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Research Article

On the transformation of regional food systems: From autochthonous to those generated by globalization

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Abstract
Attention is focused on the historical transformation of regional food systems. The latter are interpreted as diversified, regionally defined systems of production, transportation, consumption, as well as aesthetic and spiritual perception of food products based on the use of resources, both of local origin and those attracted from outside. The general approaches to understanding the evolution of regional food systems are considered without specifying the past and present pictures of the differentiated food space. An attempt is made to find the connection of spatial food systems with the "pyramid of needs" by A. Maslow. A special role in the spatial transformation of the food sector is assigned to the process of globalization and, in particular, the strengthening of the hegemony of agrarian transnational corporations, strengthening their influence on the dynamics and structure of production, as well as on food consumption. The connection of the global expansion of food trade networks with the evolution of national cuisines, which are a specific subsystem of the world's food systems, as well as with the so-called "cultural sovereignty" of countries, is noted. It is concluded that it is important to study the sustainable dependencies of regional food systems, manifested in various socio-economic conditions.

Highlights:

-Historical transformation of regional food systems

-Connection of spatial food systems with the "pyramid of needs" by A. Maslow

-Influence of the hegemony of agrarian multinational companies on the evolution of regional food systems

-Impact of globalization on the transformation of national cuisines of states

-Role of specific socio-economic conditions on the development of regional food systems

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1. INTRODUCTION

The level of food security is one of the most important indicators of the well-being of the population of the world, all its regions and social strata without exception. Due to its close interconnectedness with the task of overcoming the socio-economic backwardness of poorly developed countries, the food problem occupies an important place in the register of global problems of mankind.

Among the axiomatic ones is the fact that food production is largely determined by the natural agricultural potential of countries and territories (of course, along with the food resources of the World Ocean). Being a universally recognized prerequisite for agricultural development, natural agro potential not only largely determines the territorial differentiation of land use systems and the efficiency of agricultural sectors, but, in conditions when only a little less than half of humanity continues to be rural residents, often serves as a kind of indicator of the structure, level and nature of food consumption of the local population. Being a dynamic phenomenon and evolving in space and time, the natural agro potential and its components largely determine the structure of world food systems.

If in previous eras *autochthonous systems* of food production and consumption dominated the world, then with the expansion of world food trade, many traditional regional food systems began to change their appearance, including the culinary component. At the same time, some aspects of food consumption have gone beyond the purely economic sphere, having acquired many cultural meanings in the spiritual life of society. But in any case, it is difficult to dispute the continuing connection of such meanings with the nature, economy, the processes of globalization and the transformation of spatial nutrition systems.

The consequence of the process of economic globalization is not only the success of the agricultural sector of individual countries, but in some cases the loss of its competitiveness and even complete degradation, which changes the structure of regional food systems. It is not difficult to give concrete examples of how the territorial expansion of TNCs (transnational corporations) and financial markets has led and is leading to food crises in the economies of poorly developed and medium-developed countries (Lyson, Raymer, 2000).

In particular, we recall the fate of Mexico's corn sector, which plunged into a chronic crisis after the entry into force of the North American Free Trade Agreement due to the influx of cheaper American corn. We also recall the transformation of the Philippines, a self-sufficient rice power, into a rice importer country in connection with the restructuring of national agriculture in the spirit of free trade and trade liberalization (Gladkiy, Sukhorukov, Kornekova, 2021), etc. Such facts have a relatively weak impact on the transformation of regional types of nutrition, but they indicate the importance of taking into account the factor of globalization when analyzing the stated problem.

The *purpose* of the study is to substantiate the conceptual provisions of the evolution of spatial food systems - from autochthonous, formed at the dawn of human development, to modern, the formation of which is largely due to the processes of *globalization*. The point of view is substantiated, according to which the spatial differentiation of food systems and types of nutrition occurs under the influence of a variety of natural, political, economic, socio-cultural, ethnic, confessional and other factors. Finally, the author emphasizes the underestimated role in this process of the properties of the food consumed: *energy value, biological value, associative value* (that is, the value consisting in the ability to associate oneself with a certain community of people through the consumption of specific products, one of the unifying factors of which is a certain nutrition system), as well as *singular value* (that is, values reflecting the uniqueness, exclusivity of the food consumed, allowing to emphasize the elitism of a person).

