Russian milk export: problems and development prospects

V S Konkina*, A G Krasnikov and E A Strokova

Department of Marketing and Merchandizing, Federal State Budgetary Educational Institution of Higher Education “Ryazan State Agrotechnological University Named after P.A. Kostychev”, Ryazan, Russia

*E-mail: konkina_v@mail.ru

Abstract. Modern agriculture is showing progressive growth. However, not all segments develop in the same way. The dairy industry is showing conflicting results. A twofold increase in the productivity of cows with a simultaneous decrease in livestock does not allow for expanded production. At the same time, the Ministry of Agriculture of the Russian Federation is consistently implementing an export-oriented model for the development of the domestic agro-industrial complex. The analysis showed that the export of milk and dairy products was stable during 2000-2019. However, in 2020 it was marked by its significant growth. This is due to the influence of many factors that were formulated and analyzed in the article. These factors include: low labor and land costs, success in selection and breeding work, grants and subsidies from the state, large hayfields and pastures, the lack of a system for transferring innovations to production, etc.

1. Introduction
The Russian agro-industrial complex has undergone major changes - from complete oblivion to renaissance. Today, agriculture is the third largest grain export in the world, complete food security for poultry meat, etc. But at the same time, there are serious shortcomings, which will be figured out on the example of the dairy industry.

2. Materials and Methods
The dairy industry in the Russian Federation demonstrates contradictory trends (Fig. 1). On the one hand, there is a twofold increase in the productivity of cows (from 2,502 kg per a forage-fed cow in 2000 to 4,839 kg in 2020), and on the other hand, there is an unprecedented decrease in their livestock. Their number over the same period decreased by 4,844.3 thousand heads. Such mutually opposite vectors of development do not allow to seriously increase milk production. Over the twenty-year observed period, the scale of the dairy industry did not increase, but even decreased by 43 thousand tons [1-3].
At the same time, the potential capacity of the milk and dairy products market (according to the established medical norm of milk consumption per capita - 325 kg) is 57,506.4 thousand tons. The actual production volumes are far from the calculated ones. Therefore, foreign trade operations are the trigger balancing the supply and demand of milk and dairy products [4-8]. The dynamic analysis of export-import operations allows to state their fundamental changes (Fig. 2).

The 2000s were marked by the opening of borders and a free trade policy, which led to the expected result - the shelves of Russian stores were flooded with imported dairy products. Every year the volume of import of milk and dairy products "grew" by 1.5 million tons and reached a maximum of 9,455.1 thousand tons in 2013. The geography of delivery was the widest including Finland, Belarus, Estonia, Germany, Lithuania, Belgium, Kazakhstan and others. 2014 was a turning point. The introduction of the food embargo changed not only the geopolitical situation, but also foreign trade
logistics. Import volumes decreased by more than 3 million tons of milk. And the geography of supplies has actually narrowed down to two countries - Belarus and Kazakhstan, which used customs preferences as efficiently as possible.

When talking about exports, one can say the situation is stable and predictable. Export volumes in physical terms remained practically unchanged - about 600 ± 50 thousand tons. 2020 was characterized by a one-time increase in the export of dairy products by almost 100 thousand tons. The share of milk exports in production increased from 1.57% in 2000 to 2.19% in 2020, and the share of milk imports in its consumption increased more significantly - by 4.81% (from 15.06% in 2000 to 19.88% in 2020). The value of dairy exports reached $303.6 million, and in the structure of exports of food products and agricultural raw materials, it accounted for 1.1%. The growth of exports is primarily due to the fact that, on the one hand, manufacturers are concerned about exporting, and on the other hand, there are certain measures of state support, which, ultimately, have increased the export component [9-12].

Increasing the export of milk and dairy products is a modern mainstream, which ensures the development of dairy farming, fodder production and other sectors of the national economy. Throughout the history of the development of the dairy industry in the Russian Federation, the share of milk and dairy products in the total volume of its resources has been systematically decreasing. So in 2000 this figure was 84.23%, and in 2020 it was already 78.53%. As a result, the country's milk self-sufficiency rate ranged from 88.3% in 2000 to 84.4% in 2020. And instead of focusing on meeting domestic needs, the Ministry of Agriculture of the Russian Federation is consistently increasing the export of milk and dairy products, as a declaration of an export-oriented model for the development of the domestic agro-industrial complex. Naturally, given the tense geopolitical situation, this is the right decision. The physical increase in exports will also spur the saturation of the domestic market. Unfortunately, however, the effect will be short-lived and insignificant. Falling incomes, even taking into account lump-sum payments of 10,000 rubles to pensioners [30] and schoolchildren [31], will not be able to ensure a consistently high effective demand for milk and dairy products, the cost of which has seriously increased. So, according to experts, the production of raw milk in 2021 has risen in price by 20-30% compared to last year [32]. This is due to the fact that milk producers and processors are working under conditions of a significant increase in the costs of veterinary drugs, logistics, electricity, packaging and other cost components.

