

Research Article

Comparative analysis of theoretical and legislative approaches to the definition of “food security” notion and criteria for its estimation

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ABSTRACT

Objective: To study the theoretical approaches to defining the notion of “food security” in the works by the Russian and foreign scholars, normative-legal and legislative acts of Russia and CIS countries. To perform a comparative analysis of the existing interpretations of this economic category, to reveal their drawbacks and develop an author’s definition.

Methods: Scientific methods used when writing the article are: abstract-logic method, analysis and systematization.

Results: The research revealed the drawbacks and inaccuracies of the definitions of “food security” in scientific literature and normative-legal acts of various levels. The author’s interpretation of the “food security” economic category is proposed, reflecting such components as economic access, physical access, quality of products.

Key words: criteria of food security, economic access to food, food security, physical access to food.

INTRODUCTION

Today, food security is the basis of social-economic development and an important element of economic and national security of a state. Within the system of food security provision, the conditions and mechanisms are formed which help counteract the threats to economic security and develop the reproduction processes in agriculture and agricultural-industrial complex. The said conditions and mechanisms are the basis for increasing the level of self-reliance both of individual regions and the country as a whole.

National food security is a relatively new research object for the Russian scholars. For the first time, the issues of food security were touched upon in the works by Th. Malthus. He came to a conclusion that the population growth exceeds food production growth many time,

thus, there may be not enough food for everybody. Th. Malthus contended that a special mechanism exists to automatically provide the correspondence of the number of population and the amount of subsistence means – namely, diseases, vices, and wars.

MATERIALS AND METHODS

The comparative analysis of the “food security” category is based on the research of interpretations by both Russian and foreign scholars, as well as on definitions given in international normative-legal acts and laws of CIS countries, Russian Federation and individual Russian regions.

RESULTS

Economic and scientific literature provides

various interpretations of the “food security” in Table 1.
notion. Systematization of this notion is shown

Table 1. Definitions of food security in scientific literature on Economics

| Author | Interpretation of “food security” |
|--|--|
| A.I. Altukhov (1999, pp. 58-66) | Capability of the state to guarantee satisfaction of the need for food at the level ensuring normal living. |
| E.N. Artamoshkina (2013, pp. 58-66) | The state of economy and agricultural-industrial complex, under which, irrespective of the influence of various internal and external factors, the needs of the population in food are satisfied completely in compliance with the consumption norms. |
| U.Z. Safin (2010, p. 19) | A set of social-economic relations arising with the aim to provide the population with food in quantity and quality complying with the norms, on the basis of innovative development of reproduction processes in agriculture and providing security in the agrarian food sphere. |
| A.A. Kudryashova, O.P. Presnyakova (2007, pp. 18-21) | Provision of guaranteed satisfaction of the need for food (including the current consumption and stocking) assuming that the produced food is safe. |
| E.V. Serova (1996, p. 17) | The degree of availability of food, necessary for maintaining the normal way of living, for the main part of the country’s population. |
| O.A. Chernova, V.E. Stepanenko (2006, pp. 44-48) | Provision of the population with essential food of own production, affordable for all the country’s citizens in the amounts and assortment enabling to maximally satisfy the necessary and merit needs. |
| M. Tracy (1995, p. 431) | Food security is an argument for the measures aimed at protecting the domestic production of food. |
| G. Conway, E. Barber (1990, p. 60) | Constant guaranteed access of the population to the necessary amount of food for maintaining active and healthy life. |
| Bozena Gulbicka | Possibility for the whole population to constantly receive food in sufficient quantity for ensure active and healthy life style. |
| Z.Kh. Zhavnbekova (2003, pp. 23-27) | A category expressing relations between the state and the population in regard to forming conditions for satisfying all needs of the citizens in food in compliance with physiological norms. |
| I.P. Lupashko-Stalskiy (2002) | Provision of all the country’s population with all key kinds of food produced domestically, with the obligatory priority of the most vulnerable, low-income groups and with the condition of physical and economic access to food in the quantity and quality necessary for maintaining people’s health and activity, complete or maximal possible independence of the state from external sources of food. |
| E.S. Ospanov, A.A. Kaygorodtsev (2006, p. 204) | The state of economy and agricultural-industrial complex, under which it is possible to ensure stable provision, by domestic production, of all the country’s population with all key kinds of food, with the obligatory priority of the most vulnerable, low-income groups and with the condition of physical and economic access to food in the quantity and quality necessary for maintaining people’s health and activity. |
| S.U. Nuraliev (2003, p. 34) | The state of economy under which, irrespective of the global markets conjuncture, the stable provision of the population with food is guaranteed, in the quantity complying with the requirements of scientifically-substantiated medical norms. |
| G. Sultanbekov (2001, p. 42) | Uninterrupted provision of the population with quality food, mainly of domestic production, at the level sufficient for maintenance of people’s life and health. |
| L.A. Bimendieva (2003, pp. 14-16) | A system of economic, organizational, technological, and social factors aimed at the stable functioning of agricultural-industrial complex with the view of satisfying the demand of the population for various and quality food, creating the required reserve stocks and exporting the excess food. |
| E.I.Kendyukha (2014) | The state of the country’s economy under which, irrespective of the global markets conjuncture, the stable provision of the population with food is guaranteed, in the quantity complying with the requirements of scientifically-substantiated norms, i.e., the |

