

THE MARKET OF MILK AND DAIRY PRODUCTS: GLOBAL TRENDS AND DEVELOPMENT PROSPECTS FOR KAZAKHSTAN

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The purpose of this article is to analyze the key trends in the development of the global milk and dairy products market, as well as to determine the prospects for Kazakhstan. The article analyzes the main trends in the development of milk production in the world and the current state of the milk and dairy products market in the Republic of Kazakhstan. The main directions and causes of changes in the production, number, and productivity of dairy animals, as well as the peculiarities of the transformation of dairy farms in the world and the Republic of Kazakhstan, have been identified. The causes of fluctuations in purchase prices on the world market and their reflection on the domestic market are determined. The article uses methods of general scientific and economic research that contribute to the comprehensive achievement of goals and objectives. The generalization method provided an in-depth analysis of the materials and the development of the research structure, in contrast, the methods of interpretation and comparison allowed us to evaluate the opinions of researchers and identify the main characteristics of the development of the milk and dairy products market. Based on the data analysis and statistical conclusions, conclusions were drawn about the current state of the milk market in the Republic of Kazakhstan, factors affecting product quality were identified, and recommendations for its improvement were proposed.

Keywords: dairy products, milk and dairy products market, cow population, dairy herd productivity, consumption, development, global market, prices, forecast.

СҮТ ЖӘНЕ СҮТ ӨНІМДЕРІ НАРЫҒЫ: ӘЛЕМДІК ҮРДІСТЕР МЕН ҚАЗАҚСТАННЫҢ ДАМУ ПЕРСПЕКТИВАЛАРЫ

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Бұл мақаланың мақсаты сүт және сүт өнімдері жаһандық нарығын дамытудың негізгі үрдістеріне талдау жүргізу және Қазақстан үшін перспективаларды айқындау болып табылады. Мақалада әлемдегі сүт өндірісін дамытудың негізгі тенденциялары және Қазақстан Республикасындағы сүт және сүт өнімдері нарығының қазіргі жағдайы талданған. Сүтті сиырлар саны мен өнімділігіндегі, сүт өндірісіндегі өзгерістердің негізгі бағыттары мен себептері, сондай-ақ әлемдегі және ҚР-дағы сүт фермаларының өзгеру ерекшеліктері анықталды. Әлемдік нарықтағы сатып алу бағасының ауытқу себептері және олардың отандық нарыққа әсері қарастырылды. Мақалада қойылған мақсаттар мен міндеттерге жан-жақты қол жеткізуге ықпал ететін жалпы ғылыми және экономикалық зерттеу әдістері қолданылады. Жалпылау әдісі материалдарды терең талдауды және зерттеу құрылымын дамытуды қамтамасыз етті, ал интерпретация және салыстыру әдістері зерттеушілердің пікірлерін бағалауға және сүт және сүт өнімдері нарығының дамуының негізгі сипаттамаларын анықтауға мүмкіндік берді. Деректер мен статистикалық қорытындыларды талдау негізінде Қазақстан Республикасындағы сүт нарығының ағымдағы жай-күйі туралы тұжырымдар жасалды, өнім сапасына әсер ететін факторлар анықталды және оны жақсарту бойынша ұсыныстар анықталды.

Түйін сөздер: сүт өнімдері, сүт және сүт өнімдері нарығы, сауынды сиыр саны, сүт өнімділігі, тұтыну, даму, әлемдік нарық, бағалар, болжам.

РЫНОК МОЛОКА И МОЛОЧНОЙ ПРОДУКЦИИ: МИРОВЫЕ ТЕНДЕНЦИИ И ПЕРСПЕКТИВЫ РАЗВИТИЯ ДЛЯ КАЗАХСТАНА

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Цель данной статьи состоит в проведении анализа ключевых тенденций развития глобального рынка молока и молочной продукции, а также в определении перспектив для Казахстана. В статье проанализированы основные тенденции развития производства молока в мире и современное состояние рынка молока и молочных продуктов в Республике Казахстан. Выявлены основные направления и причины изменений в производстве, численности и продуктивности молочных животных, а также особенности трансформации молочных ферм в мире и в РК. Определены причины колебаний закупочных цен на мировом рынке и их отражение на отечественном рынке. В статье применены методы общенаучного и экономического исследования, которые способствуют всестороннему достижению поставленных целей и задач. Метод обобщения обеспечил глубокий анализ материалов и разработку структуры исследования, в то время как методы интерпретации и сопоставления позволили оценить мнения исследователей и выделить основные характеристики развития рынка молока и молочной продукции. На основании анализа данных и статистических выводов были сформированы выводы о текущем состоянии рынка молока в Республике Казахстан, выявлены факторы, влияющие на качество продукции, и предложены рекомендации по его улучшению.

