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Economic affordability of food as an indicator of food security in Russia

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Abstract. The study of the economic availability of food within the framework of state security is of particular interest to the Russian Federation, which is due to achieving the threshold criteria for indicators of the country's food self-sufficiency. Currently, there is no methodology for drawing conclusions about the level of affordability of food. The presented analysis of the level of satisfaction of the physiological needs of the population of the Russian Federation by main types of products in households, the nutritional and energy value of consumed food by the population of the Russian Federation, the dynamics of the cost of the minimum set of food products and the population's average income per person made it necessary to expand the boundaries of economic accessibility of food the first and second decile groups of the population, taking into account the disposable income. It is proposed to provide domestic food assistance, with the total funds amounted to 163 billion rubles for these groups.

1. Introduction

In recent years, research related to the problems of food security, conducted by both foreign and domestic scientists, has become widespread. The earliest studies date back to 1943. The category "food security" is quite wide. In the domestic practice it is, first of all, the state of the economy, where the physical and economic availability of food for the population is guaranteed, taking into account rational consumption. At the same time, in most regulatory and reporting documents, for example, the National Report on the Results of the Implementation of the State Program, the document is annually focused on the volumes of domestic food production and self-sufficiency. To date, the declared standards of domestic production have practically been achieved. In particular, in 2017, according to the calculations of the Ministry of Agriculture of the Russian Federation, the value of the indicator for grain is 99.3%, for sugar - 94.6%, for vegetable oil - 84.8%, for potatoes - 97%, for meat and meat products - 90.4%. The share of domestic products in the total volume of resources remains below the established values of the Food Safety Doctrine for milk and dairy products (82.4%) and for food salt (63.6%). Meanwhile, the issues of the economic availability of food for the population, taking into account rational nutrition, especially for low-income households, remain without proper attention from the state. A specialized agency of the UN, FAO, is an international organization in the fight against hunger, which has more than 194 states and takes an active position on this issue.

In Russia, an official methodology has not yet been formed that would allow grouping multiple indicators and identifying an integral indicator, which makes it possible to judge about food security and, in particular, about the economic affordability of food only in general.



2. Materials and methods

The study used a variety of methods. We relied on a monographic method, which focused on studying the theoretical and methodological aspects of assessing the economic accessibility of basic foods in the framework of food security. Methods of economic were used for analyzing and identifying the necessary funds to expand the boundaries of the economic accessibility of food. To assess the level of influence of incomes of the population, the grouping method was used. The object of the study are the households of the Russian Federation. The analytical database consists of official data from the Federal State Statistics Service.

3. Literature review

Theoretical and methodological issues of food security are touched upon in the works of Russian scientists: Miloserdov, V. V., Altukhov, A. I., Semin, A. N., Shagaida, N. I., Uzun, V. Ya. [1-4], A. V. Bogoviz [19-20], and others. In foreign publications, this problem is discussed by Sharif, A. M. et al., Mitchell, D. et al., Abbade, E. B., Diaz-Bonilla, E., Capone, R., et al. [5-9].

4. Results

Meanwhile, affordability has not been studied enough. Therefore, this article presents some methodological aspects and analysis of the current situation on this issue. From the standpoint of regulatory and legislative acts, indices of economic affordability of food are not clearly defined, only consumption indicators are allocated [10]. According to the Order of the Government of the Russian Federation of November 18, 2013 N 2138-p, 92 indicators are allocated and differentiated into 2 sections: (a) consumption targets and (b) indicators for monitoring the state of food security.

In our opinion, economic affordability is closely related to the purchase of food products at affordable prices, which is ensured by the relevant purchasing power of the population and allows one to provide adequate nutrition in accordance with rational norms. To this end, we analyze a number of key indicators.

An estimated satisfaction of the needs of the population in basic foodstuffs, taking into account the following standards, is presented in the Order of the Ministry of Health of the Russian Federation of August 19, 2016 (kg / person):

- bread products – 96;
- potatoes – 90;
- vegetables and melons – 140;
- fruit, berries – 100;
- meat and meat products – 73;
- milk and dairy products – 325;
- eggs – 260;
- fish and fish products – 22 [11].

