Development of Methodological Provisions for the Assessment of National Food Security in Russia

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Abstract: Ten years have passed in Russia since the adoption of the first Doctrine of the country food security. This problem is of paramount importance for the country and it is being actively developed at the state level. This article presents a comparative description of the methodological provisions to determine the food independence of the country until 2020 and after based on the developed and approved Doctrine of food security in Russia. The tasks of food security provision are grouped, the features of food security indicator formation and calculation in Russia are disclosed. They determined the fundamental differences in the calculation of food independence and the expected changes in the threshold values of the indicators after the entry of the Doctrine 2020 into force. The advantages and disadvantages of innovations are identified. They proposed the directions of the methodological foundation improvement for national food security.

Keywords: food security, nutrition, access, population, consumption, norms.

INTRODUCTION

Meeting the challenges of food security provision in Russia is an important aspect of national security. For many years, after the destruction of the Soviet economic system and the transition to market relations, Russia reduced production and increased food imports. However, with the adoption of the Law on the Development of Agriculture and State Programs, it became clear that the volume of domestic production increase is an important state task. In 2010, the first Doctrine of Food Security was adopted, which predetermined the significance of the problem and the need to solve it. Meanwhile, it should be noted that these issues were discussed during 1973 in international practice, when the UN Food and Agriculture Organization (FAO) introduced the Concept of World Food Security. World food security implies maintaining food market stability with the availability of basic food products for all countries of the world. The term “food security” was first introduced into widespread use in 1974 in Rome at the World Food Conference. At the end of the 80-ies of the last century, this concept was rethought. If earlier approaches to this problem were associated with own production, the need for food and reserves, then the new concept justified the need for affordable food - an approach that prevails in almost all developed countries. During the meeting in Seattle in 1999, food security debates were mainly related to trade operations in the following aspects: trade is the physical and economic exchange of goods and services; the essence of trade policy

lies in the border measures applied by states to regulate the economic and physical flows of trade. However, it was noted that restrictive and protective measures contribute to price stability, poverty reduction and food security. There are the studies by scientists in this field that raise questions about the impact of exports and imports on food security, national and international food security, the typology of countries according to different criteria, the sustainability of food systems, and others. Diaz-Bonilla E. determined that subsidized food exports contributed to the further specialization of production, thereby increasing the external vulnerability of these countries (Diaz-Bonilla E. Lost in translation, 2015). The analysis of production and imports in developing countries indicates that there is a stabilizing effect on supplies: production shortages are offset by increased imports to stabilize domestic consumption, and imports decrease during the periods of domestic production growth (Bonilla, 2015).

The approach by Bingxin Yu and Lingzhi You is also interesting, which proposed the classification of countries within the framework of food security, depending on the type of trade policy, the level of domestic production and the natural and climatic conditions (Diaz-Bonilla, 2015). Eduardo Botti Abbade has identified the links between food use levels, food accessibility, and economic and physical access to food in developing countries - the main aspects underlying the concept of food security (Abbade, 2017). Roberto Capone, Hamid El Bilali, Philipp Debs, Gianluigi Cardone, Noureddin Driouech note that food security exists when all people have physical, social and economic access to an adequate amount of safe and nutritious food at any time. Nutritional safety encompasses energy, protein and nutrient requirements for a healthy life. Food systems intersect with agricultural systems in the field of food production, but also include the infrastructure of marketing, processing, transportation, access and consumption of food (Capone et al., 2014). Donna Mitchell, Darren Hudson, Riley Post, Patrick Bell, Ryan B. Williams believe that policies should adequately and simultaneously take into account all four aspects of food security for the most effective reduction of conflict risks - accessibility, stability, use and access (Mitchell et al., 2015). Russian scientists are also exploring food security issues in terms of the choice of methods and food security indicators (Shagayda, 2015), the problems of food security provision (Abbade, 2017; Miloserdov, 2014; Semin & Karpov, 2014; Semin & Karpov, 2018; Yarkova, 2018). However, most of them identify food security with food supply, which somewhat narrows the boundaries of the first concept, but reflects a specific Russian approach to this problem. In general, it should be noted that the methodological framework for assessing the national food security of Russia is in the process of development and improvement.

