Asesorías y Tutorías para la Investigación Científica en la Educación Puig-Salabarría S.C.
José María Pino Suárez 400-2 esq a Lerdo de Tejada. Toluca, Estado de México. 7223898475
RFC: ATI120618V12

**Revista Dilemas Contemporáneos: Educación, Política y Valores.**
**http://www.dilemascontemporaneoseducacionpoliticayvalores.com/**
**Año: VII Número: Edición Especial Artículo no.:103 Período: Octubre, 2019.**

**TÍTULO:** Fundamentos metodológicos del desarrollo de la cría de ganado en el contexto de la seguridad alimentaria de la Federación de Rusia.

**AUTORES:**

1. Ph.D. Airat A. Zamaidinov.
2. Ph.D. Asiya K. Subaeva.
3. Ph.D. Marina L. Yashina.
4. Ph.D. Ilgizya M. Dolgova.

**RESUMEN:** El objetivo del estudio es proporcionar una justificación científica del desarrollo de la cría de ganado y preparar recomendaciones prácticas para mejorar el nivel de satisfacción de la demanda pública de leche y carne de res. En el estudio, se planteó la hipótesis sobre la necesidad de optimizar la ubicación de la cría de ganado en el país. El estudio se basa en la agrupación zonal de sujetos de la Federación Rusa, dependiendo de la disponibilidad de áreas productoras de forraje, su evaluación productivita; resolviendo el problema de la optimización de la distribución del ganado con la ayuda de métodos de modelado económico-matemático. El desarrollo de pronósticos multivariados para la producción de carne y productos lácteos, basados en la nivelación de series temporales temporales de rendimiento ganadero.

**PALABRAS CLAVES:** satisfacción del público, cría de ganado, producción de carne, producción de leche.

**TITLE:** Methodological foundations of Cattle Breeding Development in the context of food security of the Russian Federation.

**AUTHORS**:

1. Ph.D. Airat A. Zamaidinov.

2. Ph.D. Asiya K. Subaeva.

3. Ph.D. Marina L. Yashina.

4. Ph.D. Ilgizya M. Dolgova.

**ABSTRACT:** The aim of the study is to provide scientific substantiation of the cattle breeding development and to prepare practical recommendations for improving the level of satisfying the public demand for milk and beef. In the course of the study, the hypothesis was put forward on the need for optimization the location of cattle-breeding in the country. The study is based on the zonal grouping of subjects of the Russian Federation, depending on the availability of fodder-producing areas, their evaluating productivity; solving the problem of optimization, the distribution of cattle stock with the help of economic-mathematical modeling methods, and the development of multivariate forecasts for the production of meat and milk products, based on the leveling of temporarily time-series of livestock yield.

**KEY WORDS**: satisfying the public, cattle breeding, production of meat, production of milk.

## INTRODUCTION.

The quality of food determines the quality and living standards of people. In this respect, agrarian production, aimed at the satisfaction of the most important needs of the population for food, has no peers.

In 2012, the Government of the Russian Federation developed and approved the list of measures for implementation the Fundamentals of State Policy in the Area of Healthy Nutrition of the Population, containing three major points. The first direction is based mainly on strengthening the quality control and food safety. The second intends for the formation of the idea of a healthy nutrition in the population. The third direction provides for the formation of balanced, sensible nutrition, as the most important task of state policy, increasing the share of domestic food products on the market, primarily cattle meat and milk (Yashina, 2013). This program is designed for the period until 2020. It is assumed, that until the end of this period, Russian enterprises of the agro-industrial complex, would be able to supply the markets with food and raw materials in accordance with the Doctrine of Food Security, including: milk - by 90%, meat - by 85%.

The strategic goal of independence of the Russian food market is the provision of the country's population with domestic agricultural products. Its achievement requires the stability of domestic production and the presence of necessary reserves; physical and economic availability of secure food products, meeting the established rational consumption norms.

