural products on the market, minimum and maximum prices [131; 152]. PJSC “SFGCU” informs suppliers of agricultural products about purchase programs, purchase prices, tariffs for services for commodity producers for processing, procurement, storage, transportation, etc.; potential partners in the field of transportation, product insurance and other intermediaries of the agricultural and food markets – informs about the

terms of cooperation [152]. State corporations, which are entrusted with the functions of agricultural market regulation, provide reporting information to higher authorities and state statistics authorities regarding sales volumes and prices of agricultural products on the domestic and foreign markets. The State Reserve Agency of Ukraine provides information to interested parties regarding public procurement procedures, the procurement plan for agricultural and food products, and the terms of cooperation. Citizens, enterprises, institutions and organizations have access to public information provided by the State Reserve regarding the volume and availability of food resources [124]. The State Service of Ukraine on Food Safety and Consumer Protection provides up-to-date information on food quality requirements, activities of market operators, inspection activities, regulatory objects for the purposes of import, export and re-export, develops and publishes normative legal acts on issues, that are within its competence.

State and non-state bodies and organizations providing information and consultation to information users and analysis of food security trends should become the main link in the formation of an information system for food security monitoring. These subjects consolidate information on the situation in the markets of agricultural and food products, volumes and prices of exports and imports, production volumes and operating conditions of enterprises in the agricultural sector, food and processing industry, food security of the population, quality of nutrition and household expenditures on food. In addition, scientific research organizations and institutes analyze and forecast the state of food security in the country, develop recommendations for strengthening it, directions for financial support, improvement of the institutional and legal framework, for authorities competent to solve these issues.

Business entities in the provision of food to the population, in particular agricultural producers, provide information to the state statistics authorities, which later becomes available to users, regarding the assortment, volumes of production and sale of products, material and technical base (land resources, agricultural machinery and inventory, etc.) and staff support, the amount of use and cost of material and technical resources purchased by agricultural enterprises for production needs in agriculture (fertilizers, fuel and lubricants, fodder, etc.), the main financial and economic indicators of activity, export, import, and the amount of state financial support received. Trading enterprises inform about the volumes of sale of agricultural products and food, food and

processing enterprises provide information about the volumes of receipt of agricultural products for further processing, assortment and sales volumes of food, prices, etc.

Subjects of the infrastructure of the agricultural and food market, first of all, provide information to potential partners (agricultural, food, processing enterprises) that sell agricultural and food products, regarding the volumes and terms of purchases. For buyers, such entities of the market infrastructure provide up-to-date information on the availability and purchase prices of products. Credit and insurance organizations provide information to other market subjects regarding financing and cooperation conditions. Enterprises in the field of exhibition and fair activities present the main achievements in the agricultural sector and service industries.

According to the statistical data of the survey of the living conditions of households, which is carried out on an ongoing basis and meets international standards, important information for assessing food security is income, the structure and dynamics of household expenses, and the amount of consumption of basic food products.

Guaranteeing the Ukraine's food security is ensured by the responsible bodies of state power and management, institutions and organizations and other subjects, which carry out the formation of an information and analytical base for identifying threats, assessing and monitoring the trends of food security and making strategic management decisions based on the results of monitoring. Effective interaction of the specified participants requires timely provision of information for the analysis and assessment of the food security trends and threats based on a system of indicators, the formation of analytical reports necessary for the development of further plans and forecasts of food security at the state and regional levels.

Therefore, national food security is the area of responsibility of state authorities and management of all levels with the participation of business entities involved in the formation of the necessary information base for assessing the state of food security and making strategic management decisions based on the results of the assessment. For the purpose of their effective interaction, it is necessary to receive information in a timely manner for the analysis and assessment of the state of food security and possible threats, the formation of a system of indicators and analytical reports, planning and forecasting.

The existing food security monitoring system in Ukraine is

characterized by a sufficiently formed methodological and statistical base at the legislative level. In particular, the Draft Law of Ukraine "On Food Security of Ukraine" No. 8370-1 dated April 28, 2011 contains an article devoted to food security monitoring. At the state level, the main indicators of food security and methodical recommendations for their calculation have been developed [87; 86]. The necessary data for the calculation of indicators, analysis and further interpretation of the results are provided by the State Statistics Service of Ukraine. Consolidation of information and conducting analytical calculations is provided by the Ministry of Economic Development, Trade and Agriculture of Ukraine.

However, to date, a single information system has not yet been formed. It would be able to consolidate incoming and outgoing information flows during food security monitoring, organize the coordinated work of all participants in the food security system, and systematize and optimize governmental information resources. The availability of such an information system will allow not only to objectively assess the trends of food security in the reporting period, but also to form strategic plans and forecasts, to respond in a timely manner to possible threats to food security, and to implement corrective measures to counter factors that negatively affect food security. Therefore, an urgent scientific and practical task is to improve the information-analytical and methodical base of food security monitoring through the implementation of an information system.

The main purpose of the development is the methodical and practical implementation of information support for monitoring the food security of the country, the justification of strategic directions and mechanisms of its guarantee at all levels, the development and implementation of socio-economic development programs and sectoral development strategies. The customers of the development of the information system can be state administration bodies that participate in the formation of mechanisms and tools for regulating the functioning of the food market, programs and forecasts of socio-economic development, for example, the Ministry of Economic Development. Users of the information system should be public administration bodies of all levels, responsible for strategic measures to guarantee food security, trade, agricultural, food and processing enterprises, and market infrastructure enterprises.

Food security monitoring information system must functionally automate the process of collection, input of input data, analysis,

formation of analytical reports, storage of results and provision of operational access to information [96, p. 104]. The information system should solve the following tasks:

- automation of the procedure for collecting and processing information about the trends of food security, unification of assessment indicators and coefficients at the state and regional level;
- substantiation of the requirements for input data provided by the relevant subjects of food security monitoring information support, necessary for the calculation of indicators characterizing the situation in food security, and the formation of analytical reports;
- software and technical implementation of national food security monitoring in accordance with several evaluation methods;
- providing users with timely information about the trends of food security at the state and regional levels for timely identification and prevention of threats, development of strategic plans and forecasts, and adoption of operational management decisions in case of deterioration of the situation;
- generation of current analytical reports based on monitoring results and providing them to users in electronic form;
- physical and legal data protection and information security [96, p. 105].

The main goal of the proposed project is to create practical informational support tools for food security monitoring, development and implementation of the Ukraine's food security strategy and regional food security programs, substantiation of strategic directions and mechanisms for ensuring food security at all levels.

The customer of the development of the information system and the coordinator of the project can be the Ministry of Economic Development, Trade and Agriculture of Ukraine, since it is entrusted with the task of forming mechanisms and tools for regulating the functioning of the food market, strategies, programs and forecasts of food security.

Consolidation, processing and analysis of information can be performed by the responsible structural divisions of the Ministry. For this purpose, individual structural units of the Ministry can be assigned additional functions and responsibilities regarding the formation and implementation of a food security strategy, conducting preparatory planning activities, as well as monitoring and controlling the results of the strategy. The Ministry can be the operator of the food security monitoring information system, the developer of the technical task for the

design of the information system, and the development and implementation of the information system can be carried out by the Department of Development of Information and Communication Technologies, Document Management and Electronic Services of the Ministry [97, p. 105].

It is expedient to take part in the project also to other state administration bodies, institutions, organizations that participate in the formation of the information and analytical base of food security assessment and monitoring, substantiation of the procedure and requirements for the forms of providing input information for calculations, interim and final reports, for example, The State Statistics Service of Ukraine, the State Customs Service of Ukraine, the State Service of Ukraine on Food Safety and Consumer Protection (SSUFSCP), departments of agro-industrial development of regional state administrations.

The following stages of creating a food security monitoring information system as a new state information system are proposed:

- development of the concept of creating an information system for food security monitoring and its approval in the established order;
- provision of project financing;
- formation of technical requirements for the functions of the food security monitoring information system and its components;
- conducting tender procedures;
- creation of a software and technical complex of the information system of food security monitoring;
- design and development of an information system for food security monitoring;
- transfer of accumulated data from the current database of the State Statistics Service to the food security monitoring information system;
- implementation of an information system for food security monitoring;
- provision of technical support and support of the food security monitoring information system.

The structure of the project of the proposed food security monitoring information system is presented in fig. 4.5.

In accordance with the given scheme, it is proposed to form a logical structure of the information system of three levels with relevant databases and software modules.

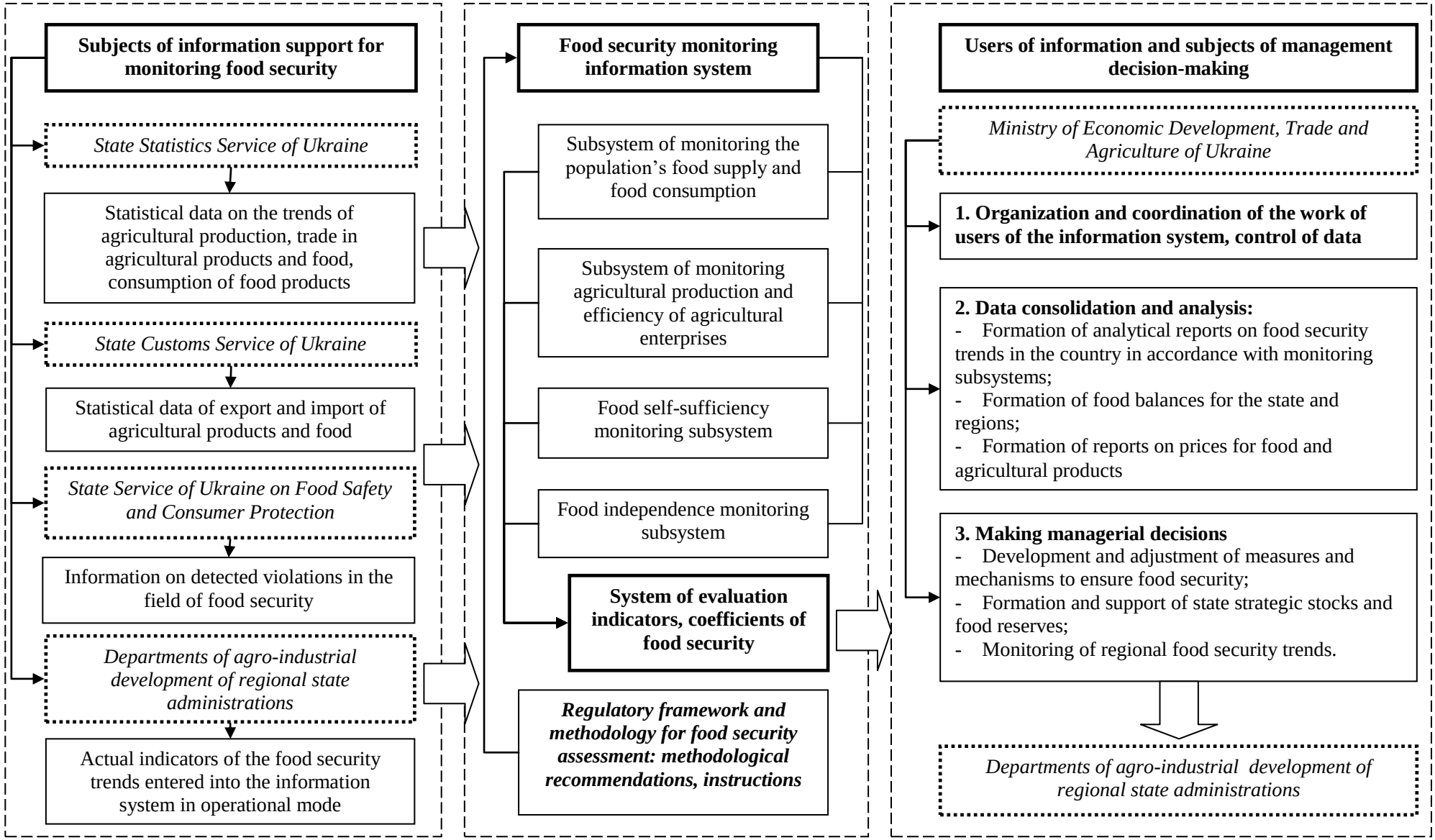


Fig. 4.5 – Food security monitoring information system

Source: developed by the author.

The first level includes subjects of information support for monitoring food security of Ukraine in an automated mode, in particular, the State Statistics Service of Ukraine, the State Customs Service of Ukraine, the State Service of Ukraine on Food Safety and Consumer Protection, departments of agro-industrial development of regional state administrations. The main task of the specified subjects is to provide the input data necessary for the calculation of indicators and indicators of food security and their further continuous monitoring during the period of strategy implementation in accordance with the developed calendar plan-schedule.

Input data for monitoring and further substantiation of the main strategic directions and priorities of ensuring food security are statistical indicators, on the basis of which the assessment of food security is carried out. The State Statistics Service of Ukraine provides statistical data on the trends of agricultural production, trade in agricultural products and food, and food consumption. The State Customs Service of Ukraine provides statistical data on the export and import of agricultural products and food. The State Service of Ukraine on Food Safety and Consumer Protection informs about detected violations in the field of food quality assurance. Departments of agro-industrial development of regional state administrations provide information on actual indicators of food security by entering data into the information system.

The responsible structural units of the departments of agro-industrial development of the regional state administrations ensure that the actual data of indicators and coefficients of food security are entered into the information system for their further consolidation.

The results of monitoring indicators and coefficients describing the current trends of food security in the regions must be entered into the information system in an operational mode by the responsible divisions of the specified information support entities in accordance with the developed calendar plan-schedule for the implementation of monitoring works, which must be placed in the appendix to the state food security strategy.

Information necessary for assessment, analysis and monitoring must be provided in an automated mode according to the relevant regulations of the Ministry of Economic Development, Trade and Agriculture of Ukraine.

The second level is the food security monitoring information system, which is proposed to be designed in the form of a logical

structure to solve the problems of: monitoring of food security of the population and food consumption, production and efficiency of agricultural enterprises, monitoring of food self-sufficiency, monitoring of food independence.

Fig. 4.6 shows the architecture of the software solution, which includes functional complexes of tasks, application subsystems, and software and technology tools for monitoring and strategic planning.

The regulatory framework and methodology for food security assessment in the monitoring information system should be digitized and contain methodological recommendations, instructions, etc. The legal and methodological basis for calculating indicators of food security is represented by the main national methods (Methodological recommendations for calculating the level of economic security of Ukraine dated 29.10.2013 No. 1277, Methodology for determining the main indicators of food security dated 05.12.2007 No. 1379 "Some issues of food security", the Draft Law of Ukraine "On Food Security of Ukraine" No. 8370-1), as well as some author's methods [16, p. 80; 29, p. 44; 35, p. 43; 84, p. 87; 10, p. 64; 66, p. 195; 96, p. 44].

The information base for assessing food security includes statistical data, in particular, indicators of the sale of agricultural products by enterprises and households, the dynamics of crop and livestock production, the movement of agricultural products at processing enterprises, household incomes and expenses, household food consumption, market prices, etc.; as well as data from the Ministry of Economic Development, Trade and Agriculture of Ukraine, analytical and consulting agencies, in particular, balances of supply and demand for agricultural products and food, prices for agricultural products and food, and other information.

As a result of the operation of the information system, a system of evaluation indicators, coefficients of food security, which is the basis for making management decisions, will be created.

The third level is the users of the monitoring information system and subjects of decision-making, namely the state administration bodies of all levels, responsible for making management decisions and strategic measures to guarantee food security, primarily the Ministry of Economic Development, Trade and Agriculture of Ukraine, as well as departments of agro-industrial development of regional state administrations.

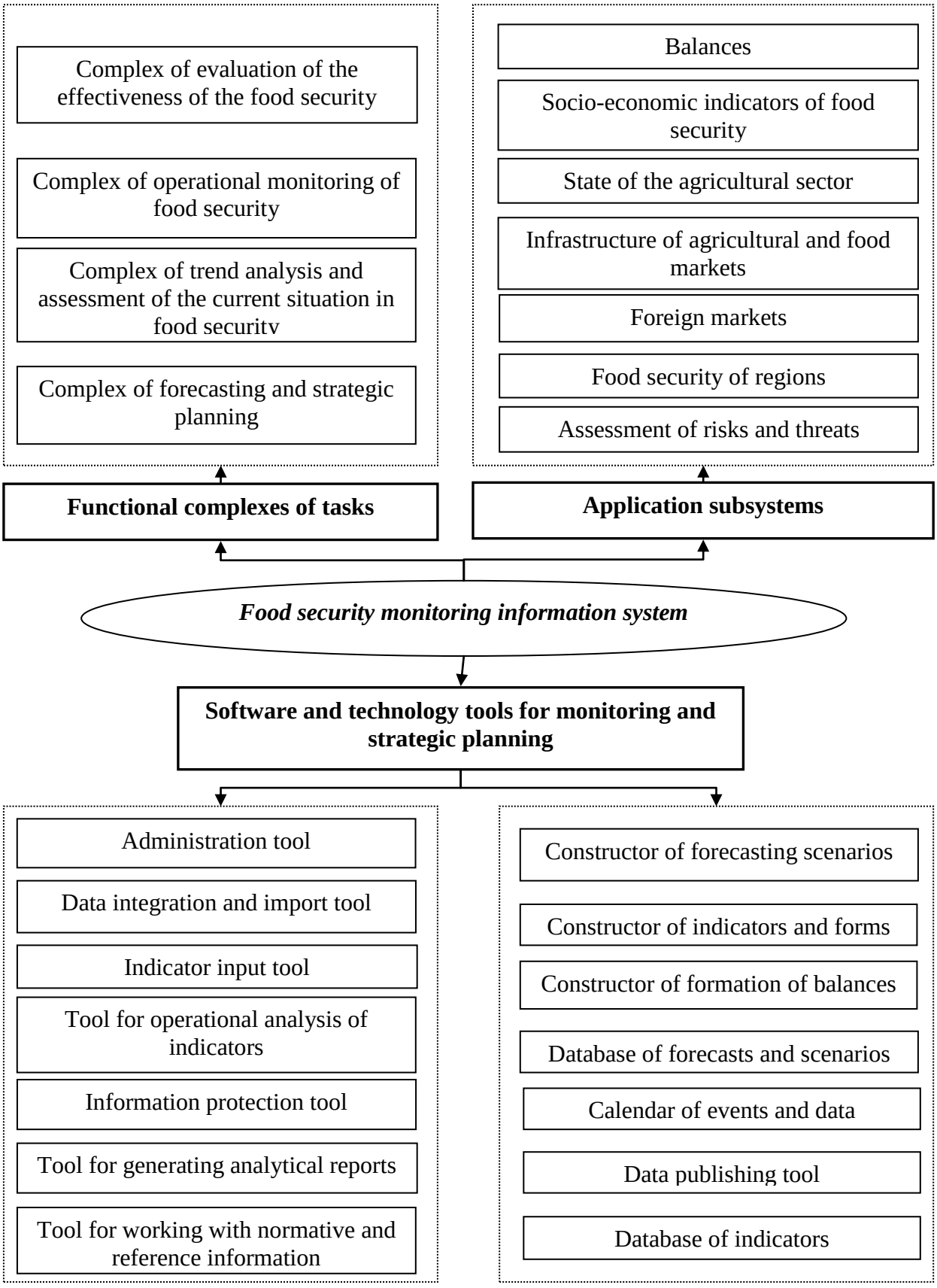


Fig. 4.6 – Software solution architecture

Source: developed by the author.

Monitoring and control of the state's food security is carried out by

the department of development and implementation of the food security strategy of the Ministry. The Ministry based on the generated analytical reports in the information system related to the trends of food security, in an operational mode forms appropriate conclusions regarding threats to food security, the effectiveness of strategic measures and substantiates proposals for their possible adjustment.

Monitoring and control of indicators and coefficients of food security according to regional programs should be carried out by departments of agro-industrial development of regional state administrations. The department of development and implementation of the food security strategy of the Ministry, on the basis of monitoring results, adjusts strategic measures, instruments and mechanisms of the state agrarian policy, target programs at the state level and agrees on their change with the management.

The Ministry of Economic Development, Trade and Agriculture of Ukraine should implement the following tasks in ensuring the operation of the information system and decision-making based on the results of food security monitoring:

1. Organization and coordination of the work of users of the information system, control of data collection;

2. Consolidation and analysis of data, which involves the creation of analytical reports on the current situation and trends of food security of Ukraine, compilation of food balances for the country and regions, formation of reports on prices for food and agricultural products;

3. Making management decisions regarding the development of strategic measures to guarantee food security and tools for its provision, as well as adjustments as necessary; formation and support of state strategic stocks and food reserves; monitoring the trends of food security in the regions.

Access to the information base can also be provided to trade, agricultural, food and processing enterprises, and market infrastructure enterprises. The provision of information at this level to interested users should be carried out within the limits of the defined access rights for an individual user.

The result of the project will be the formation of an information and analytical base for assessing the trends of food security, threats and opportunities, strengths and weaknesses, conclusions based on the results of the analysis of indicators of food provision of the population, development of the agricultural sector, agricultural production and

efficiency of agricultural enterprises, food provision of the population and food consumption, food independence and self-sufficiency. Based on the information and analytical base, it is proposed to develop a forecast and strategy of food security.

Therefore, the development of the food security monitoring information system will provide users with comprehensive, relevant, timely, objective information about the trends of food security in Ukraine. This information system will present the trends in the development of the agricultural sector, agricultural production and the efficiency of agricultural enterprises, food supply for the population and food consumption, food independence and self-sufficiency. The developed food security monitoring information system will form a technical, informational and methodological basis for the comprehensive formation and analysis of food security indicators, to develop a food security forecast and strategy.

4.3. Methodological principles of developing a food security strategy of the state using a balanced scorecard

Many works of domestic and foreign specialists are devoted to the study of ways of introducing a balanced scorecard and strategic maps in public management.

R. Kaplan and D. Norton are the first scientists who began to use the term “strategic maps” to reflect cause-and-effect chains in the activities of enterprises [64, p. 120]. A strategy map is a one-page description of a strategy in the form of a set of cause-and-effect relationships. The development of strategic maps to increase the effectiveness of strategic planning at the enterprise helped to generate staff efforts and structure the implementation of the strategy. A strategic map allows managers to transform a strategy from a formal, rarely used document into an effective, well-founded plan [64, p. 121].

The analysis of scientific works on the researched topic showed that there are models similar to the models of strategic maps described by Norton and Kaplan. Their main purpose is to determine the optimal directions for the implementation of the company’s strategy. In particular, we can consider the model of L. Meisel, which is similar to the model of D. Norton and R. Kaplan and is based on four main elements: finances,

customers, business processes, training and development. The difference between these models lies in the fact that the "training and development" element in L. Meisel's model covers the "labor resources" component and includes the improvement of personnel recruitment and motivation. In general, Meisel's model is identical to Norton and Kaplan's model. Highlighting a separate element of labor resources, L. Meisel argues that managers should pay the main attention and evaluate the efficiency of not only the enterprise as a whole, but also the employees.

The authors C. McNair, R. Lynch and K. Cross in their scientific works consider the "Performance Pyramid" model, which, similarly to the previously named strategic models, is focused on the consumer and the identification of cause and effect relationships between the main strategy of the company and its financial indicators.

The "Performance Pyramid" model is based on the concept of general management of quality and industrial developments, as well as accounting of costs by types of activities in the organization's value chain. The "Performance Pyramid" has a four-level organizational structure and characterizes a system of two-way communication, which is necessary for spreading the idea of the corporate mission and strategy at different levels of the organizational hierarchy.

The group of indicators presented in the model rather reflects some qualitative characteristics common to all or part of the levels of the organizational hierarchy. These quality characteristics include: customer satisfaction, flexibility, and productivity, which play a major role in achieving the organization's marketing and financial goals, i.e., second-level goals. They are the link connecting the upper and lower levels of the pyramid. The indicators of the fourth level include the delivery time, the operating cycle and the percentage of defects, which are dependent on each other. In particular, the quality and delivery time are directly related to the efficiency of the enterprise's external activities, while the operational cycle and indicators of defects reflect the efficiency of its internal activities.