The article focuses *on regional food systems*, although it may seem that we are talking about "*types*" or "*modes*" of nutrition. The author proceeds from the fact that the systems are the most polystructural in nature and combine the largest number of elements and activities related to the production, processing, distribution, processing and consumption of food, as well as the results of such activities, including socio-economic and environmental (A new look…, 2020; Hendriks Sheryl L., 2015; FAO, 1996). From the point of view of the interpretation of food spatial systems, the following seems to us particularly constructive: "the

system is a resource-consuming, additive, homeostatic structure consisting of interdependent parts, each of which brings something specific to the unique characteristics of the whole" (Ilyin, 2014, p. 55). The term "additive" in our case may indicate the mobility of food systems, the permanent possibility of their transformation, and the expression "homeostatic structure" indicates the ability (property) of the food system for a long time to maintain a certain constancy or set of characteristics at a certain level.

It is spatial consistency (Sukhorukov, Gladkiy, 2019) manifested in the formation of relatively closed and regionally defined systems of production, transportation, consumption, as well as aesthetic and spiritual perception of goods (including food), based on the use of resources, both of local origin and attracted from outside (through interregional and interstate supplies), as well as stable links between the spheres of production, consumption and perception, forming certain correlations - the main argument for attributing consumption problems to the sphere of social geography.

At the same time, the use of this concept in scientific research is also fraught with certain "inconveniences" due to the volume of its meaning. After all, the food system includes elements that very often remain outside the scope of geographical analysis (for example, the processes of choosing food, evaluating and calculating its nutritional and energy value, entering the body and its subsequent transformations, including metabolism). Therefore, many aspects are not touched upon in the work, as well as numerous concepts (*vegetarianism, therapeutic fasting, concepts of "ancestral nutrition", "nutritional value indices", "the main food factor", "living energy", "absolutization of optimality*", etc.)

2. HISTORICAL PARALLELS

Even ancient thinkers (Hippocrates, Celsus, Galen, etc.) tried to comprehend the role of food in maintaining human living conditions and forming local traditions of food consumption. Food topics are touched upon in various concepts related to human development, but without much attention to its evolution. The important role of food in human evolution began to be recognized much later (at the end of the twentieth century) in the works of historians, biologists, paleontologists, etc. (Spitz, 1985; Germov, Williams, 2004; Mansvelt, 2005; Turner, 2006 et al).

It has become generally accepted that the diversification of the diet has contributed to the complication of people's social behavior, the formation of various food regulations, rituals, symbols, codes. For example, no one disputes the geographical content of the idea that the type of meat consumed by ancient man depended on the locality and time of residence, and changing climatic conditions forced people to look for new sources of food and ways of managing (Pavlovskaya, 2015).

Ideas about the role of nutrition in human evolution (reflected in the theories of "*oases*", "*hilly slopes*", "*fiesta*", "*purposeful evolution*", etc.) are usually associated with the transition of human tribes from hunting and gathering to agriculture and animal husbandry. According to the highly controversial opinion of M. Cohen, author of the famous work "Food crisis in the Neolithic" (Cohen, 1977), ancient man (Neolithic individual), eating the results of the most primitive economy, had a more diverse diet compared to a person who learned to reproduce food. They say that the transition to agriculture and animal husbandry contributed to the cultivation of monotonous food, which contained less protein and vitamins. This follows from the following statement by Cohen: "... after the expansion of human habitat due to population growth became more and more difficult, people became more eclectic in their diet, they were forced to eat tasteless food, in particular food with a low trophic level and high density. In the period between IX and II thousand BC people who had already consumed the entire range of palatable foods available at that time were forced to adapt to the continuing population growth by artificially growing not the foods they preferred to eat, but those that were easy to cultivate and that provided more calories per unit of land" (ibid., p. 31).

It is possible that such a misconception stems from the belief that primitive people were carnivorous, and did not eat almost exclusively food of plant origin. Modern research suggests

that the composition of bladder stones found in the remains of Mesolithic people contains not oxalates, characteristic of "meat eaters", but calcium phosphates, indicating the vegetarian nature of the diet of ancient people.

