

Methodological Problems in Assessing Russia's Food Security: Overcoming the “Average Metrics Trap” and Diagnosing Vulnerabilities



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Abstract. The article focuses on the theoretical substantiation and verification of an optimized system of national food security indicators for the Russian Federation under escalating geo-economic and logistical risks. The aim of the study is to overcome the methodological bottlenecks of redundant regulatory lists of assessment indicators by constructing a concise analytical model for risk express-diagnostics. As a theoretical framework, the author developed a cyclical model of food security (the “matryoshka”) that describes the continuous transformation of the supply structure under the influence of changing consumption patterns. The empirical basis of the study comprises a statistical analysis of Rosstat data across population decile groups for the 2020–2024 period, applying Engel’s law and the decile expenditure ratio. Deep structural imbalances have been revealed between the macro-level of national self-sufficiency and the micro-level of economic food accessibility. It is proved that forced spending of more than 50% of the budget on food by the first decile group leads to a paradoxical qualitative deterioration of the diet due to the transition to cheap, high-calorie substitutes. A matrix grouping of the population by welfare level based on the share of food expenditures was developed and tested. It captured the polarization of society: the transition of the 10th group into the “wealthy society” category while the 1st group stagnates in the low-level zone. The critical role of agflation as a cross-cutting factor accelerating general inflation is substantiated. The necessity of establishing a Situational Analytical Center for Agflation Monitoring under

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the Government of the Russian Federation for preventive interagency modeling of commodity balances (Ministry of Agriculture, Federal Customs Service, Federal Antimonopoly Service, Bank of Russia) is demonstrated. The transition to a compact system of 3–5 key indicators for each dimension of food security (availability, accessibility, utilization, stability) will reduce the burden on state statistics bodies and overcome regulatory overload. The proposed optimized list of indicators ensures high responsiveness and precision of managerial decisions which is critically necessary for protecting the technological and financial sovereignty of the state.

Key words: food security, agflation, economic accessibility, decile groups, Engel's law, average metrics trap, standard of living, import substitution Situational Center.

Introduction

In today's geoeconomic realities, ensuring food security (FS) extends far beyond a purely agricultural or technological discourse, becoming one of the central elements in safeguarding a state's technological and financial sovereignty. The transformation of global logistics chains, unprecedented sanctions pressure, volatility in world commodity markets, and growing climatic anomalies all underscore the need for continuous monitoring of the vulnerabilities of national food systems.

The research problem stems from the methodological flaws in the current monitoring system of Russia's Food Security Doctrine. Because it relies predominantly on aggregate macroeconomic indicators, this system fails to identify latent structural threats in a timely manner – both in terms of economic access to food for the polar groups of the population and at the level of the material and technical contour of the agro-industrial complex (AIC).

The aim of this study is to provide a theoretical justification and verification of an analytical toolkit (an open list of indicators) for the food security of the Russian Federation, one oriented toward the preventive identification of latent structural threats and vulnerabilities.

To achieve this aim, the following objectives must be addressed:

- to synchronize Russian approaches to assessing food security with the basic dimensions of

the FAO concept (availability, access, utilization, stability);

- to overcome the “average metrics trap” by integrating a differentiated analysis of household budgets across decile groups;

- to reflect the unique specifics of socio-economic stratification and the technological contour of the national food system, including the risks of agflation and secondary import dependence.

In this study, the technological contour of the food system is understood as the critically important cross-section of the AIC's physical and technical infrastructure (seed stock, breeding core, veterinary preparations) that determines the sector's ability to function independently of external sanctions and logistical shocks.

The study is structured around the following research questions:

- What are the key flaws of the current macroeconomic model for assessing food security in the Russian Federation?

- How does income-based decile differentiation reshape the real picture of economic access to food?

- Where in the domestic AIC does the import substitution paradox generate risks of secondary technological dependence?

The author's research hypothesis is that the developed “matryoshka” model, together with its cyclical modification, makes it possible to decom-

pose the national monitoring system into compact sets of indicators (3–5 parameters for each FAO dimension). This in turn links macroeconomic market parameters to the microeconomic level of household consumption, overcomes the “average metrics trap”, and enables the preventive diagnosis of latent social and technological risks to the state’s sovereignty.

What are we assessing? Terms and meanings

Food security is a multifaceted phenomenon with numerous characteristics, which makes its precise identification difficult. It is reasonable to agree with the view that “the concept of food security is complex and multifactorial, encompassing behavioral, social, cultural, environmental, and economic factors, which is apparently why there is no terminological consensus among researchers” (Rossinskaya et al., 2022). A search of the Russian National Electronic Library (NEB elibrary) database for “‘food security’ in the title, keywords, and abstract of a scholarly journal article” returns more than 5,000 articles published in 2022–2026 alone (as of June 19, 2026).

The generic feature of food security as a distinctive phenomenon is security as such – namely: a) the current level of protection of the individual, society, and the state from internal and external threats, and b) the ability of the object of protection to withstand internal and external threats and destructive impacts without losing its qualitative characteristics¹. The corresponding conceptual apparatus is closely tied to risks and threats to national interests in various spheres, as well as to measures for neutralizing and eliminating them.

Food security, as one type of security, means the protection of the vital interests of the individual, society, and the state in the specific sphere of food provision for the population; its object is food systems at various levels², from national to local.

The subject area of food security represents a zone of intersection among the problematics of three independent concepts: the universal right to adequate food, national security, and sustainable development. It develops, details, and integrates into a single whole individual elements of these concepts that are directly related to the development of food systems (*Fig. 1*).

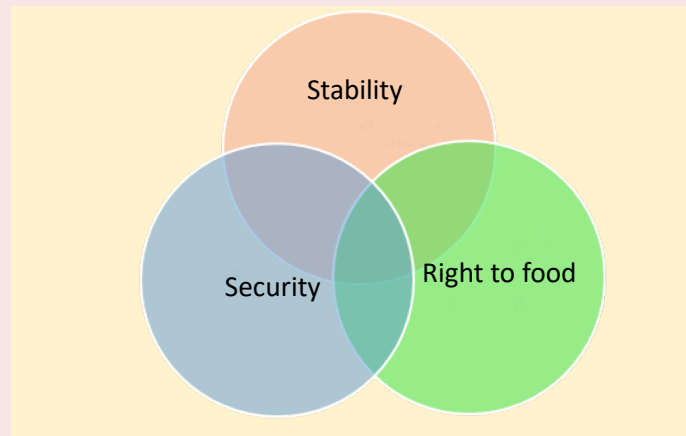
The substantive ambiguity of the concept of FS is indirectly confirmed by the polysemy of the authentic term “food security”: security, provision, confidence (Gumerov, 2013). This polysemy is lost in the Russian translation, and in Russian scholarly and legal discourse the term “food security”, as enshrined in normative acts, holds unchallenged dominance. Unfortunately, linguistic limitations do not allow the essence of FS to be fully captured at different levels of its manifestation: whereas the macrostructural and geopolitical aspects of FS are traditionally – and quite rightly – described by the term “security”, at the level of individual social groups and households it would be more appropriate to use the category “provision/sufficiency”, with its connotation of the right to food.

