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Doctrine on Food Security of Russia: Socio-Economic and Socio-Biological Aspects of Its Implementation in the Arctic *

© Georgiy G. SUKHANOV, Ph.D. of Economic Sciences, Associate Professor, Assistant Professor of Economics
E-mail: g.sukhanov@narfu.ru
Northern (Arctic) Federal University named after M.V. Lomonosov, Arkhangelsk, Russia
© Sergey G. SUKHANOV, D.Sc. of Medical Sciences, Professor
E-mail: suhanov_1954@mail.ru
Northern State Medical University, Arkhangelsk, Russia

Abstract. The article considers socio-economic and socio-biological aspects of the Russian Food Security Doctrine, approved on January 21, 2020. The need to monitor Russia's food security is due to significant changes in "the country's socio-economic development, the emergence of new risks and threats to food security caused by economic sanctions imposed in 2014 by a number of Western countries against our country, the openness of the national food market" in connection with the accession to the World Trade Organization, and the deepening integration within the EAEU. The article examines modern approaches to the definition of state food security. Certain provisions of the Doctrine of Food Security of the Russian Federation are assessed, the analysis of food security in Russia in terms of self-sufficiency, economic and physical availability of food was carried out on the basis of statistical data. Food security in Russia has been achieved for the main items of food products, which is confirmed by the results of the analysis performed. A similar positive trend in the development of our country is confirmed by the estimates of foreign researchers based on the results of the Global Food Security Index monitoring. A comparative analysis of the diet of the population of Russia and the Arkhangelsk and Murmansk Oblasts is given. The work focuses on socio-biological risk factors for food security in the Arctic region of Russia.
Keywords: *Doctrine of food security, monitoring, diet, economic accessibility, social and biological risks*.

Introduction

A new Doctrine of food security of the state was approved by the Decree of the President of the Russian Federation dated January 21, 2020 No. 20 [1]. The need to approve a new Doctrine is associated with significant changes in the conditions of socio-economic development of Russia in recent years, the emergence of new risks and threats to food security caused by economic sanctions introduced in 2014 by a number of Western countries, the openness of the national agri-food market in connection with the accession to the World Trade Organization and deepening integration within the EAEU.

The Doctrine establishes definitions and indicators of Russia's food security at the legislative level. The food security of Russia is characterized as "the state of socio-economic development of the country, which ensures food independence of the Russian Federation, guarantees physical and economic accessibility for each citizen of the country of food products that meet

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[1] Ukaz Prezidenta Rossiyskoy Federatsii ot 21.01.2020 № 20 "Ob utverzhdenii Doktriny prodovol'stvennoy bezopasnosti Rossiyskoy Federatsii" [Decree of the President of the Russian Federation dated January 21, 2020 No. 20 "On approval of the Food Security Doctrine of the Russian Federation"]. URL: http://publication.pravo.gov.ru/Document/View/0001202001210021 (accessed 20 June 2021).

mandatory requirements, in amounts not less than rational standards of food consumption necessary for an active and healthy lifestyle". Innovations and issues of implementation of the new Doctrine of food security of Russia are considered in detail in the works of Anishchenko A.N., Shutkov A.A. [1], Shagaida N.I. [2], Yarkova T.M. [3]. These works consider the main risks and identify the main causes that hamper Russia's food supply, justify the mechanisms and conditions for the implementation of the Doctrine of food security of the state. It should be noted that the presented studies do not pay attention to the regional aspects of the Doctrine implementation.

The purpose of this study is to consider the socio-economic and medico-biological aspects of the implementation of the Doctrine of food security in the Arctic on the example of the Arkhangelsk Oblast.

Assessment of food security in Russia

The main indicator of food security is the self-sufficiency threshold in percentage calculated as the ratio of the volume of domestic production of agricultural products, raw materials and foodstuffs to the volume of their domestic consumption. Table 1 presents the results of Russia's food security indicator for 2019.