Another thing is that the Neolithic revolution, indeed, radically changed people's lives and the environment, allowed food to be harvested for the future, led to the division of labor and a sharp increase in its productivity, an increase in population, etc. At the same time, before our era, the process of changes in life, including in nutrition, culture, and human appearance, occurred slowly, but later its pace began to increase, although it did not differ in uniformity.

The analysis of the role of food consumption in the historical past is important for the geographer, first of all, because even in relatively recent times, the "essential food" of people was provided by subsistence farming, the development of which almost entirely depended on local natural conditions. But it would be a mistake to assume that favorable natural conditions automatically provided better nutrition for the population, because, as the founder of Marxism noted, "too wasteful nature leads a person like a child on the suspenders". It is no coincidence that the oldest centers of agriculture arose not in the territories of modern "granaries", but in mountainous areas with not the most favorable conditions.

But later it was soil fertility and climatic conditions that caused the uneven (in territorial and temporal terms) volumes of products and the necessary labor costs. In the absence of food exchange, clearly contoured local systems of autochthonous consumption were formed, often differing in the structure of products. And although its reproductive potential increased, and the possibilities of interregional and interstate food exchange (allochthonous consumption) increased, in the pre-industrial era, food consumption provided only basic needs, often condemning the population to malnutrition and hunger.

The ideas of local systems of autochthonous consumption in the middle of the twentieth century were the basis for the theory of "regional types of nutrition" by H. Kariel (1964, 1966). Focusing on the composition of products that provide the greatest contribution (in terms of calories) to the diet of certain peoples, he proposed a classification consisting of seven types of nutrition - four global, named after the main cultures that form the basis of the diet (wheat, rice, corn, millet), and three local - *Mongolian-Tibetan, Pacific island* and *Arctic*. At the same time, the entire territory of the Earth was assigned to one of these types with a certain degree of conditionality.

The innovative nature of the approach implemented by Kariel was that, along with the factor of food production, it took into account the behavioral characteristics of different peoples associated with differences in cultural traditions, food preferences, etc. At the same time, the main goals of the research carried out by Kariel in the light of the UN "Food for Freedom" program lay in the political plane - he wanted to establish to what extent the own capabilities of various territories and regions of the world for food production are able to meet the needs of the population of these regions, thereby ensuring their economic and political independence. This author limited himself to pointing out that the needs of the population of different regions can differ significantly without any in-depth analysis of the causes and factors determining these differences, not to mention the analysis of the geographical nature of the spatial and temporal distribution and impact of these factors.

Due to the explosive nature of the development of world trade, which ensured the global redistribution of many resources, including food, it may seem that today the results of Kariel's research, as well as the ideas of regional types of nutrition, have completely lost their utilitarian meaning. But the food situation on the periphery of the world market, where the population of underdeveloped countries barely makes ends meet and focuses on the traditional composition of products that provide a decisive contribution (in terms of calories) to the diet, testifies to the survivability of the concept of "regional type of nutrition". As an example, we can cite the preserved rice diet of the population of many regions of Southeast Asia, the millet-sorghum diet of the Sahel peoples, etc. In this regard, it is too early to write off the theory of regional types of nutrition in the archive.

3. MATERIAL AND METHODS

The ontology of the scientific direction "Economics of food consumption" is quite convincingly reflected in scientific publications. Less deeply studied are the specific aspects of consumption, which are noticeably actualized in the conditions of transitivity of social systems and economic crises, when threats, both internal and external, sharply escalate. In such cases, the food sector inevitably generates negative synergetic effects associated not only with the economic, but also with the social and political spheres.

The development of world trade, which ensures the global redistribution of food resources, today has the strongest impact on the traditional spatial types of food systems. The study of numerous parameters of the influence of both economic globalization and other factors on food systems of various taxonomic levels finds so far a weak response from individual authors (Germov, Williams, 2004; Turner, 2006; Cohen, 1977; Kornekova, 2017, 2020, Watts, Ilbery, Maye, 2005 etc.).