To do this, consider the ratio of the actual volume of some food consumed to the specified norms. Calculations based on household survey data, as we note, differ in food balances. The results show that there is a shortage in potato consumption (33%), vegetables and melons (25%), fruits and berries (27%), milk and dairy products (16%), and eggs (12%). At the same time, there is also an excessive consumption of sugar and confectionery products, vegetable oil and other fats, bread products, meat and meat products (Table 1).

In addition, between household consumption in rural and urban areas there is a significant differentiation in this indicator. For example, the consumption of meat and meat products, milk and

dairy products, eggs is lower in rural households, which, of course, is connected with the income of the population.

Table 1. The level of satisfaction of the physiological needs of the population of the Russian Federation by main types of products in households.

Index	Actual annual data							
	2005	2010	2011	2012	2013	2014	2015	2016
Consumption, kg / person:	1,18	1,05	1,03	1,02	1,00	0,99	0,99	1,03
-bread products								
- potatoes	0,87	0,73	0,70	0,71	0,68	0,66	0,64	0,67
- vegetables and melons	0,64	0,69	0,70	0,71	0,69	0,70	0,71	0,75
- fruit, berries	0,51	0,70	0,71	0,74	0,77	0,76	0,71	0,73
- meat and meat products	0,88	1,08	1,11	1,14	1,16	1,16	1,16	1,21
- milk and dairy products	0,75	0,81	0,81	0,82	0,83	0,82	0,82	0,84
- eggs, pieces	0,80	0,85	0,83	0,85	0,83	0,83	0,84	0,88
- fish and fish products	0,77	0,95	0,95	1,00	1,00	1,00	0,95	1,00
- sugar and pastry	1,42	1,38	1,33	1,33	1,33	1,29	1,29	1,33
- vegetable oil and other fats	0,92	0,92	0,92	1,14	1,14	1,15	1,13	1,14

Source: compiled and calculated by the author based on data from the Federal State Statistics Service of the Russian Federation (2018).

The economic availability of food is most clearly manifested in the study of decile groups of the population in terms of income. The data indicate that the rations of the first and second groups have a deficit of consumption in 9 out of 10 indicators, and their number in 2016 was 29.3 million people, of which there are 19.5 million people with cash incomes below the subsistence minimum (Table 2).

Table 2. The level of satisfaction of the physiological needs of the population of the Russian Federation in food by decile groups in 2016.

Index	Population groups (10%)									
	1	2	3	4	5	6	7	8	9	10
Bread and Bread Products	0,95	0,97	1,02	1,04	1,04	1,05	1,04	1,09	1,05	1,04
Potatoes	0,60	0,63	0,67	0,68	0,66	0,67	0,68	0,70	0,68	0,68
Vegetables and gourds	0,47	0,57	0,67	0,69	0,73	0,78	0,81	0,88	0,91	0,96
Fruits and berries	0,37	0,48	0,58	0,64	0,69	0,74	0,82	0,90	0,96	1,03
Meat and meat products	0,75	0,94	1,05	1,12	1,19	1,26	1,30	1,43	1,52	1,51
Milk and dairy products	0,54	0,65	0,74	0,80	0,83	0,87	0,92	0,98	0,99	1,03
Eggs, pieces	0,63	0,74	0,81	0,83	0,87	0,91	0,93	0,98	1,00	1,06
Fish and fish products	0,60	0,75	0,82	0,89	0,96	1,01	1,05	1,17	1,24	1,22
Sugar and pastry	1,03	1,15	1,25	1,28	1,36	1,37	1,41	1,50	1,50	1,45

Vegetable oil and other fats	0,77	0,83	0,89	0,92	0,93	0,93	0,98	0,99	0,98	0,94
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Source: compiled and calculated by the author based on data from the Federal State Statistics Service of the Russian Federation (2018).

Regardless of income, there is a shortage of consumption of potatoes, vegetables and melons, vegetable oil and other fats. It is also noteworthy that in the Doctrine itself, there are no data on the specific structure of consumption of meat and meat products, while the Ministry of Health of the Russian Federation established the following standards: beef – 20 kg, pork – 18 kg, and meat of all types of poultry – 31 kg [11].

For example, in 1990, the largest share in the diet of the population of the Russian Federation was occupied by beef (43.3%), and it was only 16.5% in 2016, which does not meet the criteria of national food security (at least 27.4%) [12-14].