The core of the food security concept is the universal right to food. The Rome Declaration on World Food Security opens by affirming the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and

¹ See, for example: Puchkov V.A. (Ed.). (2015). Civil Protection: An Encyclopedic Dictionary. EMERCOM of Russia. 3rd ed., revised and expanded. Moscow: FGBU VNII GOChS (FTs). 664 p. P. 40.

² A food system encompasses all elements (environment, human resources, factors of production, processes, infrastructure, organizations, etc.) and all activities related to the production, processing, distribution, preparation, and consumption of food, as well as the outcomes of such activities, including socio-economic and environmental ones. Source: HLPE 2017. (2017). Nutrition and Food Systems: A Report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome. 152 p. P. 13.

Figure 1. Subject area of the food security concept*



*The subject area of the FS concept is presented as the area of intersection of three initial circles.
Source: own compilation.

the fundamental right of everyone to be free from hunger³. This right must be ensured in ways that are safe for national interests and do not undermine sustainable development “for the benefit of future generations”. It is also evident that the issue of food security is semantically closely linked to the issue of poverty and destitution.

The classic definition of food security is recognized as the formulation set out in the Plan of Action adopted at the 1996 World Food Summit: “Food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (Plan of Action)⁴. This definition is the product of a sustained rethinking of food security by the world community – a rethinking that gradually moved from predominantly

technical issues of food provision (reliability of supplies, volumes of supply and reserves at the national level) toward the idea of securing one of the fundamental human rights: the right to adequate nutrition for an active life at the level of the family and the individual⁵.

In accordance with this definition, four attributes, or dimensions, of FS are distinguished: 1) availability, 2) physical and economic access, 3) utilization, and 4) stability (Biswas et al., 2024). Recently, FAO bodies have begun to use two additional criterial attributes alongside the four traditional dimensions of food security: agency and sustainability. These two new aspects, including their precise formulations, have not been officially endorsed by the FAO but are actively promoted by the High Level Panel of Experts of the Committee on World Food Security⁶.

³ Rome Declaration on World Food Security and World Food Summit Plan of Action (1996). FAO UN. Available at: <https://www.fao.org/4/w3613e/w3613e00.htm> (accessed: 30.07.2026).

⁴ Available at: <https://www.fao.org/4/w3613e/w3613e00.htm> (accessed: 26.06.2025).

⁵ The evolution of the term “food security” is traced, for example, in (Belugin, 2019; Bolotnova, 2025); FAO Policy Brief: Food Security (2006). Issue 2. 4 p. Available at: https://www.fao.org/fileadmin/templates/faoitally/documents/pdf/pdf_Food_Security_Cocept_Note.pdf (accessed: 30.07.2026).

⁶ HLPE 2020 (2020). Building a Global Food Security and Nutrition Concept for 2030: A Report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome. 91 p. P. 7.

Expanding the FAO methodological framework with the categories of “agency” and “sustainability” appears redundant. The first of these criteria shifts the focus of monitoring from the physical and economic access to food to an assessment of sociopolitical institutions (the population’s right to influence food systems). Including this factor turns the assessment of FS from a technological audit into a subjective political rating. The attempt to single out “sustainability” as a separate, sixth dimension is likewise redundant. Sustainability is already latently present in the classical FAO 1996 criterion of “stability”, and is also fully covered by the global concept of Sustainable Development (ESG / UN SDGs). One could say that stability in the short and medium term guarantees sustainability in the long term. Both criteria are non-operational and cannot be measured using objective quantitative indicators (in tons, calories, monetary units, or shares). As a result, the practical tasks of eradicating hunger – in particular, achieving SDG 2 – are replaced by “false goals” that lack a technological toolkit for quantitative measurement.

On the methodology for assessing the state of food security

Let us establish several preliminary points.

1. The formula “all people have physical, social, and economic access at all times to sufficient, safe, and nutritious food” is an abstract target benchmark and should not be taken literally. It refers to a theoretical model – a state-guaranteed right to “equal and constant access to adequate food” for all population groups, regardless of income level, property status, or social standing. Naturally, within any population group there will always be individuals who do not have constant access to adequate food due to one or another life circumstance. FS may, for example, be ensured at the level of the family (household) rather than of the individual taken separately. To illustrate this point, in one of his earlier articles the author drew a figurative parallel

between the target state of FS and the condition of a perfectly healthy person, which in practice, as a rule, does not occur. This does not mean, however, that a sick person should not be treated. In our case, the “treatment process” consists in identifying the signs and risks of food insecurity and developing measures to eliminate, mitigate, and/or prevent them. As a cutoff operational criterion of “absolute health”, we can use the norms of consumption of basic food products accepted as consumption standards (scientifically grounded norms, rational norms) in a given territory at a given point in time.

2. The concept of FS is relative, not least because our very ideas about adequate nutrition and rational consumption norms change. According to the well-known assertion of the American cryptographer and computer security specialist B. Schneier, “security is a process, not a result”. Translating this thesis to FS, we can say that ensuring food security is a continuous process characterized by changing tactical objectives and benchmarks, and by changing mechanisms for achieving them as consumption standards and the capacity to meet them evolve.

3. Given its polymorphic nature, FS manifests at several independent levels—and, correspondingly, at several levels of control, assessment, and management intervention: global, national, subnational, group (household), and individual. Situations may arise in which the objectives pursued at different FS levels come into conflict with one another, though not antagonistically. For example, a protectionist policy (national level) may temporarily restrict the variety of goods or raise prices for a family or an individual (micro level).