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| | supply is provided and the conditions for demand and consumption at the level of medical norms are created. |
| V.I. Nazarenko (2011, p. 286) | The system including several subsystems: food independence (capability of a country to satisfy internal needs from internal sources); social stability (access to food for all social groups of the population); demographic stability (health level of the society, depending on the level of nutrition and food provision); food production sphere (basis of life provision for the population). |
| I.G. Ushachev (2008, pp. 5-10) | Two components are distinguished: provision of physical and economic access to food for any person in compliance with the rational norms of healthy nutrition in quantities sufficient for active living; high quality and security of the consumed food. |
| A.V. Mozol (2007, p. 318) | The state of the country’s economy under which, irrespective of the global markets conjuncture, the stable provision of the population with food is guaranteed, in the quantity complying with the requirements of scientifically-substantiated parameters (supply), on the one hand, and the conditions for consumption maintenance at the level of medical norms are created (demand), on the other hand. |
| Yu.S. Khromov (1996) | The state of the economy under which the access of all residents to food at all times is guaranteed, in the quantity necessary for active healthy life. |
| T.V. Yuryeva (1999, p. 355) | Constant accessibility to sufficient amount of food for maintaining active and healthy life of all people. |
| N.Ya. Kovalenko (1999, p. 29) | Provision of the country with appropriate resources, potential and guarantees for satisfying the needs of the population in food in the quantity not less than medically substantiated norms regardless of the internal and external conditions. |
| G.S. Vechkanov (2005, p. 86) | The state of the economy under which there is balance between the supply of food and the current consumer demand at the prices affordable for the population and with sufficient assortment, and the necessary reserves of food are made. |
| N. Kharitonov, N. Radugin, (1998, p. 13) | The capability of the state, provided with appropriate resources, potential and guarantees, regardless of the internal and external conditions (threats) to satisfy the needs of the population in general and each citizen in particular in food, drinking water and other foodstuffs in the quantity, quality and assortment necessary and sufficient for physical and social development of a personality, ensuring health and extended reproduction of the population. |

In the economic and scientific literature, various interpretations of the “food security” notion are provided. Based on the performed comparative analysis of the theoretical approaches to defining the notion of “food security”, we have come to the following conclusions:

1. All authors consider food security only from the viewpoint of physical access to food.
2. The authors use the following criteria of the population provision with food:
 - a) consumption norms (Artamoshkina, 2013; Safin, 2010), though the authors do not clarify what they consider to be “a consumption norm”: physiological norms or market basket norms;
 - b) guaranteed satisfaction of the need in food (Kudryashova and Presnyakova, 2007); the authors do not clarify what they mean by this criterion;
 - c) maintaining normal way of living (Serova, 1996; Altukhov, 1999); the authors do not specify what is implied by maintaining normal way of living in regard to food security category;
 - d) necessary and merit needs (Chernova and Stepanenko, 2006); the authors do not explain how the merit needs can be measured and what is included into the necessary and merit needs in regard to food security;
 - e) physiological norms of consumption (Zhavnbekova, 2003);
 - f) medical norms of consumption (Nuraliev, 2003; Kendyukha, 2014; Kovalenko, 1999);
 - g) the level sufficient for maintaining life and health of people (Sultanbekov, 2001), life and activity of people (Ospanov and Kaygorodtsev, 2006), sufficient quantity to ensure active and healthy