For example, in the international comparison, the consumption of beef per capita in Uruguay was 43 kg, Argentina – 39 kg, Brazil, and the USA – 26 kg. At the present stage, it is obvious that an unbalanced nutrition continues to exist. This is also indicated by the increase in the proportion of obese people, especially among adolescents [15].

The energy and nutritional value of diets is an equally important section of food security, where the quality of the diet should be monitored: energy value, protein, fat, and carbohydrate content. For this purpose, there are the Methodical Recommendations MP 2.3.1.2432-08 developed by the CPS, which take into account several aspects: gender and age groups of the population and the level of physical activity [16]. However, the intended grouping of the population in the statistical data processing does not coincide with the interval values for determining the relevant standards.

Using data on the population and the weighted average estimate of the standard caloric intake of food consumed, we calculated the indicators presented in Table 3.

Table 3. Food and energy value of food consumed by the population of the Russian Federation.

Index	Norm *	Actual annual data							
		2005	2010	2011	2012	2013	2014	2015	2016
Nutritional value of the diet, g per day:	72	71	77	77	78	78	78	77	80
- proteins									
- fats	77	96	105	105	105	106	105	105	109
-carbohydrates	337	368	348	341	341	337	333	329	341
The energy value of the diet, kcal per day	2376	2630	2652	2624	2633	2626	2603	2583	2675

* Source: author's calculations using [16].

In the framework of budget surveys by state statistical bodies, it was determined that, on average, there is no shortage of food and energy value of food consumed per household member. In 2016, compared with 2005, there was a positive trend in the consumption of proteins (+ 11%) and fats (+ 14%), but the amount of carbohydrates decreased (-7%). The daily energy value of the diet increased slightly (+ 1.7%) and amounted to 2675 kcal by the end of 2016. From the standpoint of rational nutritional norms, one should reduce fat intake by 42% and carbohydrates by 1.2%.

Considering the impact of income on the nutritional and energy value of food consumed (Table 4), we note that there is a deficit in protein consumption (-20%), carbohydrates (-15%), and fat (4%) in the first group; in the second group, the situation is similar, with the exception of the “carbohydrates”

indicator. The daily caloric content in these groups was only 2044.8 kcal and 2282.7 kcal, respectively. Thus, it can be stated that for this part of the population consumption of the most essential for health products is economically unavailable.

Table 4. The level of satisfaction of the physiological needs of the population of the Russian Federation in nutrients and the energy value of the daily diet by decile groups in 2016.

Index	Population groups (10%)									
	1	2	3	4	5	6	7	8	9	10
Proteins, g	0,80	0,91	1,00	1,06	1,10	1,15	1,18	1,27	1,30	1,31
Fat, g	0,96	1,15	1,26	1,34	1,41	1,47	1,54	1,63	1,66	1,65
Carbohydrates, g	0,85	0,90	0,97	0,99	1,02	1,03	1,05	1,11	1,10	1,09
Kcal - total	0,86	0,96	1,04	1,09	1,13	1,16	1,19	1,26	1,27	1,27

Source: compiled and calculated by the author based on data from the Federal State Statistics Service of the Russian Federation (2018).

The greatest contrast in the level of satisfaction is observed between the first and tenth group (between the poorest and the most population) by almost half. According to the standards established by the FAO, the famine border is in the range from 1600 to 2000 kcal, and it is 2100 kcal for the USDA (USA) [17, 18]. Consequently, the first group (14.7 million people) should be the object of close attention from the state, because it poses a threat to the food security of the country.

At the end of 2016, the share of expenditure on food in final consumption on average per person was 32.3%. At the same time, there is a tendency of annual reduction of this indicator: in 2016 compared to 2005, the decline was 7%; and it was 5% and from 2015.

Incomes directed by the population of the first group to purchase food accounted for 47%, the second/third – 43%, the fourth – 41%, and the fifth – 39%. While in the tenth group only 19%. As a result, during the period from 2005 to 2016, the difference was about 3 times. Every year, there is a rise in the cost of the minimum set of food, along with an increase in incomes of the population (Figure 1).