The dimensions of FS can be visualized as four equivalent “pillars” (Clapp et al., 2022, p. 1; El Bilali et al., 2018). In a certain sense this is indeed the case: the absence of any one of these attributes should be regarded as an absence of food security, or a state of food insecurity in the strict sense of

these concepts. However, such a visualization does not give a full picture of the interconnections and interdependencies among these dimensions of FS. A more apt analogy is to represent the four dimensions as a kind of “matryoshka” (Fig. 2), in which each nested “doll” is smaller than the previous one – from the stage of production (availability) through the stages of distribution (access) and utilization to the smallest “doll” of stability (assessment of vulnerabilities and risks of food insecurity).

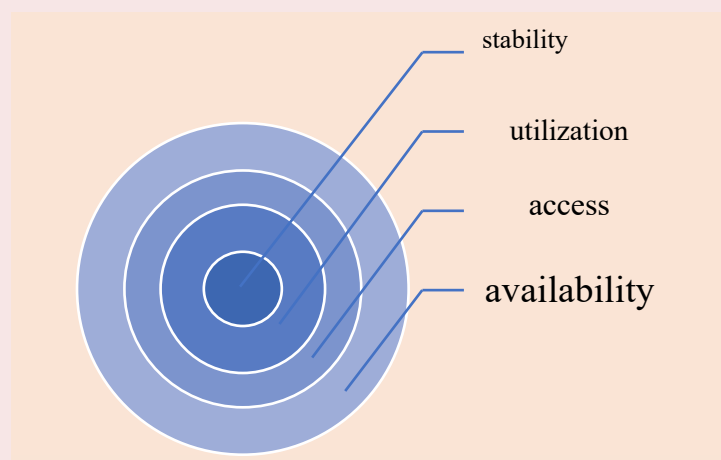
The “matryoshka” model makes it possible to partially address the fair criticism voiced by Ya. Pappe and co-authors regarding the FS criteria formulated in the Food Security Doctrine of the Russian Federation: “...if the definition of a concept employs two or more juxtaposed and equally prioritized propositions without a prior analysis of the relations between them (compatibility, subordination, and so on), this immediately raises justified doubts about its methodological correctness. This is all the more so when these propositions concern fundamentally different objects or subjects” (Pappe et al., 2017).

The model clearly illustrates the subordination of the dimensions of food security and the

corresponding vector for the sequential assessment of its indicators: from the fundamental indicators of food availability to the indicators of the stability of national systems; each subsequent dimension captures the “bottlenecks” of national food systems in ensuring FS. The “matryoshka” also makes it possible to differentiate the levels of FS assessment: assessment at the national level (availability), the household level (access), and the individual level (utilization).

However, the “matryoshka” format does not convey the cyclical nature of FS. Let us return to one of the conclusions formulated above: ensuring food security is not a result but a continuous process, since the notion of food sufficiency is subjective and relative. The most obvious illustration of the cyclical nature of FS is the change in consumption patterns, whereby, as food resources, incomes, and state support measures for food systems grow, the population begins to place new, higher demands on the availability, access, and utilization of high-quality and diverse food. To characterize different consumption patterns as a measure of FS, Yu.M. Ksenofontov and co-authors introduced the special term “food well-being” (Ksenofontov et

Figure 2. The “matryoshka” of food security



Source: own compilation.

al., 2018, p. 128). The transition from the static “matryoshka” to a cyclical model of dynamically evolving needs resolves this contradiction (*Fig. 3*). The gradual decrease in the diameters of the circles from “availability” to “stability” indeed conveys the idea of narrowing and filtering the elements of FS, as well as the subordination of its levels: from the macro level (availability) to the micro level of individual consumption.

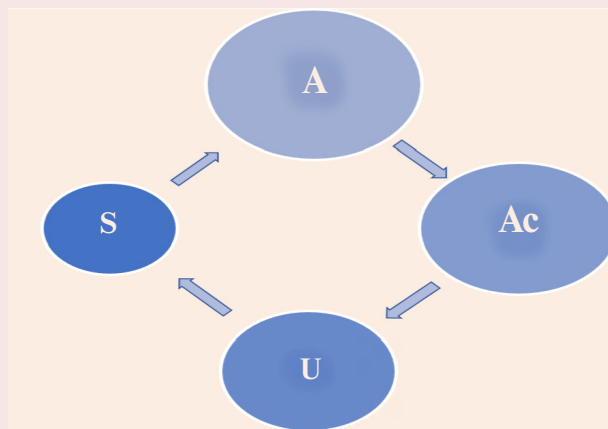
The cyclical model also clearly illustrates the operation of feedback mechanisms. As food passes through the entire chain from production to final assimilation by the body, new social needs come to light, forcing a reshaping of the supply structure in the next turn of the cycle – a response to the accumulated changes at the levels of access, utilization, and the overall stability of the system⁷.

Justification and assessment of the set of national FS indicators of the Russian Federation: Methodological “dead ends” and “forks”

International indicators

In 2015, within the framework of the 2030 Agenda for Sustainable Development, the UN launched the implementation of seventeen Sustainable Development Goals (SDGs). Goal 2, “End hunger, achieve food security and improved nutrition, and promote sustainable agriculture”, is directly aimed at eliminating hunger and malnutrition in all its forms by 2030. Monitoring of the goal’s implementation is carried out using thirteen indicators grouped under eight targets⁸. The Russian national set of SDG 2 indicators includes five indicators assigned to four targets⁹.

Figure 3. The cyclical “matryoshka” model of FS, where:
A – availability, Ac – access, U – utilization, S – stability



Source: own compilation.

⁷ These processes are most clearly visible in the case of the People’s Republic of China, where shifts in the food structure were driven by rapid urbanization, the formation of a large middle class, and overall growth in household incomes. Over recent decades, China’s food basket has undergone a fundamental transformation: the country has moved from a traditional carbohydrate-based diet (rice and grains) to a Western-type consumption pattern with a high share of proteins, fats, and processed products. There has also been an increase in the share of beef and poultry in total meat consumption and a surge in the consumption of eggs, milk, and seafood (Zhu, 2026; Sun et al., 2024; Gale, Dong, 2023).

⁸ Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development. Available at: https://unstats.un.org/sdgs/indicators/Global%20Indicator%20Framework%20after%20refinement_Rus.pdf (accessed: 21.06.2026).

⁹ National list of SDG indicators. Available at: https://rosstat.gov.ru/storage/mediabank/NPP_ZUR-2026.xlsx (accessed: 21.06.2026).