- living (Bozena Gulbicka, Conway and Barber, 1990; Yuryeva, 1999; Khromov, 1996).
3. The authors listed in Table 1 do not include economic access to food for the population of a country (region) into the definition of “food security” notion.
 4. The issues of food quality are mentioned only in the definition by U.Z. Safin.
 5. The above definitions (except (Lupashko-Stalskiy, 2002)) do not specify the source of providing food security (physical access): own production or importing food from other regions.
 6. No author specifies that food security provision is possible through developing integration processes between the raw material zone and processing industry but some authors discussed about Innovation (Fartash et al., 2018; Davoudi et al., 2018).
 7. All the above definitions of the “food security” category say nothing about the demographic component of a region (i.e., they do not take into account the number and composition of the population).
- The issues of food security are considered not only in scientific economic literature but in international legal acts as well.

Table 2. Definitions of food security in international legal acts

| International legal act | Definition of food security |
|--|--|
| The Universal Declaration on the Eradication of Hunger and Malnutrition (1974) | Preservation of stability in the global food markets for access to the staple food for all countries of the world. |
| Rome Declaration on World Food Security (World Food Summit, 1996) | Physical and economic access to safe and nutritious food for all people at all time, in the quantity sufficient to meet their dietary needs and food preferences, in the amounts necessary for active and healthy life. |
| FAO report of 2001 (The State of Food Insecurity in the World, 2001) | Situation in the world when all people have physical, economic, and socially equal access to safe and nourishing food in the quantity sufficient to meet their dietary needs and food preferences, in the amounts necessary for active and healthy life. |
| Declaration of the World Summit on Food Security (2009) | Food Security exists when all people, at all times, have physical, social, and economic access to the sufficient amount of safe and nourishing food to meet their dietary needs and food preferences to lead an active and healthy life. |

Based on comparative analysis of the above international legal acts, one may assert:

- 1) all international legal acts include both physical and economic accessibility of food into the definition of “food security” category;
- 2) all international legal acts except The Universal Declaration on the Eradication of Hunger and Malnutrition include the quality characteristic of food as “safe food”;
- 3) there is no connection to the number and age composition of the population.

In CIS countries, much attention is paid to the issues of food security. In all CIS countries (both main and associated ones), normative-legal acts were elaborated and adopted, which regulate this category.

Table 3. Definitions of food security in the legal acts of Russia and other CIS countries

| Normative legal act | Definition |
|--|---|
| On the Model Law “On food security” (1999) | Food security is the state of the country’s economy, under which the food independence of the country is ensured, and physical and economic access to food for all population is guaranteed, in quantities necessary for active and healthy life. |
| On the conception of food security of the Republic of Belarus (2004) | National food security is the state of the country’s economy, under which, regardless of the global markets conjuncture, stable provision of food to the population is guaranteed, in quantities complying with the scientifically-substantiated parameters (supply), on the one hand, and conditions are created for |

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| | maintaining consumption at the level of medical norms (demand) complying with the extended reproduction of the population, on the other hand. |
| On changes and supplements into some legislative acts of the Republic of Kazakhstan on the issues of food security (2009) | Food security is the state of the country’s economy, including its agrarian-industrial complex, provided with appropriate resources, potential and guarantees regardless of the internal and external conditions, under which, the needs of the population in food are satisfied in compliance with physiological consumption norms and the requirements stipulated by the legislation of the Republic of Kazakhstan on food safety. |
| Conception of increasing the food security of the states-participants of Commonwealth of Independent States (2010) | National food security is the state of the country’s economy, under which, by means of domestic production, food independence of the country is provided, and physical and economic access to staple kinds of food and fresh drinking water is guaranteed for all the population, with the quantity and quality necessary for active and healthy life and implementation of demographic policy. |
| On food security (Republic of Tajikistan) (2010) | Food security is the state of the country’s economy, under which, by means of domestic production, food independence of the country is provided, and physical access to food is guaranteed, necessary for active and healthy life and ensuring demographic growth. |
| On food security of the Kyrgyz Republic (2008) | Food security is the state of the Republic’s economy, under which food independence of the Republic is provided, and physical and economic access to food is guaranteed for the population in compliance with the established minimal norms of food consumption. |
| On food security (Republic of Turkmenistan) (2000) | Food security is the state of the country’s economy, under which the necessary level of essential foodstuffs and food raw materials production is provided, food independence of the country is provided, and the access to food is guaranteed for all the population, in the quantity necessary for active and healthy life. |
| On providing food security (Republic of Armenia) (2002) | Provision of the food security is the state of the country’s economy which provides food independence of the country and guarantees physical and economic access to food for the population in compliance with healthcare norms. |

