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Food Stocks as a Food Security Factor: Theoretical and Methodological Aspects

Existencias de alimentos como factor de seguridad alimentaria: aspectos teóricos y metodológicos

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Abstract

The issue of food security is a pressing one for the entire global community. This problem must be solved together at the expense of the resource capacity of countries that have sufficient or predominant agrarian specialisation to produce staple foods. Food security is ensured by favourable assessment criteria of the physical and economic accessibility of staple foods to the population. At the same time, it is necessary to take into account the presence of the poor part of the population in the area under study or the country as a whole, who need state support, which in modern conditions is more appropriate by providing a minimum sufficient level of basic foodstuffs. The availability of food supplies in addition to social support shows that food security is sustainable. The paper presents the author's definition of the concept of "food reserves", as well as a methodology for assessing the level of economic availability of basic food to the population. The practical aspect of the study was formed by developing strategic measures for the formation and use of food stocks.

Keywords: food stocks, food, food security, hunger, poverty.

Resumen

El tema de la seguridad alimentaria es urgente para toda la comunidad mundial. Este problema debe resolverse conjuntamente a expensas de la capacidad de recursos de los países que tienen una especialización agraria suficiente o predominante para producir alimentos básicos. La seguridad alimentaria está garantizada por criterios favorables de evaluación de la accesibilidad física y económica de los alimentos básicos para la población. Al mismo tiempo, es necesario tomar en cuenta la presencia de la parte pobre de la población en el área de estudio o del país en su conjunto, quienes necesitan el apoyo del Estado, que en las condiciones modernas es más apropiado al brindar un mínimo suficiente. nivel de alimentos básicos. La disponibilidad de suministros alimentarios además del apoyo social muestra que la seguridad alimentaria es sostenible. El artículo presenta la definición del autor del concepto de "reservas de alimentos", así como una metodología para evaluar el nivel de disponibilidad económica de alimentos básicos para la población. El aspecto práctico del estudio se formó mediante el desarrollo de medidas estratégicas para la formación y uso de reservas de alimentos.

Palabras clave: existencias de alimentos, alimentos, seguridad alimentaria, hambre, pobreza.

Introduction

In today's globalised economy, there are clear inequalities among countries in terms of food security, which predetermine the different levels of food security for each country in the world. This is due to a multitude of influencing factors of a natural and climatic (resource), economic, cultural, sociological, military and political nature. The underdeveloped agrarian sector of a country's economy and the supremacy of world food prices lead to increased dependence on imports and exacerbate the problem of food security. In this regard, one of the most important directions to stabilise the food security situation may be the formation and rational use of food reserves (Nazarenko, 2011).

The study of food stocks provides for the purpose of developing theoretical and methodological provisions and practical recommendations on the formation and use of food stocks in modern conditions (Yarkova, 2014).

The setting of such a goal is due to the fact that the availability of food supplies indicates sufficient or excessive agricultural production and a sustainable level of food security, accordingly.

Meanwhile, in most of the works of the Russian scientific community there is an understanding that food security is the result of an efficiently built agricultural policy, the availability and rational use of resources for agriculture (Yarkova, 2020; Khairullina & Yarkova, 2019; Gogolev et al., 2011).

There is also a point of view of the World Health Organization and the UN FAO that has developed over many years; the point of view resides in the fact that food security as a socio-economic category has concentrated on three key aspects (Linkevich & Kleshneva, 2020):

- Firstly, the constant availability of food, regardless of domestic or imported production (https://www.who.int);
- Secondly, ensuring access to food, i.e. availability of sufficient resources for adequate nutrition (https://www.who.int; Chernogor, 2018);

- Thirdly, the correct use of quality food and water in food (https://www.who.int; Mikayilova & Nağibəyli, 2020; Chernogor, 2018).

While the first aspect is quite understandable and clearly traced in a number of Russian regulatory documents, in particular in the Food Security Doctrine (2020), in relation to the second aspect we are talking about the physical and economic accessibility of food for the population. It should be emphasized here that at the present time, in the conditions of constantly arising and replacing economic crises, the population is becoming poorer, some of them are degrading, and some survive and need constant support from the state, primarily to meet the vital need for food. The third aspect is aimed at normalizing and balanced nutrition, taking into account the established traditions, and food culture in several regions of the world. Any state in the world should act as a guarantor of security for each of its citizens, including food security. First of all, we are talking about the poor part of the population, for which the state must form stocks of basic food, in addition to the available strategic reserves, which could play a significant compensating role. It is in this regard that the relevance of food stocks is clear and is a very important primary problem that affects the interests of the nation, its security, and integrity in every sense of the word.

