



Logistics Linking Territories - Producers of Raw Materials and Territories - Producers of Final Products

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Abstract

Logistics, linking territories - producers of raw materials and territories - producers of final products, is considered as the logistics of an end-to-end technological process, reflecting the interconnection of technological operations of production of raw materials, formation of stocks, their transportation, processing of raw materials and production of final products from it with its subsequent launch on the market. It is shown that such cross-cutting processes are characteristic of a number of sectors of the economy and the agro-industrial complex, including agriculture and food industry, logging and deep processing of wood, metallurgy and machine building, the generation of nuclear fuel waste, their packaging, transportation and storage. Such cross-cutting processes have a special role for the Russian economy, the effective development of which necessitates its provision with scientifically sound logistic territorial inter-regional and global world ties. At the same time, cross-cutting technological processes in agriculture and the food industry, which are necessary for the production of functional food products that increase the food security of the northern territories of Russia, are of particular importance. In this regard, the present work considers the solution of logistics problems using the example of the production of agricultural food products, their transportation, processing and production of functional food products. Recommendations have been developed to improve these problems.

Keywords: Safety of the northern territories, Forestry, Logistics, Nuclear fuel waste, Agricultural food raw materials, End-to-end technological process, Functional food products

1 Introduction

In recent years, in Russia and in foreign countries, in relation to various industries, more and more attention has been paid to improving logistics. The analysis showed that the well-known studies do not pay enough attention to the problems of logistics, linking the territories - the producers of raw materials and the territories - the producers of the final product in the enormous territories of the Russian Federation. Under these conditions, there is a need to consider logistics as an end-to-end technological process, reflecting the interconnection of technological operations of the production of raw materials, stockpiling, their transportation, processing of raw materials and production of the final product from it with its subsequent launch on the market. Such end-to-end processes are characteristic of a number of industries. Such cross-cutting processes have a special role for the Russian economy, the effective development of which necessitates its provision with scientifically sound logistic territorial inter-regional and global world ties. The authors' studies were based on the experience of substantiating logistics and the formation of end-to-end technological processes in the fields of agriculture and food industry, forestry, metallurgy and machine building, the

generation of nuclear fuel waste, their packaging, transportation and storage. In the authors' studies, it was shown that among the listed areas, solving the problems of logistics and organizing end-to-end technological processes in agriculture and the food industry is of particular importance to improve the food security of the northern territories of Russia. In this regard, the present work considers the solution of logistics problems using the example of the production of agricultural food products, their transportation, processing and production of functional food products. Recommendations have been developed on linking territories - producers of raw materials and territories - producers of final products, improving logistics of end-to-end technological processes, ensuring effective interconnection of technological operations of raw materials production, stockpiling, transportation, processing of raw materials and production of final products from it with its subsequent launch on the market.

2 Literature Review

In recent years, in Russia and in foreign countries, in relation to various industries, increasing attention has been paid to improving logistics (24, 35, 45, 46, 47, 49, 64). At the same

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time, experts note that logistics has a strategically important role due to the fact that the most effective logistics solutions minimize costs and optimize delivery times and their level (33, 40). As O.A. Oryol notes (2006), changes in the understanding of logistics activities over the past decades lies in its transformation into activities aimed at the benefit of the client, customer service.

It should be borne in mind that in logistics the transport system is a single complex uniting the entire economy of the country. Transport does not produce marketable products, but only participates in its creation. This participation is included in the cost of production. Transport regulates the course and uniformity of development of production relations and the distribution of resources in accordance with the demand for them. Having isolated itself, transport as a service production sector ensures the functioning of the following technological chain: place of production of finished products - transportation of finished products in space and time - place of consumption of finished products. About 12% of the country's fixed assets account for transport fixed assets; 2 million 800 thousand people work here, or about 6% of the workers employed in the economy. The share of transport services in the global gross product over the past 50 years has increased from 5 to 10% (36). The logistic description of the end-to-end process dictates the need for system analysis and, in particular, the construction of logical models. By the end-to-end technological process, we mean the totality of the technological processes of the procurement (extraction), transportation and processing of raw materials (semi-finished products), interlinked by means of labor at the input and output of processes determined by the place of operations, as well as the technical means used. Recent research in the field of end-to-end technological processes, as well as analysis of sources (1, 3, 4, 5, 11) shows the feasibility of such an approach to the description of such technological processes.