Table 1

The level of self-sufficiency in food products in accordance with the "Doctrine of food security of Russia" [2]

Products	Doctrine threshold, %	Produced in 2019 [3] of need, %	Deviation from the threshold, %
corn	not less than 95	155	+60
sugar	not less than 90	128	+38
vegetable oil	not less than 90	175	+85
meat and meat products	not less than 85	97	+12
milk and dairy products	not less than 90	84	-6
fish and fish products	not less than 85	82.2	-2.8
potato	not less than 95	95	0
vegetables	not less than 90	84	-6
fruits and berries	not less than 60	40	-20
food salt	not less than 85	64	-21

The above data show that for the main types of food products, such as grain, potatoes, meat and meat products, sugar, vegetable oil, the threshold values of the Doctrine in 2019 were achieved. According to the Minister of Agroindustrial Complex and Trade, I.B. Bazhanova [4], Arkhangelsk Oblast produces the amount of potatoes, vegetables, milk and dairy products, fish and seafood necessary for self-sufficiency. Apart from the traditional ones, prospective directions for the development of the region's agro-industrial complex can include the production of seed potatoes, the development of livestock breeding, aquaculture, as well as the collection and processing of forest mushrooms and berries and their cultivation, which fully corresponds to the tasks set in the Doctrine. Reindeer husbandry is developed in the Nenets Autonomous Okrug, which makes it

[2] Ibid.

[3] Rosstat. URL: https://www.gks.ru (accessed 04 July 2021).

[4] Interview of the Minister of Agroindustrial Complex and Trade of the Arkhangelsk Region, I.B. Bazhanova. URL: https://youtu.be/4vbb7oxchjc (accessed 04 July 2021).

possible not only to cover the needs of indigenous peoples, but also to supply reindeer meat products to the markets of the region. The main risks affecting the development of agriculture in the Arkhangelsk Oblast are the underdeveloped infrastructure, which complicates the logistics of products, the unsatisfactory financial condition of many agricultural enterprises, the lack of labor and climatic conditions. The majority of support measures for agricultural producers at the federal and regional levels are aimed at achieving the indicator of food independence, which will allow obtaining the desired result in problem areas.

It should be noted that food security, in addition to the criterion of self-sufficiency, includes a wider range of socio-economic and medico-biological aspects of the life. The Economist Intelligence Unit examines food security in the context of income and economic inequality, gender inequality, as well as environmental and natural resource differentials across countries [5]. In 2021, this company published another report on the Global Food Security Index [6]. The study assessed food security trends in 113 countries. The final index value was based on factors of food availability and accessibility, food quality and safety, as well as natural resources and sustainability in the region. Russia ranked 24th in terms of food security and made a significant step forward compared to 2014, when it was in 43rd place. In terms of the food availability to the population, Russia is ranked 20th in the index, and 34th in terms of food availability. Russia received high marks for food security programs, level of access to markets and agricultural financial services. Finland is the leader of the Global Food Security Index, and the rest of the countries of the Arctic Council are also ahead of Russia in this indicator. Researchers from The Economist Intelligence Unit highly assess the sufficiency of food supply in Russia (86 out of 100 points) and note that the diet meets nutritional standards (84.1 points out of 100 possible).

An important indicator of the country's food security is dietary intake. Recommendations for rational norms of food consumption that meet modern requirements for a healthy diet were approved by Order of the Ministry of Health of the Russian Federation of August 19, 2016 No. 614 [7]. These recommendations can be used to assess the achieved level of food security. Table 2 presents comparative data on food consumption in the Russian Federation, the Arkhangelsk Oblast, including the Nenets Autonomous Okrug, and the Murmansk Oblast for 2019. Statistical data on the food balances of Russia were used in the comparative analysis.

[5] Rossiya zanyala 24-e mesto v Global'nom indekse prodovol'stvennoy bezopasnosti 2020 [Russia ranked 24th in the Global Food Security Index 2020]. URL: https://agbz.ru/news/rossiya-zanyala-24-e-mesto-v-globalnom-indekse-prodovolstvennoy-bezopasnosti-2020/ (accessed 04 July 2021).

[6] Global Food Security Index. URL: https://foodsecurityindex.eiu.com/Index (accessed 04 July 2021).

[7] Prikaz Ministerstva zdravookhraneniya RF ot 19 avgusta 2016 g. № 614 "Ob utverzhdenii Rekomendatsiy po ratsional'nym normam potrebleniya pishchevykh produktov, otvechayushchikh sovremennym trebovaniyam zdorovogo pitaniya" [Order of the Ministry of Health of the Russian Federation of August 19, 2016 No. 614 "On approval of the Recommendations for rational norms of food consumption that meet modern requirements for a healthy diet"]. URL https://www.garant.ru/products/ipo/prime/doc/71385784/ (accessed 04 July 2021).