The negative dynamics of milk and meat consumption is connected not only with the low paying capacity of the population, but also the low level of self-sufficiency with milk and cattle meat (Yashina, 2013).

The main reason for the latter is a decrease in the volume of production of cattle breeding. Changes in the structure of production were mainly caused by the increased investment in poultry farming of Russia, that led to an increase in the production of poultry meat by 2.3 times in 1990-2014. During this period, much smaller support of the state was obtained by other subsectors of animal husbandry.

## DEVELOPMENT.

### Methods.

The current state and prospects for the development of sub-sector require profound scientific research, that contributes to improving the provision of population with meat and dairy products. Article 11 of the Federal Law "On Strategic Planning in the Russian Federation" (Federal Law "On Strategic Planning in the Russian Federation", 2014) provides strategic spatial development and territorial planning of the country and its regions, as well as intraregional distribution of agricultural production, taking into account the potential development of food and processing industries.

Methodological foundations and mechanisms for improving cattle breeding include the following:

Firstly, the analysis of existing distribution of cattle breeding, the assessment of its specialization and the identification of potentially possible output of milk and beef production in all regions of the country; defining positive and negative tendencies in the development of cattle breeding, territorial, intra-sectoral, inter-branch, sectoral and interregional imbalances and possible reserves of sub-sector growth, as the basis for ensuring the food security and independence of the country in milk and beef.

Secondly, the revealing of the regions needs in the livestock production, taking into account the capacities of regional agro-food markets and the potential volumes of import and export of livestock products; for this purpose food balances are developed, the excess or deficit of meat and dairy products is determined.

Thirdly, the analysis of all existing interregional transport schemes, the effectiveness of regional specialization and food relations, shifts in the territorial-sectoral division of labor in cattle breeding, and their impact on the development of milk and beef markets, and the system of reliable supply of population with livestock products.

Fourthly, the definition of direct and indirect influence on the development of cattle breeding and interregional relations of a number of factors, such as the possibilities of rational use of the regional agrarian potential; volumes and structure of the meat and dairy products, produced and consumed in the region, taking into account the population's food expenditures and national peculiarities; geographic location and degree of development of transport infrastructure, etc.

Fifthly, the solution of the economic and mathematical optimization problem of cattle breeding location. Its criterion of optimality is the minimization of production and transportation costs of livestock products, taking into account export-import deliveries. This model includes the block, optimizing transport flows.

The optimization of interregional relations in cattle breeding is based on a program-targeted approach, which takes into account strategic tasks and the efficient use of resources of separate Russian regions (Altukhov, 2017). Thus, to optimize the location of cattle breeding within the country, it is advisable to use the optimization model of linear programming. It consists of five blocks, where the criterion of optimality is the maximum profit of agricultural producers from the production and sale of milk and beef, which guarantees the satisfying of minimum public demand for milk and beef products (Figure 1).

The solution of the problem, using the economic-mathematical model of the optimal location of cattle breeding presupposes the formation of specialized zones, the formation of which is carried out according to the complex of natural economic, technological and technical factors. For this purpose, the regions are grouped into the zones of dairy, beef and dairy and beef cattle breeding, as well as livestock-importing regions and, separately, the largest cities of the country (Figure 2).

<table>
<tr><td colspan="4">A set of variables</td></tr>
<tr><td>Overall production of livestock products</td><td>Cattle stock</td><td>Quantity of used feed</td><td>Economic indicators</td></tr>
<tr><td>I Block. The need for milk and beef: the minimum and maximum demands of each zone for every kind of livestock product; potential transportation flows of cattle milk and meat from one zone to another.</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">II Block. Production and transportation of livestock products: conditions, establishing a correspondence between livestock products and the stock of the corresponding group of cattle.</td><td></td><td></td></tr>
<tr><td></td><td colspan="2">III Block. Feed requirements: conditions for the minimum diet density; conditions for the share of each feed group in the diet; conditions for the content of certain types of feeds in the diet.</td><td></td></tr>
<tr><td></td><td></td><td>IV Block. Availability, production and import of feeds: conditions, limiting the use of certain feed types; potential options for importing of deficit feeds from one zone to another; conditions, reflecting the capacity of each zone to use available fodder-producing areas.</td><td></td></tr>
<tr><td colspan="4">V Block. Calculation of economic indicators, characterizing the process of production, transportation and sale of livestock products.</td></tr>
</table>