In recent years, there has been an active development of logistics in research and applied development (42, 53, 57, 59). The analysis shows that the market of transport and logistics services in Russia is relatively young, however, it has tendencies for rapid development, since it ensures the interconnection of Russian regions with each other and with other countries. Outsourcing occupies an important place among the promising methods of reducing logistics costs (25, 51, 52, 55, 62). Effective outsourcing allows logistic customers to concentrate on their core business. Logistics themselves outsourcing individual logistics operations allows us to develop the core competency in logistics - supply chain management.

In Shumaev V.A. (2012) (63) work, issues of applications of general, scientific, and practical logistics were considered. Logistics provides for an active response to market needs. It is noted that the globalization of the world economy determines the intensive growth of cargo transportation (37, 38, 58). The effectiveness of logistics at enterprises of various business entities is relevant for almost every business entity (56). The analysis showed that the well-known studies do not pay enough attention to the problems of logistics, linking the territories - the producers of raw materials and the territories - the producers of the final product in the enormous territories of the Russian Federation. Under these conditions, there is a need to consider logistics as an end-to-end technological process, reflecting the interconnection of technological operations of the production of raw materials, stockpiling, their transportation, processing of raw materials and production of the final product from it with its subsequent launch on the market. Such end-to-end processes are characteristic of a number of industries. Petrozavodsk State University, with the participation of the authors, conducted research based on the study and justification of the scientific

rationale for logistics and the formation of end-to-end technological processes in the field of agriculture and food industry, forestry and wood processing, metallurgy and machine building, and spent nuclear fuel management. As the materials used in these studies, the research and development carried out in recent years aimed at studying both through technological processes and their individual technological operations in various sectors of the economy and agriculture are considered. At the same time, the problem finally considered in the field of harvesting agricultural food products and the production of functional food products has not been resolved.

All this necessitates a thorough study of the state and scientific substantiation of effective ways to solve logistics problems using the example of harvesting agricultural food products, their transportation, processing and production of functional food products to improve the food security of the population of the northern territories of Russia. To achieve this goal, it is necessary to study, review and use information-analytical search materials. The result of this work should be the development on the example of the production of agricultural food products and the production of functional food products of recommendations for linking territories - producers of raw materials and territories - producers of final products, improving logistics of end-to-end technological processes, ensuring effective interconnection of technological operations of raw materials production, stockpiling, and their transportation, processing of raw materials and production of final products from it, followed by its market launch.

3 Materials and Methods

The aim of the study is to develop recommendations for improving logistics, linking territories - producers of raw materials and territories - manufacturers of final products within the framework of a single end-to-end technological processes. The methodology provided for the study and analysis of logistics of end-to-end technological processes that reflect the interconnectedness of technological operations carried out in the geographically distributed territories of the Russian Federation for the production of raw materials, the formation of reserves, their transportation, processing of raw materials and the production of final products from it with its subsequent launch on the market. As the materials used, the studies carried out in recent years aimed at studying both through technological processes and their individual technological operations in various sectors of the economy and agriculture are considered. To achieve this goal, the materials of information-analytical search were studied, reviewed and used. The analysis showed the need to develop a methodology for the implementation of end-to-end technological processes to increase the efficiency of logistics in the field of agriculture and food industry, logging and deep processing of wood, transportation and storage of spent nuclear fuel. The allocation of these areas within the framework of the formulated methodology is due to the fact that logistics and end-to-end technological processes in these areas differ in the following:

- In the field of agriculture and food industry, agricultural products are produced mainly in the most productive agricultural territories of the Russian Federation, and functional food products are produced in various regions of Russia (for example, Trade House Fair company in the Republic of Karelia). Moreover, it is the production and bringing to the shelves of functional food products that is the most important factor in improving the food security of the population of the northern territories of Russia (2, 8, 22, 27, 41). In the authors' studies, it was shown that among the listed areas, solving the problems of logistics and organizing end-to-end technological processes in agriculture and the food industry, solving the

problems of improving food security in the northern territories of Russia are of particular importance.

- In the field of the forest industry, logging is carried out by various geographically distributed logging enterprises in the country's forest regions and large forest holdings, and deep processing of wood with the production of pulp and paper products, sawmills, wood-based panels and other timber is carried out located at a considerable distance from the logging sites pulp and paper and woodworking enterprises (7, 9, 17, 61).

- In the field of metallurgy and mechanical engineering, in which ore is mined, metals are smelted, metal products are manufactured, they are delivered to various machine-building enterprises, the production of modern machine-building products, their acquisition in complex modern technological lines and production (nuclear and heat power stations, mining enterprises, pulp and paper enterprises, etc.) (6, 21, 32, 44, 48).

- In the field of the generation of nuclear fuel wastes at nuclear power plants, their safe packaging for transportation and storage, these wastes are generated at various nuclear energy enterprises, then they are packaged in transport and packaging containers, sometimes transported over considerable distances, and then placed in specialized storage facilities or carried out their recycling (10, 28, 31, 43).

- Given the breadth of application of end-to-end technological processes, as well as their individual technological operations in various sectors of the economy and agriculture, at this stage of the research, within the framework of the methodology used, the logistics and end-to-end technological processes in the agro-industrial complex, agriculture and food industry necessary for production are accepted functional foods that increase food security in the northern territories of Russia. The studies took into account that the regions of Russia are located in completely different natural and climatic zones of the country (16, 19). Therefore, when choosing research directions for various aspects of economic security, including food security, it is necessary to fully take into account the specifics of the territories of these regions. This specificity includes natural resources, demographic and personnel transformations, climatic conditions, the presence and prospects for the development of the economy and industry, the potential for implementing large-scale investment projects (including with the involvement of foreign investors), the state of transport infrastructure, etc. It is taken into account that the territories the northern regions of Russia (in recent years, including the Arctic), are beginning to influence an increasing role in the development of the country's economy by expanding the development in these territories of unique resources (mineral, forestry, fishery and others.). These regions are leaders in the country in the field of oil, natural gas, apatite and nepheline concentrates, production of industrial wood, lumber, plywood, pulp, paper, and cardboard. They are also leaders in the procurement of gold and diamonds, vein quartz and mica, nickel, tin, cobalt, platinum group metals, diamonds, furs, etc.

The methodology provided a detailed analysis of the features of technological operations of end-to-end procurement technologies - transportation of agricultural food raw materials and the production of functional food products from it and development of recommendations for improving the production of functional food products that increase the food security of the northern territories of Russia. As part of the formation of logistically sound end-to-end technologies in accordance with the developed concept, the industrial partner of PetrSU LLC Trade House Yarmarka may become the base model enterprise for the production of functional products (FPP) in the Northwestern Federal District (NWFD) of the Russian Federation. This enterprise has created a high-tech

production facility for the production of functional products competitive in the domestic and foreign markets. It also worked out the modes and parameters of such production. This enterprise should provide with these products not only the Republic of Karelia in whose territory it is located, but also provide them with adjacent regions of the North of Russia (in our case, the North-West Federal District of the Russian Federation.) Solving the problems of business development LLC Trade House Yarmarka should, using the one formed with the participation of in the implementation of the project, the scientific basis was to increase the volumes of supplies of its products to the markets of Russia and abroad. PetrSU after completion of the project should develop recommendations for the creation of such basic enterprises in the Federal Districts of the North of Russia.