METHODS

Monographic, abstract-logical and dialectical methods were used to study the development of the main provisions of Food Security Doctrine in Russia. We used the grouping method, the balance method, and the comparison method to summarize the information and calculate the indicators of food independence. The calculations are based on Rosstat data.

RESULTS AND DISCUSSION

The food security indicator is a quantitative and qualitative characteristic of food security state, which allows to assess the degree of its achievement based on accepted

criteria. In international practice, FAO, WB, WWGI, WHO, UNICEF are involved in assessing food security and its indicators. Of course, the national methodology used in Russia has fundamental differences. For example, in 2011, at the round table of the Committee on World Food Security on Measuring Hunger, the indicators of accessibility, access, utilization and stability were presented. In Russia, by the decree of the Russian Federation President (December 31, 2015) N 683, food security is ensured through the achievement of food independence of the Russian Federation, the development of agribusiness and state regulation. In January 2020, a new Doctrine of Food Security was adopted in lieu of the 2010 Doctrine. The strategic goal of food security provision is designated as providing the country population with safe, high-quality and affordable agricultural products, raw materials and food in volumes that ensure rational norms for the consumption of food products.

The objectives of national food security are summarized in table 1. The decisive role of food security provision is assigned to agriculture and fisheries, the food industry. A new concept was introduced in contrast to the Doctrine of 2010: "food independence of the country" - the country self-sufficiency with the main types of domestic agricultural products, raw materials and food. This document focuses on national interests in the field of food security, food security indicators with the establishment of thresholds for basic food products, risks and threats, the main directions of state support and mechanisms for food security provision.

Table 1. Objectives for Food Security (Doctrine 2020)

Sphere	Tasks
Production	–sustainable development of agricultural production, to ensure food independence based on the principles of science-based planning; –agricultural production that meets the established environmental, sanitary-epidemiological, veterinary and other requirements; –implementation of export potential, considering the priority of the country's self-sufficiency in domestic agricultural products, raw materials and food; –development of production of material and technical resources to produce agricultural products, raw materials and food.
Consumption	–ensuring the physical and economic availability of the food assortment of high-quality and safe food products necessary for the formation of a healthy diet for every citizen of the country; –the formation of the principles of a healthy lifestyle, including the formation of a healthy diet for all population groups.
Infrastructure	– forecasting, identification and prevention of internal and external threats to food security, minimizing their negative consequences; –achieving a positive trade balance of agricultural products, raw materials and food; –improving social, engineering, transport and other infrastructure in rural areas to develop production and improve the quality of life of the population; –ensuring the safety of food products; –development of a multi-format , highly competitive retail infrastructure; –development of fundamental and applied scientific research in the field of agriculture for the development of new species, varieties and hybrids of crops, breeds, types and crosses of animals and birds; –improving the system of training specialists in educational programs of secondary vocational education, higher education and additional professional programs for agriculture and fisheries, food and processing industries.

Source: compiled by the author using (On the approval of the Doctrine of Food Security of the Russian Federation, 2020).

The Doctrine of 2020 contains only three indicators to calculate economic accessibility, physical accessibility and food independence, in contrast to the previous one, where the system of indicators was presented (table 2). The preceding Doctrine included a wider list of indicators.

Table 2. Food Security Indicators in Russia (Doctrine -2020)

Indicator	Content
Availability	The opportunity to purchase food products of proper quality at prevailing prices, in volumes and assortment that meet the recommended rational consumption standards.
Access	The level of development of the commodity distribution infrastructure, at which in all settlements of the country the opportunity is provided for residents to purchase food products or organize meals in volumes and assortments that meet the recommended rational consumption standards.
Food independence	Defined as the percentage of self-sufficiency , calculated as the ratio of the volume of domestic production of agricultural products, raw materials and food to the volume of their domestic consumption and having threshold values in relation to: a) grain - not less than 95 percent; b) sugar - not less than 90 percent; c) vegetable oil - not less than 90 percent; d) meat and meat products (in terms of meat) - at least 85 percent; e) milk and milk products (in terms of milk) - not less than 90 percent; f) fish and fish products (in live weight - the weight of raw) - at least 85 percent; g) potatoes - not less than 95 percent; h) vegetables and melons - not less than 90 percent; i) fruits and berries - not less than 60 percent; j) seeds of the main agricultural crops of domestic selection - at least 75 percent; k) edible salt - not less than 85 percent.