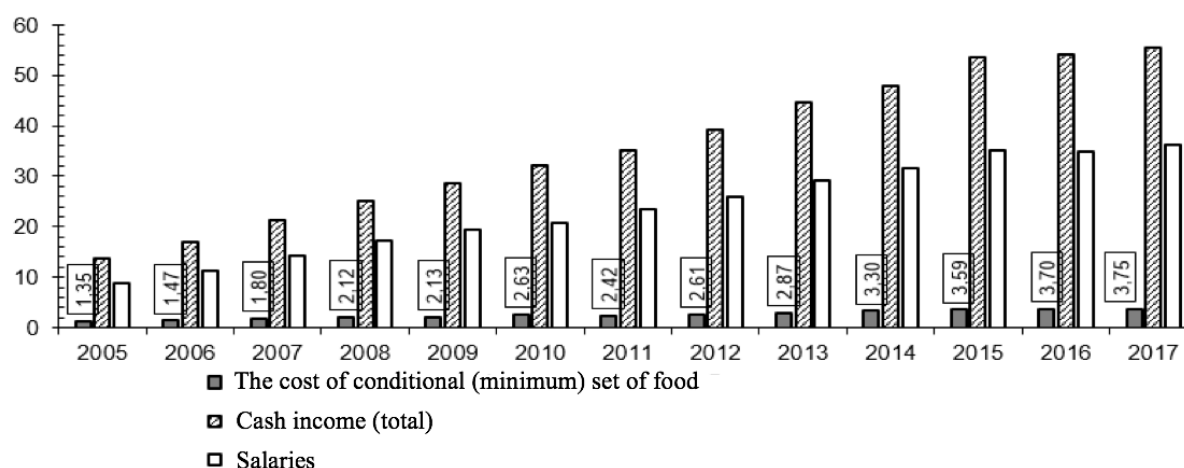


Fig.1. The dynamics of the cost of the minimum food products set and the income of the population on average per person, thousand rubles. Source: compiled and calculated by the author based on data from the Federal State Statistics Service of the Russian Federation (2018).

The purchasing power of the population, presented in table 5, indicates that the first group can acquire 1.6 sets per disposable income, which is 15.6 times less than in the tenth group.

Table 5. The purchasing power of the population by the number of minimum sets of food, by decile groups in 2016.

Index	Population groups (10%)									
	1	2	3	4	5	6	7	8	9	10
Average per capita cash income per month, thousand rubles	6,0	10,4	13,7	17,1	20,9	25,3	30,9	38,6	51,3	93,3
The share of the total cash income of the population, thousand rubles	1,9	3,4	4,5	5,6	6,8	8,2	10,0	12,6	16,7	30,3
Cost of a conditional (minimum) set of food products, thousand rubles	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7
Number of sets of food, units	1,6	2,8	3,7	4,6	5,6	6,8	8,2	10,3	13,7	24,9

Source: compiled and calculated by the author based on data from the Federal State Statistics Service of the Russian Federation (2018).

5. Conclusion

Of course, the economic affordability of food is determined by a variety of indicators, among which the monetary income and the standard of living of the population, age and gender composition of the population, traditional culture of consumption, food prices, the cost of the minimum set of food, the subsistence minimum, climatic features and regional accommodation, domestic food production. A separate detailed study should focus on economic accessibility depending on the type of terrain (rural, urban), population density, household members, the study of individual territories of the Russian Federation, decile groups of the population, depending on income.

It is necessary to clarify the definition of economic affordability in the Food Security Doctrine, to refine the existing monitoring methodology. Taking into account the policies conducted by the Russian Federation and aimed at developing the digital economy, the need for clearer detail and comparability of data between the relevant ministries and departments to identify problems in food consumption should be taken into account. Growth in food consumption should be ensured by compliance with rational norms of consumption [22, 23].

The priority should be to increase the economic availability of food for the first and second decile groups of the population. It is necessary at the federal level to develop a methodology for the provision of domestic food aid, which can be provided in the form of money for purchasing food products, direct deliveries of food products, and (or) preferential hot meals to certain categories of citizens, catering in budget institutions. According to our calculations, the required amount for the implementation of this proposal is 163 billion rubles, including 114 billion rubles for the first decile group, which corresponds to half of the state budget expenditures for the "Agriculture and Fisheries of the Russian Federation" section, namely 344 billion rubles. Given that the financial burden is serious enough, one should consider the possibility of mutually beneficial cooperation with private business in the framework of public-private partnership.

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