4 Results and Discussion

Natural factors have a continuous and diverse impact on human health in the North and the Arctic. It should be borne in mind that climate and weather conditions determine the mental and physical condition of a person in the Arctic, as well as the course of somatic and epidemiological diseases. In the works (12, 13, 14, 29) analyzed data on the influence of external climatic factors on human health. In particular, it is noted that the physical nature and biological effect of geomagnetic disturbances should be attributed to the most specific for the regions of the Arctic. Solar radiation has a direct effect on the cardiovascular system, immunobiological reactivity and leukocyte metabolism. Even weakly perturbed magnetic fields can cause the activation of the formation of free radicals in blood cells. With prolonged exposure to a person of a complex of factors of the Far North, there is a restructuring of the functioning of the circulatory system, which consists in reducing the systolic function of the left ventricle, increasing systolic pressure in the pulmonary artery. Respiratory organs undergo a deep adaptive restructuring.

The specifics of the geographical location of the Northern territories of the Russian Federation, their location, colossal area and length, of course, affect the specifics of organizing logistics chains for the procurement and supply of raw materials, as an element of end-to-end technologies for the production of functional food products, for the regions of the country located on these territories. These specifics are affected by:

- On the one hand, the most difficult natural and climatic conditions for living, eating, working, resting, restoring the energy expended;

- On the other hand, colossal natural resources located in these territories, including the Arctic, are extremely necessary both for the domestic market and to a large extent determine the country's export potential.

Experts note that in the North there is a reduced level of essential chemical elements (calcium, magnesium, phosphorus, iodine, iron, selenium, cobalt, copper and zinc) in podzolic soils and drinking water, this has a negative effect on mineral metabolism. At lower temperatures and reduced insolation, there is an increased need for calcium, magnesium, phosphorus, iron, selenium, and copper. The above problems develop hidden and pronounced forms of microelement imbalance among residents of the North: iron deficiency states (caused by deficiency of iron, cobalt, fluorine, magnesium, calcium), impaired functioning of the immune system (due to deficiency of selenium, zinc, iodine, calcium), arthrosis (violation balance of calcium, silicon, strontium), urolithiasis (excess calcium and silicon), hypertension (deficiency of magnesium, calcium), caries (imbalance of calcium and fluoride), thyroid pathology (imbalance of iodine, selenium, copper, manganese, cobalt,

calcium, magnesium and zinc) (15, 22, 26, 34, 60). In order to avoid deficient states of macro- and microelements in the human body, it is necessary to carry out preventive measures aimed at balancing the chemical elements in the diet of northerners, taking into account their antagonistic and synergistic effects in a living organism in the Far North. Such preventive measures to reduce the deficiency of chemical elements, as well as a surplus of vitamins and minerals, can be created by the development and its introduction into the mass production of functional foods in the North of Russia. In this case, the range of capabilities of functional products is expanding, as the simplest and most accessible mechanisms to the possible satisfaction of all physiological needs of the body of nutrient status. Therefore, preference should be given to a functional product providing the physiological need of northerners.

This determines the need to study the logistics chains of the procurement and supply of raw materials as an element of end-to-end technologies for the production of functional food products. These studies for the conditions of the North of the Russian Federation should take into account the general problems of food security in the country, innovative foreign experience, the specifics of the traditional diet of the population living in these territories, including changes in this diet that arose due to large-scale migration flows (for example, in the post-war years in the Republics Karelia and Komi, when the transition from seasonal workers to permanent workers was largely ensured by the influx of people from other regions of the USSR, including the Union republics of Ukraine Belarus). What is very important - it is necessary to take into account the specifics of living and working in the North of the Russian Federation. In addition, it is necessary to take into account the existing trends, according to which the population of these territories should be provided not only with the required physical volumes of food, but also provided with quality food.