Ключевые слова: молочные продукты, рынок молока и молочной продукции, поголовье коров, продуктивность молочного стада, потребление, развитие, мировой рынок, цены, прогноз.

Introduction. The market of milk and dairy products plays an important role in ensuring the food security of the state and sustainable development of the agro-industrial complex worldwide. In the context of globalization and the growing demand for quality food products, the dairy industry is becoming one of the fastest-growing industries. Growing urbanization, changes in consumption patterns, innovations in milk production and processing technology, and the pursuit of environmental sustainability have a significant impact on the national and global milk market.

In modern conditions, it is important not only to increase the volume of food production but also to guarantee balanced nutrition for the state's population. This is a key factor in increasing the life expectancy of the population. Milk and dairy products occupy a special place in food consumption. Milk is a special product that contains nutrients necessary for the growth, development, and maintenance of human health. It has a balanced composition that makes it one of the most valuable foods. Eating milk and dairy products has a positive

effect on the health of both children and adults, strengthening their immune systems, increasing efficiency and physical endurance, and improving mood. Milk is also a therapeutic product that helps to eliminate toxins and radionuclides from the body [1].

Kazakhstan, as a country with significant agrarian potential, the development of the dairy sector is a strategically important area. The country faces both internal challenges - lack of raw material base, logistical difficulties, seasonal fluctuations in production - and prospects related to export and integration into international supply chains.

The purpose of the article is to analyze the main trends in the formation of the global market of milk and dairy products, as well as to determine the prospects for Kazakhstan.

The objectives of the research in this article:

1. To analyze the main trends in the formation of milk production in the world, as well as their characteristics in the dairy market of Kazakhstan;
2. To determine the main directions and causes

of changes in production, number, and productivity of dairy animals, as well as the features of transformation of dairy farms in the world and Kazakhstan.

3. To determine the causes of fluctuations in purchase prices in the world market and their reflection in the domestic market.

The object of the study is the world market of milk and dairy products, as well as the national milk market of Kazakhstan.

Hypothesis of the study: Kazakhstan has the potential for successful development of the dairy sector, provided that world trends are adapted to local characteristics and effective development strategies are developed.

Materials and methods. The article applies the methods of general scientific and economic research, which contribute to the comprehensive achievement of the set goals and objectives. The method of generalization provided an in-depth analysis of materials and the development of

the research structure. In contrast, the methods of interpretation and comparison allowed us to assess the opinions of researchers and highlight the main characteristics of the development of the market of milk and dairy products. Based on data analysis and statistical conclusions were formed about the current state of the milk market in the Republic of Kazakhstan, factors affecting the quality of products, and proposed recommendations for improvement.

The research applied methods of content analysis and analysis of statistical data based on data from official sources of information and scientific publications on the topic of the article. The main indicators of the market of milk and dairy products were analyzed. The empirical base of the study was made up of data collected from industry reviews, and scientific articles by domestic and foreign experts. This allowed for a comprehensive review of key aspects, problems, and prospects for the development of the topic under study.