The carried out comparative analysis of the normative-legal acts of CIS countries, the following conclusions can be made:

- 1) All countries consider food security to be the state of the country’s economy.
- 2) When characterizing the food security, special attention is paid to domestic production of food.
- 3) Not all countries distinguish the demographic component in viewing the food security. This is characteristic only for:
 - a) the Republic of Tajikistan – food security is aimed at providing demographic growth;
 - b) the Republic of Belarus – food security is to comply with the conditions of extended reproduction;
 - c) the Conception of increasing the food security of CIS countries – food security is to promote demographic policy implementation.
- 4) The countries have different definitions for determining the physical access to food for the population:
 - a) at the level of medical norms (the Republic of Belarus);
 - b) physiological norms of consumption (the Republic of Kazakhstan);
 - c) minimal norms of consumption (the Kyrgyz Republic);
 - d) healthcare norms (the Republic of Armenia).
- 5) Economic access to food is stipulated only on the normative acts of the Republics of Kyrgyzstan and Armenia.

The features of determining the essence of food security are found in the Law of the Republic of Kazakhstan, where agricultural-industrial complex of the Republic is specially mentioned.

Table 4. Characteristic of “food security” definitions in federal and regional Russian normative legal acts

| Normative legal act | Definition |
|---|--|
| On the food security of the Russian Federation (1997) | Food security is the state of the Russia’s economy, including its agrarian-industrial complex, providing the country’s population with appropriate resources, potential and guarantees without reducing the country’s food reserves and regardless of the internal and external conditions, under which the needs of the population in food are satisfied in compliance with the stipulated physiological consumption norms. |
| On the project “On the food security of the Russian Federation” (1999) | Food security is the state of the economy of the Russian Federation, under which the food independence of the country is provided and the physical and economic access to food is guaranteed for all the population, in the quantity necessary for active and healthy life. |
| Strategy of national security of the Russian Federation up to 2020 (2009) | Food security is provided by the development of biotechnologies and import substitution of staple food, as well as by preventing exhaustion of oil resources and decreasing the agricultural and crop lands, seizure of the national crop market by foreign companies, unrestrained spreading of food obtained from genetically modified plants with genetically modified microorganisms and microorganisms having genetically modified analogues. |
| Doctrine of food security of the Russian Federation (2010) | Food security is the state of the country’s economy, under which the food independence of the Russian Federation is provided and every citizen is guaranteed the physical and economic access to food complying with the requirements of the Russian legislation on technical regulation, in quantities not less than the rational norms of food consumption, necessary for active and healthy life. |
| Law of Nizhegorodskaya oblast “On providing food security in Nizhegorodskaya oblast” (2011); Law of Sverdlovskaya oblast “On providing food security in Sverdlovskaya oblast” (2012); Law of Ulyanovskaya oblast “On providing food security in Ulyanovskaya oblast” (2011) | Food security of a region is the state of the region’s economy, under which every resident of the region is guaranteed the physical and economic access to food complying with the requirements of the Russian legislation on technical regulation, in quantities not less than the rational norms of food consumption, necessary for active and healthy life. |

Having studied the normative legalbasis of Russia and its individual regions (Nizhegorodskaya, Ulyanovskaya and Sverdlovskaya oblasts), one can make a conclusion:

- 1) All normative legalacts(except Strategy of national security of the Russian Federation up to 2020):
 - a) consider food security from the viewpoint of physical and economic accessibility;
 - b) define food security as the state of the country’s economy;
 - c) consider rational consumption norms to be the main criteria of providing physical accessibility of food;
 - d) consider provision of the population with quality products to be a condition of food security.
- 2) The specific features of Strategy of national security of the Russian Federation up to 2020 are as follows:
 - a) import substitution, biotechnologies development and improving soil resources are considered to be directions of providing food security;
 - b) it suggests not complete elimination of genetically modified raw materials for producing food, but only “reducing its uncontrolled use”.