At the bottom level of the pyramid, which corresponds to operational activities, the efficiency of the enterprise is evaluated for a short period of time (day, week or month). At the upper levels, the assessment is carried out much less often, using mainly financial indicators. From the point of view of C. McNair and his co-authors, the evaluation should be carried out on the basis of a comprehensive system

of indicators, in which indicators of operational activity at the lower levels would be coordinated with financial indicators at the upper levels. This would allow the top managers of the enterprise to determine the factors that affect the obtained values of financial indicators [128, p. 56].

Authors C. Adams and P. Roberts developed the strategic model EP2M (Effective Progress and Performance Measurement), according to which the most significant is the assessment of the company's performance in four areas:

- in the external environment – customer service and demand satisfaction;
- in the internal environment – increasing efficiency and productivity;
- from top to bottom in the organizational hierarchy – spreading and adapting the general strategy of the organization to all lower levels of the organizational structure, stimulating changes;
- from the bottom up in the organizational hierarchy – strengthening the influence of shareholders and expanding the freedom of action of employees [64, p. 123].

According to the concept of P. Roberts and C. Adams, the system of evaluating the company's activity should be aimed not only at the implementation of the strategy, but also at the corporate culture with its continuous movement forward and development. An effective evaluation system provides effective control and quick feedback [65, p. 84].

Russian experts pay attention to the use of the BSC at the levels of municipal and state administration. In particular, S. Andriyanov proposes an innovative model of the strategic management system, which takes into account the peculiarities of the socio-economic management of a small city and is based on the application of BSC [5, p. 44]. Another author is M. Sadkovsky proposes the construction of a BSC for a science degree [163, p. 61]. In the works of such authors as I. Zakirov, I. Tazhitdinov, V. Kazakov [54, p. 254], T. Yermakova [50, p. 30] and A. Ivanov [59, p. 11] consider the formation of the BSC of a municipal entity as a tool for implementing the strategy of territorial development.

In the study of V. Andrianov it is proposed to develop the BSC for managing economic processes in the mode of self-regulation at the state level – a system of balanced socio-economic indicators of sustainable development [6, p. 54]. The main problem in creating such a system, according to V. Andrianov, consists in determining the optimal values of

indicators and building mechanisms for their constant monitoring, a feedback system, and adjusting indicators that ensure the balance of the system.

Features of regional strategic management using a balanced scorecard are revealed in the works of scientists, for example, N. Larionova [77, p. 136]. Some scientists have studied the possibilities of using BSC to develop a strategy for the development of economic complexes, in particular, S. Kitaev. used strategic maps for the development of the logistics infrastructure of the grain market [69]. Authors E. Zvereva, M. Belyaeva, T. Narkevska implemented the formation of a strategic map of sustainable development of the forest complex of the region [58, p. 53]. The formation of a system of balanced scorecard is also provided for evaluating the effectiveness of the implementation of regional investment strategies in the studies of the authors O. Fedulova, N. Oshchepkova [197, p. 253].

Ukrainian scientists T. Pakhomova and I. Khramtsova consider theoretical approaches to the use of regional development strategies as a controlling tool in the regional management system and note that regional development strategies provide a holistic view of the processes of implementation of regional development strategies [134, p. 68]. L. Prykhodchenko investigates the peculiarities of the application of BSC for evaluating the effectiveness of public management both at the level of the activity of individual employees, groups, and the entire institution by comparing current indicators with planned ones [143, p. 79]. The authors of the methodological manual [195, p. 23] highlight the essence, methodology and practice of management based on the results of activities in local self-government bodies. It is emphasized that the applied indicators should be coordinated with already valid performance indicators at the local and national level.

The universality and targeted orientation of the balanced scorecard allows its application to solve a wide range of scientific and practical tasks of strategic planning at different levels. Considering the complexity and multifacetedness of the country’s food security, its dependence on many macro- and microeconomic factors, it is advisable to propose the use of a strategic map for the development of a food security strategy.

Based on the analysis of existing models of strategic maps, it can be concluded that the ideas of R. Kaplan, D. Norton and other scientists who dealt with this issue are aimed at solving the following questions.

1. Visual presentation of the company's strategy.

2. Determination of cause-and-effect relationships between the main factors forming value.

3. Combining financial and non-financial factors of value formation.

The effectiveness of applying the principles and approaches of the balanced scorecard at the national level is beyond doubt. The implementation of the strategic map model showed results during the strategic planning of the development of certain regions of Europe and the CIS countries [76, p. 88].

The concept of the balanced scorecard system (BSC) is one of the most effective tools of strategic management initiated by the American scientists R. Kaplan and D. Norton in the early 1990's, further advanced in their scientific papers, as well as by other economists [65, p. 49; 31, p. 80]. The success of a given concept has been repeatedly confirmed by practical results in the economic activities at enterprises in the developed countries in Europe and the world. At present, the scientific approaches to strategic management that employ a balanced scorecard have been internationally recognized.

According to the traditional concept of a balanced scorecard, the formation and development of the system of indicators is carried out in terms of components (financial, customer, internal business processes, training and development of personnel) and consists of the following stages:

- identification of key problems related to the implementation of the existing strategy and determination of the strategic goals of the organization's activities, which are aimed at highlighting in the general strategy a list of specific target attitudes regarding specific components of the BSC;

- drawing up a strategic map, which is a graphic document with depicted cause-and-effect relationships between individual strategic goals of the organization's activity, and is built in the form of a block diagram with strategic goals presented in the form of individual blocks, and cause-and-effect relationships between them in the form of arrows;

- substantiation of target indicators to reflect the content of the set strategic goals and determine the criteria for their achievement, while each strategic goal, according to the traditional concept of BSC, corresponds to 2-4 target indicators;

- substantiating the criteria for achieving the target indicators,

which must be achievable and realistic based on the situation at the time of strategy development, since only after determining the criterion for achieving the target indicator, the strategic goal is considered set;

- development of strategic measures for further specification of strategic goals and formation of the interrelationship of the strategy with the tactical tasks of the responsible executors and structural units of the organization, thus turning the strategy into a mechanism for its implementation and control.

The development of the BSC, as a rule, begins with the justification of its financial component and ends with the formation of the training and development component of personnel. Therefore, the concept of a balanced scorecard is an effective analytical tool for strategic management of a commercial organization (enterprise, firm, company, business unit) in the conditions of a modern market economy. At the same time, the effectiveness of BSC in strategic planning has been proven in the practical activities of public sector enterprises and non-profit organizations, taking into account their specific features. The tactical aspects of the BSC concept are based on building a relationship with budgetary planning and control, as well as the analysis of strategic components of the economic activity of commercial organizations based on the BSC. Therefore, the application of the concept of food security for the development of theoretical and methodological approaches to the formation and implementation of a food security strategy at the national level is a promising task that can give high results.

Let us represent the process of creating a food security BSC in the form of a matrix BSC = $[A_{ij}]$, where A_{ij} is the element of the matrix, j is the serial number of the stage in the development of a strategy card, $j = \overline{1, m}$, i is the serial number of a BSC component, $i = \overline{1, n}$.

Components of a food security BSC should be developed so that they match the tools for implementing the strategy in terms of the components of food security (production, market, resources, consumption) [241, p. 10]. Therefore, define the components of the strategy card as follows:

1. Financing of agricultural policy;
2. Social welfare of people;
3. Infrastructure support to domestic market;
4. Public administration and resources for food security.

A food security BSC development stages are defined as follows:

1. Define strategic goals to ensure the state's food security;

2. Construct a strategy card of food security;

3. Substantiate the values for targets and define the criteria for achieving them;

4. Develop strategic measures for each component of BSC of food security.

Let us consider the processes for developing the BSC food security components in more detail.

Compilation of the components on a balanced scorecard of food security begins by identifying a key strategic goal based on the detected problems, and by dividing it into the refined strategic goals for each component. A key strategic objective is related to the adopted strategy and reveals the targets that must be set for each component of food security in order to ensure a sufficient level of food security and to create preconditions for maintaining it at the sufficient level. The specified strategic objectives correspond to further strategic areas in the implementation of the strategy of food security for each component. Building a strategy card is based on the detected specific strategic goals for each component within a balanced scorecard. The card shows the list of goals, and the relationships among them, as well as the resulting effect on a BSC component.

Let us consider the compilation of specific strategic goals that underlie a would-be strategy card. The research on estimating the state of food security in Ukraine makes it possible to establish the following strategic priorities: overcome crises; maintain a sustainable state; develop areas on strengthening the state [95, p. 45].

Overcoming crises is a priority strategic direction, which implies that the main task is to transform the negative indicators of food security into positive ones. Along this direction, it is necessary to focus on the narrowest areas of food security, which demonstrate critical values for indices and indicators.

Maintaining a sustainable state is a priority strategic direction whose main task is to strengthen the existing capacity of the country’s food security. It is necessary to pay attention to the construction of an effective system for monitoring food safety and managing food security at the state’s level.

Development of directions for strengthening the state of food security is a priority strategic area where successful implementation of

strategic measures for each component on a balanced scorecard could produce maximum long-term effect. It manifests itself, in particular, by a stable growth in the values for indicators of food security and those factors that affect it.

The development of forecast values of indicators can be carried out by the method of extrapolation, for example, by the method of least squares.

Proceed to building a balanced scorecard for a country's food security.

The first component in the balanced scorecard system is agricultural policy in the context of ensuring food security, whose formation implies defining a key strategic goal of the agricultural policy and its separate specific lower-level goals. A key strategic goal of financial support to the formation of agricultural policy for food security is linked to resolving a major strategic task and includes the following: what are the goals that must be set for agrarian production to ensure a sufficient level of food security and to create preconditions for maintaining it at a sufficient level?

In this case, it is necessary to consider two aspects of strategic financial goals for supporting agricultural policy: first, they must aim to enhance the investment attractiveness and to improve basic indicators for the efficiency of enterprises in the agricultural sector, which would make it possible to implement the strategic potential and form a solid base for ensuring a sufficient level of food security in the long term; second, they define the goals, indicators and results expected from the implementation of other components on the strategy card of food security.

Strategic financial goals are interdependent and closely interconnected. Causal relationships among individual strategic financial goals are represented on the strategic card for financial support of agricultural policy, which is a component of the entire strategy card. A fragment of the strategy card for food security, the proposed strategy card for financial support of agricultural policy, is shown in Fig. 4.7.

Based on the devised strategy card for financial support of agricultural policy, let us build a balanced scorecard that substantiates the target values as it follows from the study [96, p. 46] (Table 4.1).

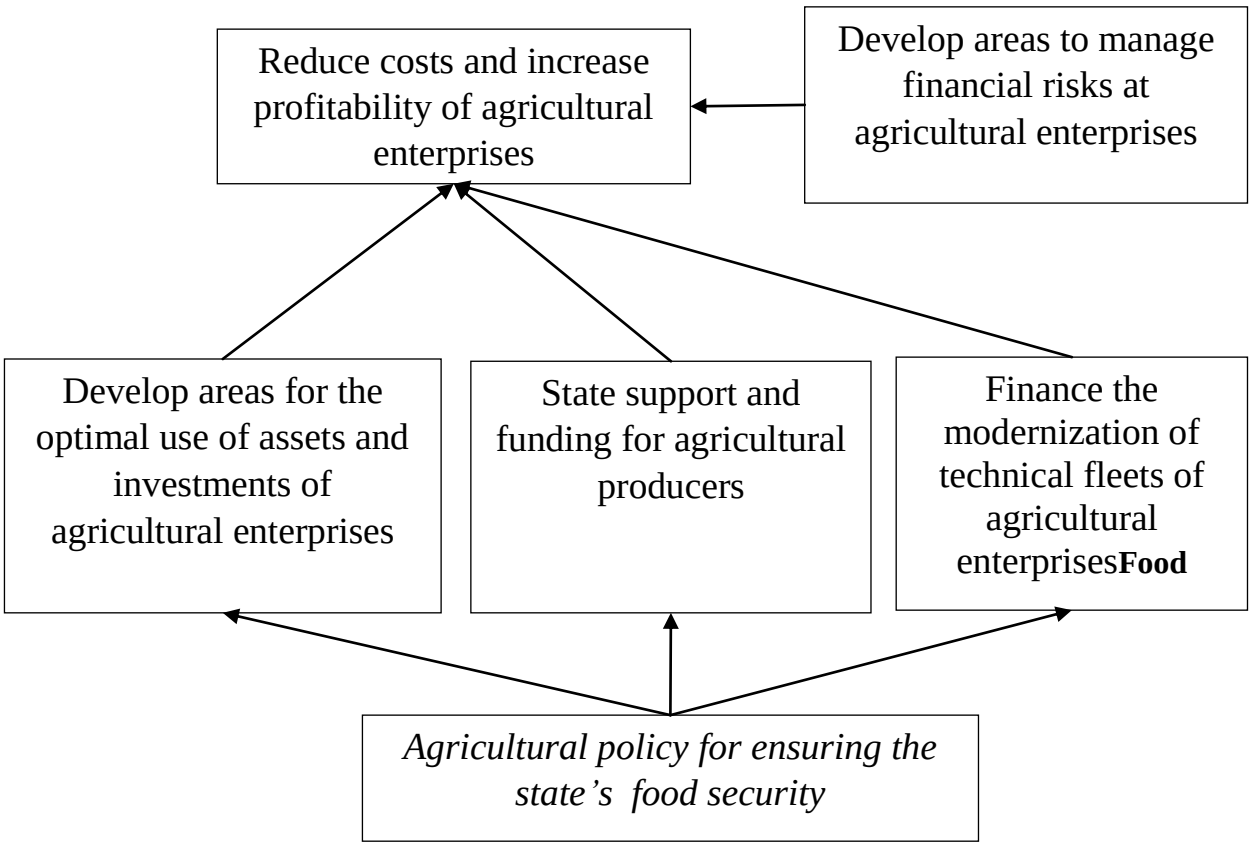


Fig. 4.7 – Strategy card for financial support of agricultural policy (a fragment of the strategy card for food security)

Source: developed by the author.

Let's illustrate some targets for agrarian policy in order to ensure food security in accordance with the developed strategic goals and strategic priorities (Table 4.2).

An important aspect in the substantiation of strategic goals for financial support of agricultural policy is the choice of strategic priorities based on a preliminary strategic analysis. If the priority is to overcome crises related to food security, the key task should be the maximal attraction of funds to the agricultural sector for each strategic financial goal, that is, focus on generating a maximal financial flow at agricultural enterprises.

For the case of the strategic priority being maintaining a sustainable state of food security, cash flow would not suffice, which is why it is necessary to pay attention to the ratio of cash receipts to expenses.

In developing the strategic directions regarding the strengthening of the state of food security, in addition to the above mentioned, it is necessary to analyze the relative indicators for utilizing fixed assets, own and attracted funds of agricultural enterprises, at the same time with the indicators for food security.

Table 4.1 – Strategic financial goals and targets for agrarian policy in order to ensure food security

Strategic financial goals for agricultural policy to ensure food security	Strategic priorities		
	Overcome crises	**Maintain a sustainable state**	**Develop directions for strengthening the state**
Develop directions for the optimal use of assets and investments by agricultural enterprises	Volumes and growth rate of foreign direct investment	Net cash flow for investment projects	Indicators for financial stability of enterprises. Level of return on investment
State support and funding for agricultural producers	Amounts of targeted financing. Amounts of compensation for interest rates on loans	Indices of tax burden	Performance indicators the use of trust funds
Fund modernization of fixed assets at agricultural enterprises	Amounts of targeted financing	Indicators of production load on technical fleet	Indicators for economic efficiency of technical fleet
Reduce costs and increase profitability of agricultural enterprises	Proceeds from the sale of products. Cost of production	Net profit	Level of profitability
Development of areas to manage financial risks of agricultural enterprises	Indicators for the number of insured enterprises and insurance reimbursement	Amount of the insurance premiums received for repayment of losses	Indicators for liquidity and solvency of agricultural enterprises

Source: developed by the author taking into account [33, c. 102].

In this case, the areas for the optimal use of assets and investments by agricultural enterprises depend on foreign direct investment; efficiency indicators of investment projects, financial stability of enterprises, return on investment.

The strategic goal of the state support and funding for agricultural producers in a balanced scorecard system is demonstrated by volumes of targeted financing, low-interest loans, tax burden, the effectiveness of

using targeted funds.

Table 4.2 – Actual and forecast targets for agrarian policy in order to ensure food security

Target indicators	Years									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Capital investment in agriculture, bln.UAH	18	29	50	63	72	84	96	108	120	133
ROI in agriculture, %	116	348	181	124	215	230	246	261	276	291
Basic assets in agriculture, fact prices, at end of year; bln.UAH	156	171	210	270	290	325	360	394	429	464
Output in agriculture, fact prices, bln.UAH	371	544	638	708	834	941	1048	1154	1261	1368
Net profit (loss), bln.UAH	21	102	90	78	120	139	159	179	198	218
Profitability level of agriculture, %	9	30	26	19	30	33	37	41	44	48

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The strategic goal to modernize fixed assets includes indicators such as volumes of targeted funding, workload, utilization efficiency, in accordance with the set strategic priorities for food security.

Reducing the costs and increasing the profitability of agricultural enterprises depend on the financial results of their operations (revenue, cost, profit). Directions for managing the financial risks of agricultural enterprises take into consideration the insurance indicators of agrarian enterprises, as well as received insurance premiums on repayment of losses, liquidity and solvency of agricultural enterprises.

Based on the developed system of strategic financial goals for agricultural policy aimed at ensuring food security and achieving the targets, it is appropriate to establish the criteria for accomplishing them. Next, it is possible to address the development of strategic measures of financial support to agricultural policy in the context of food security, which must be aimed at the implementation of investment projects, government projects and programs, and other activities that need large-scale financing at the expense of investors and the state.

The component of social security for the population should be aimed at maintaining economic affordability of food for people, which in turn depends on the price of foodstuffs and the real incomes of consumers. This is the dependence of the strategic goals for food security on the social welfare of the population.

The causal relationships among individual strategic social goals are shown on the strategy card of the social welfare of the population, which is a component of the entire strategy card. A fragment of the strategy card for food security, the proposed strategy card for the welfare of people, is shown in Fig. 4.8.

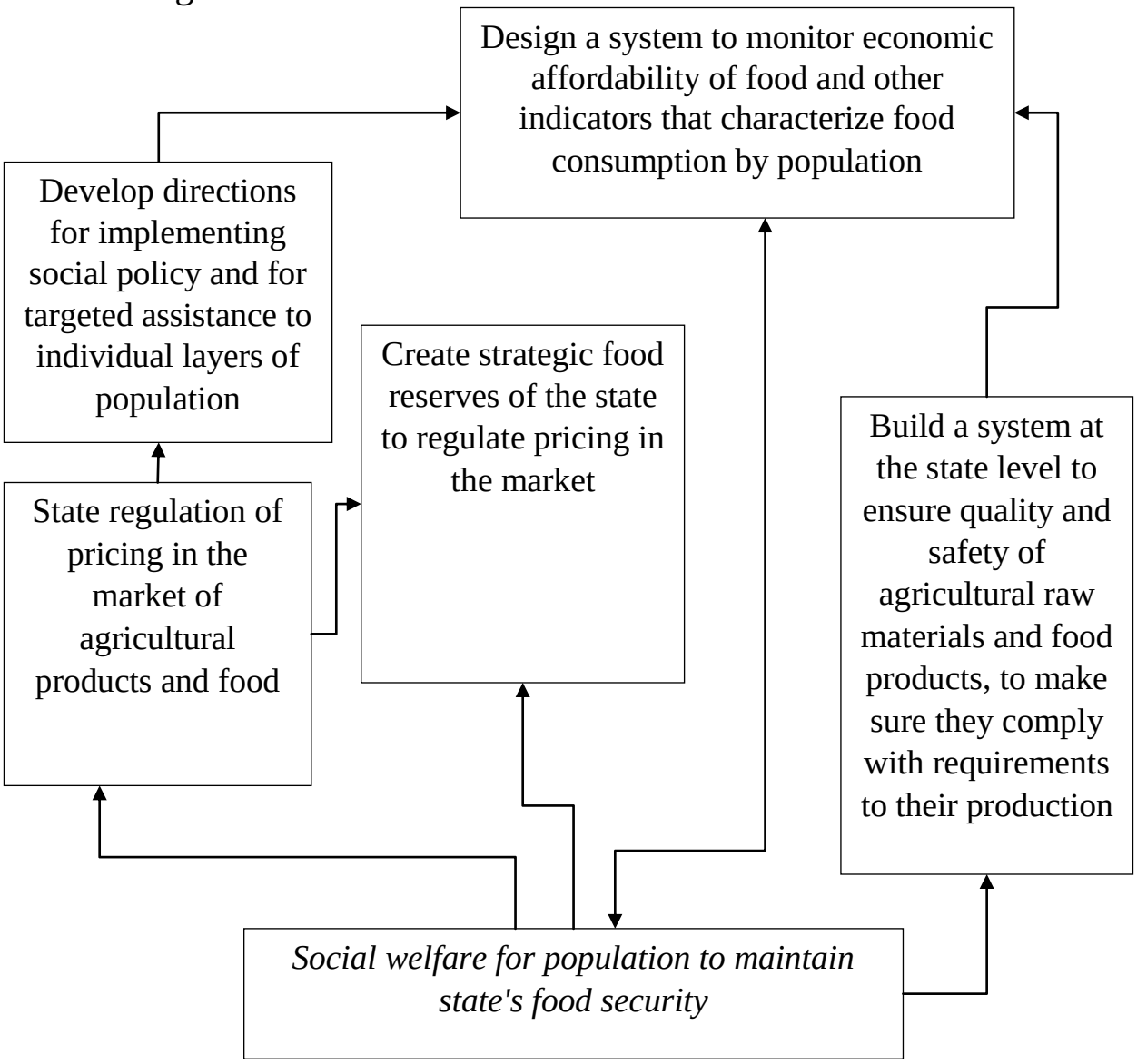


Fig. 4.8 – Strategy card of social welfare (a fragment of the strategy card for food security)

Source: developed by the author.

Substantiation of the strategic priorities of social welfare of the population in the context of development of a food security strategy is based on overcoming crises; maintaining a sustainable state, and developing areas to strengthen the state. Based on the constructed strategy card for social welfare of the population, it is advisable to represent a system of targets and to substantiate the criteria to achieve them [96, p. 47] (Table. 4.3).

Table 4.3 – Strategic goals and targets to socially ensure food security

Strategic priorities	Strategic goals to socially ensure food security				
	State regulation of pricing in the market of agricultural produce and food	**Develop directions to implement social policy and targeted assistance to individual layers of population**	**Design a system to monitor economic affordability of food and other indicators that characterize food consumption by people**	**At the state level, create a system to ensure quality and safety of the agricultural raw materials and food products, so that they comply with requirements for their production**	**Create strategic food reserves of the state to regulate pricing in the market**
Overcome crises	Food prices	Amounts of government support to certain layers of population	Social guarantees in the field of income and consumption	Control over manufacturers and sellers compliance with requirements to quality of raw materials and products	Volume of reserves of agricultural produce and food in accordance with requirements of legislation
Maintain a sustainable state	Prices for agricultural produce	Social standards	Indicators of standard of living of population		
Develop directions to strengthen a state	Prices for resources for agricultural production	Indicators of employment of population	Income and expenses by population, their structure and ratio		

Source: developed by the author taking into account [33, c. 102].

Let's illustrate some targets for the socially ensure food security in accordance with the developed strategic goals and strategic priorities (Table 4.4).

Based on the data from the represented system of strategic goals to socially ensure food security, one can conclude that in order to overcome crises, the subsequent strategic goals of the state regulation of pricing policy should take into consideration prices for food products; maintaining a sustainable state of food security is possible under condition of regulating prices for agricultural products; further strengthening requires the regulation of prices for resources for

agricultural production because they are the starting point in the formation of product cost by agricultural producers and food prices for consumer.