Thus, according to the theoretical and methodological understanding of the author, “food stocks” should be understood as the main types of high-quality food stored in specialized facilities of the regions and subject to regular updating due to national agricultural production, with an ambivalent nature of use, which implies the reduction of potential risks and threats for national security, as well as providing food for socially significant facilities and people with a low standard of living.

In general, it should be noted that the process of formation of food reserves itself is based on economic technologies, which are represented by a set of organizational, managerial and economic impacts in relation to objects and subjects of the agricultural sector of the economy involved in the formation and use of food reserves, and in timely replenishment in order to strengthen and maintain food security positions.

To confirm the objectivity of the author's hypothesis, it is important to use a retrospective analysis of the problem under study; this will reveal the trends and main stages of the development of food security from the standpoint of the formation of food reserves.

The study of Russian and foreign experience made it possible to determine that initially the problem of providing the population with food was solved through the formation of reserves, and only in the

second half of the 20th century the Soviet and world community become more active to research and solve the problem of food security.
One of the founders who have worked for the establishment of the state's food security through the formation of food reserves in Russia was Boris Godunov at the end of 16th century during the times of regularly recurring crop failures and general turmoil in the country. That period of time was characterized by massive famine, the situation with grain and bread was catastrophic, which served without any scientific justification as a basis to make a reasonable decision on the formation of three-year grain reserves.

The follower of this format for solving the problem of food security in the state was Tsar Peter I (XVII-XVIII centuries). It was by his order that the formation of food supplies began to have a dual purpose: for military purposes and for the civilian population.

Further, the idea of forming food supplies in Russia was successfully implemented under Tsar Paul I and improved under Alexander I. In particular, the latter formed food warehouses at the provincial level due to the limited transport interchange. The volumes of reserves were calculated for the civilian population within a radius of 12 versts (Nazarenko, 2011).

Of course, there was no scientific substantiation in the decisions made by the rulers of those times, which could not bring the maximum social and economic effect. A methodology was required that would make it possible to accurately substantiate the volumes of necessary food and agricultural raw materials for civilian and mobilization needs. Only at the beginning of the 20th century, namely in the 1920s, when mortal hunger and poverty began to reign again, the country (USSR since 1922) began to develop methods of calculating consumption per capita of urban and rural population, for the army supplying needs, as well as accounting carryover stocks of grain. The forces of the Union of Countries (USSR) prepared and organized an elevator network, regularly carried out and improved measures to develop a large-scale transport and trade food network, and finally, a state food reserve was created (Kuzin, 2010). In just two years, the combined efforts of the allied states formed a food grain reserve, represented by 400 million poods (weight unit equal to 16 kg) of grain.
In general, the main achievements of theory, methodology and practice in relation to the problem of food security at the Russian and foreign level in the following years and up to the present can be represented in the form of seven main stages.

Stage 1, "Generation" (20s of the XX century), is characterized by the beginning to perform the measures to form state food reserves with the use of scientifically based norms of consumption of basic food.

Stage 2, "Weakening" (50s of the XX century), was distinguished by large-scale work on the "rise" of agriculture and the development of virgin lands. There was common weak attention to technical and technological development in the country, even for the agricultural sector. The level of grain supply was the main indicator of the level of food security, which at that time was equal to only 40%.

Stage 3, "Threatening" (70s of the XX century). During this period of time, food security issues were actively discussed at the level of the world political community (UN). The global problem of hunger has formed the basis of the permitting ability to supply imports to countries in need, thereby increasing their external debt and increasing import dependence. In the USSR, despite an active planned economy, there was an irrational distribution of scarce labour resources; agriculture was in a crisis state with predominance of manual and partially mechanized labour. The principle of self-sufficiency in food was not fully implemented, which was confirmed by the growing indicator of import dependence, which during this period was about 10%.

Stage 4, "Critical" (80s of the XX century), which was the beginning of economic and political restructuring, that has led to the collapse of the planned economy; there was a shortage of food; domestic and foreign debt reached critical values and the level of import dependence doubled. In the countries of the European Union, the understanding of food security expanded; the concept of "multi-structured agriculture" was introduced as a ruling principle. The United States has developed and enacted the Food Security Act 1985.