The methodological basis of this article is based on the works of scientists on human geography, consumption theory, problems of food security, social psychology and personality psychology, institutional economics, studies of world experience in improving the quality of food consumption.

Systematic, evolutionary and structural-functional approaches are used to study the spatio-temporal features of food consumption.

4. THE CONNECTION OF SPATIAL FOOD SYSTEMS WITH THE "PYRAMID OF NEEDS" BY A. MASLOW

The intensity of transformation of the world's food systems corresponded to the dynamics in the socio-economic sphere. In the course of the *"new" agrarian revolution* (unlike the "old" – Neolithic), which unfolded in Western Europe in the XVI century, rapid and profound transformations took place in the agricultural sector: along with the development of commodity production, wage labor began to be used, rural enterprises were enlarged, output volumes expanded, etc. At the same time, there was a clear violation of the interrelationships between the established systems underlying food production, as well as nutrition indicators of individual social strata of the population.

The period of the *industrial revolution*, which caused the industrial boom and the growth of cities, not only stimulated a sharp increase in demand for agricultural products, but also contributed to the acceleration of the development of the agricultural sector. However, the pace of its development did not keep pace with the growth of food consumption, which forced industrializing countries to resort to importing food from outside. The parallel development of maritime and later railway transport made it possible to dramatically expand the geography of food trade, helped prevent hunger in these countries, improve the welfare of the population and the birth rate. As a result, the range of food products in demand has significantly increased.

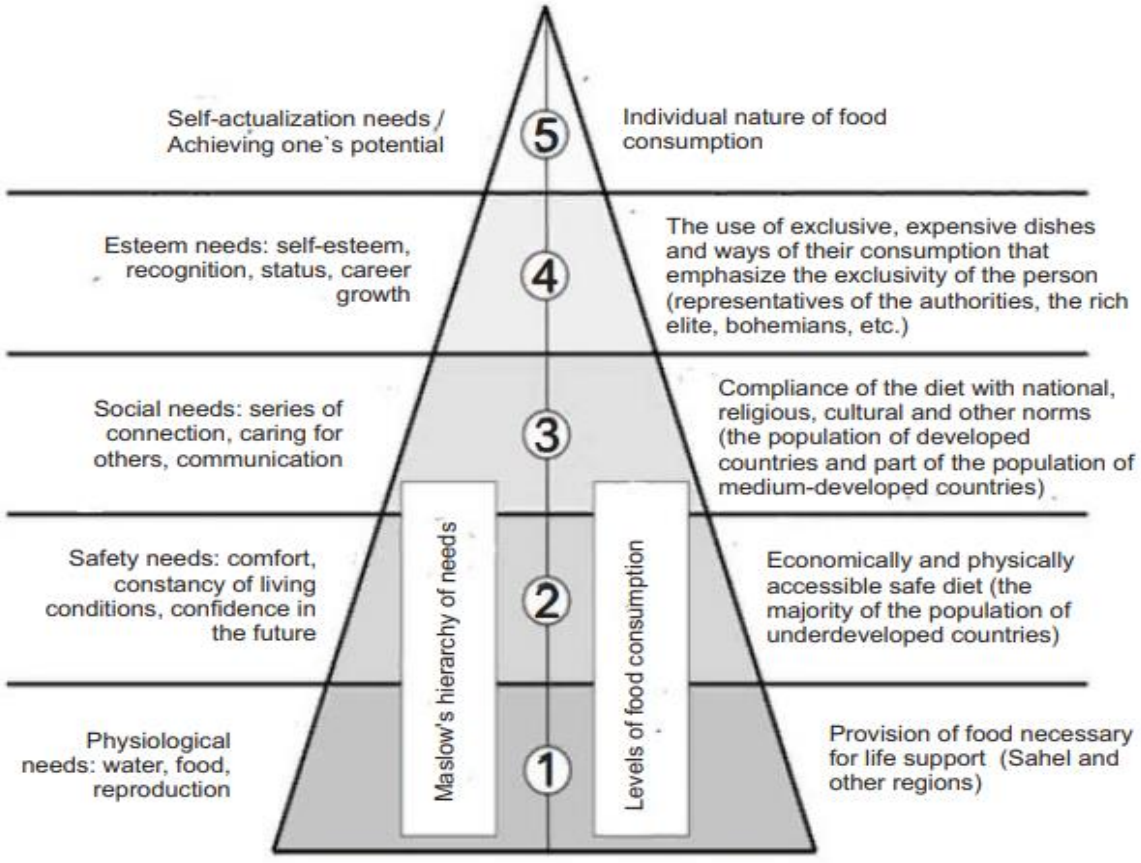
The era of industrialism is represented by different types of economic systems – from command-administrative and transit to mixed and market. Naturally, the nature of food needs and, in fact, consumption in each of them differs in specifics. In the conditions of the Soviet command and administrative economy, a little diversified assortment and price set of products dictated an easily guessed demand, especially for products of meat, cheese, alcohol and other branches of the food industry. The possibilities of the transit economy have somewhat expanded the consumer preferences of the population, but its "transformational" psychology, along with the shortage of individual products, is not yet able to "develop" an established consumer demand, which is characterized by an "eclectic" food assortment. In the conditions of a developed market economy and a well-defined atmosphere of consumerism, not only relatively stable consumer demand is formed, but also all hierarchical levels of food needs are provided with necessary goods, including persons "infected" with the virus of conspicuous consumption.