Table 4.4 – Actual and forecast targets for the socially ensure food security

Target indicators	Years									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Indices of agricultural production to the previous year, per cent	124	155	109	112	123	125	126	127	129	130
Unemployment rate (according to the ILO methodology), per cent	9	9	9	10	10	11	11	12	12	13
Average monthly wages in agriculture, UAH	2476	3140	3916	5761	6039	6881	7724	8566	9408	10250
Average cost per month per household, UAH	4049	4952	4718	5710	5984	6429	6874	7319	7764	8209
Average food costs per month per household, UAH	2101	2630	2326	2909	3040	3262	3483	3705	3926	4148

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

The strategic objectives of social policy and targeted assistance should be paid attention to when it is necessary to overcome crises, where the main tool at the national level is to provide financial assistance to the least protected groups of the population. For the case of maintaining a sustainable state of food security, the considered strategic goal has to rely on a system of social standards that maintains them. Social standards are a system of of social norms (duties of state), officially established by the state, concerning the satisfaction of social needs of citizens. The basic elements of social standards include the mandatory and full access to education, prevention of forced labor, guaranteeing proper working conditions, their duration, payment, a minimum wage, a living wage. Strengthening the status of food security requires, therefore, stable employment of people.

The strategic goal to monitor and maintain economic affordability when overcoming crises must rely on key strategic priorities, which focus on social guarantees for needy people in the area of income and consumption, namely: a living minimum; the limit of poverty; a minimum consumer budget; the cost of food basket; the level of minimum wage; a minimum pension, a minimum scholarship, the amount of social welfare,

and others. Maintaining a sustainable state of food security is impossible without taking into consideration such indicators for quality of life of the population as the real income of people and the consumer price and cost of living indices dependent on them; the distribution of population in terms of total income per person, and others. Directions of the state policy concerning the strengthening of the status of food security should be based on indicators of the volume and structure of income and expenses by population on the consumption of material goods, such as: cash incomes of the population, including per capita; monthly average wages; the average size of pensions, scholarships, assistance; natural revenues; expenses of the population, including per capita; the structure of the income and expenses by people. The specified parameters are part of BSC for the respective strategy card.

When creating, at the state level, a system to ensure the quality and safety of agricultural raw materials and food products, compliance with requirements to their production as a strategic goal for providing social food security, BSC should include indicators in the field of control over compliance of manufacturers and sellers with requirements to the quality of raw materials and products at the state level.

The strategic goal to form strategic food reserves of the state in order to regulate pricing in the market has such key indicators as the volumes of reserves of agricultural produce and food in accordance with the requirements of the legislation for each of the represented strategic priorities.

The component of regulating domestic market and infrastructural support in the food security BSC is focused on minimizing costs in the logistics chain in order to provide a market-based pricing regulation for food in the country. A fragment of the strategy card for food security, the proposed strategy card for regulation and infrastructure support to domestic market, is shown in Fig. 4.9.

Based on the constructed strategy card for the regulation and infrastructural support to domestic market, it is advisable to introduce a system of targets and to substantiate the criteria to achieve them [96, p. 47] (Table. 4.5).

Let’s illustrate some targets for the regulation of domestic market and to support its infrastructure in accordance with the developed strategic goals and strategic priorities (Table 4.6).

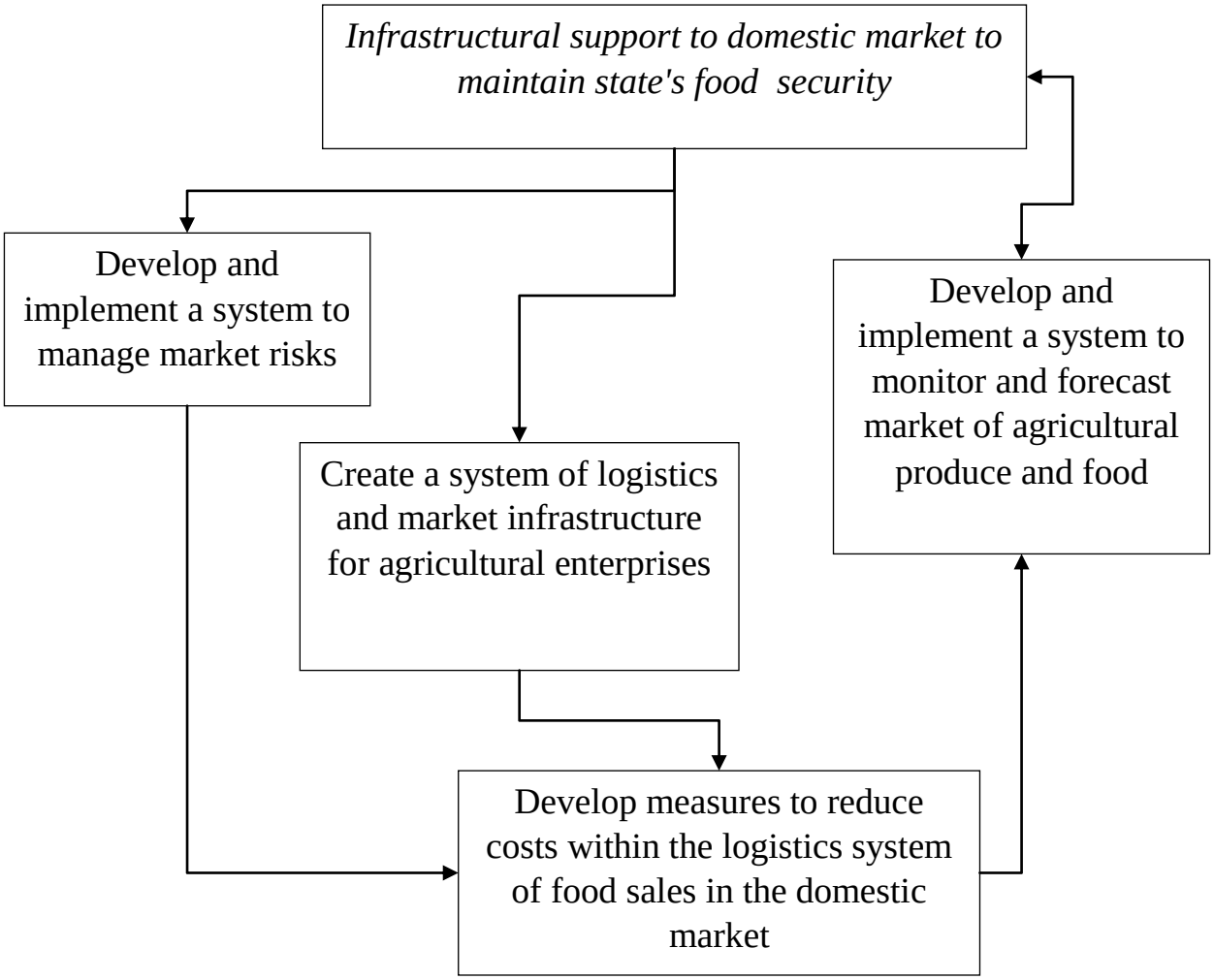


Fig. 4.9 – Strategy card for the regulation of domestic market and for its infrastructure support (a fragment of the strategy card for food security)

Source: developed by the author.

Based on the developed system of strategic goals for the regulation of domestic market and its infrastructural support for a food security strategy, it can be argued that a market risk management system, aimed to overcome crises, must focus on the performance indicators of the state's financial and credit policy (inflation rate, currency exchange rates). By introducing price regulation for agricultural produce and foodstuffs, as well as sales volumes, it is possible to maintain a sustainable state of food security.

The further strengthening of this status requires the creation of a system, and its effective operation, that would include harvesting-selling enterprises, wholesale food markets, that is, those market subjects that are responsible for the storage and sale of large batches of food and raw materials.

Table 4.5 – Strategic goals and targets for the regulation of domestic market and to support its infrastructure

Strategic priorities	Strategic goals for the regulation of domestic market and to support infrastructure			
	Develop and implement a system to manage market risks	**Create a system of logistics and market infrastructure for agricultural enterprises**	**Develop measures to reduce costs within the logistics system of food sales in domestic market**	**Develop and implement a system to monitor and forecast the market of agricultural produce and food**
Overcome crises	Performance indicators of the state's financial and credit policy	Number of harvesting-selling enterprises and wholesale food markets	Number of transportation enterprises, agricultural service cooperatives, trade houses, exhibitions, fairs, retail businesses	Presence of government think tanks, research institutions, etc.
Maintain a sustainable state	Prices for agricultural produce and food. Volume of domestic and foreign trade in agricultural produce and food	Number of logistics terminals, wholesale and wholesale and retail markets for agricultural produce, exchanges	Number of agricultural enterprises in a region and their distribution by size and volume of production	
Develop directions to strengthen the state	Indicators of trade at harvesting-selling enterprises and wholesale food markets	Number of warehouses, collection points and other infrastructure facilities to store agricultural products in regions	Indicators of stock exchange activity (number of signed agreements, turnover, and others)	Availability of special departments to ensure that all market participants, state management bodies receive relevant and reliable information about the state of the market and trends in its development

Source: developed by the author taking into account [173, c. 128].

To create a system of logistics and market infrastructure when implementing strategic priorities to overcome crises, it is necessary to plan and monitor the number of harvesting-selling enterprises and wholesale food markets. Maintaining a sustainable state of food security is not possible without a sufficient number of terminals, wholesale and wholesale-retail markets for agricultural produce, exchanges (commodity,

commodity-commodity agricultural, universal, etc.). The directions for strengthening food security are based on a sufficient quantity of warehouses, collecting points and other infrastructure facilities for the storage of agricultural produce in regions.

Table 4.6 – Actual and forecast targets for the regulation of domestic market and to support its infrastructure

Target indicators	Years									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Gross value added (basic prices) fact prices; bln.UAH	161	240	280	305	363	409	456	502	549	595
Total index of expenditures for production of agricultural products to the previous year, per cent	142	139	114	121	129	132	134	136	138	141
Export of agricultural and provisions production, mln. USD	16669	14563	15282	17757	16277	16281	16286	16291	16296	16301
Export of foods, mln. USD	3096	2468	2450	2827	2242	2028	1815	1601	1387	1174

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Maintaining a sustainable status must take account of the number of infrastructure facilities to support the functioning of the market for agricultural produce and food, specifically wholesale markets, commodity exchanges, etc. It is appropriate to build a single, or several, logistics terminals – modern logistics platforms to equipped taking into consideration the best world experience. A logistics platform is a facility with low-temperature warehouses and an area for pre-sale preparation of products, it is one of the promising directions in the development of market infrastructure, which makes it possible to receive, store, wash, calibrate, pack, form unified batches, and prepare products for further transportation. A logistic terminal is intended to store goods from different groups; in terms of its structure, it is divided into zones.

Development of directions for strengthening the status of food security requires the creation of modern facilities to store food (warehouses, storages, etc.), which must neutralize the cycle of productive and lean years, ensure price stability for agricultural produce and food, reduce the level of price fluctuations. Building capacities to

store agricultural produce is promising because it is one of the elements in logistics. The implementation of relevant projects will increase opportunities to store produce and improve the capacity of legal entities to create additional value and enhance their competitiveness, thereby maintaining the sustainable state of food security at the strategic level.

Implementation of the strategic objective to develop measures to reduce costs within the logistics system of food sales in domestic market for overcoming the crises requires a sufficient number of transportation enterprises, agricultural service cooperatives, trading houses, retail businesses, and other subjects in the market infrastructure whose functioning is directed to support retailers and to deliver products to a retail consumer.

The main task for regional trade houses is the organization of a local agricultural market and interaction with wholesale markets for exchange commodities. By employing agri-trade houses, local agricultural producers perform activities to sell their produce and to provide the necessary material resources to production. Forming the infrastructure of agrarian market is impossible without the development of exhibitions and fairs whose basic goals are to promote new products, services, and experience, to develop business contacts, create demand and grow sales, etc. [43, p. 55].

Maintaining at a sufficient level and strengthening the status of food security is possible on condition of effective work of agricultural producers in regions. The main indicators for the functioning of commodity exchanges, for example, the number of deals, the volume of deals, the value of deals, the average amount of one agreement, etc., should also be taken into consideration when implementing a strategy.

A system to monitor and forecast the market of agricultural produce and food at the strategic level requires state-owned think-tanks, research institutions, etc., as well as special departments that would ensure that all market participants, state management bodies, receive relevant and reliable information about the state of the market and trends in its development.

A component of the state management and resource support to market in a food security BSC is aimed at forming strategic food reserves of food and ensuring the volume of production of agricultural produce and food according to the requirements to food security and for implementation of export potential. A fragment of the strategy card for food security, the proposed strategy card for state management and

resource support to the market, is shown in Fig. 4.10.

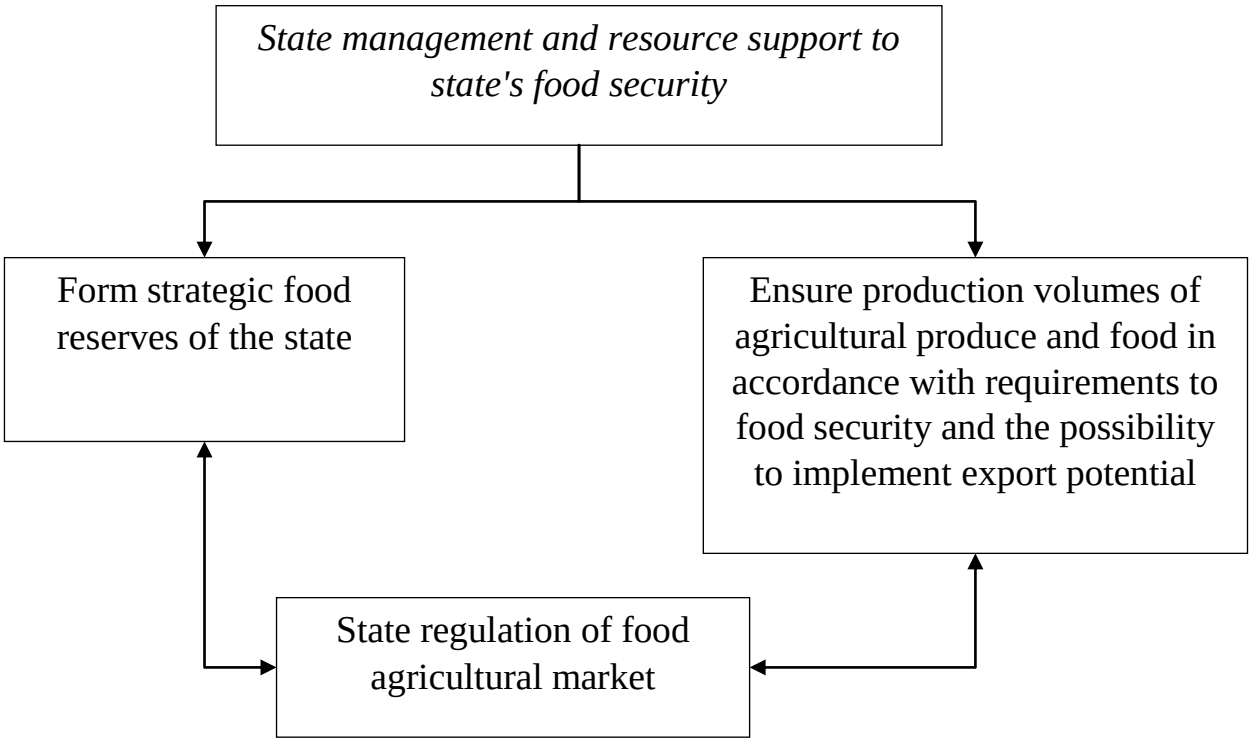


Fig. 4.10 – Strategy card for state management and resource support to the market (a fragment of the strategy card for food security)

Source: developed by the author.

Based on the developed strategy card for resource support, it is advisable to introduce a system of targets and to substantiate criteria to achieve them [96, p. 46] (Table 4.7).

Let's illustrate some targets for state management and resource support of food security in accordance with the developed strategic goals and strategic priorities (Table 4.8).

The strategic goals of state management and resource support to national food security imply, above all, the formation of strategic food reserves of the state.

A food security strategy needs an effective mechanism for state regulation of food agricultural market, which defines strategic tools of state regulation of the market of agricultural produce and food: establish a marginal trade surcharge, introduce an export duty, change the size of the value added tax on certain products, cancel VAT refunds, introduce export quotas, declare prices on food products when raising, etc.

Control over agricultural market and economic support to agricultural producers are executed in Ukraine in accordance with Law, dated 24.06.2004, No. 1877-IV "On the state support to agriculture" with changes and additions amended by the Law of Ukraine, dated 04.06.2009, No. 1447-VI "On amendments to certain laws of Ukraine regarding

improvement of the mechanisms of state regulation over agricultural market".

Table 4.7 – Strategic objectives and targets for state management and resource support

<table>
<tr><th rowspan="2">Strategic priorities</th><th colspan="3">Strategic goals for state management and resource support to the market</th></tr>
<tr><th>State regulation of food agricultural market</th><th>Form strategic food reserves of the state</th><th>Ensure production volumes of agricultural produce and food in accordance with requirements to food security and the possibility to implement export potential</th></tr>
<tr><td>Overcome crises</td><td rowspan="2">Volumes of state commodity and financial interventions</td><td rowspan="3">Volumes of reserves of agricultural produce and food in accordance with requirements of the legislation</td><td>Number of agricultural producers, processing enterprises, trading enterprises</td></tr>
<tr><td>Maintain a sustainable state</td><td rowspan="2">Indicators of efficiency for agricultural producers, processing enterprises, trading enterprises</td></tr>
<tr><td>Develop directions to strengthen the status</td><td>Effectiveness of tools of state regulation of the market of agricultural produce and food</td></tr>
</table>

Source: developed by the author taking into account [43, c. 56-57].

Table 4.8 – Actual and forecast targets for state management and resource support of food security

Target indicators	Years									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of enterprises engaged in agricultural activity, thousand units	46	45	48	46	45	45	44	43	43	42
Stocks at the end of the year, mln. tons	20	15	20	21	21	22	23	24	25	26
Total funding of the Ministry of Agrarian Policy and Food, mln. UAH	3359	1613	1691	5201	3322	3361	3399	3437	3475	3514
Financial support of the agro-industrial complex by reducing the cost of loans, mln.UAH	0	291	280	295	434	521	608	695	782	869

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Control over certain types of products is executed in line with the Laws of Ukraine, dated 04.07.2002, No. 37-IV "On grain and grain

market in Ukraine", dated 17.06.1999, No. 758-XIV "On the state regulation of production and sale of sugar", dated 24.06.2004, No. 1870-IV "On milk and dairy products", and others.

To overcome crises in order to prevent sharp fluctuations of prices in the market for agricultural produce and foodstuffs and establishing monopolistic and monopsonic low prices, the Law of Ukraine, dated 24.06.2004, No. 1877-IV "On the state support to agriculture" implies the execution of commodity and financial interventions. Their volumes must amount to establish price equilibrium (fixing) at the level not lower than the minimum purchase-intervention price and not exceeding the maximum buy- intervention price. A condition for the execution of trade interventions implies that the price demand under conditions of spot or forward on agricultural produce within a single trading session exceeds by 5 to 20 % the level of the maximum purchase-intervention price. The size of a trade intervention should be enough to establish a price equilibrium at the level that does not exceed the maximum value for a purchase-intervention price. If it is exceeded by more than 20 %, then the Agrarian Fund suspends trade in such goods during current exchange session in order to hold talks with participants in the commodity exchange market.

Under conditions of the declining market, the Agrarian Fund initiates a financial intervention by purchasing agricultural produce in the event the spot prices in the organized agricultural market fall below the minimum level of a purchase intervention price for products in order to achieve the level of price equilibrium, including through the acquisition of commodity derivatives.

For agricultural producers, and for the normal functioning of a food market, it is necessary that the level of the minimum intervention price should be economically justified. Therefore, to determine it, one takes into consideration the medium-sized industry standard production costs per unit of output, minimum profitability (not less than 10 %), market conditions in external and domestic markets. Similar to the maximum intervention prices, the minimum prices are set to be the same at the territory of Ukraine and do not change over the established period of state regulation (except for radical changes to the pricing conditions in the domestic and foreign markets).

Financial interventions are carried out when the price level for an offer in terms of spot or forward on agricultural produce within a single trading session is lower than the established level of the minimal

intervention price by 5 to 20 %. The Agrarian Fund initiates a financial intervention in the amount sufficient to establish a price equilibrium at the level not less than the minimum intervention price. If it is exceeded by larger than 20 %, the Agrarian Fund suspends trading in such goods and consults participants in the exchange market.

The strategic goal to ensure production volumes of agricultural produce and food in accordance with requirements to food security and the possibility to implement export potential requires a sufficient number of agricultural enterprises in the production of agricultural products, processing enterprises, as well as trading companies in a given sector. Maintaining a sustainable state of food security and its strengthening at the strategic level depend on the efficient operation of subjects in the market specified above.

Therefore, a constructed food security BSC would make it possible to execute, at strategic level, effective planning, to implement and monitor those indicators that affect the status of food security. A system of BSC components, key strategic goals, and strategic priorities is aimed at identifying areas for the state’s food security strategy and effective policy.

Chapter 5

STRATEGIC PRIORITIES FOR ENSURING FOOD SECURITY OF THE STATE

5.1. Legal and institutional support of food security strategies of Ukraine

In modern conditions of social development, solving the systemic problem of guaranteeing national food security requires increased attention. Against the background of worsening global social, economic, and environmental problems, the world food crisis reinforces the need for state participation in solving the food problem. All developed countries of the world have developed strategies, national programs, and a special legal framework on food security at the national level [3, p. 70]. The food security strategy and the mechanisms for providing the population with food in the required quantity, quality and safety are an important criterion that characterizes not only the level of socio-economic development of the country, but also forms a reliable basis for ensuring social stability and sustainable economic growth of the country, preservation and multiplication of the most valuable resource – the health of the nation.

According to the Strategy of development for the agrarian sector of economy for the period till 2020, the strategic directions for the development of the agri-food market provide for the improvement of infrastructural support and the creation of the necessary conditions for the sale of agricultural products and food with the aim of expanded reproduction of production, timely receipt and effective sale through sales channels, and ensuring the availability and food sufficiency for the population [153]. At the same time, the strategic goal of food security is to guarantee food independence for individual products. Therefore, it is necessary to form a national model of food security. Its basis is a system of legal support that would contribute to providing the population with safe and high-quality food products, stability and sufficiency of domestic food production to guarantee food independence of Ukraine.

The basis of the formation of Ukraine's food security strategy and the mechanisms and tools of state regulation of the agrarian sector of the economy used in it is the system of legal support, which includes legal

norms (general and special laws and by-laws) [94, p. 8].

According to the Constitution of Ukraine, the right to food security consists in recognizing human life, safety and health as the highest social value. Every citizen has the right to an adequate standard of living, including adequate food.

Decree of the Cabinet of Ministers of Ukraine dated 17.10.2013 No. 806-r "Strategy of development for the agrarian sector of economy for the period till 2020" is the main legal document that defines the principles of the formation of an effective, socially oriented agrarian sector of the economy and determines the directions for ensuring food security [153].

The basis of legal support for the formation of a food security strategy is the Law of Ukraine dated 24.06.2004 No. 1877-IV "On State Support of the Agriculture of Ukraine". According to this legal act, food security is the protection of a person's vital interests, which is expressed in the state's guarantee of an unhindered economic access to food in order to maintain his normal life activities [141]. According to the currently valid Concept of the state target program for the development of the Ukrainian rural areas for the period until 2015, approved by the Resolution of the Cabinet of Ministers of Ukraine dated 19.09.2007 No. 1158-2007-p, the main criteria for food security are the adequacy of food consumption; availability of food consumption; food independence [200, p. 5].

Resolution of the Verkhovna Rada of Ukraine dated 11.12.2014 No. 26-VIII "On the Program of Activities of the Cabinet of Ministers of Ukraine" is important from the point of view of solving the issues of forming a food security strategy. This document defines the main areas of food policy implementation, in particular, land reform, improvement of lease relations, support and development of small and medium-sized businesses in the countryside, stimulation of export of agricultural products. The need to amend and improve regulatory acts regulating relations in the field of ownership, disposal and use of land, forest, water and other natural resources is emphasized. Among the key areas of improvement of the system of legal support should be identified the development of mechanisms of state support for agricultural production, financing of farms, development of the infrastructure of the agricultural market, stimulation of the development of entrepreneurial activity in the agricultural sector, harmonization of legislation in the field of food safety with EU legislation, development of rural areas [200, p. 5]. Therefore, in Ukraine, the formation of a regulatory and legal framework aimed at

ensuring effective legal regulation of food security of the country has been initiated.