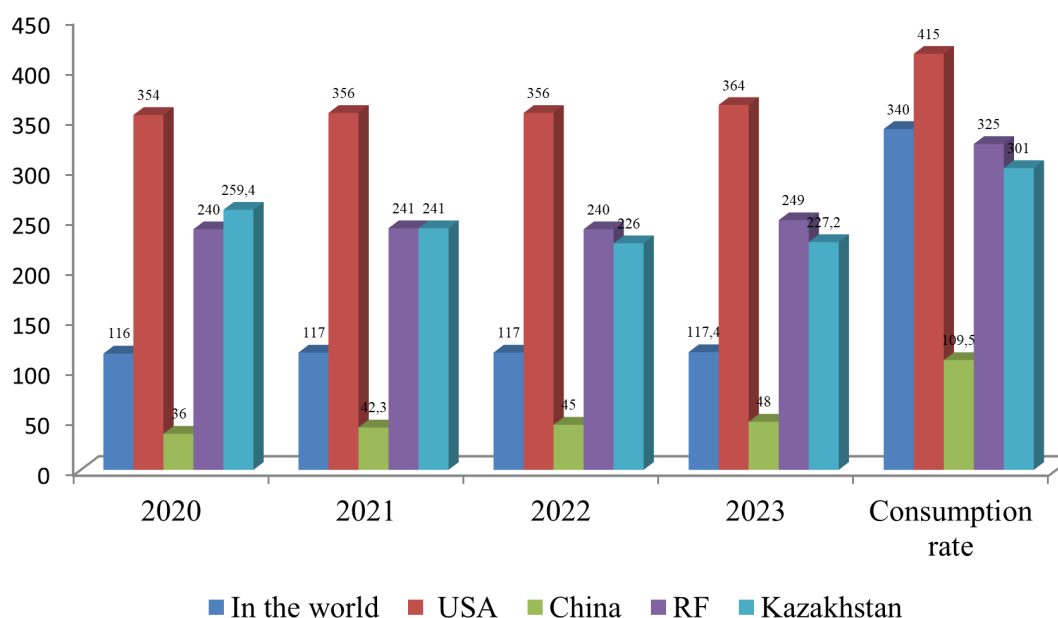


Fig.1 - Dynamics of consumption of milk and dairy products per capita in 2020-2023, kg

Note – compiled by the authors on the basis of past research

Results and Discussion. According to the recommendations of the World Health Organization, the optimal norm of consumption of milk and

dairy products is 330-340 kg per year. At the same time, according to the scientifically based physiological norms of food consumption, approved

by the order of the Minister of National Economy of the Republic of Kazakhstan in 2016, the average per capita consumption rate of milk and dairy products in the country is - 301 kg/year [2].

However, in most countries, the actual level of consumption does not reach 300 kg per year. For example, in 2022 this indicator amounted to 258 kg in Armenia and Azerbaijan, 295 kg in the USA, 213 kg in Kyrgyzstan, and 241 kg in Russia.

In Kazakhstan, according to the results of 2022, the average per capita consumption of milk and dairy products reached 226 kg. It should be noted that for the last 5 years, the highest level of consumption of milk and dairy products in the country was recorded in 2020 and amounted to 259.4 kg per capita. In 2023, the per capita consumption of milk and dairy products was - 227.2 kg/year. Including an average consumption of 13 liters of kefir, 4.2 kilograms of cottage cheese, and 3.8 kilograms of sour cream. For comparison, in New Zealand, the consumption of milk and dairy products is 366 kg per capita, and in some European countries, the figures are even higher: in Austria - 401 kg, Germany - 428 kg, Finland - 434 kg [3].

The main determinants of demand in the dairy market in different countries are: the income level of the population, availability of dairy products, and pricing policy [4]. The level of consumption of

milk and dairy products is significantly influenced by government programs aimed at promoting dairy products as components of a healthy diet (China, Brazil, and the USA). In Russia, an example of such a program is the information and education program of the National Union of Milk Producers "Three dairy products per day". In Kazakhstan in 2024, within the framework of the Technical Cooperation Program of FAO (Food and Agriculture Organization of the United Nations) began the development of a long-term sectoral program for the development of dairy farming with the provision of technical support from the organization [5].

In recent years, global raw milk production has shown an average annual growth rate of 2-5 % (Figure 2). In 2022, global milk production growth was the slowest year-on-year, driven by rising production costs, raw material constraints, labor and logistics challenges, tightening EU environmental regulations, and adverse weather conditions in several countries.

Achievement of 2023 figures was possible due to a combination of factors: growth of livestock in India, and Pakistan; urbanization and increased domestic demand in India; growth of dairy productivity in the EU, USA, and Brazil, favorable weather (New Zealand, Australia, and Brazil); growth of external demand (New Zealand).

