Food Security Management: Regional Aspect

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Abstract. The aspects of increasing competitiveness level of the agro-industrial complex are becoming particularly relevant for most countries in the world, as well as their food security in modern conditions of the global crisis and the increasing threat of a further rise in prices on world markets for agricultural products. Basic approaches to food security are presented in research work, the main features of food security management are considered. The food complex is one of the most important sectors of the national economy. Food security is defined as the main socio-economic aspect of national security. The priority place in ensuring the region food security belongs to the agricultural sector. The agricultural sector is an important strategic branch of the domestic national economy, which ensures food security and food independence of the state.

1. Introduction
In modern conditions one of the priority directions of the state's activity is its economic policy the purpose of which is to ensure the development of the economy on the basis of fair competition and self-regulation. Food security in modern conditions of development is the basis of the scientific and technological process, socio-economic development as well as the independence of each state. In this regard, the main strategic goal of regulating the agri-food industry and important condition for ensuring food security is to achieve an economic and social balance of both national and regional food markets of the country.

2. Background
At present, along with the emergence of new security threats, some of the traditional factors have significantly aggravated: natural disasters, the rapid growth of the world's population and the vital activity of human society, which resulted in a shortage of food.

In modern conditions of the global crisis and the increasing threat of further price rises on world markets for agricultural products the aspects of increasing competitiveness level of the agro-industrial complex are becoming particularly relevant for most countries in the world, as well as their food security [1].

Uneven economic development of region potential, distinctive in terms of the region size and the degree of their transport infrastructure development, the level of food products prices and incomes of
the population impose specifics on the organization of food supply and food security of the regions. In this connection food security represents the main socio-economic aspect of national security.

3. Focus of the research
The food complex is one of the most important sectors of the national economy. The need for constant growth in the productivity of the agro-industrial complex of the region determines the territories of new goals and objectives associated with the choice and application of a competitive strategy for the development of the regional economy that permits to make the most of the available potential. The future of any economic system including the development of the food complex depends on the choice of development strategy [2].

Recently special attention by foreign and domestic scientists in the field of sociological, economic, socio-ecological and other research is paid to such aspects as the security formation at different levels. Focusing on this issue of security management, it should be noted that this issue is multidimensional and interdisciplinary. The founders who made a significant contribution to the development of food security concept are such classics of economic theory as A. Maslow, M. Porter, D. Ricardo, A. Smith, and others [3-6].

The study of modern security issues began in the middle of the XX century. Currently, there are clearly formed principles of scientific research of the state, society and the individual through various aspects of their development security. In modern conditions, food security has become an independent scientific area that requires rapid development and formation on a global, national and regional scale. Thus, the classical approaches to ensuring food security are united by two key elements: own food production and the creation of reserves. However, in the second half of the XX century scientists L. Sen, J. Conuel, E. Barber, J. Madeley [7] rethought the concept of food security, which consisted in substantiating the need for economic affordability of food.

In 1996 the UN experts determined from the interpretation of the Food and Agriculture Organization of the United Nations, a world organization that deals with agriculture and food, such claim: “Food security is ensured when all people, at all times, have physical and economic access to safe and nutritious food, sufficient to satisfy their physiological needs and preferences necessary for an active and healthy life” [8].

“Overcoming hunger, achieving food security, improving nutrition and promoting sustainable agricultural development” [9-10] ranks second in the list of global sustainable development goals 2016 - 2030, approved in 2015 at the UN summit.

Developing this approach, V.F. Mayer, V.M. Rutgaiser [11] identified the relationship between consumption and production, and also determined the establishment of optimal proportions between production and consumption. Within the framework of modern economic science, scientists [12-14] actively studied the problems of national, economic and food security.

4. Solutions, results and recommendations
One of the main socio-economic aspects of national security is food security, since its livelihood depends on the physical provision of the population with food. Focusing on content characteristics ”food security” was limited only to the problems of the agricultural sector functioning and food independence. But in our time, it is obvious that the analyzed approach is considered both socio-economic and agrarian-industrial. In this regard, we believe that food security is one of the main conditions for the reproduction of the labor force, since it is the main reproductive category.

As a rule, food security is considered in the state and regional aspects since this is determined by various factors: natural and climatic conditions, demographic situation, as well as the socio-economic development of the regions. Therefore, the satisfaction of food needs for each individual person should be carried out in the places of his residence. At the same time, it should be borne in mind that the main burden in the food security formation is laid on the entities that are directly responsible to the population for its sufficient provision with quality food.
Summarizing the considered approaches to defining the essence of the "food security" concept, we believe that it is characterized by quantitative indicators and access to food. In a broad sense, the concept of "food security" can be represented as follows (Fig. 1)

![Diagram of food security concepts]

**Figure 1.** The main approaches to the definition of "food security" concept.

Focusing on the main approaches to the definition of "food security", it should be noted that this term is considered as the process of providing the population with food in accordance with physiological needs and norms. In this regard, it is necessary to consider the management model of the food security system, which is shown in Fig. 2.

![Diagram of dynamic food security system]

**Figure 2.** Model of a dynamic food security system.

The equation of a dynamic system state is written in the following form:

$$dA/dt = F [X(t), A(t), X(t+k), Z(t), S(t), I(t)].$$

(1)

F – system evolution function;
X(t) – entrance state (characteristics of industries that ensure food security for a certain period of time);
A (t) – the dynamic state of the system, measured by an increase in yield, acreage, an increase in the production and sale of food products, etc.;
X(t+k) – exit state (characteristics of industries that ensure food security for the planned period);
Z (t) – the state of the management system for the industries that ensure food security, including the level of government influence on the sectors;
S(t) – resource potential, climatic conditions, land characteristics, etc.;
I (t) – information flow.

Continuous monitoring that allows you to track the process of food production and consumption should contribute to food security research. In the process of monitoring, the factors that affect food security in different ways are determined, while using criteria that reflect the essence of achieving a global goal process, indicators and their threshold values. For each of the indicators, limit values are determined, deviations from which are a signal of the emergence of a socio-economic destabilization threat. The indicators characterize the limit values, the ignoring of which hinders the effective economic and social development and leads to the destructive trends formation in production and the standard of living of the population [15].

New commotions related to climate change, conflicts, pests and infectious diseases (such as COVID-19 and African swine fever) are damaged by food production, violate the delivery schedule and the ability of people to access nutritional and accessible food causing new food security problems in 2020. Food security becomes one of the main elements of the state's national security providing its autonomy and independence from neighboring countries. Improving the availability of safe and nutrient food and maintaining food security in a crisis is fundamental to ensure the prospects for future generations.

5. Conclusion
Thus, food security is an important component of economic security. Ensuring it at a sufficient level allows you to get a healthy, smart and overcrowded by desire to act labor which will contribute to the development of the economy. A priority in providing food security in the region belongs to the agrarian sector, the quality and safety of food are equally important. The agrarian sector is an important strategic industry in the national economy, which provides food security and food independence of the state that characterizes the agro-industrial complex as an element of the country's national security.

In the modern economic conditions of the high "smart" technologies domination, under the action of globalization, integration, decentralization, informatization and digitalization processes, the presence of a powerful potential does not guarantee the qualitative results of its use. Innovations and information technologies in the agro-industrial complex are gaining colossal pace of development. It is they who in the near future will define the leaders of both domestic and world agri-markets.

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