3. Results and Discussion
The main factors that have both a positive and a negative impact on the development of the dairy industry in general and milk exports in particular include:

- the use of competitive advantages of the development of the domestic agro-industrial complex, which is associated with the low cost of land, as a resource for feed production and the low cost of labor. Despite positive changes in agriculture, wages remain quite low and lag behind the main sectors of the national economy. In 2020, remuneration for labor in the financial and insurance sectors was 3.24 times ahead of the same indicator in agriculture, 2.46 times in the field of information and communications, and 1.34 times in the manufacturing industry [13-15];

- the presence of 17 largest milk-producing regions, providing more than half of the gross production. These regions have a large agricultural potential, being linked to large processing facilities, as well as federal and interstate transport highways;

- the accelerated development of large mega-farms in the main milk-producing regions provide a high innovative and investment level of development of the dairy industry, including the rational use of bioclimatic potential, achievements of breeding science and practice, as well as available production resources. These conditions, in fact, can become a trigger for the development of foreign trade in the context of foreign sanctions and force majeure [15-20];

- a system of measures of state support for the dairy industry in direct and indirect forms stimulates the growth of the scale of this sector of the economy, its profitability, etc. The State Program for the Development of the Agro-Industrial Complex [33] is planned to allocate a total of 33.5 billion rubles for the dairy industry. The element-wise composition of state aid includes: preferential lending, grants, investment loans, etc. All of the above support measures are aimed at creating the missing elements of
a modern production and processing infrastructure, creating and developing agricultural hubs with appropriate transport and logistics support for commodity flows of milk and dairy products both within the country, and beyond [21-25];

- the presence of significant hayfields and pastures, completely or partially withdrawn from agricultural use, as well as genetic, energy, labor resources that can potentially be directed to the dairy industry;

- high debt burden of large dairy complexes, which reached 20,866.2 billion rubles by 2020, as well as the volatility of incomes of agricultural producers (profitability of milk production decreased by 4.6 % from 25 % in 2017 to 20.4 % in 2020), price disparity for milk and purchased equipment increases financial risks, reduces financial stability and limits the potential for modernization and development of the dairy industry without serious government support;

- the lack of a well-structured system for the transfer of biological, technical and technological, socio-economic innovations to production. As a result, there is a systematic decrease in the return on the production resources used in the dairy sector, a constant increase in the cost of milk production and the appearance of a large amount of counterfeit dairy products that do not meet the established quality requirements for dairy products on the counters and tables of Russian citizens;

- weak mobilization of competitive advantages of the dairy industry associated with the use of innovative and investment factors focused on expanded reproduction in this sector of the economy. This trend is clearly demonstrated by high costs of milk production and its delivery to final foreign consumers and the relatively low export price of dairy products;

- the presence of a huge and at the same time highly differentiated in terms of population territory of the Russian Federation with a rather low density and ramification of roads, combined with strong localization of the main dairy producers, presupposes the movement of milk and dairy products oriented for export over considerable distances. This seriously increases transport costs in the cost of dairy products and makes it almost impossible to carry out foreign trade activities at an acceptable level of profitability.

Thus, all of the above factors determine the vector of development of export operations in the dairy market. At the same time, the Ministry of Agriculture of the Russian Federation will consistently continue the development of an export-oriented model of agriculture. The state program for the development of the agro-industrial complex provides for an increase in the foreign economic presence of the Russian Federation in foreign food markets. To achieve this goal, a set of measures has been developed that provide for the framework of the concessional lending mechanism approved by the decree of the Government of the Russian Federation of December 29, 2016. No. 1528, the allocation of loans to support the dairy industry [26-28]:

- short-term loans up to 1 year to purchase raw milk for the production of whole-milk products, cheeses, butter and dry milk products, including the production of milk-based baby food for young children; to purchase young dairy cattle, feed, medicinal products for veterinary use, authorized for the Russian Federation at the time of granting a preferential loan, used for dairy cattle; to purchase spare parts and materials for the repair of agricultural machinery, equipment, trucks and tractors for the development of dairy cattle breeding; to pay insurance premiums for insurance of dairy cattle; to mark certain types of dairy products; for informatization and digitalization; to purchase grain, vitamins, meal for feed purposes;