The Global Food Security Index (GFSI), developed by the Economist Group, assesses the availability, accessibility, quality, and safety of food, as well as sustainability and adaptation, using 68 indicators. According to the developers, these indicators measure the factors affecting food security in both developing and developed countries¹⁰.

The specific feature of these lists is that they do not fully correspond to the four dimensions of FS in the generally accepted UN/FAO concept. A corresponding set of indicators, fully harmonized with the four dimensions, was first proposed in the joint report “The State of Food Insecurity in the World 2014: Strengthening the Enabling Environment for Food Security and Nutrition”¹¹. The list consists of 31 indicators, including 5 availability indicators, 9 access indicators (3 of which concern physical access), 10 utilization indicators, and 7 stability indicators.

All of the above lists are unified sets of the most general indicators intended to assess FS in both developing and developed countries. At the same time, the FAO list, quite naturally, places greater emphasis on assessing the state of FS in developing countries, and a significant number of its indicators are not relevant to the developed countries of Europe and North America. This applies, in particular, to the high share of utilization indicators and to the presence among them of such indicators as “access to improved water sources”, “access to improved sanitation facilities”, “percentage of children under five years of age suffering from wasting”, and “percentage of the adult population with

low body mass index”. The same prioritization of FS indicators is characteristic of the SDG 2 indicators. As for the individual GFSI indicators, they are maximally unified and focused on cross-country comparisons (indexing and ranking), and therefore give little consideration to country-specific features of the state of FS “here and now”. To be sure, for a number of Russia's regions, indicators of infrastructural access to water supply remain relevant; however, within the framework of building a compact nationwide model for the prompt diagnosis of risks, they cannot be recognized as cross-cutting limiting factors.

Indicators of the RF Food Security Doctrine

The overloading of the current regulatory contour of the FS Doctrine of the Russian Federation, noted above, dictates the need for a change in the analytical paradigm¹². A national list of indicators should methodologically be built on a combination of universal approaches to identifying FS with an operational analysis of the specific food situation in the country “here and now”. Accordingly, the indicators we propose have been strictly structured according to the four classical FAO dimensions.

The author's position is that the number of indicators in the national list for each dimension should fall within the range of three to five. Limiting the analytical contour to 3–5 key indicators for each of the four dimensions of the FAO concept is dictated by the requirements of managerial ergonomics (triangulation, Miller's law), which make it possible to identify threats promptly

¹⁰ Global Food Security Index 2022 (2022). The Economist Group. 29 p. Available at: https://impact.economist.com/sustainability/project/food-security-index/resources/Economist_Impact_GFSI_2022_Global_Report_Sep_2022.pdf (accessed: 30.07.2026).

¹¹ FAO, IFAD, WFP (2014). The State of Food Insecurity in the World 2014: Strengthening the Enabling Environment for Food Security and Nutrition. Rome: FAO. 58 p., p. 54. Available at: <https://openknowledge.fao.org/server/api/core/bitstreams/3647342f-9f40-4bb7-94a2-996e8fe80d67/content> (accessed: 30.07.2026).

¹² The normative list of indicators for assessing the FS of the Russian Federation, developed in furtherance of the Food Security Doctrine of the Russian Federation, runs to 27 pages. The indicators presented in the list can be tentatively divided into the following subgroups, which have varying relevance to FS proper: macroeconomic indicators; indicators of FS proper; and indicators characterizing the factors and risks of ensuring FS. See RF Government Resolution 296-r of February 10, 2021, “On Approval of the List of Indicators in the Sphere of Ensuring Food Security of the Russian Federation”.

without excessively overloading the analytical system. Priority in assessment is given to indicators that identify problem areas within a compressed timeframe. The following qualitative selection criteria were used jointly:

- relevance of the indicators to the four basic dimensions of food security (availability, access, utilization, stability);
- regular end-to-end observability, presupposing reliance on continuous series of official Rosstat data or the simplest calculations based on them, which excludes expert subjectivity and ensures verifiability of results;
- logical representativeness, based on heuristic methods of analysis, including SWOT metrics (to capture the strengths and weaknesses of the AIC contour), abduction (as a method of finding the best explanation for the hidden causes of latent risks), and the Theory of Change for modeling chains of cause-and-effect relationships.

In essence, the proposed system of indicators serves to diagnose the risks of food insecurity. *Table 1* consolidates indicators that are either drawn from official databases or require minimal calculations derived from them. This system is intended primarily not to produce a snapshot, or “instant image”, of FS, but to assess problem areas, trends, and risks with a view to subsequent management decision-making. Given the limited length of the article, the focus below is on the indicators and criteria of greatest theoretical and practical interest.

Availability. In the system of balance indicators of food resources, the security criteria are: 1) no decline in the annual aggregate volumes of available food resources (production, imports, balance of stocks), and 2) compliance with the threshold ratio

of grain stocks at year-end to the volumes of their aggregate consumption in the following year. The second indicator is an emulation of the “stock-to-use ratio” used by FAO experts to assess global FS. A ratio of 17–18% is estimated to be the minimum necessary to ensure world food security¹³.

Unfortunately, we are compelled to limit the horizon of our analysis of food balances to 2021, since Rosstat ceased their official publication thereafter¹⁴. Within this study, therefore, the corresponding conclusions are more illustrative than evidentiary. Over 2017–2021, the criterion of non-declining resources was met for most types of products. The exceptions were potatoes and vegetables (a declining trend) and grain (unstable dynamics). Genuine concern may be warranted only by the decline in resources of vegetables and food melons and gourds, for which a consumption deficit is observed. In this study, the classical stock-to-use ratio has been modified by the author into an “intermediate (winter) reserve sufficiency coefficient”. It is calculated as the ratio of grain volumes held in storage at the intermediate peak moment (December 31 of the reporting year) to actual utilization in the subsequent calendar year. The resulting high values (in the range of 60–70%) are not methodologically comparable directly with the UN FAO summer carryover stocks (17–18%); however, they clearly illustrate the colossal concentration of food resources at the midpoint of the management cycle and testify to a high degree of short-term resource sufficiency of the domestic grain market in the winter–spring period. The deliberate use of the modified indicator is due, among other things, to the need to harmonize the data with other calendar-based Rosstat indicators.

¹³ Trade Reforms and Food Security: Conceptualizing the Linkages (2002). FAO UN. Rome. P. 6. Available at: <https://www.fao.org/4/y4671e/y4671e00.htm> (accessed: 30.07.2026).