In general, according to the scientific literature, the estimation of food security of the population is determined by the following:

- physical access to food, which is interpreted as access to food in the whole country’s territory at every moment of time and in the necessary assortment;
- economic access to food, which implies that the income of a citizen, regardless of the social status and place of residence, enables them to purchase food, at least at the minimal level of consumption;
- security of food for consumers, i.e. the possibility to prevent production, marketing and consumption of substandard food capable of damaging the people’s health.

N.S. Ogluzdin (2003) proposes a clear 5-score system to characterize the degree of food security of a country. Each score is determined by the state of food-producing industries, the degree of their provision to the population, the quality of food, access to it for the population, the volume and possibilities of increasing the strategic reserves of food, the condition of industrial and scientific-technical basis and possibilities for preserving and improving the living environment. The researcher distinguishes three types of conditions for achieving the food security. Their composition is shown in Table 5.

Table 5. Conditions for achieving food security

| Conditions for achieving comprehensive food security | Conditions for achieving partial food security | Food security will not be achieved |
|--|--|---|
| The country’s population is provided with the domestically produced ecologically safe and wholesome food in compliance with scientifically-substantiated norms, taking into account the gender, age, working conditions, natural-climatic conditions and national traditions. | The country’s population is provided with the domestically produced food by not less than 85%, and the food is ecologically safe and wholesome. This norm is close to the one adopted by the Food and Agricultural Organization. | The country’s population is provided with the domestically produced ecologically safe and wholesome food by 60-80%. |
| Prices for this food are affordable for all citizens, families with many children, pensioners regardless of nationality or occupation. | Prices for this food are affordable for the main part of working population. | Prices for this food are not affordable for the main part of working population. |
| Strategic reserves of food are created in case of natural disasters, wars and other emergencies. These reserves enable to avoid hunger in the country in case of restricted distribution of food during not less than five years. | Strategic reserves of food are limited and do not ensure stable supply to the population in case of emergencies. | Strategic reserves of food are exhausted or lacking. |
| Agrarian-industrial complex, fishery and forestry are sustainably developing and possess resources to increase the food production for extending reserves and rendering assistance to other countries in case of natural disasters or wars. | The production capabilities allow increasing food production. | The production capabilities do not allow increasing food production. |
| Science is at the level of top global achievements, providing all spheres of life with the latest samples of equipment, and technologies, maintains and improves the gene pool of animal husbandry and plant cultivation, makes reliable forecasts of the society development. | Scientific-technical base is developing, though lagging behind the level of top global achievements. | |
| Nature conservation and restoration policy and practice ensure preservation and improvement of the living environment. | | |

DISCUSSION

The performed comparative analysis of the theoretical and legislative approaches to defining the category of “food security” necessitated concretization of this economic category, taking into account the identified drawbacks and inaccuracies, and formulation of the authors’ definition.

Food security should be considered from the viewpoint of a country and a region.

We believe that the notions of “food security of a country” and “food security of a region” are not fully identical. Thus, it is necessary to give the authors’ definitions for each of the above notions.

The authors’ definition of food security is given in Table 6.

Table 6. Authors’ definition of food security

| Category | Authors’ definition |
|----------------------------|---|
| Food security of a country | The state of the country’s economy and agrarian-industrial complex, which enables to satisfy the payable demand of the population for food of domestic production, the quality of which complies with the State Standards requirements, in a quantity complying with the established rational consumption norms, regardless of the conjuncture of the global markets and taking into account the probable extended reproduction of the country’s population. |
| Food security of a region | The state of the region’s economy and its agrarian-industrial complex, which enables to satisfy, in compliance with the natural-climatic conditions, the payable demand of the population for food, both food of own production (for food-producing regions) and food imported (if not produced in the region) from other regions of the country (for food-consuming regions), the quality of which complies with the State Standards requirements, in a quantity complying with the established rational consumption norms, regardless of the conjuncture of the global markets and taking into account the probable extended reproduction of the region’s population. |

The composition of the categories “Food security of a country” and “Food security of a region” differ from each other. We have analyzed the composition of these economic categories, defined their general and specific criteria. Their composition is shown in Fig. 1.