Source: compiled by the author using (On the approval of the Doctrine of Food Security of the Russian Federation. Decree of the President of the Russian Federation of 21.01.2020).

The fundamental differences between two Doctrines of Food Security are presented in Figure 1.

In 2010 Doctrine variant, carry reserves are considered:

$FI_{2010} = (OD_{2010} / OL_{2010}) \times 100$ (1),

where: FI_{2010} *- the level of food independence for individual products (from 2010 to 2020);*

OD_{2010} *- production + change in stocks (reserves at the beginning years minus the end of the year);*

OL_{2010} *- the volume of personal and production domestic consumption.*

In the Doctrine 2020 version, calculation is the following one:

$FI_{2020} = (OD_{2020} / OL_{2020}) \times 100$ (2),

where: FI_{2020} *- the level of food independence for individual products (Since 2020)*

OD_{2020} *– the volume of production;*

OL_{2020} *- the volume of personal and production domestic consumption.*

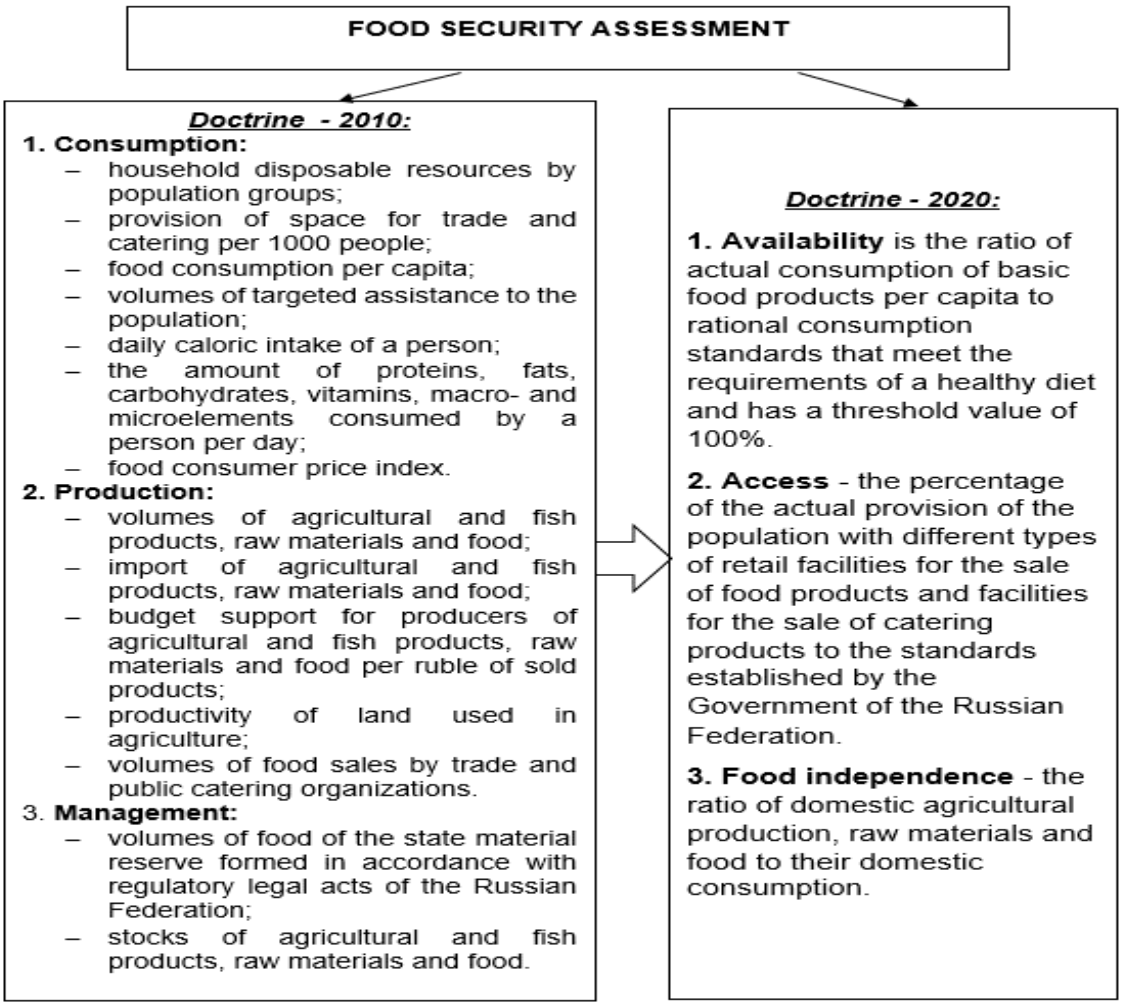

Figure 1. Food security assessment Source: compiled by the author using (On the approval of the Doctrine of Food Security of the Russian Federation; On the approval of the Doctrine of Food Security of the Russian Federation. Decree of the President of the Russian Federation of 21.01.2020).

Since 2020, the product line has been expanded participating in food independence calculation. Vegetables and melons, fruits and berries, as well as seeds of the main agricultural crops of domestic selection were included. The thresholds of food safety for sugar were increased to 90% (+ 10%), vegetable oil - 90% (+ 10%), vegetables and melons - 90% (+ 90%), fruits and berries - 60% (+ 60%), the seeds of the main agricultural crops of domestic selection - 75% (+ 75%), fish and fish products - 85% (+ 5%). There are also some methodological differences in the calculation of indicators. The application of formula 1 and formula 2 indicates that for most products, the calculation used in the new Doctrine leads to the total actual values of food independence decrease. The exception was grain, meat and meat products, fruits and berries, fish and fish products, where the failure to take stocks into account during the calculation led to value increase (table 3).