Table 2

Recommended rational norms and actual food consumption for 2019

No.	Products	Recommended rational norms kg / year / person	Household food consumption in 2019, kg / year / person [8]		
			Russian Federation	Arkhangelsk Oblast, incl. NAO	Murmansk Oblast
1.	Bread products	96	95.7	94.0	66.2
2.	Potato	90	58.4	47.8	49.2
3.	Vegetables, including:	140	104.1	94.9	90.7
4.	Fresh fruits, including:	100	75.4	80.6	87.0
5.	Sugar	24	31.2	40.5	30.0
6.	Meat products, including:	73	90.5	86.4	84.9
7.	Fish products	22	21.9	24.9	20.1
8.	Milk and dairy products, total in terms of milk	325	264.9	226	245
9.	Eggs	260	235	234	240
10.	Vegetable oil	12	10.6	11.4	8.5

Table 3

Composition of nutrients in consumed food products, on average per consumer per day [9]

	Norm	Russian Federation		2019		
		2014	2019	Arkhangelsk Oblast	Nenets Autonomous Okrug	Murmansk Oblast
proteins, g	82	78	80.5	78.4	77.7	71.3
fat, g	95	105	108.8	113.4	105.8	103.9
carbohydrates, g	417	333	332.7	351.5	339.0	278.1
kilocalories	2850	2603	2644.3	2 752.6	2 630.1	2 344.5

Analysis of the data presented shows that the diet of residents of the Arkhangelsk Oblast, the Nenets Autonomous Okrug and the Murmansk Oblast does not comply with the recommendations of the Ministry of Health of the Russian Federation. The northerners consume more meat, sugar and fish. The indicators for the consumption of eggs, bread and vegetable oil are close to the norm, while for the rest of the items there is a significant lag. The qualitative characteristics of the diet (Table 3) confirm this. In terms of the consumption of proteins, carbohydrates and caloric intake, the diet of the inhabitants of the Russian Federation and the Arctic regions of the Russian North corresponds to the standard characteristics of a healthy diet. A similar situation was noted by Karanina E. et al. [4].

Possible reasons for this situation may be food traditions, as well as a decrease in the purchasing power of the population due to high inflation rates in the country. Khairullina O.I. [5] notes that “there was a decrease in purchasing power of the most consumed by the Russians categories of products, in particular butter, bread, wheat flour, noodles, rice, cereals. There was also a significant increase in the consumer price index. The biggest increase affected sugar — 164.54%, potatoes — 134.06%, sunflower oil — 125.91%, pasta and cereals — 117.41%”.

[8] Household food consumption in 2019. URL: https://gks.ru/bgd/regl/b20_101/Main.htm (accessed 04 July 2021).
[9] Rosstat. URL: https://www.gks.ru (accessed 04 July 2021).

The decline in real incomes has a direct impact on the affordability of food and the quality of human life. The Doctrine defines economic affordability of food as "the ability to purchase food of proper quality at prevailing prices, in volumes and assortments that meet the recommended rational consumption standards" [10]. One of the indicators characterizing the economic affordability of food can be the share of spending on food in the household budget. At the end of 2019 [11], they averaged 29.7% in the Russian Federation, 28.1% in the Arkhangelsk Oblast, 27.5% in the Nenets Autonomous Okrug, and 25.3% in the Murmansk Oblast. It should be noted that in the northern regions the share of expenses for the purchase of food is slightly lower than the average for the Russian Federation. Average indicators do not always reflect the availability of food for all categories of the population. Khairullina O.I. [5] notes that "there is a significant differentiation in the level of expenditure on food among the population by income level, which is reflected in the affordability of food and, consequently, its quality". She also cites data that in the group with minimum incomes, the share of spending on food purchases in consumer spending of households by 31.1 percentage points higher than in the group with the maximum income. In the Russian Federation, according to Rosstat [12], in 2019 the share of households spending more than half of their income on food is 21.3%. In the Arkhangelsk Oblast, this figure was fixed at 17.1%, in the Nenets Autonomous Okrug — 13.2%, and in the Murmansk Oblast — 8.1%. The given data show that the successful implementation of the Food Security Doctrine requires the development of special measures to support households with low average per capita income, such as large families, pensioners and persons with disabilities.

One of the main directions of state policy in the field of ensuring food security in the Doctrine is fundamental and applied scientific research into the medical and biological evaluation of the safety of food products. An assessment of socio-biological risk factors for food security is part of such studies.