An important aspect of the formation of Ukraine's food security strategy is the assessment of its trends. A number of methodological recommendations have been developed at the legislative level to determine the main indicators of food security. General methodological approaches to the analysis of the food security trends as one of the components of economic security are outlined in the "Methodological recommendations for calculating the level of economic security of Ukraine" dated 29.10.2013 No. 1277. The assessment of the level of food security is most often carried out according to the Methodology for determining the main indicators of food security dated 05.12.2007 No. 1379 "Some issues of food security", which contains a list of indicators and their threshold values. The draft Law of Ukraine "On Food Security of Ukraine" No. 8370-1 provides a list of indicators characterizing the state of threats to Ukraine's food security when the actual values of the indicators do not correspond to the established limit values.

Adequacy of food consumption by the population is determined by the following legal acts: Decree of the Cabinet of Ministers of Ukraine dated 11.10.2016 No. 780 "On approval of sets of food products, sets of non-food products and sets of services for the main social and demographic groups of the population"; Order of the Ministry of Health of Ukraine dated 14.01.2013 No. 16 "On the approval of the Guidelines for general practitioners – family medicine regarding counseling patients on the basic principles of healthy nutrition"; Order of the Ministry of Health of Ukraine dated 03.09.2017 No. 1073 "On approval of the norms of physiological needs of the Ukrainian population in basic nutrients and energy".

The economic availability of food is enshrined in the Law of Ukraine dated 15.07.1999 No. 966-XIV "On the Subsistence Minimum"; Orders of the Ministry of Social Policy of Ukraine, the Ministry of Agrarian Policy and Food of Ukraine, the State Statistics Service of Ukraine dated 03.02.2017 No. 178/147/31 "On approval of the Methodology for determining the subsistence minimum". Legal acts determine the living wage and the tools for its establishment and provision, the need to take it into account when the state implements the constitutional guarantee of the population to a sufficient standard of living.

The basis of an effective food security strategy is the sustainable

development of the agrarian sector of the economy and a set of measures to ensure it. According to the Law of Ukraine dated 24.06.2004 No. 1877-IV “On State Support of the Agriculture of Ukraine”, the main instrument for guaranteeing national food security is the system of state price regulation of agricultural products and food. The law defines the objects and procedure of pricing regulation, provides measures for financial support of agricultural enterprises, state support for producers of livestock products and other agricultural producers.

According to the current Law of Ukraine dated 18.10.2005 No. 2982-IV "About the basic principles of the state agrarian policy for the period till 2015", guaranteeing food security at a strategic level requires favorable legal, economic, political, and organizational conditions for agricultural production. The strategic goals of food security provide for the sustainable comprehensive development of rural areas and the solution of social problems in the countryside. It should be noted that the provisions of this legal act are somewhat declarative in nature and do not reveal detailed measures and tools for achieving the set strategic goals.

Similar strategic priorities are determined by the Law of Ukraine dated 17.10.1990 (revision dated 04.11.2018) No. 400-XII “On the priority of social development of the village and agro-industrial complex in the national economy”. The most important condition for the country’s food security is a high level of socio-economic development of rural areas.

Important from the point of view of the development and implementation of the food security strategy is the Decree of the President of Ukraine dated December 28, 2005 No. 1867/2005 "On the decision of the National Security and Defense Council of Ukraine dated December 9, 2005 "On the state of the agro-industrial complex and measures to ensure food security of Ukraine". The decree defines the main directions of state policy in the sphere of guaranteeing national food security. Among the strategic priorities in the food sector, the Decree does not include ensuring the economic availability of food, which, according to the conducted research, is the most acute for the population of Ukraine.

One of the components of the legal ensuring of food security is the formation of a system of quality and safety of agricultural products and food in accordance with international norms. Legal regulation of food quality and safety includes a list of legislative acts. Further development of the legislative framework for guaranteeing food security in this direction requires improvement of the use of genetically modified

organisms in Ukraine. The legal framework for regulating the quality and safety of food products requires harmonization of Ukrainian legislation with European standards.

The main legal acts in the field of ensuring food quality and safety are: Laws of Ukraine dated 12.12.1997 No. 771/97-VR "On Basic Principles and Requirements for the Safety and Quality of Food Products", dated 14.01.2000 No. 1393-XIV "On withdrawal from circulation, processing, disposal, destruction or further use of low-quality and dangerous products", dated 06.09.2005 No. 2809-IV "On amendments to the Law of Ukraine "On the quality and safety of food products and food raw materials", dated 10.07.2018 No. 2496-VIII "On the basic principles and requirements for organic production, circulation and labeling of organic products", dated 31.05.2007 No. 1103-V "About the state system of biosafety during creation, testing, transportation and use of genetically modified organisms", dated 24.02.1994 No. 4004-XII "On ensuring sanitary and epidemic welfare of the population", dated 12.05.1991 No. 1023-XII "On protection of consumer rights" and others. The legal acts of this group determine the procedure for ensuring the safety and quality of food, regulate the rights and obligations of producers and sellers of food, the organization of production and circulation of food, etc.

Attention should be paid to legal acts in the field of regulation of agricultural production and the agricultural market, which provide strategic priorities for the formation of economic, legal and organizational conditions for the competitive production of agricultural products and food, the functioning of the food market to ensure the internal needs of the state in food and the development of export potential.

In particular, the system of legal acts in the sphere of regulation of the food reserve of Ukraine includes: Law of Ukraine dated 24.01.1997 No. 51/97-VR "On the State Material Reserve", Law of Ukraine dated 23.11.2018 No. 2629-VIII "On the State Budget of Ukraine", Law of Ukraine dated 25.12.2015 No. 922-VIII "On public procurement", Resolution of the Cabinet of Ministers of Ukraine dated 08.10.2014 No. 517 "About approval of the Regulations on the State agency of reserve of Ukraine", Resolution of the Cabinet of Ministers of Ukraine dated 06.07.2005 No. 543 "On the Agrarian Fund" and others. The aforementioned legal acts regulate the functioning of the state food reserve, determine the general principles of formation, placement, storage, use, replenishment and renewal of state material reserve stocks

and regulation of relations in this area.

Therefore, the state is entrusted with the responsibilities of creating socio-economic conditions under which a person can satisfy his needs for full nutrition, as well as ensuring an effective food supply system and the quality of the population's nutrition, control and supervision of the quality and safety of food products.

On the basis of the conducted research, the following main problems of legal support for the formation of the state food security strategy should be formulated, such as:

- lack of a procedure for developing a state food security strategy at the legislative level;
- lack of systematic legal regulation of strategic areas of ensuring food security and fragmentation of legislative acts in this area;
- lack of practical mechanisms for strategic provision of food security, such as the system of threat assessment and monitoring, information provision;
- limited powers of state authorities, which are entrusted with the performance of food security functions, which should be established in a separate legislative document – the food security strategy.

It is necessary to develop a mechanism for state management of food security, which defines the objects and subjects of state management and strategic analysis, their functions and tasks, management methods, a system of criteria and indicators for evaluating the effectiveness of state management of food security, methodical approaches to the formation and implementation food security strategy of the state using the strategic planning methodology, information support system for assessing the state and trends of food security, modeling food security threat assessment, monitoring the implementation of strategic decisions. For this, it is necessary to adopt an appropriate legislative act that would regulate the outlined strategic tasks.

A necessary condition for the formation of a competitive national economy is the guarantee of the country's food security, which, in turn, is impossible without an appropriate institutional basis for the sustainable development of the agricultural sector and state agrarian policy. A state with a highly efficient agrarian economy and a food supply system has the necessary prerequisites for the formation of food independence and export potential. At the same time, the strategic priorities of the state should be aimed at guaranteeing food security of the population in the face of global challenges and threats.

Therefore, the most acute problems that prevent the formation of a food security strategy are the imperfection of the institutional basis, which does not allow the full realization of the state's potential in the field of ensuring food security. Simultaneously with the incompleteness of the interaction of institutions and institutions, financial, informational, legal support, obstacles appear on the way to the development of the agrarian sector of the economy and certain branches of agriculture, the implementation of the state agrarian policy, technical and technological modernization of the agrarian sector, its reorientation to the investment and innovation principles of development. The process of creating an effective system of state support for agricultural producers, harmonizing domestic norms and standards for certification of agricultural products with the current requirements of the member states of the European Union is being slowed down. In addition, the lobbying of the interests of the agricultural sector of Ukraine on the European agricultural market and the implementation of an effective policy of protectionism in the conditions of trade liberalization with EU countries are becoming more difficult [200, p. 9].

The problem is that the institution of the state intervention agent has not yet been established at the legislative level. The increase in risks and threats to food security is also related to the imperfection of the state intervention fund and the lack of effective practice of carrying out commodity and financial interventions in the agricultural market [200, p. thirteen].

The guarantee of food security by the state requires an appropriate institutional basis, which allows for the creation of the necessary mechanisms and instruments of the state agrarian policy, as well as the formation of a food security strategy, which requires agreement between the participants of the food security system and the coordination of their actions in the implementation of practical measures with clear mechanisms for their implementation and sources of funding. Let's move on to the study of institutes and institutions that accompany the formation of the mechanism for ensuring the state food security.

The American scientist D. North defines institutes as "rules of the game" created by society, or formal and informal restrictions, norms that are not related to individuals and organizations [125, p. 17]. D. North substantiates the conceptual difference between "rules of the game" – institutes, and "participants, players, subjects" – institutions.

According to O. Shpykulyak, rules are necessary in order to observe

them, and organizations are the result of the consolidation of rules to achieve a goal, that is, the formation of an institution. It is impossible to identify the organization with the institute. Institutes (principles, rules, traditions, mentality) in the market mechanism, social development take the form of institutions (competition, law, property, organization, institution, etc.) [208, p. 17]. The organization is a mechanism of interaction, a connecting link between the institute and the institution.

We will define the institution of food security as an institutional structure, an organizational and economic system, a mechanism, a set of tools created by society, an individual, and the state, which ensure the formation of a food security mechanism. The institute of food security should be understood as state and market stable "rules of conduct and regulation" that create conditions, establish directions for interaction, development of relations between entities guaranteeing food security (institutions) and create conditions for effective interaction, coordination and monitoring in the process of strategy implementation food security.

The institutional basis of guaranteeing the food security of the country is presented in Fig. 5.1.

The system of institutes that ensure the functioning of the food security guarantee mechanism includes:

- the institute of market mechanisms and market pricing, which covers the processes of price formation for agricultural products and food on the domestic and foreign markets based on supply and demand;
- the institute of social standards and macroeconomic indicators, focused on the social component of guaranteeing food security, in particular, establishing directions and volumes of state social support for the population and forming a system of indicators related to the implementation of measures to ensure the economic availability of food for the population and a high standard of living in the country;
- the institute of technical regulation, certification, safety and quality of products allows to form a system of basic requirements, measures and tools in the field of ensuring the quality and safety of food products, regulation of activities of agricultural market operators, inspection measures, objects of regulation for the purposes of import, export and re-export;
- the institute of commodity and financial interventions, food reserve covers the tasks of price regulation, planning and use of strategic state reserves of food and agricultural products;

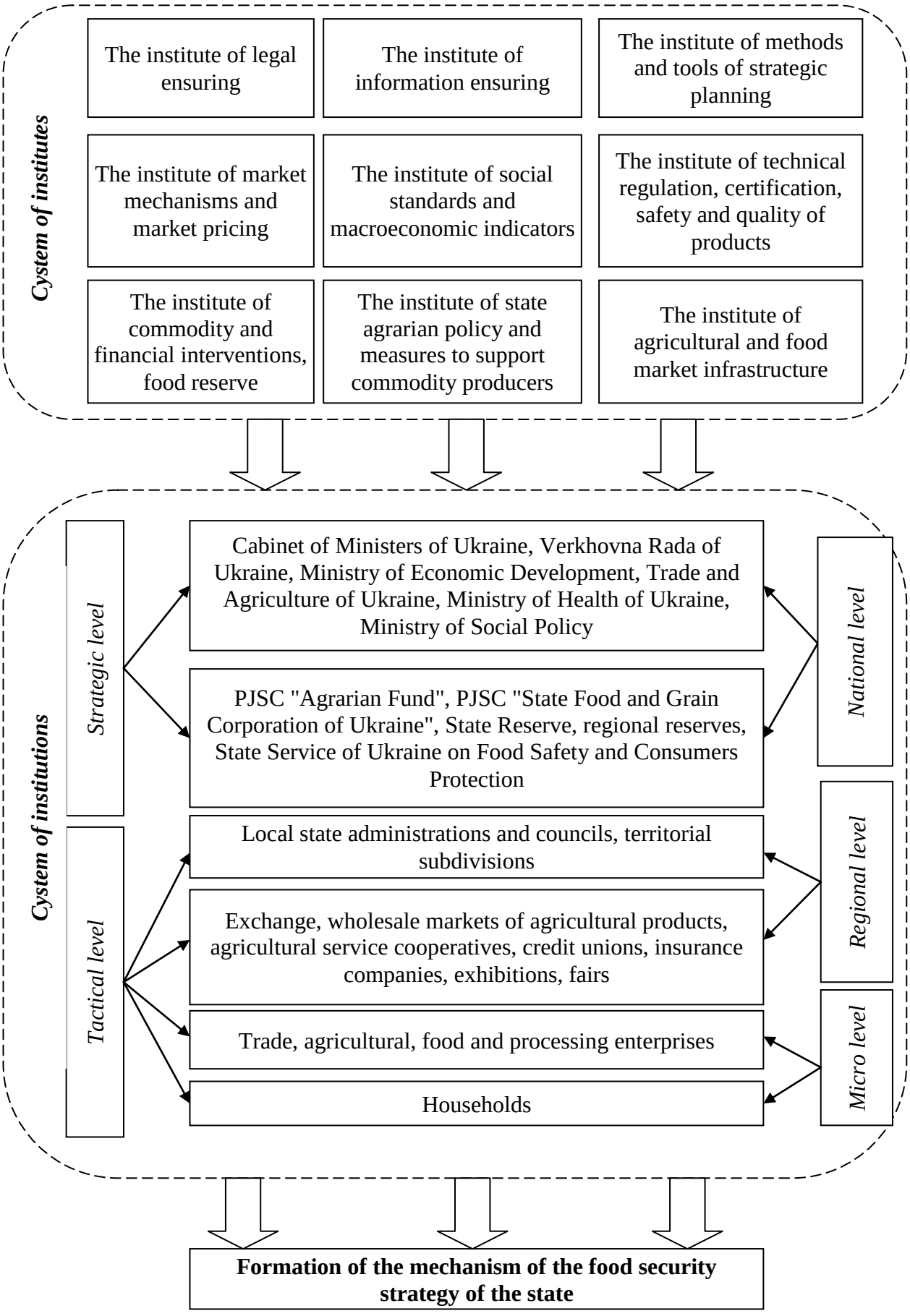


Fig. 5.1 – The institutional basis of guaranteeing the food security of the state

Source: developed by the author.

- the institute of state agrarian policy and measures to support commodity producers is focused on the creation and implementation of an effective system of mechanisms, measures, tools of state support for commodity producers through financing, customs and tariff regulation, development of agricultural industries, price regulation;

- the institute of agricultural and food market infrastructure allows to create and maintain the functioning of the logistics system and market infrastructure, mechanisms for regulating the activities of market intermediaries;

- the institute of methods and tools of strategic planning includes, in particular, the methodological principles of forming and implementing a food security strategy using a balanced system of indicators, developing strategic maps, methods and techniques for assessing the state and trends of food security, risks and threats;

- the institute of information provision of food security determines the subjects involved in the process of guaranteeing food security and information flows between them, an information base for assessing the state and trends of food security, risks and threats, with the aim of forming a food security strategy, determining strategic measures and responsible for their implementation, monitoring and control of the implementation of the strategy and evaluation of the effectiveness of the developed strategic measures;

- the institute of legal provision of food security, which includes legal norms – general and special laws and by-laws that regulate the main tasks: guaranteeing the adequacy of food supply for every citizen; formation of an effective, socially oriented agrarian sector of the economy; methodical approaches to assessing the state and threats to food security; ensuring sufficient consumption and economic availability of food products; sustainable development of the agrarian sector of the economy; quality and safety of food products; support of agricultural production and regulation of the agricultural market; regulation of the food reserve of Ukraine.

We will begin the study of the main institutions for guaranteeing food security and their interaction with the institutions at the strategic level, which focuses on the mechanisms of food security strategy formation.

At the national level, the guarantor of the country's food security is the Cabinet of Ministers of Ukraine, the Verkhovna Rada of Ukraine, the President of Ukraine, the National Security and Defense Council of

Ukraine, the ministries responsible for certain aspects of food security (the Ministry of Health of Ukraine, the Ministry of Social Policy of Ukraine, the Ministry of Economic Development, Trade and Agriculture of Ukraine).

The Ministry of Economic Development, Trade and Agriculture of Ukraine resolves strategic issues of state policy formation in the field of international trade, foreign economic relations and European integration, food safety and quality, development of rural areas, protection of consumer rights, price regulation and control, technical regulation, public procurement. In the list of tasks of the Ministry for guaranteeing food security, there is the creation and monitoring of supply and demand balances of the main types of food, development of strategies and state target programs [4, p. 240]. The main tasks are: implementation of WTO requirements under the FTA into national legislation; formation of strategic directions of state policy in the agrarian sphere related to guaranteeing food security; coordination and control of the activities of executive authorities in the food sector in accordance with the current market situation; development of the agrarian sector of the economy and areas of support for domestic producers; regulation of the formation of the state strategic food stock [4, p. 241].

The Ministry of Health of Ukraine coordinates the work of executive authorities on issues of food safety and quality; approves lists of food products that have a high and low risk for human health. In the context of ensuring food security, the institution substantiates optimal standards of food consumption, approves mandatory parameters of food safety and other objects of sanitary measures, requirements for the quality of food products, forms rules for their production for the purpose of health protection population.

The Ministry of Social Policy ensures the implementation of the social component of guaranteeing food security, in particular, determines the size of the subsistence minimum per person per month and reconciles it with the indicators of the state budget, taking into account the forecast consumer price index. Determines other macro-indicators important for the formation of an effective social policy and the standard of living of the population (low-income limit; minimum consumer budget; cost of a food basket; minimum salary level; minimum pension, minimum stipend, amount of social benefits, and others), compiles a consumer basket for citizens, develops the main directions of social policy for vulnerable sections of the population.

Competent bodies and organizations in the field of guaranteeing food safety: PJSC "Agrarian Fund", PJSC “State Food and Grain Corporation of Ukraine”, State Reserve Agency of Ukraine (State Reserve), regional reserves, State Service of Ukraine on Food Safety and Consumers Protection.

PJSC “State Food and Grain Corporation of Ukraine” implements the state policy of increasing Ukraine’s competitiveness on the global grain market by guaranteeing the commitments undertaken, ensuring high demand for Ukrainian agricultural products due to the expansion of sales markets and effective logistics infrastructure [152]. The main tasks of the Corporation are: implementation of interstate and intergovernmental agreements on the supply of agricultural products; reception, storage, processing and shipment of grain; production of flour and groats and fodder products; transportation and port transshipment of grain and oil crops; purchase and export of grain and its processing products [4, p. 240].

The State Service of Ukraine on Food Safety and Consumers Protection participates in the development of measures for the development of market infrastructure, monitors agricultural and food markets, monitors compliance with standards and technical conditions during transportation, storage, production, processing of food, ensuring its quality, conducts food production expertise; cooperates with international organizations in the field of guaranteeing food safety; participates in the development of strategies and state target programs for food security, development of the agricultural sector, support of domestic producers, formation of the state strategic food stock [4, p. 241].

In order to prevent sharp fluctuations in food prices and support agricultural producers, food security in Ukraine is guaranteed by such participants as PJSC “Agrarian Fund”, State Reserve Agency of Ukraine, and regional reserves.

The State Reserve carries out a state policy on the creation of a material reserve, including reserves of agricultural and food products. The tasks of the State Reserve in the context of ensuring food security include: management of the state reserve of agricultural products and food; planning supplies to the reserve in accordance with the accumulation levels approved by the Cabinet of Ministers of Ukraine; selection of suppliers of agricultural and food products for concluding state contracts (contracts) with them; accounting of stocks and movement of agricultural and food products; preparation of reports to other state bodies;

management of the activities of enterprises, institutions and organizations accountable to the State Reserve regarding the creation, placement, storage, use and replenishment of stocks of agricultural products and food, compliance with regulatory requirements for their storage. Due to the purchase of agricultural products and food from commodity producers to the state reserve, the issue of excessive supply and devaluation of the value of regulated objects was partially settled.

An important tool for creating the state's food reserves is the Plan of the Ministry of Agrarian Policy and Food of Ukraine for the Implementation of the Action Plan for the Program of Activities of the Cabinet of Ministers of Ukraine for the Implementation of the Strategy for Sustainable Development "Ukraine – 2020", approved in 2015 [183]. According to this plan, export restrictions should gradually be transformed into the creation of a state mobilization food reserve. The legal provision provides for the adoption of a new version of the Law of Ukraine "On the State Material Reserve" and the development of a draft law "On the Basic Principles of Food Security of Ukraine" for submission to the Cabinet of Ministers [211, p. 22].

Next, we will consider the tactical level of food security, which focuses on the mechanisms of implementation, coordination and monitoring of the food security strategy. At this level, the functioning of relevant institutions in the field of ensuring food security is connected with the monitoring of the market situation, commodity and financial interventions, the implementation of agrarian policy, mechanisms of state support for commodity producers.

Local state administrations and councils, territorial subdivisions implement the state policy in the field of food security at the regional level, determine the mechanisms for the formation and distribution of food, stable food supply for the population of the region in accordance with approved norms. These institutions implement state strategies and target programs for food security, development of the agricultural sector; coordinate the work of enterprises, institutions and organizations in the field of food security at the territorial level; develop regional strategies and targeted programs, measures aimed at maintaining regional food security; are responsible for the formation of a regional strategic food supply. Therefore, regional reserves are a stabilizing tool for maintaining food security for the region.

Functioning of the institute of commodity and financial interventions, the formation and use of the food reserve is ensured by the

activities of PJSC “Agrarian Fund”. The institution ensures price stability on the agricultural and food market by implementing intervention measures and effective price policy in the agricultural sector. To guarantee food security, PJSC “Agrarian Fund” creates reserves for individual items of objects of state price regulation, that is, those types of agricultural and food products to which state support will be directed (as a percentage of annual domestic consumption) [78, p. 53].

According to the Law of Ukraine dated 04.07.2002 No. 37 “On grain and the grain market in Ukraine”, the state policy in the field of grain market development as a key direction of the agrarian sector of the economy requires the creation of economic, legal and organizational conditions for effective production and the formation of a stable grain market to replenish the state’s internal reserves, stimulate exports. According to the Law of Ukraine dated 24.06.2004 No. 1877 “On state support of the agriculture of Ukraine”, the development of the agricultural market, the stimulation of the production of agricultural products and the guarantee of food security require a coordinated and effective budgetary, credit, price, insurance, regulatory policy, the definition of entities of state price regulation [211, p. 20].

The main goal of PJSC “Agrarian Fund” is to ensure balance in the agricultural and food markets, meet the food needs of the population, ensure the food independence of the state, and prevent price increases in the markets of objects of state price regulation. The institution forms a state intervention fund – a state reserve of certain types of agricultural products, which must guarantee the food security of the state [211, p. 21].

The institute of market mechanisms and market pricing is inseparably interconnected with the institute of commodity and financial interventions, food reserve. In order to avoid instability in the agricultural and food markets and the establishment of excessively high and low prices in accordance with the Law of Ukraine dated 24.06.2004 No. 1877-IV “On state support of the agriculture of Ukraine”, commodity and financial interventions are carried out in volumes that allow fixing the equilibrium price for agricultural products at a level not lower than the minimum and not higher than the maximum purchase intervention price. The basis for carrying out commodity intervention is the excess of the demand price on spot or forward conditions during one trading session within 5 to 20% of the highest purchase intervention price. The amount of commodity intervention should be sufficient to establish an equilibrium price not higher than the highest intervention price. If the price exceeds

by more than 20%, PJSC “Agrarian Fund” suspends trading in the current stock exchange session and consults with stock market participants [141].