Table 3. Change in critical values of food security, %

Product	Year					
	2013	2014	2015	2016	2017	2018
Grain (without processed products)	110.92	107.79	104.60	111.45	111.07	86.23
Meat and meat products	100.30	99.31	100.05	99.92	100.56	100.47
Milk and d airy products	100.21	99.54	100.58	100.68	100.36	99.87
Eggs and egg products	99.93	99.78	100.22	100.39	99.93	99.89
Potatoes	99.14	102.14	105.55	95.90	95.51	99.51
Vegetables and gourds	98.91	101.16	101.13	99.41	101.53	99.45
Fruits and berries	106.11	88.89	92.03	99.90	95,99	105.57
Fish and fish products in live weight (raw weight)	98.50	101.54	101.77	104.59	98.16	99.40

* Comparison of Doctrine 2020 to Doctrine 2010 indicators.
Source: compiled by the author using Source: compiled by the author using (Rosstat, 2020).

The methodology for economic affordability calculation involves calculating only within the framework of joint food groups. For example, meat and meat products, milk and dairy products, etc. Meanwhile, the Order of the Ministry of Health of the Russian Federation "On the approval of recommendations on rational food consumption standards that meet modern requirements for healthy nutrition" approved more detailed consumption standards (Table 4).

Table 4. Rational norms of food consumption in Russia

No.	**Product Name**	**kg / year / per capita**
1.	Bread products (bread and pasta in terms of flour, flour, cereals, legumes), including:	96
	flour for baking bread and pastry from it * :	64
	Rye	20
	wheat, including:	44
	fortified wheat flour	24
	cereals, pasta and legumes, including:	32
	Rice	7
	other cereals, including:	14
	Buckwheat	4
	Semolina	2
	Oatmeal	2
	Millet	2
	Other	4
	Pasta	8
	legumes (peas, beans, lentils, etc.)	3
2.	Potatoes	90
3.	Vegetables and melons, including:	140
	white cabbage, red cabbage, cauliflower, etc.	40
	Tomatoes	10
	Cucumbers	10
	Carrot	17
	Beet	18

