Digitalization and Economic Strategies for Strengthening State Food Security Systems

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Abstract. The research objective is to identify the most promising areas of digitalization in the field of food security in Russia. The methodological basis of the study is comparative analysis. It was used to determine the consequences of the use of digital technologies in various areas based on 2021 statistical data. Results. The author defined the Russian model of digitalization for ensuring food security of Russia, revealing the most promising areas of digitalization of agriculture in Russia: financial settlements in electronic form, access to databases via the Internet, and electronic document management systems. The research prospects are related to the specification of economic returns from each of the areas of digitalization in Russia, seen from the viewpoint of food security and quantitative measurement. The empirical value of the revealed prospects of improving digitalization in the sphere of food security is explained by the fact that the orientation of state regulators of the economy towards it will ensure the maximum use of the potential for strengthening food security in Russia in 2030-2031.

1 Introduction

The growing number of digital technologies and devices that allow the application of these digital technologies makes it possible to increase the intensity of information flows from various sources [1], participants in the production chain, and orient towards the use of modern methods of obtaining and processing information [2].

The use of digital technologies in the production complex, ensuring the availability of more complete and qualitative information for the consumer, makes it possible to optimize production, reduce the level of risks and negative consequences from them, and provide a rational choice of logistic decisions [3]. One should recognize the fact that the use of digital

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technologies is becoming common in large companies and holdings, while small manufacturing enterprises, small and medium-sized businesses remain unnoticed or uncovered.

A comparative analysis of production capacities and food markets in developed countries (Russia, Germany, the USA, and China) allowed stating that Russia has the largest resources per capita, but the efficiency of their use is rather low. That is why the country has to import basic foodstuffs in order to saturate the domestic food market [4, 5]. The analysis of consumption of some basic types of food allowed identifying the nutrition types most common in these countries. The most favorable situation is observed in Germany, and less favorable in the United States due to excessive consumption of foodstuffs rich in carbohydrates [6, 7].

From a doctrinal viewpoint, production security is the economy condition in which every citizen of the country has sufficient physical, social, and economically reasonable access to safe and wholesome foods. These foods must be balanced and fulfilling the nutritional requirements of the individual based on their needs.

Food security issues are more acute in countries with unfavorable climatic conditions or with less land resources. The high population density and low income levels of these countries do not allow them to meet the demand for necessary foodstuffs from their resources [8, 9].

The level of food security is assessed by food balance. Food balance is a system of aggregated and analytical indicators reflecting the supply sources of the main types of food products in the country: production and imports, as well as comprehensive information on the use of these food products. The balance is provided annually, which is necessary to characterize the state of food security in a given period [10, 11]. The balance determines the level of self-sufficiency in basic foodstuffs. The level of self-sufficiency is understood as the degree to which the country's demand for a given product is met from its own resources [12, 13].

The evolution of agricultural production consists in the alternation of various techniques and technologies. Throughout the history of the agricultural sector formation there were several transitional periods, which were marked by the introduction of new technological processes that simplified the task of the state in providing its population with food [14]. It was important to affect all processes of the production cycle, from manufacturing and storage to processing and consumption by the customer [15, 16]. The quality of manufacturing and raw materials, as it is known, determines the profit; therefore, the more new ways of improving efficiency are applied, the easier it is to fulfill this task. In the 21st century, the greatest breakthrough factor in the development of agriculture is its digital transformation.

Most modern studies of digital economy are based on the concept of post-industrial model of society development described by an American futurologist, sociologist and philosopher E. Toffler in his book "The Third Wave" [17]. This article just marginally touches upon the issues of digitalization of economic processes; however, production capacity and food security in general concern all economic processes. Russia is in the post-industrial period. This is the time of digital resources and tools, the time to improve the quality and efficiency of practical application of various safe consumption techniques.