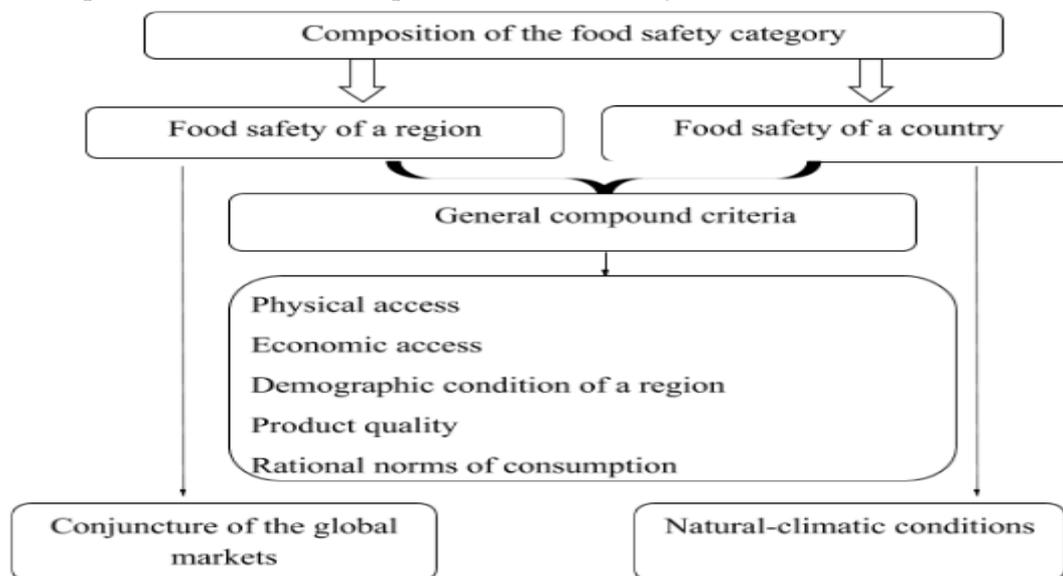


Fig. 1. Composition of the categories “food security of a country” and “food security of a region”

Many of the criteria of food security, shown in Fig. 1, are compound categories. In order to present the more comprehensive estimation of food security, reveal the factors influencing its level and search for reserves for improving its state, we itemized the composition of the criteria, which is shown in Table 7.

Table 7. Itemized composition of the criteria of food security

| Criterion | Criterion composition |
|-----------------------------------|---|
| Physical access | 1. Volume of food production: - availability of the raw materials zone and dynamics of its development (labor resources, cultivated area, number of livestock, availability of stock buildings, availability of agricultural equipment); - availability and condition of processing industry; - availability of logistic systems between producers and processors of raw materials |
| Economic access | 1. Prices for food in a country (region) 2. Living standard of the population of a country (region): - average income per capita; - average pension; |
| Demographic condition of a region | 1. Dynamics of the number of population 2. Number of population by age groups |
| Natural-climatic conditions | Climate Quality composition of soil |

CONCLUSION

Based on the performed comparative analysis, of scientific literature and normative-legal basis (that of Russia, CIS and other foreign countries), one may assert that food security is a complex economic category. Based on the revealed drawbacks and inaccuracies in the existing definitions of this economic category, the authors formulated their own interpretations of the notions “food security of a region” and “food security of a country”. The proposed authors’ definitions eliminate the drawbacks mentioned above. According to it, food security is a multifaceted economic category, which includes criteria necessary for estimating the food security. These are:

- economic access to food, expressed through providing the “payable demand of the population for food”;
- physical access to food, determined by the volume of own production and the volume of food imports from other regions);
- demographic condition of a region (number of the population and capability to increase it);
- quality of food, restricted by State Standards requirements;
- independence of external economic conditions;
- natural-climatic conditions.

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