	Bow	10
	other vegetables (sweet pepper, greens, zucchini, eggplant, etc.)	20
	gourds (watermelons, pumpkin, melons)	15
4.	Fresh fruits, including:	100
	Grape	6
	Citrus	6
	stone fruit	8
	Berries	7
	Apples	50
	Pears	8
	other fruits	5
	dried fruit in terms of fresh fruit	10
5.	Sugar	24
6.	Meat products, including:	73
	Beef	20
	Mutton	3
	Pork	18
	poultry (chickens, hens, turkey, ducks, geese, etc.)	31
	meat of other animals (horse meat, venison, etc.)	1
7.	Fish products	22
8.	Milk and dairy products in total in terms of milk,	
	including:	325
	milk, kefir, yogurt with a fat content of 1.5 - 3.2%	50
	milk, kefir, yogurt with a fat content of 0.5 - 1.5%	58
	including fortified	50
	sour cream, cream with a fat content of 10 - 15%	3
	animal oil	2
	cottage cheese with a fat content of 9 - 18%	9
	cottage cheese with fat content 0 - 9%	10
	Cheese	7
9.	Eggs (pieces)	260
10.	Vegetable oil	12
eleven.	Common salt	4 **
	including iodized	2,5

* At least 30% of the flour should be represented by coarse grades.
** In including for home canning.
Source: compiled by the author using (On approval of recommendations on rational food consumption standards that meet modern requirements for a healthy diet).

In this regard, it is almost impossible to conduct such a detailed analysis of consumption from the standpoint of rational norms. Based on the data of food balances, the indicators of basic food product consumption in the Russian Federation were calculated, where in the context of enlarged groups it can be argued that the actual diet has a deformed structure. There is a shortage of consumption of vegetables and fruits, milk and eggs. At the same time, sugar and vegetable oils are excessively consumed by the population (table 5). For a more objective assessment of the situation, the data on sex and age groups of the population are necessary, considering activity and other criteria (Khairullina, 2019; Khairullina & Yarkova, 2019). The current rational norms do not take these aspects into account.

Table 5. The Consumption of basic food products per capita of Russia in a year (kilograms)

Indicator	Norm	2000	2005	2010	2015	2016	2017	2018
Potatoes	***90***	109	109	95	91	90	90	89
Vegetables and gourds	***140***	79	87	98	102	102	104	107
Fruits and berries	***100***	32	46	57	60	60	59	61
Meat and meat products in terms of meat	***73***	45	55	69	73	74	75	75
Milk and dairy products in terms of milk	***325***	215	234	245	233	231	230	229
Eggs and egg products, pieces	***260***	229	250	270	268	273	279	280
Fish and fish products	***22***	NA	NA	NA	22.3	22.3	22.9	20.2
Sugar	***24***	35	38	39	39	39	39	39
Vegetable oil	***12***	9.9	12.1	13,4	13.6	13.7	13.9	14.0
Bread Products	***96***	117	121	120	118	117	117	116

Source: compiled by the author using (https://www.gks.ru).

The advantages of the Doctrine 2020: an expanded understanding of the risks and threats to food security, which are combined into four groups: economic, technological, climate and agroecological, and foreign policy. However, a reliable objective methodological basis for their assessment has not been created yet, which makes monitoring difficult.

SUMMARY

It is expected that the methodological provisions for assessing national food security will solve many important problems mentioned in this article. The vast territory of Russia has not only climatic differences, but also unites people with different nationalities and traditions and a food culture, which also affects the diet. In addition, there are significant differences in the disposable income of various social groups. Poverty in Russia is concentrated in small towns and rural areas (40% of the poor live in rural areas, another 25% - in the cities with the population of less than 50 thousand). At the same time, the country has not yet received widespread use of the domestic food aid program. The categories of poor and extremely poor that are the most vulnerable segments of the population in terms of food security. The situation is aggravated by the uneven regional development of Russia. Currently, only 14 of the 83 constituent entities of the Russian Federation are net producers of food, the remaining 69 act as net consumers. All the above should be considered during national food security evaluation (Food security, self-sufficiency of Russia according to the criteria of goods from the food consumer basket for the coming years: inform). In Russia, it is necessary to develop the

methodological framework to assess food security in the following areas:

- monitoring and evaluation of the situation concerning certain categories of citizens (in terms of income, gender and age structure, physical and mental stress intensity of the employed population, etc.);
- monitoring and evaluation of the nutritional value of the diet and nutrition quality (the amount of food consumed does not guarantee its sufficient nutritional value);
- food security indicator expansion and a comprehensive integrated indicator development that would allow a reliable assessment of the actual situation;
- improving information and analytical resources to monitor food security and ensure a unified methodology for indicator calculation;
- improving the methodological foundations of regional food security, considering the specifics of the Russian Federation constituent entities.