Over the entire period of studying human needs, a great many different classifications of needs have been proposed. Let us mention one of them - the approach of A. Maslow (Maslow,

1954), which combined all human needs into five groups, arranged in such a way that a person's transition from perceiving one group of needs as dominant to another, hierarchically higher, is carried out only when the needs of the current level of the hierarchy of needs (often referred to as the "Maslow pyramid") are satisfied.

The *first level* of Maslow's pyramid – the needs to satisfy physiological or vital needs – corresponds to food consumption, which provides the nutritional value of the food consumed necessary for life support, and nutritional value in the most primitive sense – that is, first of all, sufficient caloric content of food (fig.1). Biological value, unlike energy, is not perceived by people correlated with the first level as a prerequisite for the preparation of a food diet. It is quite obvious that this type of diet is inherent in the population of the most backward countries and regions of the world (Angola, Mozambique, Burundi, Rwanda, Burkina Faso, Ethiopia, Sierra Leone, Cambodia, Afghanistan, etc.).

Figure 1. The author's interpretation of A. Maslow's hierarchy of needs from the standpoint of food consumption



Finding a person at the *second level* of the Maslow pyramid implies that his needs for security and confidence in the future are dominant, and food consumption corresponding to these needs is based on the choice of a diet that would simultaneously meet the requirements of a safe (diverse) diet and at the same time be physically and economically accessible for as long as possible. In other words, at the second level of the "food" pyramid, the *biological value* of the food consumed becomes the prevailing factor. Unfortunately, the transition to a balanced diet that takes into account the body's need not only for the main components -

proteins, fats, carbohydrates, but also for the so–called essential elements of food – macronutrients (potassium, calcium, magnesium, etc.), trace elements (iron, zinc, iodine, etc.), vitamins that play a huge role in metabolism - inevitably leads to an increase in the cost of the food basket. This level reflects the type of nutrition of the population of the majority of underdeveloped countries that find effective ways to combat hunger.

In contrast, the transition to the *third level* of the "food" pyramid, focused on satisfying the individual's need to feel belonging to a certain community of people, to feel unity and mutual love with them, by bringing the diet in accordance with the canonical (for a certain religion, national, regional, cultural, professional community) rules of food consumption, is not necessarily associated with an increase in the amount of human income. Thus, the substitution of pork in Islam occurs both at the expense of more expensive types of meat - lamb or beef, and at the expense of cheaper poultry meat than pork. The degree of conformity of a particular food product or a dish prepared on its basis with the traditions inherent in a particular community, the feeling of belonging to which is the dominant need of a person who associates (or self-identifies) with the third level of the "food" pyramid, is fundamental. In this case, the regional food "identity" is somewhat "blurred" due to weak accounting of the social stratification of the population.

Satisfaction of the needs of the fourth and fifth levels by including exclusive and expensive dishes in the diet and ways of their consumption, emphasizing the exclusivity of the individual, is usually observed with an increase in the welfare of the population.