It is important to remember that in the period of economic processes transformation and introduction of new means and forms of working with information, numerous researches appear in various fields of knowledge, but all of them must meet the principles of reliability and relevance. At the peak of recent scientific debates is the concept of "fourth industrial revolution", the main theorist of which is Klaus Schwab, the founder and president of the World Economic Forum. According to K. Schwab, the fourth industrial revolution differs significantly from the previous ones in terms of the scale and degree of transformation of the

technosphere. This is because it is characterized by the introduction of many fundamentally new technologies that lead to the diffusion of the physical, digital and biological worlds.

Digitalization processes make it possible to expand the possibilities of states in economic development. The current revolutionary changes promote the use of the latest transformation methods in agriculture and production sphere. The system of super-smart artificial intelligence allows changing the processes of logistics, raising animals for food needs, improving the agribusiness of the region, etc.

2 Materials and Methods

The term "food security" means a state of the economy and agro-industrial sector of the country, which, while preserving and improving the environment, regardless of external and internal conditions, allows the country's population to consistently receive ecologically safe and healthy food products at affordable prices, in amounts not lower than scientifically substantiated norms.

The theoretical research was based on academic works, statistical studies on the food security digitalization, and analytical materials on the production sector development. The methodological basis of the study was a combination of general scientific methods such as abstraction, analysis and synthesis, induction and deduction and others.

3 Results and Discussion

Food security is a component and the most important part of national security, as it ensures sustainable production of basic foodstuffs and their availability to the population. Ensuring food security contributes to a sustainable social climate in society. In the absence of necessary stocks and reserves in the regions, dissatisfaction of the population may arise, which allows considering the food issue as the most important structural element ensuring national security of a country.

Notably, modern systems providing the population with food are complex. Each country is characterized by its unique production system and peculiarities of agricultural production. Due to the trends in the production complex development, it is necessary to use additional natural objects, attract workers and representatives of rare specialties, modernize production, and introduce innovative technologies [18].

According to Yu.S. Khromov, food security is a concept that can be understood in different ways [19]. On the one hand, it is associated with the economic process of food supply, on the other hand, with the need for food supply within the system of national security. It is necessary to achieve an optimal combination of all the properties that contribute to providing the population with food in the most full-fledged way in terms of volume and quality. It is important to develop new indicators of the state's food security and its quality, and to carry out the appropriate assessment.

It is considered correct if the food security concept reflects the socio-economic responsibility of state institutions and all citizens. Talking about safe consumption, we mean healthy consumption, compliance with the criteria of food quality and its sufficiency for the state's population. Food must be accessible to citizens and safe in composition.

According to N.P. Zyryaeva, "food self-sufficiency characterizes not so much the food security of the population as the food security of the country as a state" [20].

As follows from theoretical studies and statistical reviews, the issues of food security of any state are complex. The state must develop and implement a unified program for the introduction of digital technologies in the production complex in order to prevent a crisis in the consumption of goods and services [21]. The system of orders and their distribution by

regions within the state is carried out taking into account the regional aspect, includes the use of all the latest technologies in the production sphere, and involves all the possibilities of small and medium-sized businesses.

4 Conclusion

Based on the theoretical approach, food security is a well-functioning system capable of providing all segments of the population, regardless of their material well-being, with high-quality food. We consider it correct that food security of the Russian Federation can be ensured only within the framework of a comprehensive approach, while its basic components should be enshrined at the legislative level by adopting a unified concept. Also, in order to ensure food security, it is necessary to take into account all the recent achievements of modern digital tools.

The use of digital technologies in the production complex is a future and a reality that will come soon. Digital solutions will soon have to provide digital security in the food sector. The state will then become a future-oriented and fast-developing state.

The main methods of using digital technologies include:

1) incentivizing;
2) motivation;
3) attraction of additional funding sources;
4) formation of information analytical base;
5) return of a part of costs;
6) formation of personnel potential possessing qualitatively new knowledge providing innovative decision-making.

Small and medium-sized businesses most of all need a governmental support, as they are at initial stages of transition to digital platforms and undoubtedly need support both at the federal and municipal levels.

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