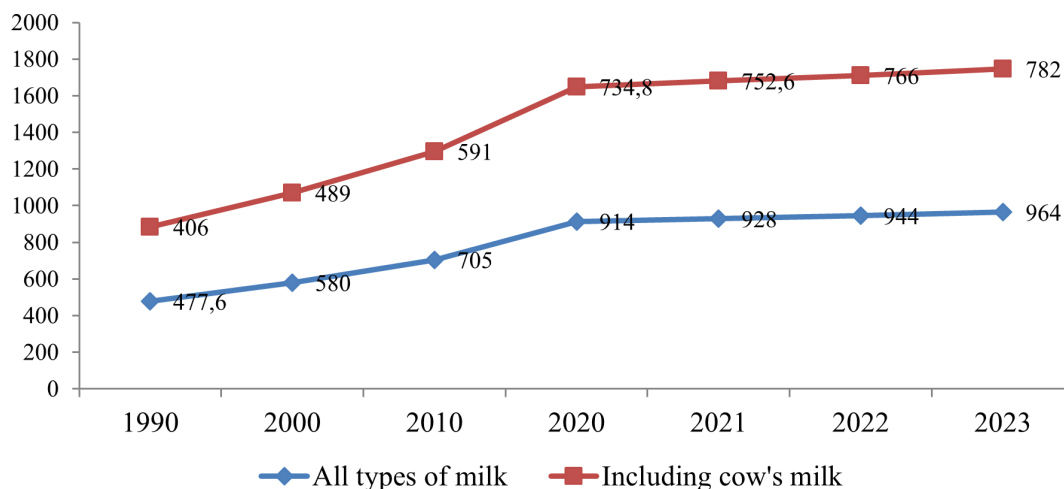


Fig.2 -Dynamics of global production of raw milk, million tons

Note – compiled by the authors on the basis of past research

India is one of the world's largest producers of milk and dairy products, accounting for about 23% of global milk production (Figure 3). The Indian livestock population accounts for 38.7% of the global total. There are more than 60 million dairy farms in the country, most of which are small and medium-sized family farms with an average herd size of 2.3-2.5 cows. The largest milk producing state is Uttar Pradesh, which accounts for 17.22% of the national milk production, equivalent to 23.33 million tons per annum.

According to Jordbrukare analytics, the most promising segment of the Indian dairy market in terms of consumer demand and profitability is the cheese market, which is in the early stages of

development. There is also an increase in demand for butter and ghee.

China is rapidly developing its dairy industry, and the country's raw milk production is projected to reach 41.7 million tons by 2023. Currently, China has about 1 million small dairy farms, each with an average of 4.5 cows. However, the prospects for growth in dairy production are limited by a number of key factors, such as lack of drinking water and quality feed. China's self-sufficiency in milk and dairy products is 75%. At the same time, the country has seen an increase in the consumption of cheese and pasteurized milk, which was particularly noticeable during the pandemic.

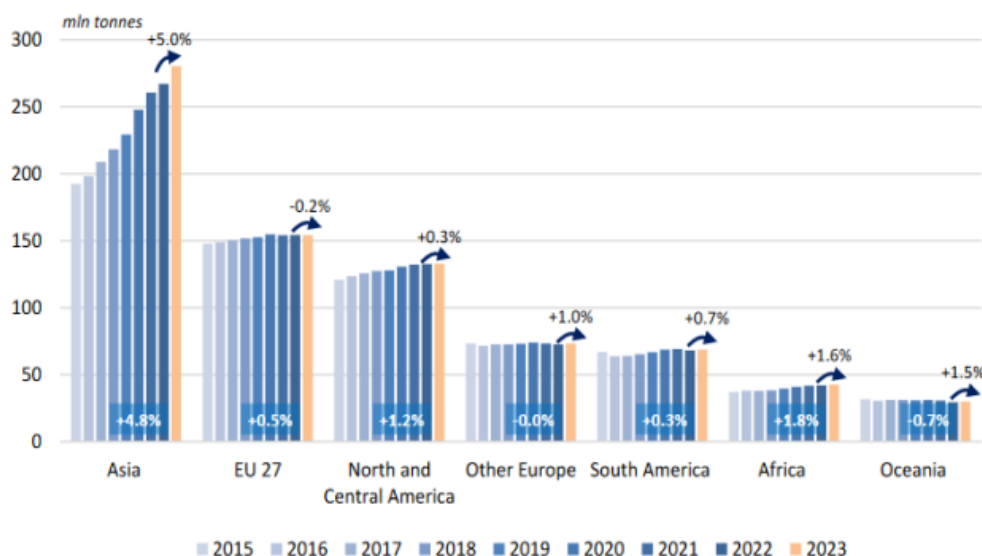


Fig.3 - Major global milk producers in 2015-2023, million tons [6]