¹⁴ Federal Law 55-FZ of February 28, 2023, “On Amending Article 5 and Suspending the Operation of Part 7 of Article 8 of the Federal Law ‘On Official Statistical Accounting and the System of State Statistics in the Russian Federation’ and on the Specifics of Conducting Official Statistical Accounting in the Territories of Certain Constituent Entities of the Russian Federation”, introduced amendments permitting the Government to temporarily suspend the dissemination of official statistical information.

Table 1. List of indicators for monitoring and controlling the state of food security of the Russian Federation

FS dimension	FS indicators	Corresponding measures
Availability	Balances of individual types of food resources	Volume of available food resources (by individual commodity groups)
	Modified " <i>stock-to-use ratio</i> " indicator used by FAO experts to assess global FS (17–18%)	Calculation based on Rosstat indicators (food balances)
	Gross agricultural output per capita, dynamics	Calculation based on Rosstat indicators
Access	Ratio of actual expenditures on food purchases (by decile groups) to the cost of a minimum (conditional) food basket	Calculated indicator based on Rosstat source data
	Share of food purchase expenditures: – per capita on average; – in the first decile group	Rosstat indicators
	Decile coefficient of food purchase expenditures (expenditures of the first group relative to those of the tenth group)	Calculated indicator based on Rosstat source data
	Level of moderate or severe food insecurity of the population, according to the Food Insecurity Experience Scale, %	Position in the national list of SDG indicators. Calculated using the Food Insecurity Experience Scale (FIES)
	Density of retail space per 1,000 people	Regional statistics indicators
Utilization	Per capita consumption of basic food products	Rosstat indicators
	Consumption by decile groups	Rosstat indicators
	Decile coefficient of per capita consumption of the most valuable food products (consumption of the first group relative to that of the tenth group)	Calculated indicator based on Rosstat source data
	Energy and nutritional value of food consumed, including the ratio of proteins, fats, and carbohydrates in the diet	Rosstat indicators
Stability	1. Production and consumption: – fluctuations in gross grain harvests within a five-year period (lowest to average); – share of domestically produced products in total resources of basic types of agricultural raw materials and food, %, by value (dynamics); – level of monopolization of food markets	Rosstat indicators and calculated indicators based on Rosstat source data. The FAS methodology for analyzing the state of competition in a commodity market makes it possible to assess the monopolization of individual markets
	2. Technology: – share of domestically produced seeds (a); – share of animals of domestic reproduction used for agricultural production on the territory of the Russian Federation (b)	Indicator of the FS Doctrine of the Russian Federation (a) Position in the national list of SDG indicators (b)
	3. Finance: – volume of state support for agriculture; – level of agflation	Data from the Ministry of Agriculture of Russia and Rosstat
Source: own compilation.		

Access. Statistical analysis verifies the “cyclical matryoshka” model: although at the upper level (“availability”) food resources in the country are largely in place, at the next level (“access”) the volumes and economic conditions for purchasing food differ markedly across decile groups.

A first approximate assessment of the economic access to food is provided by the ratio of actual household expenditures on food purchases to the cost of a minimum (conditional) food basket (FE/CB), not only for the population as a whole but also broken down by decile groups¹⁵. As can be seen from *Table 2*, in 2020–2024 the first decile group of the country’s population found itself in a conditional zone of absolute deprivation: its food purchase expenditures were below the cost of the conditional basket. The second group was in a conditional zone of vulnerability (heightened risk), or relative deprivation, periodically “falling” into the zone of absolute deprivation: actual food purchase expenditures in this group only marginally exceeded the cost of the minimum basket (2020, 2023, 2024) or fell below it (2021, 2022).

The limitation of the FE/CB indicator is that it is conditional in nature and does not take into

account shifts in consumption structure – whether between or within groups. A more nuanced picture of the economic access to food for different groups of the Russian population can be obtained by examining their share of food purchase expenditures in total consumption expenditures.

In the theory and practice of international relations, the principle of the indivisibility of security is widely applied, meaning that it is impossible to ensure one’s own security at the expense of the interests of other actors. Within our study, this principle is transposed onto the system of basic human needs. Food security can be considered achieved only when a consumer not only has sufficient means to purchase a desired set of quality products, but also uses them without detriment to the satisfaction of other basic material and spiritual needs¹⁶. Infringement of any of these spheres for the sake of survival devalues the individual’s overall security.

As an evaluative criterion for the economic access to food, the author used the UN living standards scale based on Engel coefficients. A high share of food expenditures (above 50%) represents another form of food insecurity, since in this

Table 2. Actual household food expenditures by decile group compared with the annual average cost of the conditional (minimum) food basket, 2020–2024, rubles per month

Year	Actual food purchase expenditures, by decile group			Annual average cost of the conditional (minimum) basket
	Group 1	Group 2	Group 3	
2020	3263.6	4334.9	4950.0	4320.1
2021	3557.8	4681.8	5485.4	4911.7
2022	4126.3	5397.5	6330.2	5775.6
2023	4466.0	5997.8	6990.0	5788.7
2024	5075.3	6820.0	7987.2	6495.3
Note: zones of absolute deprivation (expenditures below the cost of the minimum basket) are highlighted in red; zones of relative deprivation/vulnerability are highlighted in yellow. Source: own calculations based on Rosstat data.				

¹⁵ The conditional (minimum) food basket comprises 33 items of food products. Data on the cost of the basket are determined per person per month. Its calculation uses the uniform conditional volumes of food consumption established for the Russian Federation as a whole and the average consumer prices for them by constituent entity of the Russian Federation (“Official Statistical Methodology for Monitoring Consumer Prices for Goods and Services and Calculating Consumer Price Indices”, approved by Rosstat Order 915 of December 15, 2021).

¹⁶ Committee on Economic, Social and Cultural Rights. General Comment No. 12 (1999): The Right to Adequate Food (Art. 11). UN. Doc. E/C.12/1999/5. May 12, 1999. Available at: <https://docs.un.org/ru/E/C.12/1999/5> (accessed: 30.07.2026).

case food purchases cannot be made without detriment to expenditures on other basic needs, rehabilitation, and development. This is a very important nuance¹⁷.