When the market conditions decrease, PJSC “Agrarian Fund” conducts financial intervention, purchasing agricultural products on the condition that spot prices on the organized agricultural market fall to a level lower than the minimum purchase intervention price. The goal is to achieve price equilibrium, including through the purchase of commodity derivatives.

For producers and for the stable functioning of the food market, minimum intervention prices must be economically justified. Therefore, when determining them, the average industry normative production cost per unit of production, the minimum level of profitability (at least 10%), and the market situation are taken into account. Both types of intervention prices are set uniformly for the entire territory of Ukraine and do not change during the period of state regulation (with the exception of radical changes in the market situation) [141].

Financial interventions are carried out in the event that the offer price of agricultural products on spot or forward terms during one trading session is lower than the established minimum intervention price by 5-20% of its value. The size of the financial intervention of PJSC “Agrarian Fund” must be sufficient to establish the equilibrium price at a level not less than the minimum intervention price. In the event of an excess of more than 20%, PJSC “Agrarian Fund” suspends trading and consults with stock market participants.

PJSC “Agrarian Fund” in the conditions of exceeding the volume of grain production over the volume of consumption does not fulfill the function assigned to it of interventions on the grain market. Intervention purchases do not solve the problem of excess supply of commodity grain. Taking into account the above, Ukraine’s accession to the formation of the UN FAO World Food Programme and EU food funds is relevant [211, p. 20].

Ukrainian government, with the help of PJSC “Agrarian Fund”, regulates the prices of certain types of agricultural products and food on the organized agricultural market and forms a food reserve through the following instruments:

- minimum purchase prices for agricultural and food products at a level that ensures minimum profitability for the producer;
- maximum purchase prices for agricultural and food products in order to prevent the increase of producer prices in an amount greater than

the general index of consumer prices for goods and services in the country;

- commodity interventions through the sale (delivery) of certain types of agricultural and food products from the State Reserve on spot or forward terms with the aim of fixing the equilibrium price at a level not higher than the maximum purchase price;

- financial interventions through the purchase of certain types of agricultural and food products on spot or forward terms with the aim of fixing the price at a level not less than the minimum purchase price, for the formation of food reserves;

- temporary administrative regulation of prices – a system of measures to prevent or stop speculative or coordinated pricing of agricultural and food products by sellers and/or buyers.

- state collateral purchases in the form of granting PJSC "Agrarian Fund" a budget loan to a producer against the collateral of such an object, which is executed by handing over to the creditor a simple or double warehouse certificate or warehouse receipt [211, p. 20-21].

At the microeconomic level, trade, agricultural, food and processing enterprises, as well as stock exchanges, wholesale markets of agricultural products, agricultural service cooperatives, credit unions, insurance companies, exhibitions, and fairs participate in ensuring the food security of the state. These entities ensure food independence of the state, physical and economic availability of food.

Households and citizens of Ukraine participate in the formation of food policy through public associations. In the process of food consumption, one must have free access to them, physical and economic availability.

In view of the conducted research, we will determine the strategic priorities for improving the institutional provision of food security in Ukraine and a set of state policy measures:

- improvement of the legal support of the food security strategy and its harmonization with the EU member states due to the improvement of the mutual coherence of its organizational and economic tools at different levels of management;

- adaptation of the legal provision of the food security strategy to the legislative framework of the Common Agrarian Policy of the EU member states, primarily regarding the mechanisms of financial support for the development of rural areas;

- improvement of food security information provision through the

development of methodological bases for assessing risks and threats to food security, approximation of domestic methods of assessing the trends of food security to international ones, formation of methodological approaches to the development of the state food security strategy, monitoring and control of the effectiveness of the implementation of the strategy;

- optimization of the sectoral structure of agricultural production through state financing of further modernization of agricultural enterprises, their technical and technological re-equipment, primarily in animal husbandry, on the basis of innovation and leasing; creation and development of cooperatives;

- the development of protectionism of the domestic agricultural market, which involves lobbying national interests at the interstate level within the framework of signed trade agreements through the mechanisms of customs-tariff and quota regulation of food imports, reducing the level of dependence of the domestic agricultural sector on the import of modern technologies and equipment, as well as financing the development of national agricultural engineering;

- implementation of the policy of import substitution in the agricultural sector through state financing of less developed branches of agriculture, use of preferential taxation, stimulation of the introduction of innovations;

- increasing the economic availability of food: formation of food support mechanisms for vulnerable population groups and provision of targeted assistance; prevention of speculation in food markets by means of intervention measures; implementation of state targeted food supply programs; implementation of the practice of monetization of benefits, creation of a network of social food stores;

- balancing the consumer diet of the population in accordance with the recommended rational nutrition norms by reviewing the main macroeconomic indicators related to the social sphere; approximation of the consumer diet of the population to the recommended rational nutritional norms developed by the Ministry of Health of Ukraine;

- harmonization of Ukrainian product quality and safety standards with EU standards, development of state food certification, approximation of standards of production and technological processes in the agricultural sector to European requirements by eliminating bureaucratic barriers and simplifying the product certification procedure, making changes to the current State Standards of Ukraine (DSTU) in terms of compliance with

the current norms of the EU Directives, creation of preventive mechanisms to prevent exceeding the maximum permissible norms of harmful substances in food products, improvement of labeling by increasing the informativeness of their packaging, activation of the process of implementation of the basic component of the HACCP food safety management system [4, p. 136; 211, p. 22];

- the development of logistical and infrastructural support for the agricultural market, in particular, the expansion of the network of wholesale trade facilities at the expense of state and investment funds, the simplification of the procedure for the allocation of land plots for the creation of wholesale agricultural markets, the promotion of the creation of interregional cooperative logistics centers for the provision of procurement services , warehousing and conditioned storage of products, simplifying market access for small producers [24; 30, p. 70; 211, p. 22].

Improving the institutional provision of food security in Ukraine requires the implementation of state policy measures aimed at the development of the legal and information base for the formation and implementation of a food security strategy, the harmonization of national legislation with international legal acts, the optimization of the sectoral structure of agricultural production, the protection of Ukrainian commodity producers, and the implementation of the policy of import substitution in the agricultural sector. It is necessary to increase the economic availability of food for the population, guarantee the quality and safety of products due to the harmonization of domestic standards with EU norms, the development of state certification of food, improvement of the organization and logistical and infrastructural support of the agricultural market.

5.2. Management of the development of the infrastructure of the agro-food market in the system of ensuring the state food security

Guaranteeing the food security of Ukraine in the context of ensuring the physical and economic availability of food in the conditions of a modern market economy is impossible without the formation and development of infrastructure. An important factor in the effective functioning of the agricultural and food market is the creation of

conditions for maintaining the optimal ratio of supply and demand, speeding up the time of sale of foods, accelerating the turnover of capital, reducing costs of turnover and prices, forming a competitive environment. The functioning of the food market depends on the level of infrastructure development, and therefore the quantity, quality and price of food consumed by the population.

At the current stage of the development of Ukrainian economy, insufficient development of the food market infrastructure does not allow effective communication between producers and consumers of food. In the course of economic reforms, the previously existing process of goods movement was disrupted, the number of additional links in the process of selling agricultural products and food increased, costs, prices, and the number of irrational transportations increased. The implementation of trade and brokerage activities is carried out in an unsystematic and comprehensive manner and is not regulated at the national level.

The formation and improvement of the food market infrastructure in Ukraine is a priority strategic direction for the creation of a civilized national market of agricultural and food products. In future, it will become a basis for the successful integration into the regional and global agro-food market. Therefore, measures to improve the efficiency and regulation of the food market infrastructure should become the basis of sustainable development of the agricultural sector, employment growth, improvement of the social climate in rural areas, development of agribusiness and the achievement of country's food security.

In accordance with the Law of Ukraine "About the basic principles of the state agrarian policy for the period till 2015" dated 18.10.2005 No. 2982-IV, the strategic priorities of state agrarian policy include the creation and improvement of market infrastructure elements for the sale of agricultural products and food, stimulation of development private and private-cooperative enterprises in the field of agricultural service, processing, product sales and marketing support of agricultural enterprises. The infrastructure of the agro-food market ensures the economic and physical availability of food due to the creation of favorable conditions for the functioning of economic entities in the agrarian sector, which contribute to the harmonization of the interests of the participants in the system of guaranteeing food security; introduction and implementation of modern mechanisms and methods of forming a transparent market for agro-food products, effective use of production, financial, information and labor resources.

The influence of the level of development of the infrastructure of the agro-food market on the country's food security is obvious. Fig. 5.2 shows the relationship between food market infrastructure and food security.

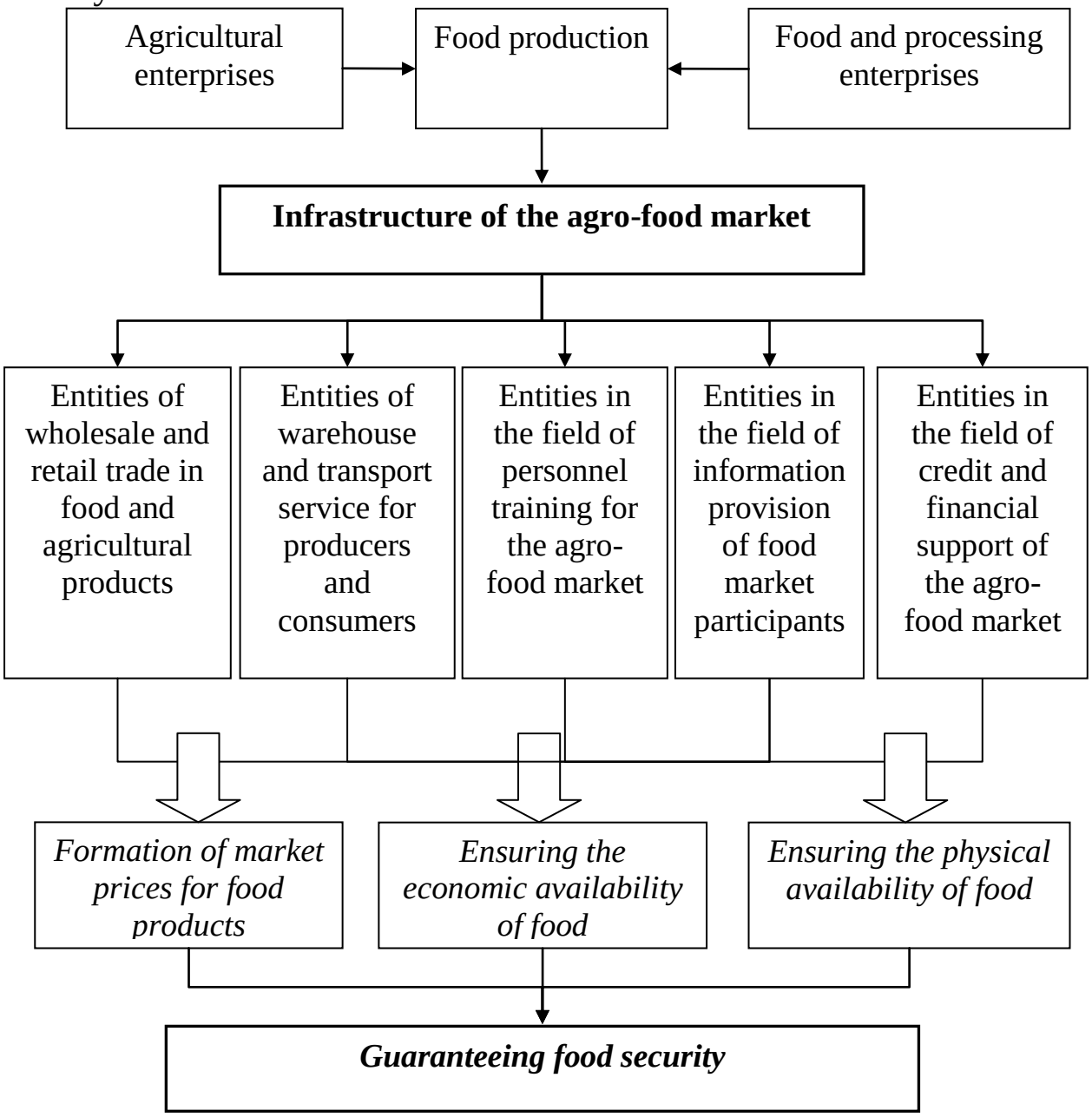


Fig. 5.2 – The relationship between the infrastructure of the food market and food security

Source: developed by the author based on [9; 12; 48; 78; 161].

The specificity of the functioning of the agro-food market is justified by its structure. According to V. M. Yermolenko, such a market includes the exchange market of agricultural products, wholesale and wholesale-retail markets of agricultural products, auctions, branded stores of agricultural enterprises, agricultural exhibitions and fairs, etc. Auxiliary elements of the infrastructure of the agro-food market are:

transport, warehousing, communication, systems of price monitoring, standardization, certification, insurance, etc. [2, p. 396-397]. We will analyze the infrastructure of the agro-food market as a strategic mechanism for guaranteeing food security.

An important role in the organization of the agro-food market belongs to market infrastructure institutions, which are designed to perform the function of a generator of demand for agro-food products and, accordingly, their price. They include: agricultural exchanges, trading houses, auctions, wholesale and retail markets, etc. Their development is carried out by a certain governmental policy.

The activity of agricultural exchanges in Ukraine as subjects of ensuring food security through trade in agricultural products on the organized market is not regulated by a special legal act. According to the legislation, the Agrarian Exchange is a non-profit (non-entrepreneurial) enterprise, the founder of which can be the Cabinet of Ministers of Ukraine represented by the Agrarian Fund. The Agrarian Exchange creates a settlement and clearing center and a system for guaranteeing the performance of exchange contracts registered by it using the services of one of the state banks of Ukraine to carry out settlements under concluded exchange contracts and provide (accounting and payment) of exchange guarantees.

Therefore, the agricultural exchange is actually an association of legal entities and individuals in the field of production and intermediary activities, which creates conditions for concluding exchange contracts for agricultural products, products of their processing and goods that ensure agricultural production, and commodity derivatives, the basic assets of which are agricultural products [132, p. 4]. The Agrarian Exchange is a specific entity that participates in the organized market of certain agricultural products in accordance with the legislation.

PJSC “Agrarian Fund” is a state budgetary specialized institution, authorized to carry out state price policy in the agricultural sector of the economy, accountable and under the control of the Ministry of Agrarian Policy and Food of Ukraine.

The functions of PJSC “Agrarian Fund” in the field of guaranteeing food security consist in the creation of a state intervention fund, which must exceed 20% of the annual domestic consumption of the product for the previous marketing period [141]. With the decrease in the consumption of food grain, the amount of the state food reserve also decreases. The role and importance of PJSC “Agrarian Fund” in modern

state agrarian policy are unique and emphasized by its strategic tasks.

The elements of the market infrastructure are agricultural trading houses, created in Ukraine first in the form of joint-stock companies, later – agricultural service cooperatives. These trading houses accelerate the implemented agrarian reforms, create a market environment, develop commodity-monetary relations, profitably sell agri-food products and improve the material and technical supply of commodity producers. The legal framework regulating the activities of agricultural trading houses is quite outdated today, and therefore it can be argued that the state does not pay enough attention to this institution, despite the fact that the importance of these subjects in ensuring the food security of the state and regions remains important.

The sale of agro-food products by commodity producers is carried out at exhibitions-fairs. It allows the buyer to get the goods, and the seller – to receive the financial resources needed to support the production process. If auctions and commodity exchanges are relatively permanent events and institutions, then exhibitions and fairs are held less often, but with a clear periodicity.

Among the most famous agricultural exhibitions are “InterAgro”, “AgroExpo”, “Agro-(year)”, “Grain Tech Expo”, “Agroforum” and others. Exhibitions of agro-food products allow producers to sell their products to wholesale buyers, demonstrate the achievements of the agricultural sector, establish contacts with foreign partners, and solve industry problems. During exhibitions, conferences, “round tables” are held to discuss various issues of the development of agriculture and the agro-food market.

Fairs are not only a trade, but also an entertainment and tourist event, the holding of which is an important tool in strengthening food security, improving the image and competitiveness of the state.

It can be concluded that the government ensures the implementation of the policy on the development of the institute of wholesale and retail trade in agricultural products and food. In order to speed up the process of development of the specified institute, it is necessary to establish a mechanism for the implementation of state support measures, since most of them are currently of a declarative nature. In addition, state support for the development of wholesale and retail markets for agri-food products should be supported by appropriate state funding.

Normative and legal regulation of the infrastructure of the agro-food market is represented by a number of normative and legal acts, in

particular:

- Laws of Ukraine “About the basic principles of the state agrarian policy for the period till 2015” dated 18.10.2005 No. 2982-IV, “On State Support of Agriculture in Ukraine” dated 24.06.2004 No. 1877-IV, “On Commodity Exchanges” dated 10.12.1991 No. 1956-XI, “About Economic Societies” dated 19.09.1991 No. 1576-XI, “On Wholesale Markets of Agricultural Products” dated 25.06.2009 No. 1561-VI and others;

- Resolutions of the Cabinet of Ministers “On the Creation of the Agricultural Exchange” dated December 26, 2005 No. 1285, “On the Agrarian Fund” dated July 6, 2005 No. 543, “On Approval of the Program for the Development of Agricultural Service Cooperatives for 2003-2004” dated December 12, 2002 No. 1858, “On the improvement of exhibition and fair activities in Ukraine” dated August 22, 2007 No. 1065, “On formation of the public joint-stock company “Agrarian Fund” dated April 22, 2013 No. 364 and others;

- the order of the Cabinet of Ministers on the approval of the Concept of the State target program for the creation of wholesale markets of agricultural products dated November 19, 2008 No. 1447-p and others;

- orders of the Ministry of Agrarian Policy “On approval of the Regulation on the organization and holding of auctions of live livestock and poultry” dated 13.08.2002 No. 653/6941, “On regional agricultural marketing centers of wholesale trade in agricultural products” dated 13.11.2006 No. 660, “On raising the effectiveness of the functioning of agricultural trading houses” dated 20.04.2005 No. 163, “On the improvement of exhibition and fair activities in the system of the Ministry of Agrarian Policy” dated 27.04.2008 No. 183 and others.

An important condition for ensuring food security due to product quality is the certification of products and services on the agri-food market. It is carried out by specialized certification bodies, among which an important place is occupied by the State Service of Ukraine on Food Safety and Consumer Protection – the body for certification of food products and food raw materials. The Chief State Inspector of Veterinary Medicine supervises the veterinary and sanitary examination of economic entities regarding the slaughter of animals, processing, storage, transportation and sale of food raw materials, food products, including those of animal origin. Official veterinary documents are issued by: an authorized state inspector of veterinary medicine or an authorized veterinarian: the administration of veterinary medicine in regions and

districts, Kyiv; state institution of veterinary medicine; regional service of state veterinary and sanitary control and supervision at the state border and transport.

Warehousing and transport services for producers and consumers of the infrastructure of the agro-food market ensure the physical availability of food and affect the price of its sale to consumers through costs within the supply chain. Participants of the distribution system unsystematically create short logistics chains at individual stages of goods movement. In the production unit, this is the movement of products from the field to warehouses, in the procurement unit, they are closely related to marketing and are built along separate sales channels, in the distribution unit, and optimal transport tasks are solved.

An important stage in the formation of the final price for agricultural products and food is the storage and processing of grain crops. The development of the elevator industry in Ukraine depends on the growth of the gross collection of grain in recent years, the growth of export potential, which requires additional capacities for storing the crop. Today, there are about 800 working certified granaries in Ukraine. More than half are floor storage warehouses, the rest – in roughly equal proportions – are modern elevators with a full technological cycle, as well as old enterprises with concrete silos that have been in operation for more than 30 years and whose service life is coming to an end. About a third of all elevator capacities in the country belong to ten agricultural holdings and companies. The largest owner is the State Food and Grain Corporation.

The highest density of elevators is in the regions with the largest volumes of grain production – in Vinnytsia, Kirovohrad, Odesa, Poltava, Dnipro, and Kharkiv. The fewest elevators are in the eastern and western regions.

In the elevator market of Ukraine in 2019, 102 companies have more than one elevator (elevator networks). The largest, but also the least reliable, remains State Food and Grain Corporation. PJSC “Kernel” has the second largest number of elevators.

In addition to 51 million tons of storage at specialized elevators, Ukraine has up to 25 million tons of grain storage capacity in the farms of commodity producers. These facilities have different levels of automation and security, they are mainly used as places of intermediate accumulation and short-term storage for the purpose of processing (cleaning, drying) collected agricultural products by small and medium-sized farmers.

Warehouses of food products in Ukraine have a low level of

equipment with modern equipment, refrigeration units, packaging machines and mechanisms. As a result of privatization, large warehouse complexes were divided into small private enterprises. The creation of a large number of new legal entities has led to a reduction in the total capacity of infrastructure facilities of the agri-food market and deterioration in their technical condition, as well as an increase in costs and a decrease in the economic availability of food products for consumers.

Only some domestic retail enterprises and trade networks have well-developed logistics complexes with modern trade and warehouse management, necessary equipment, including refrigeration, transport services, etc.

The analysis of warehouse and transport service of goods manufacturers indicates a lack of elevators, warehouse complexes, specialized transport, and container stock. One of the problems of the country's agro-food market is the lack of free space in elevators for grain storage.

One of the promising directions is the construction of warehouse terminals. The development of wholesale and retail trade in agricultural products and food, the increase in monetary turnover in the country lead to an increase in cargo turnover, therefore, to an increase in demand for storage facilities. Both transport and warehouse services are developing very actively in the country, which is connected with the growth of the economy, active development of the market by domestic and foreign companies. Therefore, the analysis of the infrastructure of the agro-food market showed certain negative aspects that hinder its formation and development to achieve the tasks of guaranteeing food security:

- lack of interaction between various subjects of the agro-food market;
- insufficient awareness of service consumers about their provision by various institutes of market infrastructure;
- lack of state support for infrastructure facilities of the agro-food market;
- inconsistency in the development of the agricultural sector and the infrastructure of the agro-food market.

Table 5.1 presents the proposed mechanisms for improving the management of the formation of the food market infrastructure as a condition for guaranteeing food security, which includes a set of economic and managerial measures.

Table 5.1 – Mechanisms for improving the food market infrastructure as a condition for guaranteeing food security

Elements of the infrastructure of the agro-food market	Economic measures	Management measures
wholesale and retail trade in food and agricultural products	Develop mechanisms for implementing laws on wholesale food markets at the state and regional levels. Create a three-level system of markets (regional, city wholesale and retail and wholesale food markets) with proper trade conditions, compliance with safety and sanitation requirements.	Conclude an agreement on cooperation between regional executive bodies and representatives of trade networks on the sale of agricultural and food products. Form an interregional freight system, develop exchange, auction and electronic trade, create distribution centers.
warehousing and transport service for producers and consumers	To develop the investment opportunities of commodity producers due to the improvement of crediting and leasing conditions. Provide state support for infrastructural elements of supply, warehouse complex, transport service, in particular, suppliers of material and technical resources for agriculture and participants of the organized agricultural market, service cooperatives, etc.	Develop a strategy for the development of the logistics infrastructure of the agricultural and food sector and a system of indicators for assessing its effectiveness and monitoring. In the food security strategy and regional food security programs, include areas of support and stimulation of logistics infrastructure enterprises with the help of a set of measures for the development of the material and technical base of the warehouse and the creation of a transport and logistics system for the agro-food market
personnel training for the agro-food market	Restore the system of personal distribution to agricultural organizations of graduates of educational institutions, who graduated them at budget expense. To introduce new specialties and specializations in accordance with the directions of agricultural production reform, to improve the system of training and retraining of specialists, to expand the complex of educational and consulting services on an innovative basis in order to increase the prestige of agricultural education.	In the governmental target and regional programs for personnel support of the market infrastructure, include a set of strategic measures to improve the qualifications and organize the training of specialists working in the field of trade in agricultural products and food.
information provision of agro-food market participants	To organize an information and consultation system of governmental, private and cooperative services, points, working groups with various sources of funding, which should be part of the unified information space of the state. Create a marketing center for information and consulting services in the field of agrarian consulting, which has informational connections with marketing divisions of market infrastructure enterprises, agricultural and wholesale and retail enterprises. Establish cooperation of information and consulting services with suppliers of material and technical resources.	To organize the work of information and consulting services in the field of agrarian consulting with regard to their development of innovative educational programs and educational activities aimed at increasing the educational level of market infrastructure participants. Organize the work of information and consulting services in the field of agricultural consulting to improve the credit, insurance and leasing literacy of commodity producers. Information and consulting services to form a database of logistics service providers and provide services aimed at improving the knowledge of producers in the field of agricultural logistics.
credit and financial support of the agro-food market	Develop a set of measures aimed at enabling all business entities of the agro-food market to receive economically justified credit resources from most financial and credit organizations at competitive rates for the required term according to technological processes. To develop agricultural cooperation with the help of special lending programs for consumer and credit cooperatives with the participation of state and commercial banks.	Deepen the specialization of financial and credit institutions designed to serve the agricultural sector, expand the range of services provided by them, ensure the availability of financial resources for all business subjects of the agro-food market. Develop special microcredit programs that take into account the specifics of borrowers' activities in the agri-food market.