In our opinion, it was rightly noted in work (39) that interregional relations can be an important way to improve the food security of the northern territories. We believe that with regional ties being debugged with the support of the government of the constituent entities of the Federation, they will facilitate the supply to the north of Russia of high-quality food raw materials and food products from the regions producing food raw materials. It is necessary to study the logistic chains of the procurement and supply of food raw materials as elements of end-to-end technologies for the production of functional food products. These studies for the conditions of the North of the Russian Federation should take into account the general problems of food security in the country, innovative foreign experience, the specifics of the traditional diet of the population living in these territories, including changes in this diet that arose due to large-scale migration flows. For example, this happened in the post-war years in the Republics of Karelia and Komi, when the transition from seasonal workers to permanent workers was largely ensured by an influx of people from other regions of the USSR, including the Union republics of Ukraine and Belarus. What is very important - it is necessary to take into account the specifics of living and working in the North of the Russian Federation. In addition, it is necessary to take into account the existing trends, according to which the population of these territories should be provided not only with the required physical volumes of food, but also provided with quality food. Logistics of end-to-end technology for the preparation and transportation of food raw materials and the production of functional products includes the steps of:

Production of agricultural food raw materials: 1. Soil preparation: a) main processing: stubble peeling; plowing or

subsurface processing; presowing harrowing and cultivation; b) presowing tillage: harrowing; looping; cultivation; disking; rolling; 2. Sowing; 3. Harvesting: preparing fields for harvesting; harvest; grain transportation for current.

Preliminary preparation of agricultural food raw materials: 1. Weighing; 2. Sampling for analysis; 3. Unloading and temporary storage; 4. Preliminary cleaning of a heap of grain; 5. Temporary storage pending drying; 6. drying; 7. Secondary treatment; 8. Purification of difficult to separate impurities; 9. Moisturizing; 10. Steaming; 11. Cooling; 12. Fractionation and sorting; 13. Peeling; 14. Grinding; 15. Grinding cereals; 16. Flaking cereals; 17. Storage; 18. Packing. **Transportation:** a) sea, rail, road, air; b) bulk, in shipping containers, in consumer packaging.

Production of functional products: 1. Mixing components; 2. Packaging in consumer packaging; 3. Passing through a metal detector; 4. Weighing; 5. Sampling for analysis; 6. Labeling; 7. Packing in shipping containers; 8. Storage; 9. Transportation to a trading company.

The analysis showed that when choosing suppliers of agricultural food raw materials in general, only the soils of the Southern, Central and Volga Federal Districts as a whole, due to soil conditions, are favorable for growing large amounts of agricultural crops here. Most agricultural holdings are located in the southern chernozem and southwestern parts of Russia, as well as in the Volga region and Altai. In these regions, the most favorable climatic conditions for the placement of farmland. It is recommended that suppliers of food raw materials, individual enterprises and agricultural holdings located on the lands of the Southern and Central Federal Districts be selected as suppliers of their main arable land. At the same time, in the territories of all the districts of Russia, drawing on the experience of Finland, it is recommended that ecologically safe areas be allocated for the production of "local" food agricultural products with their inclusion in the formulated FPP formulations.

Studies of the length, density, technical condition and accessibility of roads have shown that the provision of agricultural areas with roads is necessary for the development of both rural areas as a whole and for the development of agriculture. Moreover, the state of road infrastructure is one of the main indicators of such development (50). Timely delivery of raw materials is largely necessary for the distribution of supplied resources (18). According to the research of the doctor of economic sciences, V. A. Verzilin (2013) (23), the role of transport in agricultural production is constantly increasing. Therefore, the rational use of transport in agriculture is of great importance. As noted in (20), it is necessary to increase the volume of financing for the construction and reconstruction of roads from 0.6% to 1.2-1.5% of GDP, which will allow the construction and reconstruction of about 400 thousand km of roads, as well as maintaining the existing network local roads in good condition. Based on this opinion, it can be concluded that the solution to the problem of developing a network of roads and their quality, taking into account the existing factors characterizing the development of road-building domestic equipment, to increase the economic affordability of agricultural products is quite real. Another important factor in solving these problems of increasing the economic affordability of food raw materials is that improving the quality of roads for transporting agricultural raw materials will in turn lead to an increase in the speed of vehicles moving along such roads. This, in turn, will shorten the duration of transportation of goods and, in turn, will reduce transport and technological and cost costs.