Satisfaction of the needs of the *fourth* and *fifth* levels by including exclusive and expensive dishes in the diet and ways of their consumption, emphasizing the exclusivity of the individual, is possible only with an increase in the welfare of the population.

Thus, it is possible to distinguish four properties of food products that significantly affect their ability to meet certain human needs:

- energy value;
- biological value;
- associative value (that is, the value that consists in the ability, through the consumption of specific products, to associate oneself with a certain community of people, one of the unifying factors of which is a certain food system);
- singular value (that is, a value reflecting the uniqueness, exclusivity of the food consumed, allowing to emphasize the elitism of a person).

As we will see later, the singular value of consumed products has largely acquired a large-scale character due to globalization.

5. THE ROLE OF GLOBALIZATION IN THE MODIFICATION OF FOOD SYSTEMS

The impact of globalization, as the leading trend in the modern world economy of recent decades, on the state of world agriculture and food consumption is quite obvious. In parallel with the growth of capital concentration at each stage of the production and distribution chain of the agricultural sector of the economy, the strengthening of the hegemony of agrarian transnational corporations in the food sector is being traced, their influence on the dynamics and structure of production, as well as on food consumption is increasing.

Real shifts are observed in the network form of the organization of the food systems of the EU and Russia as a result of the policy of mutual economic sanctions of recent years. Before 2014, the food companies of the EU member states were the undisputed leaders in the Russian food market. Products from EU countries had a number of competitive advantages in Russia compared to products from other suppliers. European quality standards were highly valued (including prohibition of transgenic products, stabilizers, artificial preservatives and dyes), the necessary supply volumes were consistently provided, there was a desire to constantly update the range of food products, etc. (Gladky, Sukhorukov, Kornekova, 2021). The strict connection of the policy of economic sanctions with the deformation of food systems is confirmed by numerous publications (Gevorkian, 2012; Hufbauer et. al., 2007; Portela, 2010; LaRae-Perez, 2002, etc.).

The transformation of food systems in many countries of the world in recent decades has been caused by the expansion of multinational chains - Kraft Foods, Mars Inc., Kellogg's, General Mills Inc., PepsiCo, Coca-Cola, Wal-Mart (*USA*), Aldi, Metro, Obi (Germany), Auchan, Carrefouer (France), Nestlé S.A. (Switzerland) and many others. At the same time, the shifts are not limited only to changes in the modes (subsystems) of nutrition, but include changes in the use of resources of local origin and the functioning of local food companies, in the mechanisms of food transportation, not to mention the nature of the aesthetic and spiritual perception of foreign products. (In the latter case, we are talking not so much about the economic dimension of globalization as about the cultural one).

If we abstract from the degradation of local agro-industrial "conveyors" under the influence of cheaper imported products, then it should be recognized that network trade has a number of undeniable advantages of geographical properties. So, taking into account the territorial features of the target market, it is possible to place goods with a change in space. The geographical location and size of retail chains allow them to place orders in large batches of goods, while receiving maximum discounts, saving on transportation costs. There is an opportunity for a certain freedom of action for each store of the entire trade, for successful competition, taking into account local human needs, etc. Important advantages of transnational retail chains also consist in the concentration of the management system in the main center; the introduction of a unified information system; providing all outlets included in the network with modern cash register equipment; the use of bar coding methods, etc.

The extent of spatial diffusion of food trade networks across countries depends on many factors and, above all, on changes in the economy of the host countries and possible risks. (By the way, *country risk* is one of the four components of the *A.T. Kearney trade development index*, along with market saturation, attractiveness for business, retail growth rate, its prospects and general economic condition). Well-known facts indicate that among the most attractive investment countries at the end of the XX century there were European countries (Poland, Czech Republic, Hungary, Slovenia), in the early 2000s - China and Russia, in recent years Uruguay, Brazil, India are in the most attractive phase for retailers.