In the Russian Federation as a whole, the share of food expenditures in total household consumption expenditures is at an acceptable level, corresponding to the average level of development of society and a relatively well-off population, and in recent years it has shown a weak downward trend. In previous years, by contrast, this indicator grew – from 33.2% in 2013 to 37.0% in 2020. Within the period 2013–2020, two spikes in food purchase expenditures can be noted – in 2014 and 2020. In the first case, the share rose from 33.2 to 33.9% in connection with the adoption of retaliatory protective measures in foreign food trade; in the second, the increase from 34.6 to 37.0% was driven mainly by the logistical consequences of the COVID-19 pandemic.

The data obtained allow us to state, with a certain degree of caution, that an institutional

turning point has occurred in the long-term dynamics of the indicator in question, insofar as average values are concerned. At the same time, detailed statistical data confirm the viability and practical significance of the cyclical “matryoshka” model we have developed, not only with respect to the interrelations among the four FS dimensions but also for the analysis of each dimension individually. The methodological trap of “average well-being” masks the fact of pronounced stratification of the Russian population.

As can be seen from *Table 3*, in 2024, in five out of ten groups the share of food expenditures was in the 40–50% range, which, according to our hypothesis, corresponds to a below-average standard of living, while 10% of the country's population (the first decile group) spends more than half of its consumer budget on food, which corresponds to a low level of well-being. It is precisely the indicators of this group, and not average indicators, that should be the primary focus of FS monitoring and control (control of the limiting link).

Table 3. Grouping of the Russian population by welfare level based on the share of food expenditures (2020 and 2024)

Food expenditure scale, % of total expenditures	Interpretation (living standards)	Distribution of decile groups of the Russian population by category	
		2020	2024
> 60	extreme poverty		
50–60	low level, basic needs barely met	Group 1	Group 1
40–50	below-average level, basic needs met	Groups 2, 3, 4, 5, 6, 7	Groups 2, 3, 4, 5, 6
30–40	average level, relatively well-off population	Groups 8, 9	Groups 7, 8
20–30	above-average level, affluent society	Group 10	Group 9
< 20	high level, rich society		Group 10
Source: Rosstat data.			

¹⁷ Recently, publications have appeared claiming that a significant portion of food—meat, sugar, eggs, butter—has become more accessible compared with the Soviet period on the grounds that the ratios between average Russian wages and prices for these products have changed. This conclusion was reached, in particular, by experts interviewed following an analysis conducted specifically for TASS. See: “Price/Income”: How the affordability of food in Russia has changed compared with the USSR. Available at: <https://tass.ru/obschestvo/26443829> (accessed: 06.07.2026). This is a major methodological error leading to incorrect practical conclusions. All that can be considered proven is that the aforementioned ratios have changed. Such an assessment fails to take into account that housing and utility tariffs and public transport fares, along with many other types of expenses, have simultaneously risen and now absorb a noticeable share of the expenditures of contemporary Russian households compared with the Soviet period. This is to say nothing of the fact that it is improper to assess the affordability of food for the Russian population on the basis of average wages.

The decile coefficient of food expenditures proposed by the author has fluctuated in recent years within the range of 3.08–3.27 (*Fig. 4*). The decile coefficient of food expenditures, K_{fe} , is calculated as:

$$K_{fe} = E_{10} / E_1,$$

where K_{fe} is the decile coefficient of food expenditures,

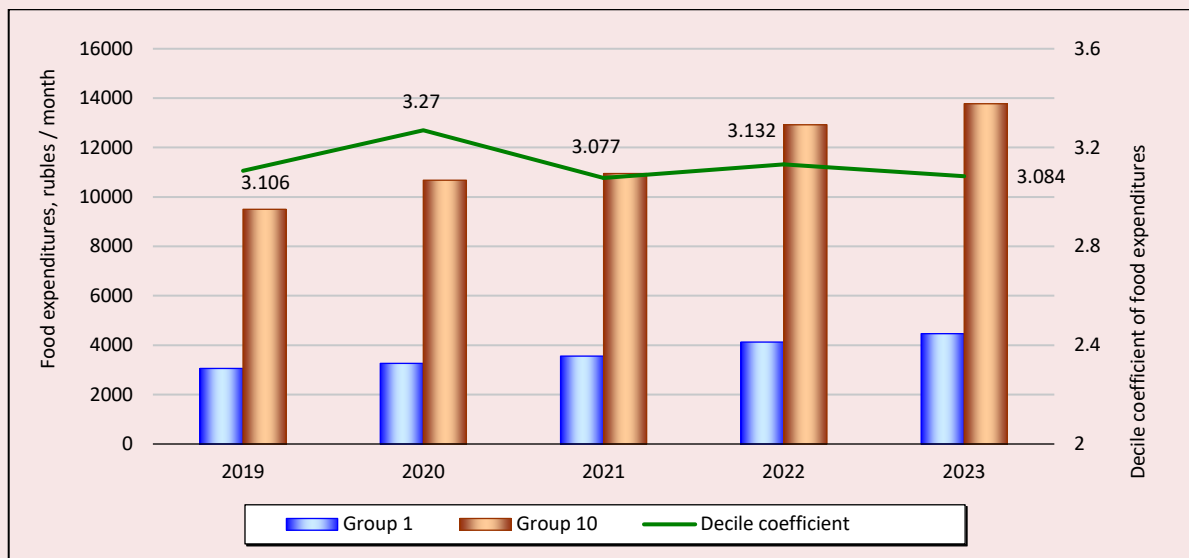
and E_{10}, E_1 are the monthly food expenditures in the tenth and first decile groups, respectively.

Fluctuations of the decile coefficient of food purchase expenditures within a narrow range of values may indicate the diminishing marginal efficiency of traditional instruments of targeted support for low-income groups and the need to search for new forms.

In the Russian literature, a fairly widespread interpretation of the physical accessibility of food treats it as the presence/sufficiency of food in accordance with rational norms of consumption of its basic types (Kireeva et al., 2020; Shchetinina, 2024; Yashkova, 2020).

Methodological triangulation does not confirm this approach: both the FAO methodology and the GFSI, as well as the Food Security Doctrine of the Russian Federation, use other indicators as criteria for physical accessibility. Here we are dealing with a methodological conflation of different FS dimensions – availability, access, and utilization. In reality, the term “physical accessibility” has an obvious connotation with the possibility of purchasing food in one’s place of residence, within reach. The High Level Panel of Experts on Food Security and Nutrition of the Committee on World

Figure 4. Food expenditures of the first and tenth decile groups and the decile expenditure coefficient in 2019–2023



Source: own calculations based on Rosstat data.