Source: developed by the author based on [43; 67; 68].

In addition to measures of state support for agricultural production and compensation of individual costs of commodity producers, it is necessary to develop and implement state and regional target programs for food security. These programs will include measures to form an effective system of sales of agro-food products through the system of supply and sales cooperatives, regional wholesale and retail agro-food markets. This is possible only if there is an updated regulatory and legal framework, as well as a food security strategy with a mandatory set of measures to develop the infrastructure of the agro-food market.

A comprehensive food security strategy and strategic directions for improvement and development of the infrastructure of the agro-food market will allow to accelerate its development, ensure rapid movement of goods from the producer to the consumer and increase the competitiveness of distribution systems based on the coordination of the activities of scientific, educational, informational, financial, and logistical structures.

The main strategic goal of the development of the infrastructure of the agro-food market is to consolidate positive trends in its development, accelerate its growth rates and further increase the competitive economy. The infrastructure of the market of agricultural products and food must ensure the use in production of the achievements of scientific and technical progress, increasing the volume of production and sale of agricultural products.

The strategic goals of the development of the infrastructure of Ukrainian agro-food market should be:

- a comprehensive and systematic approach to managing the infrastructure of the agro-food market;
- optimization and stabilization of the food situation: achieving food independence; ensuring physical availability due to optimization of supply and consumption, equalization of supply and demand; improvement of product quality and market monitoring;
- reduction of costs of food sector producers;
- raising the level of education and awareness of employees of the food complex;
- statistical monitoring of trends in the agro-food market and elements of its infrastructure, information and consulting support for the work of market participants;
- improvement of the supply system of commodity producers in order to update their material and technical base;

- the organization of a competitive system of goods movement, which will allow to reduce the number of links in the chain from the producer to the consumer, will reduce circulation costs and consumer prices;

- logistics of the market of agricultural products, raw materials and food;

- increasing the competitiveness of products of the agro-food market.

Therefore, it is expedient to propose priority directions infrastructure improvement, based on the strategic goals of development of the agro-food market, the analysis of its trends and current trends.

The key strategic direction of the further development of the infrastructure of the agri-food market at the current step should be a set of measures to improve the management and strategic development of all its elements. The trends of food security, depending on a stable market infrastructure, will depend on how complex the relationship of spheres and industries will be in chain of promotion of agro-food products.

The conducted study of the current trends of the agro-food market allows us to conclude that today the legislation that determines the legal status of market infrastructure elements is imperfect and does not always meet the needs of its participants. Comprehensive analysis and development of measures to improve the management of the infrastructure of the agro-food market in order to ensure the food security of the state within the limits of the tasks assigned to it. For this, it is necessary to develop or update the legal framework for each of the subjects participating in the agricultural market.

5.3. Strategic directions of ensuring food security of Ukraine in the conditions of economic integration

In recent years, the processes of globalization increasingly affect the food security of the state. The dependence of Ukraine’s food security on the development of integration processes is due to both the geopolitical situation and the significant potential of the agrarian sector of the economy. Therefore, the food security strategy should be implemented through effective state policy and setting priorities for mutually beneficial cooperation with developed countries and the implementation of interstate

standards. The integration of Ukraine with the countries of the European Union is particularly important in guaranteeing food security. European standards in the food sector are an example for the modernization of state management mechanisms and the development of the agricultural sector of Ukraine. However, in recent years, despite significant shifts in the direction of European integration, state management of the domestic agricultural sector is still characterized by insufficient coordination with European states and a lack of systematicity in solving strategic issues of food security. The consequences of the identified problems are the isolation of the European market from the products of the domestic agricultural sector, the lack of comprehensive improvement of production quality standards, increased import dependence for certain food products, which poses threats to the food security of the country.

Therefore, the key strategic direction of ensuring food security in the conditions of European integration of the agricultural sector should be interstate coordination in the management of the industry within the framework of European standards. It is the experience of the EU that is indicative for reforming the domestic agricultural sector and solving strategic issues of ensuring food security at the level of member states and at the supranational level. During the conclusion of the EU-Ukraine Association Agreement and the subsequent acquisition of Ukraine's full membership in the EU, the focus of ensuring food security should be set precisely on guaranteeing food independence, self-sufficiency, and the quality and safety of food.

As shown in fig. 5.3, one of the main strategic directions of ensuring food security should be the guarantee of food independence and self-sufficiency.

According to the draft Law of Ukraine dated 28.04.2011 No. 8370-1 "On food security of Ukraine", food independence of Ukraine is a state of food security in which the physical and economic availability of vital food products for the population is ensured at the expense of domestic production of these products and stocks of the state material reserve at a sufficient level [147]. Food independence is characterized by such a level of economic development that the state is able to ensure food security in cases of complete or partial cessation of external food supplies.

Food independence is also understood as the level of annual production of vital food products produced within the country at the current level of development of productive forces, in accordance with the targeted set of basic food raw materials and food products recommended

by health care authorities as a rational (minimum) consumption rate [261, p. 154].

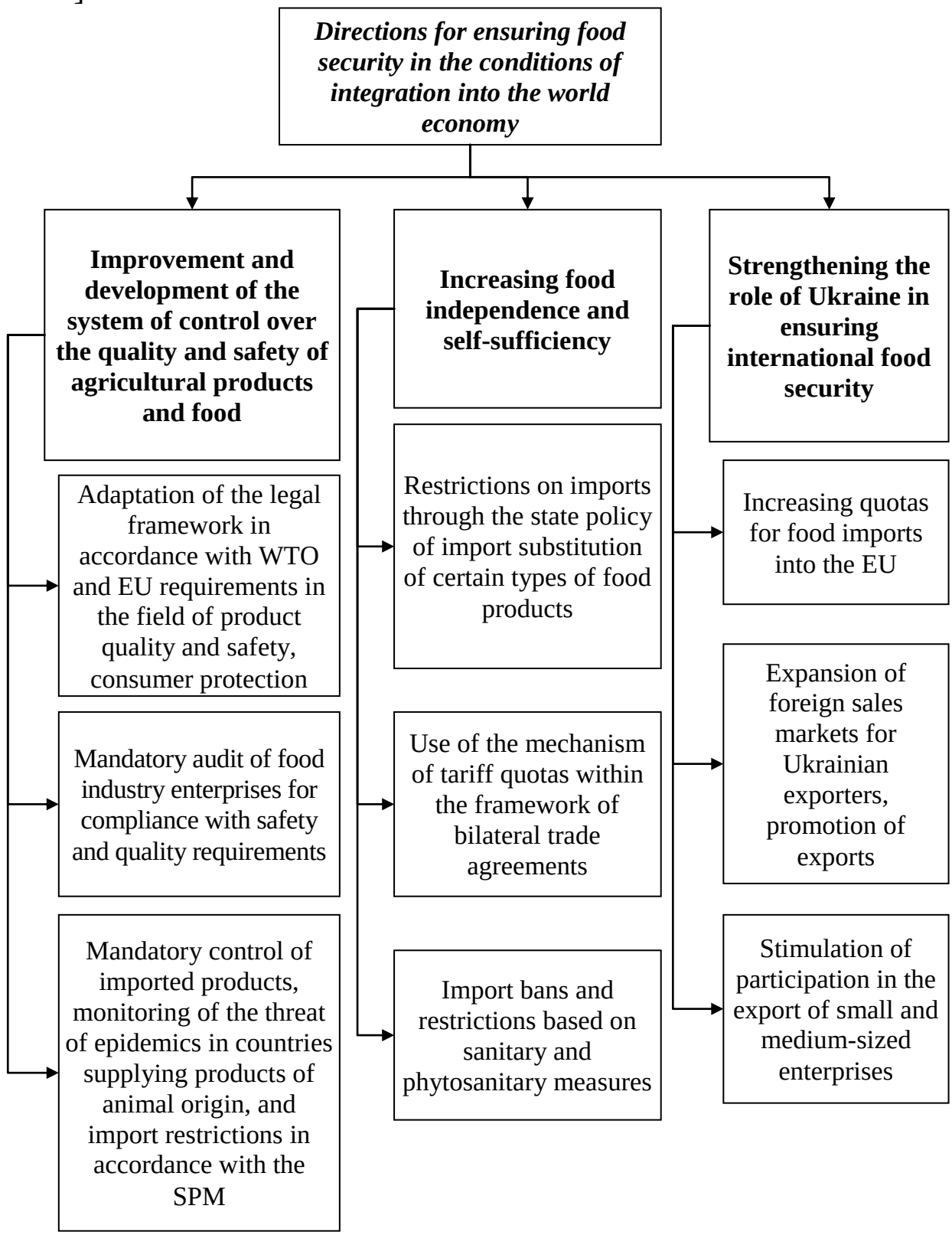


Fig. 5.3 – Strategic directions of ensuring food security of Ukraine in the conditions of economic integration

Source: developed by the author.

The analysis of food independence for all agro-food products based

on food resource balances showed that two trends can be distinguished in recent years:

1) decrease in food independence and increased import expansion (2010-2015);

2) increasing food independence and reducing the level of import dependence (2016-2018).

The increase in import dependence was directly related to the period of economic growth and investment and consumer demand. Therefore, we can expect an increase in the level of import dependence for basic food products after the end of the economic crisis and the transition to the stage of economic growth.

In the conditions of economic integration, it is important to assess and strengthen food self-sufficiency, which involves meeting the needs of the main part of the population in food products at the expense of domestic production, which determines the food independence of Ukraine in meeting the basic food needs of its citizens.

One of the means of increasing food independence is import substitution. The analysis of food independence and self-sufficiency in previous years showed that the potential of the agricultural sector of Ukraine allows to ensure the internal needs of the state in food. Even the actual share of agri-food imports can be replaced by domestic production. Import substitutes should primarily be food products of final consumption, which are sold directly to the population through a network of retail trade enterprises. At the same time, it is necessary to replace imported raw materials with Ukrainian analogues equivalent in price and quality. The import of raw materials, without which the production of food within the country is unprofitable or impossible, should be carried out with the minimum degree of processing in order to create the maximum added value within the country.

The policy of import substitution consists in establishing priority industries from the point of view of import substitution, as well as constant monitoring of imports and sales of imported food products on the domestic market.

According to the conducted analysis, meat and meat products, fish and fish products, fruits, berries, grapes, etc., have the greatest import substitution potential. The state import-substitution policy is carried out by applying mechanisms of tariff and non-tariff protection at the maximum level allowed by agreements with the WTO and attracting investments for the modernization and development of strategically

important branches of the agricultural sector (beet growing, vegetable growing, animal husbandry, fisheries, sugar production, and others).

Analyzing the foreign economic aspects of the formation of the state's food security, it should be said that one of the important factors of its guarantee and maintenance at the strategic level is Ukraine's participation in international trade. The development of the country's foreign trade requires the liberalization of foreign trade. At the same time, solving the strategic task of ensuring food security in the conditions of globalization and reducing trade barriers led to the fact that Ukraine turned into a major importer of food. For certain types of food products, the level of food security has become threshold. Food imports are currently 25-35%, while the share of imports in large cities of the country is about 50-60% [56, p. 33].

The results of the analysis of the dynamics and structure of foreign trade in the main food products (Table 5.2) show that in 2018, the coverage ratio of import by export of sugar was 198, eggs – 46.5, bread and bread products – 153.4, oil and other vegetable fats – 23.1, milk and dairy products – 4.5 [45].

Table 5.2 – Analysis of foreign trade in food products in Ukraine

Foods	Import, thousand tons					Export, thousand tons				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Meat and meat products	201	158	182	233	283	218	245	303	351	399
Milk and milk products	357	78	105	132	180	527	464	434	835	807
Eggs	7	11	5	7	4	147	126	112	155	186
Sugar	7	4	5	7	3	40	153	505	617	594
Oil	223	160	219	239	259	4578	4253	5104	5988	5986
Potatoes	40	17	27	24	28	17	15	5	18	22
Vegetables, water-melons, melons and gourds	225	95	136	129	188	294	212	224	444	434
Fruits, berries and grapes	856	588	732	819	878	350	324	283	291	331
Bread products	263	190	240	255	280	33423	38338	41451	42499	42940

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Domestic imports do not allow to implement the modernization of the agricultural sector and fully ensure the economic availability of food for the population. Foreign economic policy actually led to the decline of

some Ukrainian branches of the agrarian sector, for example, livestock and poultry farming, crop production and the production of agricultural machinery, undermined the competitiveness of domestic production. The state's excessive import dependence on some types of food significantly worsens food security.

The analysis of the independence of the food market is key in Ukraine's foreign trade in food, because based on the results of calculations of its criteria, legal restrictions on the export and import of food or other restrictions on ensuring food security are introduced without violating the Ukraine's international legal obligations, in particular WTO norms [56, p. 34]. In this context, the state's strategic priorities for increasing the level of food self-sufficiency should not discredit foreign producers, but should be aimed at protecting the national economy. At the same time, the main problems and risks of food security can be: a decrease in the competitiveness of national production and the efficiency of the national economy due to a forced decrease in competition with foreign suppliers, as well as an increase in the tax burden on the budget.

Since the natural and climatic conditions do not allow growing all agricultural crops on the territory of Ukraine for a stable year-round supply of food to the population, imported goods are needed in the food market. The strategic objectives of the state agrarian policy should be to restrain the import of food that can be produced domestically through import substitution, as well as to stimulate the import of raw materials that are not produced in the country and their subsequent deep processing at domestic food industry enterprises. A similar policy is carried out by economically developed Western and European countries.

Implementation of the import substitution policy is carried out with the help of a system of state instruments aimed at protecting the domestic producer: customs duties, tariff quotas, licenses, technical regulations, minimum prices. The legal framework for combating the expansion of food imports is represented by the Laws of Ukraine "On the protection of the national product producer from subsidized imports", "On the protection of the national product producer from dumping imports", "On state regulation of the import of agricultural products", "On the application of special measures regarding imports to Ukraine", "On the protection of economic competition", "On foreign economic activity" and others. A direct ban on food imports does not meet WTO requirements and is possible only through restrictions based on sanitary and phytosanitary measures.

EU duty-free tariff quotas are currently established for 36 types of food products (in particular, for beef, pork, lamb meat, poultry meat, milk, cream, yogurts, cereals, bran, honey, sugar, starch, mushrooms, garlic, malt, grape and apple juices, butter, eggs and albumins and others). At the same time, additional tariff quotas are provided for certain products (pork meat, poultry meat, mushrooms, eggs). For 18 types of food products, the tariff quotas provide for an increase in import volumes during 5 years from the date of application of the trade provisions of the Association Agreement with the EU. In Ukraine, tariff quotas have been established for 3 types of food products (pork meat, poultry meat and semi-finished products from poultry meat, and sugar), and additional tariff quotas for poultry meat and sugar are provided for [189].

Separate quotas for the import of food products in comparison with actual imports are shown in the Table. 5.3.

Table 5.3 – Actual volumes of imports and quotas for the import of food products within the FTA in 2017-2018, thousand tons

Foods	Import 2017	Quota 2017	Import 2018	Quota 2018
Poultry meat	120	36,8	133	37,6
Pork	95	40	128	40
Beef	13	20	14	20
Sugar	7	34,07	3	36,07
Eggs	7	4,8	4	4,1

Source: compiled by the author based on the data of the State Statistics Service of Ukraine and the Addendum to Annex I-A of the EU-Ukraine Association Agreement

The tariff quota for sugar is quite high, and the actual import did not exceed 13-14 thousand tons, for beef – 13-14 thousand tons, respectively, in comparison with the unchanged quota of 20 thousand tons in the last 2 years. Therefore, the tariff quotas on these products without actually restricting the free trade regime can be reduced. In 2017, a quota of 36.8 thousand tons was set for the import of poultry meat from the EU, in 2018 – 37.6 thousand tons, and the actual import was 120 and 133 thousand tons, respectively. This quota should be left unchanged or increased on a parity basis with the EU quotas [228].

Sanitary and phytosanitary measures (SPM) are aimed at protecting consumers, animals and plants from pathogens and pests that may be in imported goods. According to the rules of the WTO, the country has the right to create its own protection system, which should be scientifically based, based on international standards and recommendations and not contain hidden obstacles to the import of food.

According to the information of the State Veterinary and

Phytosanitary Service of Ukraine, in recent years, exporters of food products (especially vegetables) to Ukraine, including those from EU countries, did not closely monitor the presence of quarantine harmful organisms. Infected cargoes were subject to detention, disinfection or return to the country of origin, notification messages were sent to exporting countries. For example, on November 7, 2019, state phytosanitary inspectors of the Department of Phytosanitary Measures at the Border of the Phytosanitary Security Department of the Main Directorate of the State Consumer Service in the Kharkiv Region detained about objects of regulation – fresh feijoa (0810) in the amount of 6.4 tons, fresh pomegranates (0810) in the amount of 6.2 tons, fresh persimmons (0810) in the amount of 4.9 tons, which arrived from Azerbaijan without a phytosanitary certificate, which is violated the requirements of the International Standard for Phytosanitary Measures No. 12 "Guidelines for Phytosanitary Certificates". Extended phytosanitary control was applied to the detained cargo. Based on the detected violation, a notification was drawn up [46].

An important strategic task in the context of the implementation of import substitution is the improvement of the product structure of Ukrainian exports. It is mainly raw material with a large share of crop production. Considerable volumes of feed and food grain, cake, are exported to EU countries, which are processed at foreign enterprises and imported to Ukraine in the form of meat and dairy products, confectionery, pasta products, etc. Ensuring food security requires an increase in the volume of processing of products by domestic enterprises of the food industry and the export of products with a higher added value. Achieving the task is possible with the help of such methods as banning or limiting the export of raw materials, and stimulating enterprises to in-depth processing of raw materials in the country. The first method is a violation of WTO rules and can be implemented only in certain cases. The second method does not contradict the rules of the WTO and can be used to attract foreign investments. Currently, the investment climate in Ukraine does not favor the import of international capital. The main strategic directions for its improvement should be trade policy mechanisms, stimulation of the creation of joint enterprises and joint investment projects with the EU in the trade and economic sphere.

The strategic direction of ensuring food security in the conditions of Ukraine's integration into the world economy should be the improvement and development of the system of control over the quality and safety of

food.

In accordance with the EU-Ukraine Association Agreement, the state undertook to create conditions for the development of trade and economic relations with the aim of step-by-step integration of Ukraine into the EU market through a free trade zone, to accelerate the reform of the economy on a market basis and to adapt the legislation to EU legal norms in the food sector. In response to the established requirements, the Law of Ukraine dated 22.07.2014 No. 1602-УІІ "On the basic principles and requirements for the safety and quality of food products" was adopted. According to the Resolution of the Cabinet of Ministers of Ukraine dated 10.09.2014 No. 442 "On the optimization of the system of central executive authorities", the State Service of Ukraine for Food Safety and Consumer Protection was established, the provisions of which were approved by the Resolution of the Cabinet of Ministers of Ukraine dated 02.09.2015 No. 667.

According to the plan of measures for the implementation of the Association Agreement, approved by the Resolution of the Cabinet of Ministers of Ukraine dated 25.10.2017 No. 1106, the authorities responsible for fulfilling the obligations of Ukraine in accordance with the established terms are: Ministry of Economic Development , Trade and Agriculture of Ukraine, the State Production and Consumer Service, the Ministry of Foreign Affairs, the State Fisheries Agency, the Ministry of Justice, the Ministry of Natural Resources, the Ministry of Health, the Ministry of Finance, the State Tax Service, the State Forestry Agency. At the same time, the Ministry of Economic Development, Trade and Agriculture of Ukraine and the State Production and Consumer Service are tasked with the comprehensive adaptation of Ukrainian legislation in the field of sanitary and phytosanitary measures to EU legislation, which is an important area of ensuring food quality and safety. Implementation of the tasks is regulated by the Comprehensive Strategy for the Implementation of Legislation in the Field of Sanitary and Phytosanitary Measures. According to this document, by the end of 2021, Ukraine should adapt more than 250 EU acts into national legislation in the field of food safety, food and feed safety, animal health and welfare, plant health, etc. [176].

In order to achieve the set goals at the legislative level, the European model of the food safety and quality assurance system based on HACCP procedures was implemented in Ukraine (Law of Ukraine dated 12.23.1997 No. 771/97-BP "About the basic principles and requirements

to safety and quality of foodstuff", Law of Ukraine dated 09/20/2015 No. 1602-VII "On amendments to certain legislative acts of Ukraine on food products"). Also, on 21.12.2017, the Law of Ukraine "On feed safety and hygiene" was adopted, which will enter into force in January 2020. According to this law, feed market operators who produce, distribute and use feed are obliged to implement the HACCP system [176].

On April 4, 2018, the Law of Ukraine dated 18.05.2017 No. 2042-VIII "On state control over observance of the legislation on foodstuffs, animal feedstuffs, byproducts of animal origin, animal health and welfare" entered into force. It defines legal and organizational principles of state control over compliance by market operators with legislation on food products, feed, animal health and welfare, as well as legislation on by-products of animal origin during their import (transit) to the customs territory of Ukraine [176].

This Law introduces risk-oriented control, which is carried out periodically from once a quarter to once every three years. The risk assessment for the market operator takes into account the type of agro-food products, the type of activity – production or transportation, and the results of preliminary inspections and recording of observations and violations of the market operator's activities. Further, the degree of risk and the frequency of scheduled inspections are determined according to the point system.

In 2018, the following tasks were solved in the field of ensuring the country's food security, taking into account integration into the European economy:

- modernization of the legal framework for the functioning of the organic market, ensuring the safety and hygiene of feed;
- a draft law on the tracking and labeling of genetically modified organisms was developed;
- requirements for items and materials in contact with food products, as well as requirements for information for consumers regarding food products, have been brought into line with EU legislation;
- the requirements for the production and circulation of coffee and chicory, fruit raw materials for the production of juices and honey have been brought into line with the EU legislation.

According to the "Pulse of the Agreement" in 2018, the percentage of completion of the tasks of the "Agriculture" section is 86%, and the "SPM" section is 64% (at the same time, a significant increase in the level of implementation is expected due to the completion of registration with

the Ministry of Justice of a number of already developed documents in the first quarter in 2019 – by approximately 25-30%) [176].

According to the "Pulse of the Agreement", the Implementation of the Association Agreement in the field of agriculture was carried out in the following directions: "Organic farming", "Plant trade standards", "Quality policy". The state of implementation of legislation in the field of agriculture is presented in Appendix C. The Law of Ukraine dated 30.07.2018 "On basic principles and requirements for organic production, circulation and labeling of organic products" was adopted, which introduces a clear and transparent system of registration of certification bodies, market operators and organic seeds, determines the mechanism of state control (supervision) over the activities of organic market entities and establishes their responsibility for violations of legislation in this area. Regulates procedures for certification of organic production and circulation of organic products, and establishes requirements for certification bodies and their functions.