Stage 5, "Catastrophic" (90s of XX century and 2000s of XXI century), when the political views of many developed and developing countries of the world have been reoriented towards food security issues. In the European Union and the United States, the level of financial support for agricultural sectors is growing, and the rate of export is increasing. In Russia, agricultural economists were actively working on the development of theoretical, methodological and practical measures aimed at maintaining the food situation in the country. Imports exceed the critical level of 35%. In the 2000s, targeted software was developed for

measures to regulate agriculture and food markets, and the only normative legal act was adopted, i.e. the Doctrine of Food Security of the Russian Federation.
6 stage, "Stimulating" (2010s of the XXI century), when there was one of the key moments of this period for Russia: the entry into the WTO and opposition to this process by a number of Russian politicians and the scientific community. The imposition of sanctions by the EU countries and the US on certain sectors of the economy caused the introduction of Russian retaliatory measures against the supply of imported food. Activation of import substitution processes initiated the formation of a roadmap.

7 stage, "Unpredictable future" (2020), includes the spread of COVID-19 infection, limitation of the activities of a number of organizations, including agro-industrial complex. We see world economic crisis and falling GDP in almost all countries. Incomes of the population decrease and economic affordability of food lowers; there is concentration of cash in the hands of the population, and a rush demand for basic types of food with a long shelf life. The role of digitalization for the agro-industrial complex and food markets strengthens.

Analysis of the main periods of studying and solving the problem of food security and food supply to the population allows us to conclude that out of the seven presented stages, the first five have a negative development trend, and only the last two stages stimulated and allowed the development of Russian agriculture and food markets through the implementation of the main processes import substitution. This has brought definitely positive results in terms of meeting the needs of Russian citizens in the main types of food (Table 1).

Table 1. Prospects for the Russian agro-industrial production of certain types of food and the possibility of solving the problem of food security *

Types of food	Target indicators of the Food Security Doctrine 2010,%	Actual level of consumption of domestically produced food products,% (for the period of 2018)	Prospective level of production and sale of domestic food (Food Security Doctrine 2020),%	Possibility of achieving targets (according to expert assessments)
Grain products	95	99	95	Yes
Sugar	80	95	90	Yes
Vegetable oil	80	85	90	Yes
Meat	85	93	85	Yes
Milk	90	84	90	Yes
Fish	85	81	85	Yes

* Compiled and calculated by the author using data from Rosstat (Federal State Statistics Service of Russia)

Based on the data in Table 1, it can be noted that the target indicators of the “new” Doctrine in Russia have changed in relation to a few types of food: these are sugar and vegetable oils, from 80 to 90%. Statistical data for 2018 objectively assess the negativity of the situation in the field of milk and fish supply. But at the same time, the Russian agro-industrial complex and agriculture have all the necessary resources to achieve the targets in the near future.

It is important to pay attention to the current "unpredictable" stage in the development of food security, which is burdened by a negative biological factor of natural origin (COVID-19), according to scientists. The shocks caused by the widespread pandemic of 2020 had a strong impact on the decrease in the economic affordability of food for the population both in Russia and in other countries of the world due to a decrease in the income of citizens and a radical change in the structure of expenses.
In general, the problem of economic affordability of food should be considered not only in quantitative, but also in qualitative aspect.

It is recommended to regularly assess the degree of economic affordability of food to the population. In the event of critical values, this will allow to take a set of interrelated and decisive measures to stabilize the price situation on the food market, which is conditioned by supply and demand.

The basis of the desired indicator must include two main criteria:

1) The actual expenditures of the population for the main types of food for the year F_f (formula 1);

$$F_f = \sum_{i=1}^{n} \frac{Y_i \times \bar{D} \times H}{100} \times 12, \quad (1)$$

Where Y_i - household expenditures in the region for the i-th type of staple food,%;

- D - average per capita income of the population per month, roubles;
- H - population of the region, people;
- 100 - constant conversion factor % to natural values;
- 12 - the number of months in a year.

2) Expenditures of the population (normative) for the main types of food, roubles - R_N (formula 2).

$$R_N = \sum_{i=1}^{n} \left[C_i \times \sum_{j=1}^{n} \left(N_i \times K_{hi} \times h_j \right) \right], \quad (2)$$

Where C_i - price for the i-th type of basic food, roubles / kg.

As a result, we obtain the aggregate form of calculating the economic availability of basic food for the population - W (formula 3):

$$W = F_f \ / R_N \rightarrow 1, \quad (3)$$

In a more detailed form, the calculation tool for determining economic affordability is as follows (formula 4):

$$W = \sum_{i=1}^{n} \frac{Y_i \times \bar{D} \times H}{100} \times 12 \ / \sum_{i=1}^{n} \left[C_i \times \sum_{j=1}^{n} \left(N_i \times K_{hi} \times h_j \right) \right] \rightarrow 1, \quad (4)$$

The calculation mechanism proposed for the diagnosis of the degree of economic affordability of food for the population assumes the tendency of the result to 1. Only in this case it is possible to testify to the provision of adequate nutrition, which will not only allow maintaining a healthy lifestyle, but also exclude the overspending of the population's funds on food.