Figure 1. Modeling the optimal distribution of cattle stock and the formation of specialized commodity áreas.

| | |
|---|---|
| I. Regions with sufficient potential for the development of dairy cattle breeding. | Republics: Mordovia, Mari El, Udmurt, Chuvash.<br>Krays: Primorsky, Perm.<br>Regions: Moscow, Leningrad, Bryansk, Vladimir, Kaluga, Ryazan, Smolensk, Ivanovo, Pskov, Tver, Kirov, Tula, Yaroslavl, Vologda, Arkhangelsk, Kaliningrad, Sverdlovsk, Novgorod, Kostroma, Nizhny Novgorod. |
| II. Regions with sufficient potential for the development of beef and diary cattle breeding. | Republics: Chechen, Tatarstan, Khakassia, Adygea, North Ossetia - Alania, Ingushetia, Kabardino-Balkaria, Crimea.<br>Krays: Krasnodar, Krasnoyarsk.<br>Regions: Belgorod, Voronezh, Kursk, Tambov, Lipetsk, Orel, Samara, Penza, Ulyanovsk, Irkutsk, Kemerovo, Tomsk, Amur, Rostov, Tyumen, Chelyabinsk.<br>City: Sevastopol. |
| III. Regions with sufficient potential for the development of beef cattle breeding. | Republics: Kalmykia, Altai Bashkorostan, Buryatia, Tyva, Karachaevo-Circassian, Dagestan.<br>Krays: Stavropol, Altai, Transbaikal.<br>Regions: Astrakhan, Volgograd, Orenburg, Saratov, Kurgan, Novosibirsk, Omsk. |
| IV. Regions with insufficient potential for development of cattle breeding (importing). | Republics: Karelia, Komi, Sakha (Yakutia).<br>Krays: Kamchatka, Khabarovsk.<br>Regions: Murmansk, Magadan, Sakhalin.<br>Autonomous districts: Khanty-Mansiysk - Yugra, Yamalo-Nenets, Chukotka, Nenets.<br>Autonomous region: Jewish. |
| V. The largest urban conglomerates. | Cities: Moscow, St. Petersburg. |

Figure 2. Grouping of the subjects of the Russian Federation, depending on the natural and climatic potential and the economic conditions for the development of cattle breeding.

Sixthly, the rational selection of regions-suppliers and buyers of livestock products, volumes and optimal directions of interregional relations, taking into account the potentially possible export-import food supplies of meat and dairy products.

Seventhly, the development of predictable options for the rationalization of interregional food relations, taking into account the growth of livestock products, the specialization of regions in the

production of agro-industrial products, the improvement of the territorial and sectoral structure of agro-industry, the changes in the domestic and world market conditions for dairy and beef products.

**Results and discussion.**

The solution of the problem of optimization the location of cattle stock (Yashina, 2012; Maksimov, 1983) showed, that structural changes in the development of cattle breeding are necessary for the formation of large-scale zones for the livestock production, primarily in regions with low prime cost and high quality. This is practiced now in economically developed countries and has been widely used in Russia before the period of market transformations.

The research proved, that the rational distribution of cattle stock contributed to 16.0% reduction in the prime cost of beef production in the country, an increase by 8.2% in the dairy production, due to the compete feeding of animals, the improvement of distribution and specialization of agro-industrial production, and the optimization of transport flows of livestock products. With the increase in the livestock yield, we should expect an increase in the output of livestock products, including dairy, according to the inertial forecast, to 39.0 million tons, while the State program calls for an increase in production to 38.2 million tons (National Report "On The Progress And Results of the Implementation in 2015 of the State Program for the Development of Agriculture and Regulation of Markets of Agricultural Products, 2016). Due to structural changes in cattle breeding, the level of food provision will be ensured. However, by 2020, it will hardly be possible to achieve full satisfaction of needs, by means of the own production, primarily beef.

