

**LEASECON 2020**  
**International Conference «Land Economy and Rural Studies Essentials»****EVALUATION OF DAIRY PRODUCERS' CONTRIBUTION TO  
PROVIDING FOOD SECURITY**

Anargul S. Belgibayeva (a)\*  
\*Corresponding author

(a) Sh. Ualikhanov Kokshetau State University, 2/4, Nazarbayev avenue, Kokshetau, Kazakhstan,  
anargul.belgibayeva@mail.ru

**Abstract**

The article shows the role of the agro-industrial complex (AIC) in ensuring food security in Kazakhstan. Current problems of ensuring food security of the state are considered. The author paid attention to the issue of dairy industry of agriculture development in Kazakhstan. Theoretical and statistical data, allowing one to determine the main measures to eliminate internal and external threats, resisting to ensure food security, was analyzed. Main trends of dairy cattle breeding development in the state are studied. The current situation and dynamics of dairy industry development in Kazakhstan are shown. Information on the role of various categories of producers in ensuring the dairy industry development is presented. The role and contribution of agricultural enterprises, peasant farms and households in ensuring state security were determined. It was determined that the leading milk producers are households and peasant farms. It was also found out that the number of cattle, including cows, as well as milk production, has a clear tendency to decrease in households for the analyzed period. Households development trends of Kazakhstan, their role in the social and economic development of rural areas, problems and solutions are considered as well. It touches upon certain problems hindering sustainable development of dairy industry and ways to solve them. Recommendations to increase production volumes, improve government support measures are given in order to ensure state food security.

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## 1. Introduction

Nowadays, the issue of food security has acquired a special meaning, since the events taking place in the global political arena cannot but affect interaction of our state economy and world food market. All of this significantly affects food security (Trukhachov & Agarkova, 2015).

A state that cannot ensure food security cannot ensure political, economic or national security as well. Consequently, food security as the basis of social economic development is an important element of economic and national security of the state.

Ensuring food security guarantees state independence, acts as a factor in increasing stability in society, achieving social-economic development goals (Trukhachov & Agarkova, 2015).

Food security of the Republic of Kazakhstan is one of the main conditions for ensuring national security of the country and formation of a strong state, its successful long-term development and economic growth (Resolution of Government, 2018). The necessity for food security to ensure national security at the legislative level is enshrined in the Law of the Republic of Kazakhstan dated January 6, 2012 “On the National Security of the Republic of Kazakhstan” (Law of republic of Kazakhstan, 2012).

Currently the agro-industrial complex of Kazakhstan is not developing at a sufficient pace. The share of agriculture in the country's GDP is only 4.2%. At the same time, a favorable geographical location, large land resources, natural and climatic conditions make it possible to multiply production of agricultural products and increase exports to neighboring countries with a huge consumption market (China with a population of 1.4 billion people, the EAEU countries - 165 million people, Central Asia - 48 million). At this stage of development, the main priority of AIC should be import phaseout with subsequent entry into export markets. This is due to the fact that Kazakhstan is strongly dependent on import, production volumes are not enough to achieve food independence (Akimbekova et al., 2019).

Taking into account the current situation in the food market, a strategic task of the domestic agro-industrial complex is import phaseout (Trukhachov & Agarkova, 2015).

Based on the foregoing, the state agro-industrial complex must solve the following priority tasks: to ensure state food independence basing on import phaseout, to increase competitiveness of agricultural products, to ensure high level of sustainment in rural areas basing on the social-economic development of territories (Altukhov et al., 2016).

## 2. Problem Statement

One of the main directions of ensuring food security in Kazakhstan is creating necessary conditions for saturation of domestic agricultural food market with products of domestic manufacturers.

The article is devoted to determining the role of various categories of agricultural producers in ensuring state food security. Dynamics of milk production by individual categories of farms for the analyzed period showed that there has been a steady downward trend in milk production in households, one of the most difficult types in the system of organizing import phaseout. Households, despite the high share of milk production, officially remain not admitted as an equal and necessary form of the social production organization. There is a hypothesis regarding decrease in role of households in solving import phaseout issues and self-sufficiency of rural population with food. Therefore, the purpose of the work is

to evaluate contribution of various categories of agricultural producers, including households, to ensuring food security and determining their role in the social-economic development of rural territories of the country.