Providing the population of Russia with food is of national importance (54). One of the most important tasks in this case is to increase the economic affordability of food raw materials. In the framework of these studies, it is necessary to note the

proposals (30) on the need for economic incentives to stimulate transportation in agriculture. Thus, the cost of transportation is affected by the location of intermediate points and the storage time of food supplies and food raw materials. As a result of the technological process of storage, losses arise from non-compliance with the storage conditions of food raw materials and food products.

Today, the transportation of food products and food raw materials is a complex technological process, including the direct transportation of products to intermediate storage points where food and food raw materials are stored and sorted, as well as transportation from intermediate storage facilities either to enrichment points or to the final consumer. The transportation of food raw materials directly from the places of growth is carried out mainly by road transport, since other modes of transport are not available, then there is an accumulation of food and food raw materials in specialized storages that meet certain storage standards and requirements. These storages are usually located near railway terminals where food and food raw materials are loaded onto wagons and delivered either to enrichment points or to the final consumer.

A study of the production logistics of processing raw materials into functional food products for residents of the northern territories of the Russian Federation is necessary for the effective functioning (selection of parameters and operating modes) of technological lines for the production of functional products as a whole. The focus on ensuring food security in the northern regions of the Russian Federation through the formation of logistic end-to-end processes for the procurement of food raw materials and their production of functional food products from it has serious advantages over other areas of research. To a large extent, the prospects of the chosen research direction are due to the fact that the most important direction of the development and implementation of state policy in the field of food security is the creation of innovative natural food products based on ingredients created in the Russian Federation from domestic food raw materials. It is important that the implementation of such studies should not only be aimed at providing the population of the North of the Russian Federation with physical volumes of food, but at the need to satisfy its needs for high-quality and natural food, while guaranteeing import substitution and increasing the food safety of the North of the Russian Federation. In addition, ongoing and planned projects of the Russian Federation for the development of the northern territories and the Arctic, highlight these territories as potential for the movement of civilians and military persons to these territories, which also confirms the significance of the chosen research area.

When choosing suppliers of food agricultural products and the formation of material flows and supply chains, it is recommended to take into account the results of the study justifying the choice of territories - areas of production of agricultural food products supplied for processing, including the established soil characteristics of the territories of the Federal Districts of the Russian Federation. The analysis showed that chernozem soil types are concentrated mainly in the Central and Southern federal districts. Only in an insignificant part of the Volga, Ural and Siberian districts we observe the distribution of relatively rich typical and ordinary chernozems, in the northern regions, up to 60 ° s. sh., such soils are absent, and water and air erosion processes are observed at the rock concentration sites. Thus, as the main arable land, we can consider mainly the land of the Southern and Central Federal Districts. It is also recommended to use data that the largest presence of agricultural holdings is noted in the Central and Southern Federal Districts, followed by the Volga and Siberian Federal Districts. Among the regions, leaders stand

out: Krasnodar Territory, and Voronezh Region, followed by Belgorod Region and Altai Territory. Also, a high level of presence is noted in the Lipetsk, Oryol, Tambov, Rostov regions, as well as the Moscow, Volgograd regions and the Stavropol Territory.