Food Security defines physical accessibility as the “physical proximity” of food¹⁸. To assess physical accessibility, the author proposes using a fairly neutral indicator from the Doctrine, “the level of development of the distribution infrastructure”. Since, in accordance with legislation, the minimum standards for the provision of the population with retail space for the constituent entities of the Russian Federation are developed by the authorized executive bodies of the respective constituent entities, it would be advisable to delegate to them the authority to monitor and assess this parameter as well.

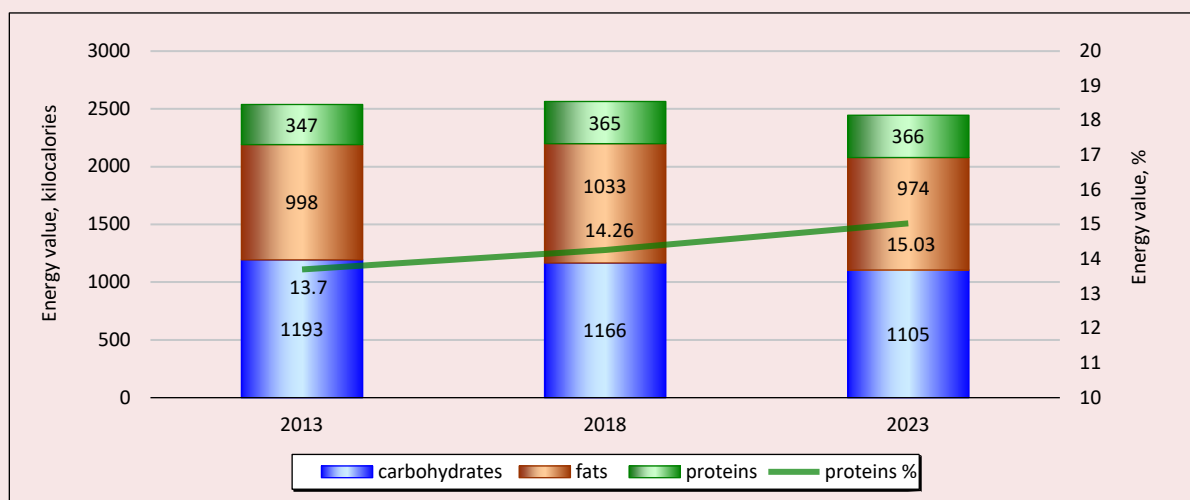
Utilization. Utilization assesses the energy value, balance, and diversity of the diet, its digestibility, and its correspondence to the traditions, customs, and ideas about nutrition in a specific cultural environment.

A retrospective analysis of the energy and nutritional value of food consumed records two trends (Fig. 5): 1) stabilization of the energy value

of the daily diet of the average Russian (a decline of less than 4% can be disregarded), alongside 2) a qualitative improvement of the diet through a certain increase in the share of kilocalories obtained in the form of proteins.

Another indicator of utilization is the degree to which the consumption diet corresponds to rational (scientifically grounded) norms, which characterizes the material and physical form in which the necessary macronutrients (proteins, fats, carbohydrates) with sufficient energy value are consumed. Let us emphasize the conditional nature of rational consumption norms. The recommended rational norms of the Russian Ministry of Health are nothing other than a scientific notion (hypothesis) of a set of food products that best meet the criteria of balance, diversity, and digestibility under existing assumptions and constraints – primarily the actual availability and economic accessibility of food. There are known studies that used other criteria to assess the diet: the total caloric content of the

Figure 5. Dynamics of the nutritional and energy value of the daily diet of persons aged 14 and older



Sources: data from sample surveys of the population's diet in 2013, 2018, and 2023; own calculations based on them.

¹⁸ HLPE 2020 (2020). Building a Global Food Security and Nutrition Concept for 2030: A Report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome. 91 p., P. 90.

diet (Pradhan et al., 2014; Kinnunen et al., 2020) or an alternative set of products (Stehl et al., 2025). Additional components of utilization are conventionally considered to be free access to clean water, sanitation, and healthcare, which promote better assimilation of nutrients.

The volumes of per capita consumption of all basic food products showed positive dynamics in the 2000s; nevertheless, actual consumption of vegetables, fruits and berries, and dairy products lags noticeably behind the norms recommended by the Russian Ministry of Health; this applies to a lesser extent to fish consumption. A mirror image is observed with respect to sugar: its actual per capita consumption is more than four times the recommended rational norm. In fairness, we should note that the recommended norm is considerably lower than the historically established consumption standards of the Russian population; it was revised substantially downward in 2020 and can for now be classed as unrealistic.

The existing inequality in the consumption of the most valuable food products across decile groups (Tab. 4) corresponds to the differentiation in these groups' expenditures on food purchases.

Here we once again fall into the average metrics trap and observe a certain paradox: the larger the share of their expenditures that households devote

to purchasing food, the less nutritious and healthy their diet is.

Stability. The dimension of stability (sustainability) in the food security system has a dual, dualistic nature. On the one hand, within the FAO cluster approach, stability acts as an independent, fourth dimension of FS, assessing the system's vulnerability to short-term shocks and long-term risks. On the other hand, stability is a cross-cutting factor and a necessary condition for the realization of all the other dimensions – availability, access, and utilization. This methodological feature can be compared to the projections of a geometric body (a pencil, for instance): viewed end-on, we see only an isolated point (an independent dimension), but viewed from the side, we see an extended segment running through the entire structure of the “cyclical matryoshka” (a cross-cutting factor). Stability as a “point” is measured by specific markers, such as the share of domestically produced products in the total resources of basic types of agricultural raw materials and food, or fluctuations in gross grain harvests within a five-year period. At the same time, stability as a “segment” determines how sustainable over time are the economic access for decile groups, the physical continuity of supplies to retail chains, or the balance of the diet.

Table 4. Food consumption by decile (ten-percent) groups of the population in 2023

Consumption of basic food products, average per consumer per year, kg	First group	Second group	Fourth group	Seventh group	Tenth group
bread products	75.1	82.4	87.3	89.0	86.0
potatoes	46.2	52.7	55.8	55.9	51.9
vegetables and melons and gourds	68.7	86.9	101.3	116.7	129.6
fruits and berries	39.1	51.2	63.9	77.7	104.1
meat and meat products	63.9	80.1	91.9	105.9	117.5
milk and dairy products	169.7	212.9	249.3	274.7	321.6
eggs, units	171	204	225	241	288
fish and fish products	13.8	17.0	20.2	23.1	33.2
sugar and confectionery	22.3	26.3	28.5	30.9	29.8
vegetable oil and other fats	7.7	8.8	9.6	9.3	9.3
Source: Rosstat data.					