Thus, multivariate forecasts (Table 1) allow us to conclude that by 2020, ensuring food security in the domestic market of livestock products will unlikely have been possible.

Table 1. Alternative forecasts of the level of satisfying the public demand for milk and beef in the Russian Federation.

| The types of products | The need for rational norms, thousand tons. | | by means of domestic production, in 2014% | Forecast for 2020 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Pessimistic | | Inertial | | Optimistic | |
| | Min | Max | | Production, thousand tons. | The level of satisfaction of minimum needs, % | Production, thousand tons. | The level of satisfaction of minimum needs, % | Production, thousand tons. | The level of satisfaction of minimum needs, % |
| Milk | 45856 | 48722 | 66,6 | 33210 | 72,4 | 39027 | 85,1 | 47412 | 103,4 |
| Beef | 3583 | | 45,6 | 1687 | 47,1 | 1890 | 52,7 | 2032 | 56,7 |

The practical significance of the authors' research is in the possibility of using methodological and methodical approaches to the optimization of territorial systems, grounding forecasts and prospects for the development of agro-industry.

**Deductions.**

The results of the research showed the need for reorientation of the further development of sub-sector to the formation of large-commodity zones for the production of cattle milk and meat. The identified reserves will allow the latter to use its internal advantages to increase the competitiveness of production.

In the course of the research the following conclusions were made:

- 3/4 of Russians consumed milk and dairy products below the required rate, underfed about 10 kg of beef annually.
- The reasons for the decline in the production of livestock products were identified, the most important of which were the following: the reduction in the number of cattle stock, limited

supply of feed for livestock, in the presence of large areas of unused natural lands, the lack of complete feed, over-consumption of feed.

- According to the forecasts of cattle breeding development, by 2020 the indicators of the Food Security Doctrine will not have been achieved, but due to the structural changes in the sub-sector, a significant increase in the level of consumption by the population of the country of milk and beef of own production will have been possible.

**CONCLUSIONS.**

The solution of tasks, specified in the State Program for 2013-2020, on the increase in output of gross production of dairy products (in the recalculation of milk), up to 36 million tons by 2020 will have ensured the domestic solvent demand for milk and dairy products, amounting to only 66,6%, for beef this amount will be 45.6% of rational needs.

Many scientists of All-Russian Institute of Agricultural Problems and Informatics named after A.A. Nikonov (Galiev, 2014), All-Russian Research Institute of Agricultural Economics (Altukhov, 2014; Altukhov et al., 2003; Altukhov, 2014; Ushachev, 2013), and others (Kropyvko, 2014; Aubakirov, 2013; Kaletnik & Pchelianska, 2014; Luchyk & Luchyk, 2014) are also inclined to believe that the achievement of criterial indicators of cattle milk and meat production, provided for by the State Program, is not sufficient to satisfy rational needs of the country's population.

In case if by 2020, milk and dairy production output will have reached 47 million tons, beef - 2 million tons, according to the optimistic forecast, the population of the regions will not have been able to use this quantity of meat and dairy products economically, due to the existing social inequality. In 2016-2017, due to the fall in real incomes of population, there will be a decrease in consumption levels of livestock products.

At the same time, it should be remembered, that ensuring food security of the country is a complex problem, based not only on agrarian policy, but also on ensuring economic affordability of food; that is, the optimization of relationship between consumers' demand and the volume of output in the country and its regions.