Logistics should take into account that for the production of FPP within the framework of end-to-end technologies in the Northern territories of Russia, in particular in the NWFD of the Russian Federation, development of ecologically clean areas of agricultural and meat production, as well as the collection of wild plants of northern latitudes, breeding of northern animals, fish farming and fish farming using this product in the production of functional products. The basic model company for the production of functional products in the NWFD of the Russian Federation may be the industrial partner of PetrSU LLC Trade House Yarmarka. At this enterprise, high-tech production will be created to produce functional products competitive in the domestic and foreign markets. It will also work out the modes and parameters of such production. This enterprise should provide with these products not only the Republic of Karelia in whose territory it is located, but also provide them with adjacent regions of the North of Russia (in our case, the North-West Federal District of the Russian Federation.).

When creating progressive domestic functional products, it is necessary to take into account that high-quality and properly organized nutrition facilitates human life processes in the harsh climate of the north of Russia, with the right relationship between nutrients, especially between proteins, vitamins and mineral salts, playing a role in market development functional products necessary and meeting food safety requirements for residents of the regions of the north of the country is an innovation approach in the domestic market. Properly organized nutrition facilitates the processes of human life in harsh climates. A special role is played by the correct ratio between nutrients, especially between proteins, vitamins and mineral salts. The problems of market development of functional products for residents of individual regions (geographical principle) is an innovative approach in the domestic market. In the North of Russia, the target audience of consumers of functional products will be not only residents of megalopolises and large cities who work, lead an active lifestyle, while taking care of their health, are ready to pay for their free time, receiving a quality and tasty product, but also residents of the geographically distributed territories regions of the North of the country of small cities, towns, villages, people who use them in dachas, outdoors, on hikes, and, very importantly, military personnel, workers, engineering and administrative personnel and members of their families living and working in remote areas, including working on a rotational basis.

5 Conclusion

1. Logistics, linking territories - producers of raw materials and territories - producers of final products, is considered as logistics of an end-to-end technological process, reflecting the interconnection of technological operations of production of raw materials, formation of stocks, their transportation, processing of raw materials and production of final products from it with its subsequent launch on the market. It is shown that such cross-cutting processes are characteristic of a number of industries, including agriculture and food industry, logging and deep processing of wood, the generation of nuclear fuel waste, their packaging, transportation and storage. Such cross-cutting processes have a special role for the Russian economy, the effective development of which necessitates its provision

with scientifically sound logistic territorial inter-regional and global world ties. The studies took into account that the regions of Russia are located in completely different natural and climatic zones of the country. This specificity includes natural resources, demographic and personnel transformations, climatic conditions, the presence and prospects of economic and industrial development, the potential for implementing large-scale investment projects (including with the involvement of foreign investors), the state of transport infrastructure, etc.