In this study, we would like to focus attention on two basic indicators of stability: the share of domestically bred seeds (technological stability of the food system as an expression of technological sovereignty) and the level of agflation (financial stability as an expression of financial sovereignty).

Earlier (Gumerov, Guseva, 2018), the so-called “import substitution paradox” was formulated: given the established volumes of supplies of production resources for agriculture (seeds, breeding material, plant protection products, feed premixes), import substitution in the sphere of agricultural products, all other things being equal, will be accompanied by growing secondary resource dependence; other Russian researchers have also drawn attention to this feature (Potapov, 2019). Growing secondary dependence is understood as a situation in which the expansion of domestic volumes of final output critically relies on a proportionally growing import of first-level material and technical resources (genetic material, hatching eggs, veterinary preparations, premixes, and seed material), which under external shocks creates latent vulnerabilities for the entire food system.

The updated 2020 edition of Russia's Food Security Doctrine, alongside threshold values for self-sufficiency in basic types of agricultural products and food, includes an indicator for the provision of domestically bred seeds of major crops at a level of no less than 75%. Here, too, it is important not to fall into the “average values” trap: while self-sufficiency in seeds of wheat, rice, and barley is high, the provision of domestically bred seeds for crops such as potatoes and sugar beets looks positively catastrophic – at 10 and

2%, respectively (2024)¹⁹. On the whole, the import substitution process has been structured and regulated. By RF Government Resolution 4133-r of December 23, 2022, a schedule for increasing the share of domestically bred seeds by major crop has been approved; under the State Program for Agricultural Development, subsidies are paid for the purchase of elite seeds of domestic breeding to producers of grain and sunflower, and for producers of vegetables from elite seeds of domestic breeding, increasing coefficients for subsidization are provided. In parallel, quotas on the import of potatoes, malting barley, and hybrid sugar beet seeds are being reduced. It is important to monitor the target indicators of the Doctrine and to extend the import substitution policy to other production resources of agriculture within the framework of the Federal Scientific and Technical Program for Agricultural Development (FSTP) for 2017–2030.

The food price index (the level of agflation) is an informative indicator of the stability of the food system at the “first level”. As the experience of the global food crisis of 2007–2008 showed, food price growth may be driven by a whole set of heterogeneous factors: climatic change and weather fluctuations, political decisions, population growth and changing consumption patterns, and shortages of production resources. In recent years, the risks of military-political conflicts and the logistical problems associated with them have grown substantially. A detailed analysis of the nature, triggers, and macroeconomic consequences of such price spikes in the domestic food market has been carried out in detail by the author in a dedicated study (Gumerov, 2021).

¹⁹ Results of the Year in Plant Breeding and Seed Production – 2024. Available at: <https://поле.рф/journal/publication/itogi-goda-v-selekcii-i-semenovodstve-2024> (accessed: 05.07.2026).

On the basis of the presented graph (Fig. 6), three key stages in the dynamics of agflation in the Russian Federation over the period 2019–2025 can be identified.

1. The period of outpacing growth (2019–2021). The onset of the COVID-19 pandemic and disruptions in global logistics chains led to a sharp spike in food prices (Gumerov, 2021). The orange line climbs steeply, peaking in 2021 (around 112.5%). At this time, general inflation (the blue area) grew much more slowly, producing a wide gap (“price scissors”) in favor of agflation, which placed excessive economic pressure on the least protected segments of the population.

2. The catch-up inflation effect (2022). In 2022, the trend temporarily reversed. Food prices

stabilized and even declined slightly, while the overall consumer price index (the blue area) reached its peak (around 111.8%). This is explained by the fact that the agflation surge of previous years spilled over into other sectors of the economy (fuel, services, and non-food prices rose), and general inflation “caught up” with food inflation (the scissors “closed”).

3. The second wave of agflation (2023–2024). After a brief decline in 2023, the orange line of food prices surged upward again, forming a second peak in 2024 (around 111.8%). The blue area of general inflation was lower at the time. This confirms that the chronic structural imbalances of the food market are regularly exacerbated under the influence of external shocks.

Figure 6. Consumer price indices



Source: Rosstat data.

In 2025, a synchronous slowdown of both indicators was observed; however, the food price index fell faster than general inflation. At present, we cannot say how stable this dynamic is or whether it will develop into a trend; subsequent observations will show.

The obvious complex nature of agricultural inflation, which originates at the intersection of macroeconomic, monetary, transport, and phytosanitary triggers, requires the integration of interdepartmental analytical competencies through the creation of a special institution – for example, an Interdepartmental Coordination Council or a Situational Center for Food Markets under the Government of the Russian Federation. The main functions of such a center, in the context of the proposed system of indicators, should be: 1) the consolidation and end-to-end monitoring of departmental information flows to form a unified database on the state of the food market; 2) the development of short-term operational supply and demand balances for critically important food groups, making it possible to identify latent imbalances before they manifest in the retail price contour; and 3) scenario modeling of the risks of agflation and secondary technological dependence of the AIC for the prompt adoption of tariff, customs, and monetary regulation measures.

Conclusion

In accordance with the stated aim of the study (the development of a compact model for the

prompt diagnosis of food security risks based on polar intergroup analysis), the following main results were obtained, mirroring the resolution of the key objectives.

1. With respect to synchronization with international approaches: the transition from aggregate indicators to the four-component FAO framework has been substantiated, making it possible to identify latent threats masked by the average indicators of the national doctrine.

2. With respect to overcoming the “average metrics trap”: on the basis of the author's decile coefficient of food expenditures (Kfe), the critical depth of socioeconomic differentiation has been empirically demonstrated – where the inflationary compression of the diets of the least well-off groups occurs against a backdrop of stable average indicators.

3. With respect to the technological contour and stability: a two-stage “matryoshka” model (in its static and cyclical modifications) has been developed and verified, and the need to create a Situational Center under the Government of the Russian Federation for scenario modeling of agflation shocks and related functions has been substantiated.

The developed methodological approach possesses conceptual completeness and shifts the focus of monitoring from ascertaining crises that have already occurred to the preventive management of latent risks.

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