### **3. Research Questions**

Basing on purpose of research, the following tasks were set:

- drawing up a balance of resources and use of milk and dairy products; studying the structure of commodity resources and structure of using milk and dairy products; calculation of indicators characterizing the level of self-sufficiency of the state in milk and dairy products;
- analysis of milk production by various categories of agricultural producers; contribution evaluation of agricultural enterprises, peasant farms and households to milk production and ensuring state food security; determination of role of various categories of agricultural producers in the social-economic development of rural areas of the country.

### **4. Purpose of the Study**

The purpose of the work is contribution evaluation of various categories of agricultural producers to ensuring food security and determining their role in the social-economic development of rural areas of the country.

### **5. Research Methods**

The information base of research was made up of materials of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, current legislative acts and regulations, scientific literature materials and periodicals. The initial data is indicators of dairy industry development for 2010-2019.

Analytical and balance methods, as well as historical and theoretical cognition, were used as main methods of research.

### **6. Findings**

According to State program of agro-industrial complex of Republic of Kazakhstan on 2017-2021 it is planned to increase labor productivity in agricultural production and recycled agricultural goods at least 2,5 times comparing to 2017 from 945,1 up to 2400 million USD in 2021 over the next 5 years (Kazakhstan Government, 2018).

Dairy cattle breeding is one of the most important branches of animal farming. Milk is an irreplaceable source of nutrition, as well as a raw material for food industry; beef is one of the most consumed types of meat. Stable development of cattle breeding of the country and its regions is necessary to provide people with food, preserve food security of the country, and affects providing people with jobs, improving the social-economic situation of rural areas (Steklova, 2013).

Self-sufficiency of rural area population in terms of dairy products is one of actual directions of fulfilled nutrition organization.

In order to compare market supply and demand of milk and dairy products, the commodity balance of milk and dairy products for 2016-2018 was compiled (table 1) (Kazakhstan Statistics Service, 2019).

**Table 1.** Balance of resources and use of milk and dairy products, thousand tons

Indicators	2016	2017	2018	Percentage of resources		
				2016	2017	2018
Stores for beginning of year	402.3	371.15	305.54	6.35	5.76	4.68
Production	5341.6	5503.4	5686.2	84.30	85.34	87.04
Import	592.4	574	541.2	9.35	8.90	8.28
Overall resources	6336.3	6448.6	6532.9	100	100	100
Production consumption	1634.4	1704.7	1825.6	25.79	26.44	27.94
Other industrial use	0.6336	0.6449	0.6533	0.01	0.01	0.01
Losses	31.682	32.243	32.665	0.50	0.50	0.50
Export	46.8	54.754	105.11	0.74	0.85	1.61
Possible personal consumption of people	4251.6	4350.7	4259.4	67.10	67.47	65.20
Store for end of year	371.15	305.54	309.53	5.86	4.74	4.74

The balance of resources and use of milk and dairy products for the analyzed period indicates an increase in the resource part of balance by 196.6 thousand tons (or 3.1%). This became possible due to growth of production with a simultaneous decrease in store at the beginning of the year and imports. The increase in the resource part of the balance led to increase in exports from 0.74% in 2016 to 1.61% in 2018.

Milk resources in the country are formed at the expense of its own production (87% in 2018). The share of imports accounts decreases from 9.35% in 2016 to 8.28% in 2018.

In the use of milk, personal consumption prevails (65.2% in 2018). Outflow, including exports, accounts for 1.61%.

Based on the balance of resources data and use of milk and dairy products, a number of indicators were calculated that characterize level of self-sufficiency of the country (table 2).