Of particular interest is the connection of the global expansion of food trade networks with the evolution of *national cuisines*, which are a specific subsystem of the world's food systems. The most famous of them are distinguished by enviable stability. The "secret" here is simple: the gastronomic preferences of the people are the mainstay of centuries-old cultural traditions that every person cherishes, preserving all the recipes for cooking national dishes and passing them from generation to generation. It is no accident that gastronomic culture is one of the important markers of the formation of national identity. At the same time, the secrets of cooking various dishes (the composition of available culinary raw materials, methods of its processing, etc.), even their names, have a strict geographical "binding".

The idea of the so-called "*culinary sovereignty*" of states is developing in the literature. According to A.B. Rakhmanov, the essence of such sovereignty consists in the degree of orientation of its inhabitants to dishes of national cuisine. This indicator is proposed to be determined based on the ratio of restaurants of national cuisine to the total number of restaurants in the leading cities of the respective country (Rakhmanov, 2017). The mentioned author distinguishes four gradations of countries that differ in varying degrees of noted sovereignty: 1) states that have full culinary sovereignty; 2) states with limited culinary sovereignty; 3) culinary "semi-colonies" and 4) culinary "colonies".

This idea is not devoid of originality, but our attitude to this method of determining the "culinary sovereignty" of countries is critical, if only for the reason that in many countries (especially middle- and low-income, with a significant proportion of rural population), the number of citizens visiting restaurants does not differ in scale. On the other hand, if additional statistical information is available to make more representative conclusions, this indicator may be useful.

As for the concepts of "culinary nationalism" and "culinary cosmopolitanism", their content depends not only on the degree of perception of other people's culinary recipes and dishes,

but also on the nature of the relevant policy in this area carried out by the governments of the countries.

It is difficult to dispute the opinion that the development of culinary art is largely connected with human culture, with the "national spirit", with the desire of the people to increase their "competitiveness" in comparison with their "neighbors", etc. In this regard, the use of the expression "culinary powers of different ranks" by the mentioned author can be considered appropriate (Dunne et. al., 2011).

6. POINTS FOR DISCUSSION

The geographical approach to the analysis of regional food consumption systems and various kinds of correlations existing in the system "human - agro-natural resources - food production - consumption" is especially useful in the conditions of vast, multi-ethnic countries. It allows us to consider the problem comprehensively, "synergetically", taking into account many factors, including culinary, aesthetic, etc.

Rarely discussed in the scientific community, but an unavoidable feature of the sphere of food consumption for many countries is that its need for its development is dictated not only by concern for the nutrition of the population, but by the interests of *ensuring national security*. For example, the strengthening of Russia's import dependence on food at the turn of the last centuries has created a real threat to its economic security, with all the ensuing consequences. Under these conditions, the subsidized nature of agriculture has acquired various forms of state support, which in turn has affected the restructuring of regional food systems. The authorities of the country have declared the strategic task of creating a mechanism of state regulation, including a set of measures of regional impact on both the processes of food production and direct provision of the population with products of all subjects of the Federation (The doctrine..., 2010).

Beyond the scope of a thorough geographical analysis, there is often the presence in many countries of a diversified *household economy*, which differs significantly by region in its sectoral, organizational and spatial structure. Abstracting from the assessment of the adaptive capabilities of household farming (including ethnic type), which has traditionally been a kind of insurance against hunger and social unrest for the peasant and the most natural tool for survival, is unlikely to help objectively characterize the state of food security of countries (in this case, Russia).

The expansion of acreage under GM crops has contributed to the transformation of food systems in many countries of the world in recent decades (Kornekova, 2020).

7. CONCLUSION

The geography of the chosen research vector can best be ensured not only by identifying regional food consumption systems, but also by establishing stable dependencies that manifest themselves in various socio-economic conditions. In the proposed work, only general approaches to understanding the historical transformation of regional food systems are outlined without properly specifying the past and modern pictures of the differentiated food space.

It should also be noted that the most used taxonomic level, at which research is usually conducted in the field of geography of food consumption, is the state. But for states such as the Russian Federation, characterized by a significant territory and a wide variety of natural conditions, as well as significant imbalances in economic and social development, regions are no less important level of research. It is within their limits that food systems are often formed that are not similar to other food systems, with their own agro-natural, industrial and ethno-cultural specifics.

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