Along with such an assessment, it is necessary to annually keep records of the presence in a particular territory of the country of a low-income category of citizens living below the poverty line, whose income does not exceed the subsistence level.

Based on the number of poor citizens, the level of criticality of the economic availability of food for the population, the state needs to form food reserves to provide with them the disadvantaged population and socially significant facilities.

The strategy for the implementation of the set goal for the formation of food stocks should be based on the state of development of agriculture and the agro-industrial complex in general, as well as on the basis of the proposed evaluation unit (Fig. 1).

It is also proposed to include in the evaluation unit the definition of the physical accessibility level, which is determined on the basis of the production results in agricultural sectors, the total population, and the standards of consumption of the main food types. At its core, the physical availability of food is the ability to meet the needs for basic food products through our own production (Miloserdov & Miloserdov, 2012).

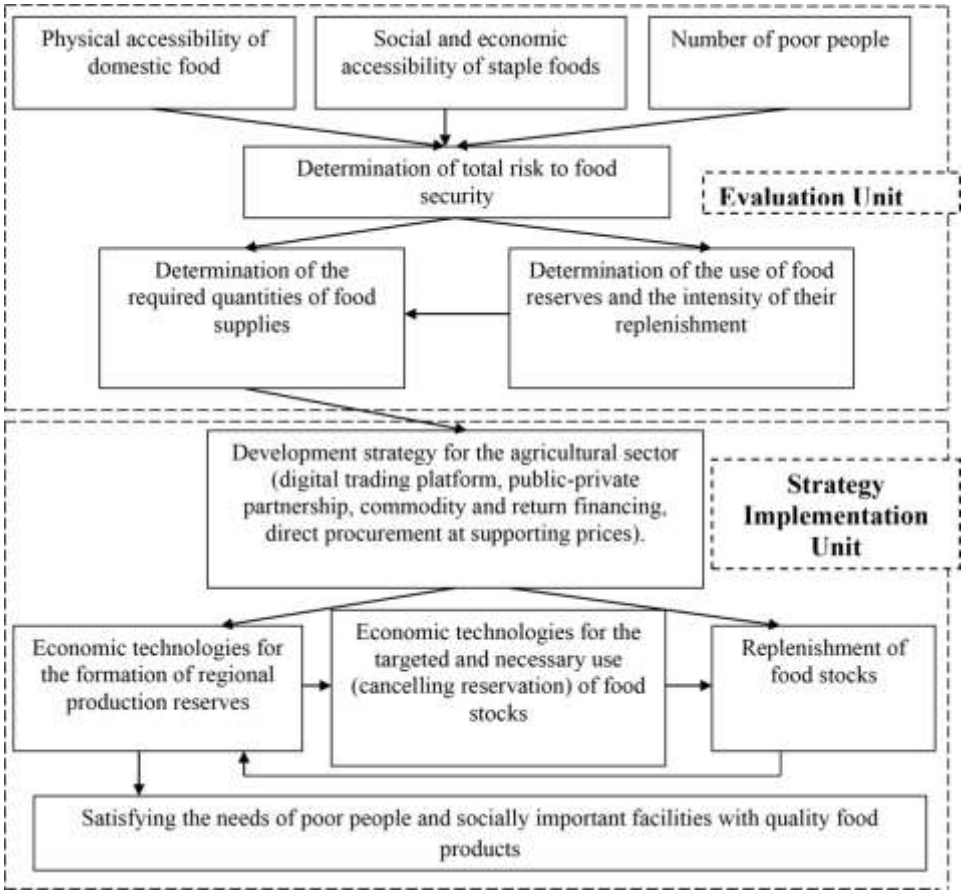

Figure 1. Aggregate assessment of food security and safety and the process of managing and strategic using food stocks

In general, the processes for the formation of food reserves must be implemented at the regional level within the country. Each region has an individual set of organizational and economic technologies and the necessary resources for the creation, use and renewal of food supplies.

Food supplies can reduce the risk of socio-economic tension, and in the event of different risks and threats, they can minimize them. The very presence of food reserves in a region or in the whole country knowingly determines the level of food security as relatively stable, and a calculated assessment of the levels of physical and economic availability of food for the population allows a more detailed assessment of the causal relationships of food security.

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