Socio-biological risk factors for food security in the Arctic region of Russia (on the example of the Arkhangelsk Oblast)

Living in the extreme climatic and geographic conditions of the Arctic leads to an increase in the degree of stress of adaptation processes in the human body, which causes functional shifts in various physiological systems. Attempts to understand the essence and significance of the influence of environmental factors of high latitudes on human health have been made before, but the interpretation of data in this area is rather complicated [6–11]. Today, reliable information of a comprehensive nature is extremely scarce due to objective and subjective reasons.

[10] Ukaz Prezidenta Rossiyskoy Federatsii ot 21.01.2020 № 20 "Ob utverzhdenii Doktriny prodovol'stvennoy bezopasnosti Rossiyskoy Federatsii" [Decree of the President of the Russian Federation dated January 21, 2020 No. 20 "On approval of the Food Security Doctrine of the Russian Federation"]. URL: http://publication.pravo.gov.ru/Document/View/0001202001210021 (accessed 20 June 2021).
[11] Rosstat. URL: https://www.gks.ru (accessed 04 July 2021).
[12] Rosstat. URL: https://www.gks.ru (accessed 04 July 2021).

Panin L.E. and Kaznacheev V.P. [6, 7] and a number of other polar medicine specialists [14, 15] characterize the unfavorable factors of human living in the North and identify the reasons for the formation of the so-called phenomenon of “polar stress syndrome” or “northern stress”. The “polar stress syndrome” determines the restructuring and mobilization of psychophysiological parameters with the activation of hypothalamic-pituitary-adrenal system and metabolic processes [6, 15]. Currently, there is evidence of genetically determined response programs of the neuroendocrine system to the effects of environmental factors of the North [15]. Khasnullina A.V. emphasizes that “the action of unfavorable social factors aggravates the negative effects of natural influences, which requires additional energy expenditure by the body and, accordingly, increases the severity of the state of chronic stress” [14] and notes that metabolic adaptation prevails at the basis of the biological adaptation system to extreme environmental conditions. The “standard” of adaptation to local geoclimatic conditions is a group of the aboriginal population of the North. The centuries-old contact of the aborigines with the harsh geographical factors of the North, the peculiarities of the way of life and nutrition affected the state of metabolism, which made it possible to distinguish a special “polar” (northern) metabolic type. Panin L.E. [6] formulated the “Concept of formation of the “polar metabolic type””. The main provisions of this concept have been confirmed by other researchers.

Sukhanov S.G., Alikberova M.N. [19] concluded that the rejection of the traditional diet — a decrease in the amount of proteins and fats in the diet of the indigenous population with a simultaneous increase in the consumption of carbohydrates (bread, sugar) and alcohol — “influenced metabolism and caused the development of maladaptive and pathological disorders digestive organs, respiration, urinary system, ENT organs, immune and endocrine systems” [19].

According to Nikiforova N.A. [20], nutrition should be considered as a preventive factor of long-term impact on the health preservation of the inhabitants of the North. Kozlov A.I. and a number of other researchers note that a high level of energy metabolism is accompanied by a significant consumption of proteins and lipids [21].

Summing up the assessment of the socio-biological risks of the implementation of the Food Security Doctrine in the Arctic, it can be concluded that it is necessary to conduct comprehensive studies of the problem of developing rational nutritional standards for various groups of the population of the Far North, paying special attention to indigenous and small peoples.

Conclusion

1. Food security is one of the most important indicators of a country's sustainable development. Russian researchers confirm the achievement of the required level of food security for half of the Doctrine's indicators. In order to solve the problems of agriculture in the Far North, joint efforts of the state and private investors are required to build the infrastructure of the agro-industrial complex, to attract investments in the organization of production in the promising areas of agricultural development in the Arctic region.

2. The diet of the population of the Arctic zone of Russia does not meet the recommendations of the Ministry of Health. In developing the food safety doctrine for the population of the Arctic regions, it is necessary to take into account the duration of the historical residence of various groups of the population (newcomers, indigenous Russians, small peoples of the Far North) in these territories. The structure of basic food products for the population of high latitudes should take into account the peculiarities of their metabolism, age, occupation, and other socio-biological factors.
3. At present, many aspects of metabolic regulation from the standpoint of assessing the functional reserves of hormonal and metabolic supply depending on the period of the year, the degree of risk of developing borderline prenosological states and the degree of adaptation to unfavorable environmental factors (environmental, climatogeographic and professionally determined extreme factors) are not completely disclosed and require further study and understanding.

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