The dairy market is projected to undergo significant changes over the next decade, influenced by various factors including consumption trends, production dynamics, and global trade patterns. Key forecasts point to a steady growth in global milk demand along with challenges such as price fluctuations and resource costs. Global consumption of dairy products is expected to grow due to population growth and increased health awareness.

Production will be concentrated on fewer large farms, especially in developed countries, leading to increased efficiency. The average

farm size is increasing and the number of dairy farms is decreasing, reflecting the trend towards industrialization (Kozak & Hryshenko, 2022) [7]. Although the dairy market shows promising growth, it is important to consider the potential volatility and external factors that may affect these forecasts. The relationship between demand, production efficiency, and market risks will be critical in shaping the future landscape of the dairy industry.

Several megatrends are influencing the development of the dairy market, including changes in production and consumption, technological

advancements, and changing consumer preferences. All these factors combine to shape the future of the dairy industry, highlighting both opportunities and challenges.

Megatrends in dairy production and consumption:

- Geographic changes: there is a marked shift in dairy production from the Global North to the Global South, driven by growing demand in developing countries.

- Consumer preferences: the emergence of non-dairy alternatives is changing the market dynamics and encouraging traditional dairy producers to adapt (Bojovic & McGregor, 2022) [8].

- Technological advances: innovations in breeding, nutrition, and herd management improve production efficiency and sustainability (Thornton, 2010) [9].

- Market demand: the dairy sector is growing rapidly due to increased consumer demand and improved supply chain (Fuller et al., 2015) [10].

- Environmental impact: The dairy industry is subjected to scrutiny of environmental impact, so

a balance between production and sustainability is necessary (Bojovic & McGregor, 2022).

Although the dairy market is poised for growth, it needs to overcome challenges such as competition from plant-based products and the need to adopt sustainable practices. The future remains uncertain due to socio-economic factors and changing consumer values (Thornton, 2010).

One of the key indicators reflecting the efficiency of dairy farming is productivity. In agricultural organizations of Kazakhstan, the productivity of cows exceeded 5 thousand kg of milk with a fat content of 3.8%. This positive dynamics was the result of comprehensive measures to develop dairy farming, including increasing the level of production culture and improving the quality of fodder [11].

The next most important indicator of dairy cattle breeding development is the volume of marketable milk. The main growth of this indicator is associated with the growth of milk yield in peasant/farmer farms and in subsidiary farms of the population, although the level of average milk yield is higher in agricultural organizations (Table 1).

Table 1 - The efficiency of milk and dairy products production by category of farms in Kazakhstan for 2022-2023

Prospective development of the raw milk market in Kazakhstan requires attention to improving the material and technical base of dairy cattle breeding. This is due to the slow introduction of innovative technologies in this sector, which makes it one of the most labor- and capital-intensive among livestock breeding areas. Despite the mechanization of some labor-intensive processes, the level of labor productivity remains low. For example, in foreign countries there are 35-40 cows per employee, while in Kazakhstan this indicator is only 13-16 cows. As a result, labor inputs for production of 1 centner of milk on mechanized farms abroad are 0.6-0.6 person-hours, while in Kazakhstan this indicator is 4 times higher and reaches 2.5-3.0 person-hours.

Conclusion. Key factors negatively affecting the development of the dairy subcomplex in Kazakhstan include: the low competitiveness of products due to weak scientific and technical equipment, the

consequences of structural changes in the agro-industrial complex in the 1990s, which led to a reduction in milk production, and lower efficiency of the industry, the dependence of the dairy subcomplex on climatic conditions affecting the formation of the fodder base.