- loans for a period of 2 to 8 years inclusive for the construction of complexes (farms), livestock facilities and the purchase of equipment for them; for the construction, reconstruction and modernization of points for the acceptance, primary and (or) subsequent (industrial) processing of milk (including refrigeration and storage of dairy products) and the purchase of equipment and specialized transport for them; enterprises for the production of whole-milk products, cheeses and butter and the purchase of equipment for them; workshops and sections for processing and drying milk and whey; for the construction, reconstruction and modernization of feed mills and workshops and the purchase of equipment for them; for the construction, reconstruction and modernization of bio factories for the production of bacterial concentrates and starters for the food and processing industry, including the cheese-making industry, and the purchase of equipment for them;
- loans for a period of 2 to 5 years inclusive for the purchase of equipment for labeling certain types of dairy products; for the purchase of trucks, trailers and semi-trailers.

4. Conclusion
Thus, the modern strategy for the development of agriculture in general and the dairy complex in particular, unfortunately, cannot solve all the problems that have accumulated in the industry, since it does not cover all areas, elements and processes. Therefore, there is serious work to be done to build the management system in general and state regulation in particular of such a complex mechanism as the agro-industrial complex and the dairy industry.

References
[1] Bakulina G, Fedoskin V, Pikushina M, Kukhar V and Kot E 2020 Factor Analysis Models in Enterprise Costs Management *International Journal of Circuits, Systems and Signal Processing* 14 232-240

[2] Martynushkin AB, Kostrova Yu B and Lyashchuk Yu O 2020 Analysis of costs for measures to reduce the level of biological risks in milk production *Bulletin of KrasGAU* 6 (162) 157-164

[3] Simonov P M 2006 On one method for studying dynamic models of the economy (the method of model equations) *Proceedings of Bratsk State University. Series: Natural and Engineering Sciences* 2 55-58

[4] Belova T N 2019 Processes of import substitution in the agro-food sector *Economy of the region* 15(1) 285-297

[5] Konkina V S, Martynushkin A B 2020 Analysis of import substitution processes in the milk and dairy products market using cluster analysis *International Transaction Journal of Engineering, Management and Applied Sciences and Technologies* 11(10) 11A10L

[6] Beukes P C, Gregorini P, Romera A J, Levy G and Waghorn G C 2010 Improving Production Efficiency as a Strategy to Mitigate Greenhouse Gas Emissions on Pastoral Dairy Farms in New Zealand *Agriculture, Ecosystems and Environment* 136(3-4) 358-365

[7] Martynushkin A B, Konkina V S, Kostrova J B, Fedoskina I V, Barsukova N V, Polyakov M V 2020 Modern trends and development problems of the milk and dairy products market in the Russian Federation *Modern Trends in Agricultural Production in the World Economy* 77-84

[8] Byshov N V, Borychev S N, Uspenskiy I A, Shemyakin A V, Yukhin I A, Fedyashov D A and Piskachev I A 2018 Development prospects of transportation in the agroindustrial complex by reducing the damage of fruit and vegetable products when using the pneumatic container *Intern. J. of Engin. and Tech.* 7(4.36) 914-919

[9] Anikin N, Terentyev V, Andreev K, Shemyakin A and Martynushkin A 2020 Qualitative assessment of passenger service *Journal of Physics: Conference Series* 012094

[10] Krylatykh E N 2011 Multifunctionality of the Agro-Food Sector: Theoretical Concept, Practical Implementation *Economics of the Region* 4(28) 21-35

[11] Krylatykh E N and Fedorov V P 2013 Food Security in the Context of Integration: Trends, Achievements, Threats *Modern Europe* 2(54) 138-142

[12] Zavgorodnyaya A S, Shashkova I G, Konkina V S, Romanova L V, Mashkova E I and Pikushina M Yu 2018 Adaptive Management of the Agricultural Enterprise in the Conditions of Environmental Uncertainty *Journal of Advanced Research in Dynamical and Control Systems* 7 2022-2031

[13] Kuhl S, Flach L and Gauly M 2020 Economic assessment of small-scale mountain dairy farms in South Tyrol depending on feed intake and breed *Italian Journal of Animal Science* 19(1) 41-50

[14] Martynushkin A B, Konkina V S 2020 Quality improvement of public service of automobile transport: economic evaluation method *Advances in Economics, Business and Management Research. Proceedings of the Russian Conference on Digital Economy and Knowledge Management* (RuDEcK 2020) 449-455