2. Logistics in the agricultural sector and the production of functional food products has its own specifics. When implementing and implementing a cross-cutting technology for the production of import-substituting functional foods and organizing logistics chains for the procurement and supply of raw materials as elements of cross-cutting technologies for the production of functional foods for the regions of the country located in these territories, it is recommended to take into account the specifics of the geographical location of the Northern territories of Russia, their location, huge area and extent. It should be taken into account that this specificity is affected by the most difficult natural and climatic conditions for living, eating, working, resting, and recovering the energy expended. It is recommended to introduce logistic-related end-to-end technologies for the harvesting, transportation of agricultural food raw materials and the production of functional food products as the most important factor in improving the food safety of the population living in the northern territories of Russia in the practice of the agricultural and food industry enterprises.
3. Today, the transportation of food and food raw materials is a complex technological process consisting of several stages consisting of direct transportation of products to intermediate storage points where food and food raw materials are stored and sorted, as well as transportation from intermediate storages or until enrichment points, or to the final consumer. The transportation of food raw materials directly from the places of growth is carried out mainly by road transport, since other modes of transport are not available, then there is an accumulation of food and food raw materials in specialized storages that meet certain storage standards and requirements. These storages are usually located near railway terminals where food and food raw materials are loaded onto wagons and delivered either to enrichment points or to the final consumer.
4. One of the modern tools for increasing the efficiency of such a scale of logistics costs is outsourcing. Effective outsourcing allows logistic customers to concentrate on their core business. Logistics themselves outsourcing individual logistics operations allows us to develop the core competency in logistics - supply chain management.
5. It is recommended that the development of specific logistic-related end-to-end technological processes for the procurement, transportation of agricultural food raw materials and the production of functional food products for specific enterprises be carried out taking into account the following methodology: raw materials and its use in the production of FPP. The first two technological operations are carried out by agricultural enterprises (independent or part of agricultural holdings). At the same time, the manufacturer of functional food products independently determines the suppliers of food raw materials. The transportation of edible agricultural raw materials is carried out mainly using outsourcing in the transport logistics of the end-to-end process. According to the general logistics and solving the problems of increasing food regional and interregional security of the population of the North of Russia, the manufacturer of functional food products is located in one of the regions of the northern territories. Food raw materials are recommended to be delivered under contracts based on the principle of "ex-enterprise" supply.
6. The most important factors affecting the choice of suppliers of agricultural raw materials for the production of functional food products are the availability of necessary arable land by types of food raw materials and regions of the country; agricultural productivity and quality, the availability of reliable suppliers of food raw materials in the framework of end-to-end technologies for the production of functional food products.
7. When developing the composition and formulations of functional foods for the population of the North of Russia, it is recommended to take into account that the nutrition pattern of the peoples of the North is currently transformed in combination with the so-called "European" type of nutrition, which, in contrast to the traditional nutrition of the indigenous peoples of the North, significantly higher proportion of carbohydrate and fat intake. It is recommended to take into account that the population of the North of Russia increased the consumption of food saturated with carbohydrates, which led to the emergence of disadaptive changes in metabolic processes in the northern ethnic groups, and the transformation of the use and organization of food consumption by the indigenous inhabitants ceased to correspond to the corresponding rhythm of their digestion processes. An important urgent task is to determine the places of enrichment of food raw materials. The most likely places are the accumulation of food and food raw materials, as well as regions where there is a shortage of certain micronutrients due to their geographical location. In addition, the final cost of delivery is affected by the duration and storage conditions of food and food raw materials. The need to solve the problem of the optimal choice of ingredients that form a particular food product is due to the needs of the population in various food products. Changes in the volume of food supplies entail the correction of the probable supply route and, as a result, the costs of its implementation.
9. As the main territories - sources of agricultural and meat raw materials of the agro-industrial complex of Russia for the implementation of end-to-end technologies for the production of functional food products, manufacturers and suppliers of these raw materials from the Southern, Central and Volga Federal Districts are recommended. It is the territories of these districts due to soil conditions that are favorable for growing here in large volumes of agricultural crops, both as raw materials for food production and for fodder meat production. In the Northern territories of Russia, in particular, in the NWFD of the Russian Federation, it is advisable to develop agricultural and meat production in some ecologically clean areas, as well as gather wild plants of the northern latitudes, breed northern animals, fish and fish using these products in the production of functional products. The basic model company for the production of functional products in the NWFD of the Russian Federation may be the industrial partner of PetrSU LLC Trade House Yarmarka. At this enterprise, high-tech production will be created to produce functional products competitive in the domestic and foreign markets. It will also work out the modes and parameters of such production. This enterprise should provide with these products not only the Republic of Karelia in the territory of which it is located, but also provide them with adjacent regions of the North of Russia (in our case, the North-West

Federal District of the Russian Federation.) Solving the problems of business development LLC Trade House Yarmarka should, using the one formed with the participation of in the implementation of the project, the scientific basis was to increase the volumes of supplies of its products to the markets of Russia and abroad. PetrSU after completion of the project should develop recommendations for the creation of such basic enterprises in the Federal Districts of the North of Russia.

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