In the field of trade in plants, as well as plant seeds, products obtained from plants, fruits and vegetables, the norms of the current legislation have been adapted to the requirements of the EU. The Law of Ukraine dated 08.12.2015 No. 864-VIII "On amendments to certain laws of Ukraine intended for harmonization of Ukrainian legislation for seeds and seedlings in line with European and international norms and standards" was adopted. To implement this law, a number of resolutions of the Cabinet of Ministers of Ukraine and acts of the Ministry of Agriculture were developed and adopted, which regulate the issue of keeping registers in the field of seed production, importing seeds into the territory of Ukraine, issuing certificates to agronomists-inspectors, and the procedure for certification and marking of seeds and planting material. Amendments were made to the Laws of Ukraine: "On seeds and planting material"; "On protection of rights to plant varieties".

The direction "Quality policy" concerns bringing the norms of the current legislation to the EU requirements in the field of protection of geographical indications. A draft of the Law "On amendments to certain legislative acts of Ukraine on improving the legal protection of geographical indications" has been developed (No. 6023 dated 03.02.2017). This legal act foresees important changes in the field of regulation of agricultural products. The process of drafting bills to regulate the specifics of the procedures for geographical indications for the specified types of products is ongoing. Such an important quality

scheme for the Ukrainian market as traditional guaranteed features (traditional dishes) is being implemented.

Information on the state of implementation of legislation in the field of sanitary and phytosanitary measures is presented in Appendix C.

To fulfill Ukraine's obligations under the Association Agreement, a number of important laws in the field of sanitary and phytosanitary measures have been adopted:

- Law of Ukraine No. 771/97-VR "On basic principles and requirements for the safety and quality of food products" (new version dated 20.09.2015 with amendments dated 04.04.2018);
- Law of Ukraine No. 287-VIII "On by-products of animal origin, not intended for human consumption" (adopted on 04.07.2015 with amendments from 10.19.2016, effective date 05.09.2016);
- Law of Ukraine No. 2042-VIII "On state control over compliance with the legislation on food products, feed, animal by-products, animal health and welfare" (adopted on 18.05.2017, effective date of 04.04.2018);
- Law of Ukraine No. 2264-VIII "About safety and hygiene of forages" (adopted on 21.12.2017, entered into force on 19.01.2020).

The implementation of the above-mentioned laws provides for the adoption of a number of by-laws, some of which have already been adopted, and some of which are being developed.

In addition, a draft of the Law of Ukraine "On Amendments to the Law of Ukraine "On Veterinary Medicine" has been developed, which should regulate legal relations in matters of animal health and welfare, private veterinary practice, circulation of veterinary drugs, etc.

According to the "Pulse of the Agreement", the implementation of the Association Agreement in the field of sanitary and phytosanitary measures was carried out in 18 directions, covering the sphere of regulating the safety of plant and animal products, food products, feed, as well as the use of means of food labeling, animal identification, etc.

It is obvious that in the direction of the integration of Ukraine into the EU economy, large-scale work has been carried out, aimed at the development of the legal framework and its adaptation to international norms in order to guarantee the food security of the state by ensuring the safety and quality of agricultural products and food products.

The analysis of the situation in the field of adaptation of the legal framework in the field of production of safe and high-quality food products allows us to single out the strategic directions of ensuring food

safety in the context of the integration of Ukraine into the EU economy with the aim of strengthening the position of the domestic agricultural sector in the world food market, improving the quality of products, protecting the domestic food market from dangerous and substandard food products, and thus, guaranteeing food safety. Such directions should be:

- further development of the legal framework in the field of quality and safety of food and agricultural products and consumer protection;
- implementation of the HACCP food quality control system in the food industry in accordance with the terms established by law;
- implementation of permanent safety procedures based on HACCP principles at primary production enterprises;
- limitation of food imports on the basis of SPM.

In the direction of the development of the legislative and regulatory framework, the Law of Ukraine dated 18.05.2017 No. 2042-VIII "On state control over observance of the legislation on foodstuffs, animal feedstuffs, byproducts of animal origin, animal health and welfare" was developed. A number of bills and regulatory documents in the field of consumer protection have also been adopted.

The need to implement HACCP in the activities of food industry enterprises is caused by the fact that such enterprises use food products that contain unprocessed ingredients of animal origin (meat, dairy, fish raw materials). Therefore, it is necessary to carry out strict control by the State Consumer Service, especially, monitoring of enterprises that do not apply safety procedures, development of an audit schedule to justify the feasibility of implementing the procedures. For enterprises that use food products without unprocessed ingredients of animal origin, the state of implementation of HACCP does not look critical. But such enterprises are characterized by a high level of depreciation of fixed assets and outdated food production technologies. Such enterprises should independently conduct an audit for compliance with the minimum requirements of basic programs, in particular: ISO/TS 22002-1:2009 Prerequisite programmes on food safety — Part 1: Food manufacturing. The audit should also be conducted by small enterprises. According to its results, it is possible to objectively establish the necessity and real possibilities for compliance with the requirements of the law.

According to legislative norms, primary production enterprises are not obliged to implement HACCP. However, there are general requirements for primary product market operators, in particular,

compliance with sanitary and hygienic production conditions, taking necessary measures to manage dangerous factors and prevent their impact on public health and environmental ecology.

The production of safe livestock products requires an audit (by enterprises or inspectors of the State Food and Consumer Service) for compliance of primary production with the minimum requirements of the basic programs: ISO/TS 22002-3:2011. In case of non-compliance with the minimum requirements, it is necessary to develop and carry out a set of works and implement permanent procedures to ensure the safety of food products. After their completion, the inspectors of the State Food and Consumer Service must draw up a protocol for the performance of work and the implementation of permanent safety procedures, which is the basis for recognizing the company's compliance with the minimum requirements of the basic programs. In the future, it is expedient to conduct such an audit by producers of plant products.

Subdivisions of the State Food and Consumer Service must carry out continuous monitoring of the epizootic and epiphytic situation in countries that import or move food products through the customs border of Ukraine in order to timely identify the threat and counter the spread of epidemics on the territory of Ukraine. To do this, it is necessary to organize inspection posts at border customs stations, which limit the import of food based on compliance with the SPM.

An important strategic direction of ensuring food security is the strengthening of Ukraine's competitive position on the international food market and the use of the opportunities of the FTA with the EU for the development of domestic exports.

One of these areas is the prospects of applying export quotas for certain agricultural products. The practice of using autonomous trade preferences of the EU with Ukraine since November 1, 2014 showed that the volumes of exports of a number of agri-food products under zero tariff quotas to the EU with high non-tariff barriers remain unused, and other goods are exported by domestic enterprises in excess of the specified volumes [130, p. 100]. It is not profitable to export goods with high tariff rates above the limit of zero tariff quotas to the EU. At the same time, duty-free quotas for exports to the EU for corn, wheat, oats, honey, grape and apple juice, processed tomatoes, poultry meat, sugar, barley and some other agricultural products were almost completely used. Some products are competitive on the European market regardless of zero tariff quotas, for example, honey, juice concentrates, etc. However, high tariff rates for

importing poultry meat into the EU in excess of quotas do not allow exporters to take stable market positions in the EU [189].

The tariff quota for corn for Ukraine is low compared to the actual volumes of exports to the EU. However, most cereals can be exported within quotas to third countries with a preferential rate of import duty, the amount of which depends on the production and stocks of grains in the EU. Consequently, Ukraine's role in ensuring global food security may increase. Among the Ukrainian agro-food products that may be in demand on the EU market when exported outside of tariff quotas, there may be honey, corn, juice concentrates, malt and starch processing products, processed starch, and cereals. For the rest of the products, especially of animal origin, import duties outside the quota volumes are actually prohibitive. Therefore, the strategic direction of ensuring food security in the conditions of European integration should be to increase the size of such tariff quotas.

The result of the bilateral negotiations between the Government of Ukraine and the EU regarding the increase in tariff quotas fully used by Ukrainian exporters during the period of the EU's autonomous preferences regime, in particular, for wheat, corn, honey, apple and grape juices, poultry meat, was the proposal of the European Commission on 29.09.2016 to the European Parliament and the Council of the EU regarding the introduction of autonomous trade measures for Ukraine in the form of zero tariff quotas for a number of agro-food products. It was proposed to establish additional volumes of tariff quotas, in accordance with the Association Agreement, and partially or completely cancel import tariffs on certain goods. As a result, not all proposals of the Government of Ukraine and the European Commission were approved.

Table 5.4 shows the volume of tariff quotas for duty-free import into the EU territory of some Ukrainian agro-food products, the rates of the EU customs tariff for the import of these products outside the quotas, and the actual volume of export of these products from Ukraine to the EU.

According to the State Statistics Service of Ukraine, exports to the EU increased for all types of goods for which quotas were established and for which Ukrainian exporters received permits. In 2014, the volume of honey exports to the EU was 26.1 thousand tons, then in 2017 it increased by 85% to (48.4 thousand tons). Exports of barley groats and flour to the EU increased from 10.5 thousand tons in 2014 to 15.7 thousand tons in 2017 (by 49%). The export of processed tomatoes increased from 11.5 thousand tons in 2014 to 39.7 thousand tons in 2017 (3.4 times).

Table 5.4 – Volumes of duty-free quotas, duty rates and exports of certain food and agricultural products

Goods	Volume of the annual quota for duty-free import into the EU territory, in accordance with the EU-Ukraine Association Agreement, tons/year	EU customs tariff for imports outside the quota	Volumes of exports from Ukraine to the EU in 2017, thousand tons
Natural honey	5,000 tons with a gradual increase over 5 years to 6,000 tons/year	17,3 %	48.4
Barley groats and flour; cereal grains processed by other methods	6,300 tons/year with a gradual increase over 5 years to 7,800 tons/year	171 €/ton, 93-234 €/ ton	15.7
Processed tomatoes	10000	14,4%	39.7
Grape and apple juices	10,000 tons with a gradual increase over 5 years to 20,000 tons	22,4 % + 27 €/ 100 litres, 18 %	40.5
Oat	4000	89 €/ ton	3.7
Soft wheat, wheat flour and granules	950,000 tons with a gradual increase over 5 years to 1,000,000 tons	95 €/ ton, 172 €/ ton, 175 €/ ton	1238.0
Corn, corn flour and pellets	400,000 tons/year with a gradual increase over 5 years up to 650,000 tons/year	94 €/ ton, 173 €/ ton, 173 €/ ton	6673.8
Barley, barley flour and granules	250,000 tons/year with a gradual increase over 5 years to 350,000 tons/year	93 €/ ton, 171 €/ ton, 171 €/ ton	234.3

Source: compiled by the author based on the data of the State Statistics Service of Ukraine and the Addendum to Annex I-A of the EU-Ukraine Association Agreement.

The results of the analysis show that the volume of honey exports to the EU in 2017 exceeded the volume of the tariff quota more than 9 times. The volume of annual export of barley groats to the EU is almost 3 times higher than the established tariff quota. The export of processed tomatoes also exceeds the established quota by 3 times; export of apple and grape juice – 4 times. Therefore, it is necessary to make a proposal of the EU Commission on the above goods, which could satisfy Ukrainian exporters. The quotas for wheat (950,000 tons per year) and corn (400,000 tons per year) exports to the EU are insufficient to realize Ukraine's export potential in the EU.

According to the estimates of the European Commission, the EU will lose annually (accordingly, Ukraine will save) more than 50 million euros in revenues from the customs tariff on goods for which autonomous trade measures will be introduced, 80% of which will be due to

agricultural goods. According to the estimates of the Ministry of Agrarian Policy, the increase in the volume of exports of agri-food products to the EU will benefit Ukraine by 200 million USD [57].

The positive decision of the European Commission regarding the increase of quotas for certain products is extremely important for the state trade policy and the strengthening of Ukraine's position on the international food market, since negotiations on the revision of quotas can formally be initiated only five years after the Association Agreement enters into force (November 1, 2014) in accordance with Art. 29, paragraph 5 of the Agreement, i.e. no earlier than November 1, 2020. The previous experience of conducting negotiations on temporary tariff quotas in 2016-2017 showed that some goods were initially excluded from the proposal of the Government of Ukraine by the European Commission, and then the volumes of zero tariffs were agreed with the EC tariff quotas were significantly reduced in the Resolution of the European Parliament and the Council of Europe [189].

Therefore, further agreements on increasing the volume of zero-tariff export quotas should be made taking into account possible difficulties in passing the decision approval procedure in the European Parliament and the Council of the EU. The previous decision of the European Parliament's Committee on Agriculture and Rural Development was not unequivocally positive. In the conclusion of December 22, 2016 regarding the proposals of the European Commission to the European Parliament and the Council of the EU regarding the introduction of temporary autonomous trade measures for Ukraine, in addition to those provided for in the Association Agreement, it was said that the reasoning for increasing quotas was insufficient. This is due to the fact that the proposed autonomous trade preferences concern very sensitive EU agricultural sectors, which have recently suffered from serious crises and were negatively affected by the embargo on trade with the Russian Federation – fruits, vegetables and cereals. In particular, it was noted that Ukraine is a competitive exporter of grain crops, so EU tariffs outside the tariff quotas will not affect the reduction of grain exports from Ukraine.

In such conditions, during negotiations within the framework of the EU-Ukraine Association Agreement, Ukraine should focus on the fact that it is promising to increase the quotas for goods whose exports increase during the period of the FTA with the EU, since the tariff quotas at the very beginning of the creation of the FTA with the EU were determined on the basis historical export volumes were used as the basis

for determining the volume of tariff quotas [189].

It is also important to pay attention to the fact that Ukrainian manufacturers are not interested in small amounts of tariff quotas for duty-free exports to the EU because the costs of obtaining export permits exceed the economic effect. In particular, when exporting meat and dairy products, the procedures for obtaining export permits last several years, and the annual quotas are insignificant (in 2019: beef – 12 thousand tons, pork – 20 thousand tons, lamb – 1.95 thousand t, poultry meat – 18.4 thousand tons, dairy products – 9.2 thousand tons, oil – 2 thousand tons). Insignificant volumes of supplies within the quotas are exhausted by producers who have received permission to export to the EU very quickly (quotas for the export of poultry meat to the EU before 11.01.2018 were exhausted by 25%) [193]. Export outside the tariff quotas for products of animal origin is not possible given the practically "prohibitive" amount of the import duty. At the same time, it should be noted that the consumption of livestock products by the population of Ukraine is insufficient from the point of view of rational medical standards.

In addition, for certain food products, the terms of trade with the EU are asymmetric, which can be paid attention to when justifying the increase in quota volumes. Beef, pork, mutton, poultry, eggs, wheat, barley, corn, milk, butter are subject to ad valorem duties in Ukraine, which are calculated as a percentage of the customs value of the goods, while in the EU, specific duties are used, which are calculated in the established monetary amount per unit of goods subject to customs duty, or combined, which combine both types of customs taxation and are set at such a high level for many items that Ukrainian exports above the limit of zero tariff quotas are not profitable.

It should also be added that the European Commission, in its proposals to the European Parliament and the Council of the EU, used the argument that in the recent FTA negotiations with Peru and Colombia, Central America, Vietnam and Canada, these countries were granted free duty-free access to the EU markets for some products included in the offer for Ukraine [257].

Participation in the export of small and medium-sized businesses is also an additional argument in favor of increasing quotas.

Therefore, ensuring food security in the conditions of integration into the world economy, including the EU economy, requires Ukraine to take reasonable measures to reduce the import of goods, the production of which is more appropriate domestically, and to increase the volume of

exports to EU countries to strengthen the role of the state in the world markets and ensuring global food security. To increase exports, it is necessary to increase quotas for duty-free import into the EU of goods produced mainly or at least partially by small and medium-sized producers (honey, mushrooms, processed tomatoes, grape and apple juice, etc.). It is necessary to promote these goods to the EU markets under their own brands, which will make it possible to sell them at a price favorable for export outside the limits of zero tariff quotas.

Afterword

The integration of strategy and economic processes allows Ukraine to create an effective economic strategy, because taking into account economic processes allows country to develop more effective and transparent strategies due to the clear establishment of the relationship between strategic goals and priorities and the obtained result.

The economic strategy should be understood as a complete system of actions of the entity aimed at realizing the goal, tasks and priorities of its economic reproduction, taking into account the complex of influences of external and internal factors in the long-term period of time. Economic tactics are a form of implementation of economic strategy, which includes a set of measures to adapt the subject and influence individual economic processes to achieve the objectives of the economic strategy.

The state economic strategy should be aimed at the formation of mechanisms for monitoring and managing the development of elements of the socio-economic system, conditions for the implementation of strategic goals and ensuring social reproduction. Economic tactics are focused on the implementation of strategic measures, predicting the object's possible response to the measures taken, monitoring and evaluating their effectiveness, adjusting and developing methods and means of influencing the object of management.

Economic strategy in connection with economic tactics form the governmental economic policy, which should be understood as the activity of state authorities and management in determining strategic goals, tasks and priorities, tools of economic tactics for their achievement.

In Ukraine, a system of state strategies aimed at creating conditions for the economic development of various sectors of the national economy has been developed. The development and implementation of economic strategies requires the identification of key priorities for sustainable economic development, the implementation of modern tools and mechanisms of state economic policy, and the social orientation of state strategic management. State strategies are the basis for the development of state projects, regional, industrial, target programs of socio-economic development aimed at various sectors of the national economy.

The process of developing and implementing an economic strategy

should be based on the main directions, goals and priorities of activity formulated on the basis of a general analysis of external factors, threats to development and the internal potential of the country. It is necessary to take into account resources and develop tools and mechanisms for the implementation of the strategy in the direction of the developed indicators of achieving the planned results. The final stage should be the provision of monitoring and analysis of the results of strategy implementation, assessment of its effectiveness.

Ukrainian development strategies are characterized by shortcomings, which consist in the absence of a system of development planning and forecasting, the formulation of goals, threats, opportunities, a system of indicators (models) and indicators.

The food security strategy is defined as a plan to achieve the level of development of the national economy and its agricultural sector, provided with the necessary resources and potential, in which the population will be guaranteed a stable supply of food in quantity and quality that meets scientifically based parameters and socio-economic conditions for supporting consumption will be created according to medical standards, regardless of adverse factors in international relations and the global market situation. According to the structure of the strategy, the primary stage is the determination of strategic areas of food security, which include increasing the efficiency of agricultural enterprises, export orientation of the agricultural sector, and ensuring the quality and safety of food.

Strategic tasks in the food sector are the guaranteed provision of safe, high-quality food to the population, the development of balanced food markets, technical re-equipment of enterprises, increasing the competitiveness of domestic products, minimizing the negative impact on the environment and ensuring environmental safety, improving land relations. Determining the strategic potential of the country's food security should be based on an assessment of the current state of the problem based on reasonable parameters, the conditions for ensuring food security, the country's strengths and weaknesses at the time of strategy development. It is necessary to determine the country's comparative advantages in ensuring food security, environmental threats and risks. On the basis of the analysis, it is necessary to develop measures and tools to achieve the set goals for ensuring food security. The final stage should be to ensure monitoring and evaluation of strategy results.

The developed structure of the food security strategy will allow

establishing unified approaches and methodological principles for the development of the strategy as a planning document, taking into account the main components on which the food security of the state depends. The process of forming a strategy according to the developed structure will take into account the specifics of tasks in accordance with production, the formation of the internal market, resource potential and food safety and quality. The improved structure of the strategy can be the basis for the development of state programs, methodological recommendations, instructions and other documents for the implementation of the assigned tasks regarding the strategic provision of food security. Detailing the main stages of strategy formation and implementation in accordance with the components of food security will allow government bodies to offer practical measures and recommendations.

A classification of threats to food security has been developed, which includes management threats at the level of state administration and at the level of agricultural producers; market threats at the level of foreign economic activity of the country and at the level of the domestic market; social threats in the sphere of ensuring a high standard of living of the population and in the sphere of ensuring the quality of products; natural threats are unrelated and related to the impact of human activity.

Particular attention is paid to the identification of informational threats to food security, which consist in the extremely low information provision of market subjects and the absence of systematic monitoring of food security in general, the absence of an analytical base for assessing threats, and the ineffective organization of informational interaction of participants involved in guaranteeing food security.

Subjects of information provision of food security monitoring are, first of all, state authorities and management bodies that regulate issues of guaranteeing food security; competent bodies and organizations that control and are responsible for individual components of guaranteeing food security in the field of provision of state food stocks, assessment and control of food quality and safety; state and non-state bodies and organizations providing information to information users and analyzing trends in food security; business entities in providing the population with food, in particular agricultural producers, trade enterprises, food and processing enterprises; subjects of the infrastructure of the agricultural and food market and the population.

Methodical approaches to assessing the level of food security of the country have been improved. In accordance with the developed structure

of the food security strategy, it is proposed to systematize the indicators of the strategic level of food security according to four groups: indicators of the assessment of production trends and its compliance with internal needs; indicators of dependence of the country's food supply and resource provision of the agricultural sector on import supplies; indicators for assessing the dynamics of stocks (ratio of production and consumption); indicators for assessing the quality and availability of food, nutritional balance.

The grouping of indicators is necessary for the further localization of identified problems and the concentration of governmental resources in the necessary direction, which will allow to improve the methodological and methodical apparatus for developing a food security strategy and increase the effectiveness of its implementation. Each group of indicators corresponds to an integral index, the sum of which constitutes the integral index of food security.

Methodical approaches to the strategic analysis of the country's food security based on a comprehensive analysis of the external and internal environment have been improved. To carry out the analysis, a system of indicators was developed to assess agricultural production, the agricultural market, the resources of the agricultural sector, food consumption, which corresponds to the main strategic components of food security, for the objective establishment of strategic directions, responsible actors, the distribution of resources and effective control in further development and implementation strategies. The indicators obtained from the data of the last period of analysis are compared with a value favorable for a certain criterion or a normative value. As a result, a system of relative values for objective assessment of food security trends was obtained.

The block of strategic analysis of the internal environment of food security involves identifying strengths and weaknesses and establishing their sustainability. It is necessary for determining strategic priorities and further effective allocation of resources during strategy development. The strengths and sustainable opportunities of food security are those that maintain a positive trend of the relevant indicators during the studied period. Those that, on the contrary, maintain a negative trend of the relevant indicators during the studied period will be classified as persistent weaknesses and persistent threats.

When developing a state food security strategy, persistent weaknesses will require maximum attention, non-persistent weaknesses will require increased attention, and non-persistent strengths will require supporting measures, the intensity of which will depend on the specific strategic priorities of state policy in the agrarian, trade, and social spheres. Persistent strengths should be used to implement other measures in the food security strategy.

The block of strategic analysis of the external environment of food security includes the assessment of threats and opportunities and establishing their sustainability. Maximum attention should be paid to stable threats and the development of measures to neutralize their impact, increased attention to unstable threats. Persistent and non-persistent threats must be transformed into opportunities for food security and sources of its further strengthening. Non-persistent opportunities should be reinforced with appropriate supporting strategic measures from state regulation of agrarian, foreign trade, and social policy. Persistent opportunities require strategic measures aimed at maximizing their realization in the long term.

The assessment of food security of Ukraine was carried out according to separate indicators according to the FAO and GFSI methodology. Monitoring of indicators of the population's diet and ensuring food security at the expense of domestic production showed that, in comparison with the obtained indicators of neighboring countries, Ukraine is the most significantly lagging behind in the quality of nutrition. The average cost of food production in Ukraine is on a par with other countries, and even exceeds the corresponding indicators. According to the monitoring data of the indicators of the economic availability of food for the population, as well as the state of the country's infrastructure, it can be stated that almost all the values of the indicators are at a level lower than in other countries. At the same time, the percentage of people suffering from unsafe food and the prevalence of food insecurity significantly exceed the corresponding indicators of other countries.

The assessment of indicators of food independence and political stability of Ukraine showed that with a fairly high amount of food production in monetary terms compared to other countries and a low percentage of imported food in relation to export volumes, the state cannot guarantee food security at the level of economically developed countries. A critical level of political instability and corruption has a

significant impact on the deterioration of food security. Monitoring of indicators characterizing the level of access to water and sanitation facilities, negative consequences of insufficient consumption of food and trace elements allows us to conclude that in Ukraine, compared to other countries, there is a violation of nutrition standards. Assessment of food security based on international methodological approaches is necessary to identify strategic problems in the food sector and objective analysis and comparison of food security trends with global trends.