REFERENCES

1. On approval of recommendations on rational food consumption standards that meet modern requirements for a healthy diet. Order of the Ministry of Health of the Russian Federation of 19.08.2016 No. 614 [Electronic resource] // URL: http://www.consultant.ru/document/cons_doc_LAW_204200/ (last access 14.02.2020).
2. On the approval of the Doctrine of Food Security of the Russian Federation. Decree of the President of the Russian Federation of 30.01.2010 No. 120 [Electronic resource] // URL: http://www.consultant.ru/document/cons_doc_LAW_96953/ (last access 14.02.2020).
3. On the approval of the Doctrine of Food Security of the Russian Federation. Decree of the President of the Russian Federation of 21.01.2020 No. 20 [Electronic resource] // URL: http://www.consultant.ru/document/cons_doc_LAW_343386/ (last access 14.02.2020).
4. Abbade E.B. Availability, access and utilization: Identifying the main fragilities for promoting food security in developing countries // World Journal of Science, Technology and Sustainable Development. 2017. Vol. 14, Issue: 4. P. 322-335.
5. Altukhov A. Ensuring food independence of the country – the basis of its food security // Economics of agriculture of Russia. 2015. No. 11. P. 2-12.
6. Bingxin Yu., Lingzhi You. A typology of food security in developing countries [Electronic resource] // China Agricultural Economic Review. 2013. Vol. 5, Issue: 1. P. 118-153. doi: 10.1108/17561371311294810.
7. Bonilla Eu.D. Macroeconomic Policies and Food Security // In Food Security in an Uncertain World. 2015. 31-47.
8. Capone R., Bilali H.E., Debs Ph., Cardone G., Driouech N. Food System Sustainability and Food Security: Connecting the Dots [Electronic resource] // Journal of Food Security. 2014. Vol. 2. No. 1. P. 13-22. URL: http://pubs.sciepub.com/jfs/2/1/2 (last access 14.02.2020).
9. Diaz-Bonilla E. Lost in translation: The fractured conversation about trade and food security [Electronic resource] // Food and Agriculture Organization of the United Nations Rome. 2015. P. 77. URL: http://www.fao.org/3/a-i5219e.pdf (last access 14.02.2020).
10. Food security, self-sufficiency of Russia according to the criteria of goods from the food consumer basket for the coming years: inform. ed. - M.: FSINI "Rosinformagroteh", 2019.256 p.
11. Khairullina O.I. Research of an organizational and institutional basis of the food

export state support in Russia [Electronic resource] // Amazonia Investiga. 2019. Vol. 8, Núm. 21. P. 428-436. URL: https://www.amazoniainvestiga.info/index.php/amazonia/issue/view/22 (last access 14.02.2020).
12. Yarkova T.M., Khairullina O.I. Food Issue and Need for its Normative and Legal Regulation in Russia [Electronic resource] // Helix. – 2018. Vol. 8(6). – P. 4702- 4706. doi: 10.29042/2018-4702-4706.
13. Khairullina O.I., Yarkova T.M. Program-target instruments of the mechanism of state support for agriculture [Electronic resource] // Revista Amazonia Investiga. 2019. Vol. 8(19). URL: https://www.udla.edu.co/revistas/index.php/amazonia-investiga/article/view/1361/pdf (last access 14.02.2020).
14. Miloserdov V.V. Food Security: Causes and Tasks for its Support // Agri-Food Policy of Russia. 2014. No. 8 (32). P. 2-9.
15. Mitchell D., Hudson D., Post R., Bell P., Williams R. B. Food Security and Conflict // In Food Security in an Uncertain. 2015. P. 211-225.
16. Rosstat. Federal State Statistics Service [Electronic resource] // URL: https://www.gks.ru (last access 14.02.2020).
17. Semin A., Karpov V.K. Food security of Russia: modern problems and new opportunities // Agri-food policy of Russia. 2014. No. 6 (30). P. 5-8.
18. Shagayda N.I., Uzun V.Ya. Food Security: Assessment Issues // Economics. 2015. No. 5. P. 63-78.
19. Yarkova T.M. Social and economic availability of food for the population of the region: methodical aspect // The Turkish Online Journal of Design, Art and Communication. 2018. Vol. March 2018, Special Edition. P. 219-225. doi:10.7456/1080MSE.