**Acknowledgements.**

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

**BIBLIOGRAPHIC REFERENCES.**

1. Yashina, M. L. (2013). Healthy Nutrition of the Russian Population: Realities and Prospects. M.L. Yashina. Economic Research, 4. 5.
2. Yashina, M. L. (2013). Consumption of Milk and Beef in the Russian Federation: Realities and Prospects. M.L. Yashina. Nikon readings, 18, 437-440.
3. Altukhov, A. I. (2017). Improvement of interregional food relations in the country: issues of methodology and practice. Agrofood Policy of Russia, 2(62), 2-11.
4. Maksimov, A. D. (1983). Methodical recommendations on optimization of development and location of agricultural production of the Russian SFSR. All-Russian Research Institute of Production Engineering, Workplace Management and Business Administration in Agriculture, Kosino, - 59
5. Federal Law "On Strategic Planning in the Russian Federation". (2014). from June 28, 172-FZ (rev. from July 3, 2016) [Electronic resource] Available at: http://www.consultant.ru/ (accessed date: 03.06.2017)
6. Yashina, M. L. (2012). Development of cattle breeding in Russia, on the basis of deepening the territorial-sectoral division of labor. Economic Research, 3, 5.

7. National Report "On The Progress And Results of the Implementation in 2015 of the State Program for the Development of Agriculture and Regulation of Markets of Agricultural Products. (2016). raw materials and food for 2013-2020", M, - 257.
8. Altukhov, A. I. (2014). Ensuring food security and increasing the profitability of agriculture – is the basis of the new state agrarian policy of Russia. In coll.: The materials of All-Russian Scientific Conference of Young Scientists "Sustainable Development of Rural Territories: Theoretical and Methodological Aspects". - Ulyanovsk: State Agricultural Academy named after P.A. Stolypin, 1, 16-29.
9. Altukhov A. I. et al. (2003). State and Main Directions of Ensuring the Food Security of Russia. Moscow: State Scientific Iinstitution All-Russian Research Institute of Agricultural Economics, - 147.
10. Altukhov, A. I. (Ed.) (2014). The Main Directions of Regional Distribution and Specialization of Agro-Industrial Production In Russia: Monograph. State Scientific Iinstitution All-Russian Research Institute of Agricultural Economics; Krasnodar: KubSAU, – 183.
11. Galiev, R. R. (2014). Socio-economic development of village in Russian Federation. «The First International Conference on Economic Sciences». Proceedings of the Conference (April 03, 2014). «East West» Association for Advanced Studies and Higher Education GmbH. Vienna, 384
12. Kropyvko, M. F. (2014). Organization and planning of agroindustrial production and rural area complex development under the conditions of power decentralization. Economy of agroindustrial complex, 7(237), 109-121.
13. Aubakirov, G. M. (2013). The Republican Meet and Milk Market. Life Science Journal, 10, 329-333.

14. Kaletnik, H. M., & Pchelianska, H. O. (2014). Place and role of food security in formation of economic security. Business Inform, 2, 30-34.
15. Ushachev, I. G. (2013). Food Security of Russia within the Framework of Global Partnership. - M.: Publishing house of private entrepreneur Nasirddinov V.V., - 330.
16. Luchyk, S. D., & Luchyk, M. V. (2014). Food security assessment as part of the economic security of the country. Problems of the economy (Kharkov), 2, 56-61.

**DATA OF THE AUTHORS.**

**1. Airat A. Zamaidinov.** Ph.D. in Agriculture. Kazan Federal University.

**2. Asiya K. Subaeva.** Ph.D. in Economics. Kazan Federal University.

**3. Marina L. Yashina.** Ph.D. in Economics. Federal State Budgetary Educational Institution of Higher Professional Education, Ulyanovsk State Agricultural Academy named after P.A. Stolypin.

**4. Ilgizya M. Dolgova.** Ph.D. in Economics, Federal State Budgetary Educational Institution of Higher Professional Education, Ulyanovsk State Agricultural Academy named after P.A. Stolypin.

**RECIBIDO:** 4 de septiembre del 2019. **APROBADO:** 13 de septiembre del 2019.