Most of the international methods of assessing the level of food security are based on a step-by-step algorithm for calculating a limited set of indicators that are combined into an integral indicator (index) of food security. The comparison of indices across regions or countries allows drawing conclusions about the dynamics of the level of food security, positive and negative trends, taking measures to strengthen food security.

The directions for improving the food security strategy are substantiated based on the analysis of the international experience of strategic provision of food security. Reimbursement of the costs of commodity producers for the main types of agricultural products will lead to a reduction in the cost price, which in turn will allow to increase the level of consumption of these products by the population and the competitiveness of domestic products. The specified mechanisms of state support for commodity producers in Ukraine should be a component of both the state's agrarian policy and the food security strategy. Compensations to commodity producers, similar to those applied in foreign countries, can be implemented simultaneously with the establishment of recommended prices depending on the average cost price of the main types of agricultural products, which would ensure a sufficient level of food security in the regions. For this purpose, it is necessary to create monitoring services and provide compensation amounts in the structure of state budget expenditures. Food security of Ukraine and sustainable development of the agricultural sector of the economy require a system of subsidies and compensations.

Mechanisms of state regulation should be flexible enough to protect domestic producers and simultaneously comply with WTO requirements, in particular when applying such protective measures as customs duties and import tariffs on food. It is also recommended to strengthen state control over monitoring the food balance to prevent losses from export restrictions.

The assessment of the state of food security according to the

methodological recommendations of state authorities and management showed that the main threats to the state's food security are unbalanced consumption of food products. Malnutrition is noted in such food groups as meat, milk, fish, fruits and berries. Even 5 years ago, the food needs of the Ukrainian population were met mainly at the expense of cheap potatoes and bread products. However, even this opportunity has been lost in the last 5 years. One of the main reasons for the deterioration of food security is the low purchasing power of the population. High differentiation of the living standards of the population by social groups and the economic inaccessibility of food due to low and unstable incomes of the population, the growth of consumer prices for food products at a faster pace than incomes, does not allow ensuring food security at a sufficient level for high-quality and complete nutrition of the population. Unlike consumers of economically developed countries, Ukrainians are forced to spend the majority of their income on food. In fact, when food needs are met at the expense of a powerful agricultural sector and there is no food shortage in the country, the level of consumption of basic products by the population is below rational norms. Also, the reason for the insufficient consumption of high-quality food products is the decrease in the production of livestock products. In the agricultural sector, the dominance of crop production has been observed in recent years. A reduction in the number of animals, an increase in the cost of production of livestock products leads to an increase in prices for them for the population.

Current volumes of consumption of basic food products do not reach rational standards, which negatively affects the country's food security. Sufficient amounts of agricultural production do not allow to guarantee food security due to the low level of income of the population, which is the main condition for sufficient food consumption. The acuteness of food security was determined by the increase in prices for food products at higher rates compared to the solvent demand of the population.

The analysis of conceptual legislative acts of Ukraine in the sphere of regulation of the agrarian sector of the economy and provision of food security showed the absence of a comprehensive vision of the food security strategy. The specificity of the modern legal provision of food security is the lack of specific areas of regulation of Ukrainian food security strategy, which does not allow to guarantee food security at the state level comprehensively and effectively. The lack of a single legal

basis and systematic provision of food safety does not allow to guarantee its sufficient level in modern conditions.

To solve these problems, it is advisable to develop a model for the formation and implementation of a strategy for ensuring the food security of Ukraine and its consolidation at the legislative level to regulate the economic, legal and organizational aspects of the state's activities in the field of protecting food interests and guaranteeing food security, further development, systematization of legislation in the field of food security and integration with international legal norms.

The functioning of the mechanism for guaranteeing food security is ensured by the institutions of: market mechanisms and market price formation; social standards and macroeconomic indicators; technical regulation, certification, product safety and quality; commodity and financial interventions, food reserve; state agrarian policy and measures to support producers; agricultural and food market infrastructure; strategic planning methods and tools; information provision of food security; legal provision of food security. The main institutions for guaranteeing food security function at the state, regional and microeconomic levels. Food security institutions are systematized according to the strategic level, on which the mechanisms of food security strategy formation are concentrated, and the tactical level, on which the mechanisms of implementation, coordination and monitoring of the food security strategy are concentrated.

The strategic priorities of improving the institutional provision of food security in Ukraine and state policy measures are to improve the legal and information base of food security and its harmonization with EU member states, optimization of the sectoral structure of agricultural production, development of agricultural market protectionism, implementation of import substitution policy in the agricultural sector, increasing the economic availability of food, harmonization of domestic standards of quality and safety of products with EU norms, development of state certification of food, development of logistical and infrastructural support of the agricultural market.

The development of a holistic mechanism for the formation and implementation of a strategy in the field of ensuring food security takes into account the interaction of subjects involved in the process of developing a food security strategy at the state level, information and analytical support for strategic planning, strategic analysis of trends and the state of food security, methodological and methodical approaches to

the diagnosis and monitoring of internal and external threats, the methodical basis for the development of the strategy as a state document, as well as a set of tools and mechanisms of the governmental agrarian policy. A comprehensive solution to these problems will allow to timely identify the presence of critical crisis situations in the food supply system, apply the appropriate levers and mechanisms and thereby strengthen the food security of Ukraine.

An organizational and economic mechanism for the formation and implementation of a strategy in the field of ensuring food security has been developed. It consists of four blocks according to the stages of strategy development and implementation and strategic tasks. Each block has its own information and analytical database, on the basis of which current trends and the state of food security are evaluated and analyzed in an operational mode. A system of interaction between the participants of the mechanism of formation and provision of food security has been developed. Within each block in the strategy, a set of measures to achieve results should be designed, expected results from the implementation of the specified measures and quantitative and qualitative indicators of their measurement should be planned.

The organization of effective coordinated work of the participants of the food safety system requires the formation of a single information system that would be able to consolidate incoming and outgoing information flows during food security monitoring and create an information and analytical base for making strategic management decisions. To solve the task, it is proposed to develop an information system for monitoring food security, which will allow to systematize and optimize state information resources, to receive timely information for analysis and assessment of the state of food security from various sources, to objectively assess the trends of food security in the reporting period, to form analytical reports, strategic plans and forecasts, to promptly respond to possible threats to food security and to implement corrective measures to counter factors of negative impact on food security.

The functions of the information system should be collection and consolidation of input data, analysis, generation of analytical reports, storage of results and provision of prompt access to information. The proposed information system will make it possible to form an information and analytical basis for comprehensive assessment, analysis and monitoring of food security indicators, development and implementation of the state food security strategy and regional food security programs,

justification of strategic directions and mechanisms for ensuring food security at all levels, formation of regulatory mechanisms and tools functioning of the food market, strategies, programs and forecasts of food security.

A balanced scorecard of food security of Ukraine has been developed, which takes into account strategic goals and indicators. The key strategic goal of financial support for the formation of agrarian policy to ensure food security within each considered group of strategic priorities is to overcome crisis phenomena; maintaining a stable state and developing directions for strengthening the state – should be divided into strategic financial goals, which generally include: development of directions for optimal use of assets and investments by agricultural enterprises; state support and financing of agricultural producers; financing the renewal of the technical fleet of agricultural enterprises; reducing costs and increasing the level of profitability of agricultural enterprises; development of directions for managing their financial risks.

The key strategic goal of social security of the population in the context of developing a food security strategy includes such strategic social goals as: state regulation of price policy on the market of agricultural products and food; development of directions for the implementation of social policy and targeted assistance to certain segments of the population; development of a system for monitoring the economic availability of food products and other indicators characterizing food consumption by the population; creation at the state level of a system for ensuring the quality and safety of agricultural raw materials and food products, compliance with the requirements for their production; formation of strategic food reserves of the country in order to regulate pricing on the market.

The key strategic goal of internal market regulation and infrastructure provision covers strategic goals: development and implementation of a market risk management system; formation of the logistics system and market infrastructure for agricultural enterprises; development of measures to reduce costs within the logistics system of food sales in the domestic market; construction of a system of monitoring and forecasting of the market of agricultural products and food. The key strategic goal of state management and resource provision of the market is represented by such strategic goals as state regulation of the food and agricultural market; formation of strategic food reserves of the country; ensuring the volume of production of agricultural products and food in

accordance with the requirements of food security and the possibility of realizing the export potential.

The role of the infrastructure of the agro-food market in ensuring food security is to support the economic and physical availability of food, which, in turn, requires the creation of conditions for the effective operation of agricultural and service enterprises and the harmonization of the interests of the participants in the system of guaranteeing food security; application of mechanisms and methods of organizing a transparent market of agro-food products, effective use of production, financial, information and labor resources. Mechanisms for improving the management of the formation of the infrastructure of the food market as a condition for guaranteeing food security should be implemented at the levels of: wholesale and retail trade in food and agricultural products, warehousing and transport services for producers and consumers, information support for participants in the agro-food market, credit and financial support for the agro-food market, training of personnel for agro-food market, and provide for a complex of management and economic measures.

Directions for ensuring food security in the conditions of integration into the world economy include a system of measures to improve and develop the system of control over the quality and safety of agricultural products and food, in particular: adaptation of the legal framework in accordance with the requirements of the WTO and the EU in the field of product quality and safety, protection consumers, mandatory auditing of food industry enterprises for compliance with safety and quality requirements, and mandatory control of imported products, monitoring of threats of epidemics in countries supplying products of animal origin, and import restrictions in accordance with the sanitari and phitosanitary measures. Directions for increasing food independence and self-sufficiency should include restrictions on imports through the state policy of import substitution of certain types of food products, use of the mechanism of tariff quotas within the framework of bilateral trade agreements, bans and restrictions on imports based on sanitary and phytosanitary measures. Directions for strengthening Ukraine’s role in ensuring international food security, increasing quotas for food imports into the EU, expanding foreign sales markets for Ukrainian exporters, stimulating exports, stimulating the participation of small and medium-sized enterprises in exports.

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APPENDICES

Appendix A

Increase in food production volumes

Table A.1 – Growth rates of the production of main foods, %

Foods	Years								2018 to 2010
	2011	2012	2013	2014	2015	2016	2017	2018	
Meat and meat products	4.1	3.1	8.1	-1.2	-1.6	0.0	-0.3	1.6	14.4
Milk and milk products	-1.4	2.6	1.0	-3.1	-4.7	-2.2	-1.0	-2.1	-10.5
Eggs	9.5	2.3	2.6	-0.2	-14.3	-10.0	2.8	4.0	-5.4
Sugar	43.3	-17.1	-41.1	62.5	-28.9	38.5	1.1	-14.1	-2.8
Oil	5.4	24.4	-8.7	32.7	-7.0	18.1	16.0	-0.5	101.3
Potatoes	29.6	-4.1	-4.3	6.4	-12.0	4.4	2.1	1.3	20.3
Vegetables, water-melons, melons and gourds	19.0	2.4	-1.4	-3.2	-5.1	2.1	-2.8	2.3	12.0
Fruits, berries and grapes	12.3	1.9	16.5	-15.2	4.3	-6.1	3.1	23.6	41.1
Bread products	44.5	-18.6	36.4	1.3	-5.8	9.9	-6.3	13.1	78.4

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

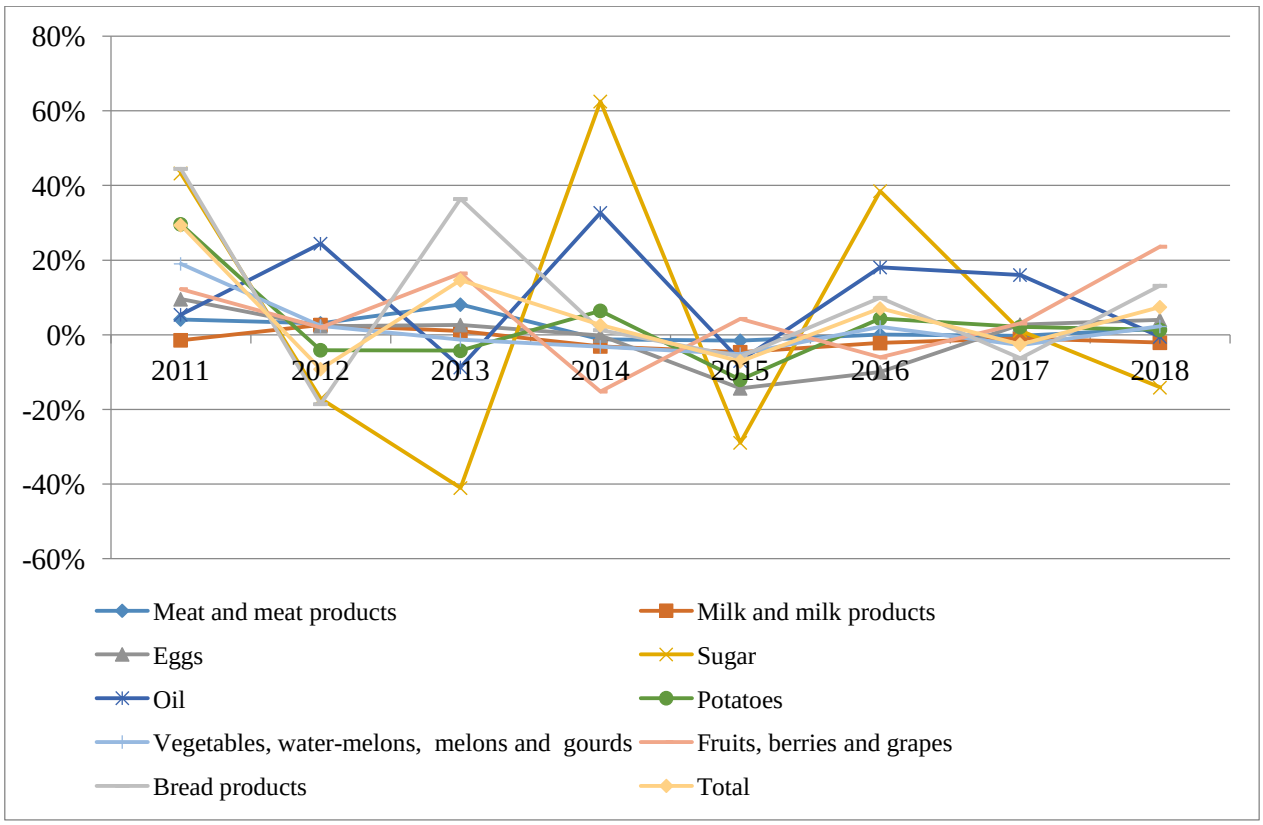

Fig. A.1 – Growth rates of the production of main foods, %

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Table A.2 – Growth rates of consumption of main foods, %

Foods	Years								2018 to 2010
	2011	2012	2013	2014	2015	2016	2017	2018	
Meat and meat products	-1.9	5.9	2.9	-8.6	-6.3	0.7	0.0	1.7	-6.2
Milk and milk products	-1.1	4.5	2.6	-4.4	-6.1	-0.6	-5.0	-1.7	-11.6
Eggs	6.6	-1.0	0.4	-5.2	-10.0	-5.0	1.7	0.1	-12.5
Sugar	-8.0	1.2	7.2	-27.6	-23.4	11.7	12.1	8.1	-25.1
Oil	3.4	-2.6	-1.5	-7.4	-2.0	-7.0	-9.2	-2.3	-25.8
Potatoes	-7.8	-5.4	2.1	-7.0	-6.4	-5.3	-0.2	0.9	-26.1
Vegetables, water-melons, melons and gourds	7.6	0.3	-3.6	-1.3	-2.8	1.3	2.1	-3.2	-0.1
Fruits, berries and grapes	13.0	0.0	-0.2	-5.3	-1.8	1.4	-2.9	2.1	5.4
Bread products	9.1	1.0	5.4	-12.0	-3.1	-2.8	5.8	9.1	11.2

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

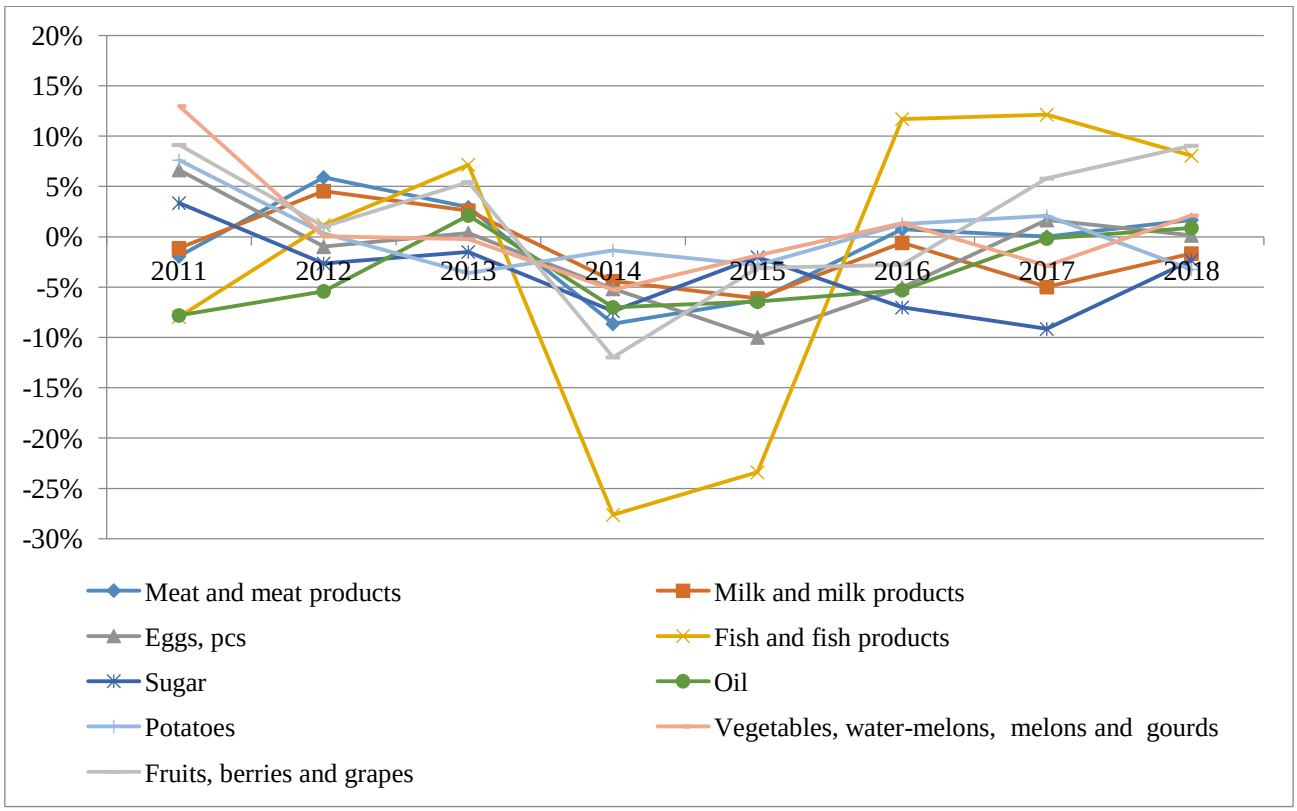

Fig. A.2 – Growth rates of consumption of main foods, %

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Appendix B

Increase in consumption of basic foods

Table B.1 – The rate of increase in the consumption of main foods per year on average per person, %

Foods	Роки								2018 to 2010
	2011	2012	2013	2014	2015	2016	2017	2018	
Meat and meat products	-1.5	6.3	3.1	-3.6	-5.9	1.0	0.6	13.7	13.1
Milk and milk products	-0.7	4.9	2.8	0.9	-5.8	-0.2	-4.5	14.6	11.0
Eggs	6.9	-1.0	0.7	0.3	-9.7	-4.6	2.2	-16.5	-21.4
Fish and fish products	-7.6	1.5	7.4	-24.0	-22.5	11.6	12.5	55.6	15.9
Sugar	3.8	-2.3	-1.3	-2.2	-1.7	-6.7	-8.7	6.6	-12.7
Oil	-7.4	-5.1	2.3	-1.5	-6.1	-4.9	0.0	53.8	21.6
Potatoes	8.1	0.6	-3.4	4.1	-2.5	1.7	2.6	-47.3	-41.3
Vegetables, water-melons, melons and gourds	13.4	0.4	-0.1	-0.1	-1.5	1.8	-2.4	-33.1	-25.6
Fruits, berries and grapes	9.6	1.3	5.6	-7.1	-2.7	-2.4	6.2	-13.6	-5.0
Bread products	-0.8	-0.9	-0.9	0.1	-4.9	-2.1	-0.2	-1.2	-10.5

Source: calculated by the author based on the data of the State Statistics Service of Ukraine.

Appendix C

The state of implementation of legislation in the field of agriculture in accordance with the EU-Ukraine Association Agreement

Table C.1 – The state of implementation of legislation in the field of agriculture in accordance with the EU-Ukraine Association Agreement, the European Atomic Energy Community and their member states

The law	The purpose of the law	Date of acceptance
Law of Ukraine № 1602-VII "On amendments to certain legislative acts of Ukraine on food products"	The law aims to harmonize the legislation of Ukraine with the legislation of the EU in the field of food safety and quality. It also provides for the creation of a single supervisory body in the field of food safety, the cancellation of permit documents and procedures that are absent in the EU, the introduction of European principles of GMO regulation	22.07.2014
Law of Ukraine № 1648-VII "On amendments to some legislative acts of Ukraine regarding the identification and registration of animals"	Mandatory identification and registration of all farm animals is introduced. The application of this law will allow consumers to be guaranteed that they will consume meat and dairy products of known origin – from registered animals whose health status is subject to examination, and therefore such products are safe	14.08.2014
Resolution of the Cabinet of Ministers of Ukraine No. 42 "On some issues of deregulation of economic activity"	The deadlines for issuing quarantine and phytosanitary certificates have been shortened (from 5 days to 1), the mandatory quarantine certificate for the transportation of grain and oil crops, as well as the need to obtain a quarantine certificate for domestic transportation, has been canceled	28.01.2015
Law of Ukraine № 191-VIII "On Amendments to Certain Legislative Acts of Ukraine on Simplifying Business Practices (Deregulation)"	Stimulation of rational use of agricultural land and simplification of relations in the field of land lease	12.02.2015
Order of the Ministry of Agrarian Policy and Food of Ukraine №157 "On approval of requirements for cocoa and chocolate products"	Establishing European requirements for cocoa and chocolate products	13.04.2016

Completion of the table C.1

Law of Ukraine № 864-VIII "On amendments to certain laws of Ukraine intended for harmonization of Ukrainian legislation for seeds and seedlings in line with European and international norms and standards"	Establishing rules for keeping registers in the field of seed production, importing seeds into the territory of Ukraine, issuing certificates to agronomists-inspectors, and the procedure for certification and marking of seeds and planting material	08.12.2015 (becoming valid 30.06.2016)
Наказ Мінагрополітики № 592 «Вимоги до видів цукрів, призначених для споживання людиною»	Establishment of European requirements for types of sugars intended for human consumption	02.11.2017
Law of Ukraine № 2496-VIII "On the basic principles and requirements for organic production, circulation and labeling of organic products"	Improvement of the principles of legal regulation of organic production, circulation and labeling of organic products	10.07.2018 (putting into effect 02.08.2019)

Source: compiled by the author based on the data [176].

Table B.2 – The state of implementation of legislation in the sphere of sanitary and phtosanitary measures in accordance with the EU-Ukraine Association Agreement and the European Union, the European Atomic Energy Community and their member states

The law	Effective date	The number of normative legal acts that cover the scope of the laws
Law of Ukraine № 771/97-BP "On Basic Principles and Requirements for the Safety and Quality of Food Products"	20.09.2015 (new edition)	-
Law of Ukraine № 287-VIII "On by-products of animal origin, not intended for human consumption"	09.05.2016	4
Law of Ukraine № 2042-VIII "On state control over observance of the legislation on foodstuffs, animal feedstuffs, byproducts of animal origin, animal health and welfare"	04.04.2018	31
Law of Ukraine № 2264-VIII "About safety and hygiene of forages"	19.01.2020	18

Source: compiled by the author based on the data [176].

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Anastasiia Dmytrivna Mostova

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