The Republic of Kazakhstan has developed state support measures, such as the “National Project for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2021-2030”. The main attention is paid to raw milk producers: subsidies are provided for investment projects, short-term loans, construction of dairy farms, and increasing the productivity of dairy cattle. However, milk processors are left out of direct financial support, which creates an imbalance in the development of the production and marketing chain [12, 13]. Unlike the EU and the USA, where there are mechanisms of fair distribution of income

between producers of raw materials and, processors and trade, in Kazakhstan there is no regulatory mechanism to avoid price conflicts. This leads to the fact that raw material producers and processors are forced to sell products below cost, and small and medium-sized enterprises face pressure from network trade.

We offer the following recommendations for the development of the dairy subcomplex of Kazakhstan, based on successful international practices, including the following areas:

1. Introduction of carbon-neutral farms. In the EU countries, New Zealand and Canada are actively developing projects of carbon-neutral agriculture, based on technology that reduces greenhouse gas (methane) emissions, and the creation of waste treatment systems. In Kazakhstan, it is necessary to stimulate farms to install biogas plants that convert livestock waste into energy, develop a support program for the introduction of technologies to reduce emissions, through changing the diet of cows or the use of special feed additives that reduce methane emissions, the introduction of carbon subsidies for farmers who modernize their farms to meet environmental standards.

2. Creating dairy innovation hubs. In the Netherlands and Denmark, there are specialized hubs where farmers, researchers, and companies cooperate to develop and test new technologies. In Kazakhstan, the creation of such hubs is possible at agrarian universities and research centers with the involvement of international experts and private investors. In these hubs, farmers will be able to test new technologies, and receive consultations on their implementation and adaptation.

3. Development of contract farming. India, Brazil, and Kenya are actively developing contract farming, where processing companies enter into long-term contracts with farms, ensuring fixed prices for their products. The introduction of contract farming in Kazakhstan will allow processing companies, and retailers to provide farmers with seeds, feed, and equipment in exchange for a commitment to supply milk at fixed prices. This measure will be possible only based on a developed legislative framework to protect the interests of both parties.

4. Application of blockchain technology in supply chains. In the USA and Australia, blockchain technologies are actively used for supply transparency, tracing the origin of products and quality control. In Kazakhstan, it is necessary to create a platform that integrates all participants in the chain: farmers, processors, logistics companies and retailers. The introduction of this technology in Kazakhstan will help guarantee the quality and safety of products and increase consumer confidence.

5. Development of digital markets for farmers. India and Kenya have introduced digital platforms for farmers, allowing them to sell directly to consumers and processors, bypassing intermediaries. The creation of Kazakhstan's digital platform for farmers, where they can place offers to sell milk, fodder, or equipment, as well as the development of a mobile application with the functions of monitoring market prices and receiving a subsidy will reduce the dependence of farmers on intermediaries and increase their income.

6. Transition to pasture-based livestock production. In New Zealand and Australia, most of the milk is produced on pasture farms, which reduces feed costs and improves milk quality. In Kazakhstan, the implementation of this measure is possible based on pasture modernization programs: their reclamation, planting of grasses resistant to Kazakh climatic conditions, development of pasture rotation systems to prevent land degradation, introduction of subsidies for farmers switching to pasture-based animal husbandry.

7. Product diversification and development of niche markets. In the EU countries, niche areas are successfully developing organic milk, lactose-free products, and functional nutrition. In Kazakhstan, it is necessary to develop measures to support producers of organic and specialized dairy products through subsidies and grants, training of farmers and processors of organic production standards, promotion of niche products in foreign markets under the national brand. The results of the implementation of these measures will reduce the environmental load and increase the competitiveness of Kazakhstani products

in international markets, where environmental sustainability is increasingly valued, accelerate the introduction of advanced technologies and improve the interaction between science and practice, reduce financial risks for farmers, sustainability of raw material supplies for processors and increase price transparency, increase confidence in Kazakhstani dairy products in international markets and optimize internal processes, reduce dependence on dairy products, and improve the quality of dairy products.

Thus, increasing the economic efficiency of the dairy subcomplex requires a comprehensive approach, including reforms at the level of individual economic entities and improvement of government policy. Adaptation of advanced technologies and strategies to national conditions will ensure the competitiveness of Kazakhstani products in the world market and strengthen the country's position in the agro-industrial sector.

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