[15] Konkina V 2020 Investment management in the dairy industry *BIO Web of Conferences* 17 00086
[16] Emelyanova A S, Kashirina L G, Stepura E E, Emelyanov S D, Borycheva Yu P 2020 Dynamics of variability of the animal heart rhythm and its correlation with economic parameters and age Bio Web of Conferences 17 00095
[17] Kashirina L G, Ivanishechev K A, Romanov K I 2019 The quality of dairy products made from the milk of cows under the Influence of vitamin-containing preparations Bio Web of Conferences 17 00096
[18] Bystrova I Yu, Fedosova O A, Ulivanova G V, Glotova G N, Pravdina E N and Rydanova E A 2019 Analysis of the Relationship between Economic and Useful Traits of Cattle with Genetic Polymorphism of Alleles of Blood Groups and Dairy Proteins International Journal of Advanced Biotechnology and Research 10(2) 392-405
[19] Tunikov G M, Bystrova I Yu, Byshova N G, Mayorova Zh S, Pravdina E N and Kulibekov K K 2019 Biophysical Properties of Hoof Horn and Their Connection with Some Biological Parameters of Cows in the Conditions of Industrial Technology International Journal of Advanced Biotechnology and Research 10(2) 465-473
[20] Emelyanova A S, Stepura E E, Gerasimov M A and Emelyanov S D 2019 Mathematical modelling of heart rhythm in dairy cattle IOP Conference Series: Earth and Environmental Science: Russian Conference on Technological Solutions and Instrumentation for Agribusiness (TSIA-2019) Stavropol Russia 488
[21] Emelyanova A S, Kashirina L G, Emelyanov S D, Trfandyan M T, Dorokhina J E 2020 Cardiac rhythm variability method - an innovative decision in the area of modern dairy cattle breeding IOP Conference Series: Earth and Environmental Science 422 (1) 012068
[22] Khripin V, Ulyanov V, Kryuchkina E, and Cherkashina L 2020 Research of some physical and mechanical characteristics of cow's udder nipples E3S Web of Conferences 175 03005
[23] Kashirina L, Ivanischev K, Romanov K 2020 Studying the processes of lipid peroxidal oxidation in the organism of fresh cows under the antioxidant impact E3S Web of Conferences 176 02001
[24] Kondakova I, Vologzhanina E, Lomova J, Kryuchkova N 2020 Causes of diseases of the digestive system of the young cattle E3S Web of Conferences: International Scientific and Practical Conference. Development of the Agro-Industrial Complex in the Context of Robotization and Digitalization of Production in Russia and Abroad 222 02013
[25] Saikhanov E, Besedin D, Semenov V, Kulakov V, Gertseva K 2020 Assessment of the efficiency of therapeutic and prophylactic treatment of cows’ hooves using a modern antiseptic E3S Web of Conferences: International Scientific and Practical Conference. Development of the Agro-Industrial Complex in the Context of Robotization and Digitalization of Production in Russia and Abroad 222 02017
[26] Guber N B, Morozova N I, Eliseenkova M V, Sereda T I, Tamaev S A 2020 Morphology and quality of beef with regard to a biostimulator used in the diet of animals IOP Conference Series: Earth and Environmental Science 613(1) 012044
[27] Stepanova I A, Nazarova A A, Arisov M V 2020 Peculiarities of Mineral Metabolism of Holstein Heifers’ Diet Supplemented with Copper Nanopowders World’s Veterinary Journal 10 (4) 492-498
[28] Britan M N, Gerceva K, Kiseleva E V, Kulakov V V, Saytkhanov E O, Soshkin R S 2019 Nosological profile of animal farms of Ryazan oblast and evaluation of the efficiency of modern medicines for treating mastitis International Journal of Pharmaceutical Research 11 (1), 1040-1048
[29] Metelkova E, Demishkevich G, Gusev A 2019 State support for the production of cattle meat: The experience of countries with high levels of self-sufficiency IOP Conference Series: Earth and Environmental Science 274(1) 012036
[30] Decree of the President of the Russian Federation of August 24, 2021 No. 486 "On a one-time cash payment to citizens receiving a pension"
[31] Resolution of July 30, 2021 No 1277
[32] https://secretmag.ru/news/v-rossii-stalo-dorozhe-proizvoditel-moloko.html
[33] Decree of the Government of the Russian Federation of July 14, 2012 N 717 (as amended on April 6, 2021) "On the State Program for the Development of Agriculture and Regulation of the Markets of Agricultural Products, Raw Materials and Food"