**Table 2.** Indicators characterizing the level of state self-sufficiency in terms of milk and dairy products

Indicators	Threshold amount	2016	2017	2018	Deviation	
					absolute	relative
Self-sufficiency level, %	≥ 100	90.25	90.39	92.94	2.69	103
Import dependence, %	≤ 10-35	9.35	8.90	8.28	-1.07	88.6
Import consumption, %	≤ 10-35	10.01	9.43	8.85	-1.16	88.4
Export level, %	≥ 10-35	0.88	0.99	1.85	0.97	210.2
Share of import in sales volume, %	≤ 10-35	10.06	9.53	8.84	-1.22	87.9

Note: Calculated by the author basing on the source (Bulletin, 2019)

The level of self-sufficiency is a ratio of production to its internal consumption. The analysis of the self-sufficiency level showed that the state is self-sufficient in milk and dairy products. There is a decrease in import dependence for the analyzed period by 1.07 points.

As a result, the level of import consumption in the country decreased from 10.01% in 2016 to 8.85% in 2018, that is, by 1.16 points. With the identified trends in import dependence and import consumption, the level of exportability in the country increased by 0.97 points.

The share of imports of milk and dairy products in sales volume decreased from 10.06% in 2016 to 8.84% in 2018, that is, decrease equals 1.22 points. The share of import is not dangerous, since the boundary number for evaluation threatening share of imports is considered to be 10-35%.

In order to determine the level of food security it is necessary to evaluate dynamics of commodity stocks of milk and dairy products. The analysis of stocks shows that there is a slight decrease in milk and dairy products stocks from 371.15 thousand tons in 2016 to 309.53 thousand tons in 2018.

In the modern agrarian economy, government regulation measures mainly consist in government support (subsidies and grants) that distort market mechanisms and have no economic return. Sales difficulties, high energy costs and a number of other unresolved problems in dairy and cattle breeding industries led to decrease in livestock and a flow of capital into grain farming, an industry characterized by a higher and faster return on investment. If large agricultural enterprises reduced the number of livestock, then most farmers preferred to deal only with the grain (Krylatykh & Belova, 2018).

Analysis of the dairy industry in Kazakhstan shows that the main problem is underdevelopment of the raw material base. For development of raw milk production, it is necessary to increase the proportion of cows and the number of the entire cattle livestock.

The proportion of cows in the country was 50.7% in 2019 of the total cattle population, or 3769.8 thousand units (table 3) (“Statistical collection ...”, 2019).

**Table 3.** Units of cattle and cows in the Republic of Kazakhstan

Years	Cattle		Cows		Share of cows in total number of cattle, %
	Thousand units	Share, %	Thousand units	Share, %	
2019					
All the farms, incl.	7436.4	100	3769.8	100	50.7
Enterprises	717.9	9.7	280.7	7.4	39.1
Peasant farms	2624.3	35.3	1444.5	38.3	55.0
Households	4094.3	55.1	2044.6	54.2	49.9
2018					
All the farms, incl.	7150.9	100	3576.5	100	50.0
Enterprises	712.8	10.0	275.3	7.7	38.6
Peasant farms	2409.8	33.7	1312	36.7	54.4
Households	4028.3	56.3	1989.2	55.6	49.4
2015					
All the farms, incl.	6183.9	100	2999.3	100	48,5
Enterprises	507.5	8.2	200.7	6.7	39.5
Peasant farms	1790.3	29.0	950.2	31.7	53.1
Households	3886.1	62.8	1848.4	61.6	47.6
2010					
All the farms, incl.	6175.4	100	2751.3	100	44.6
Enterprises	312.1	5.1	108.5	3.9	34.8
Peasant farms	877.6	14.2	365.6	13.3	41.7
Households	4985.6	80.7	2277.2	82.8	45.7

The proportion of cows in the state for the analyzed period increased from 44.6% of total cattle population in 2010 to 50.7% in 2019.

Absolute increase in the number of cows during this period amounted to 1,018.5 thousand units (from 2751.3 thousand units in 2010 to 3769.8 thousand units in 2019). In relative terms, the number of cows increased for 37%.

The largest livestock of cows is kept in households (in 2010 - 2277.2 thousand units or 82.8% of the total cow population). But over the analyzed period, the number of cows in the category of agricultural producers has been steadily decreasing and in 2019 it was already 2,044.6 thousand units (54.2%).

Meanwhile, there is an increase in the number of cows in peasant farms (from 13.3% in 2010 to 38.3% in 2019) and at agricultural enterprises (from 3.9% in 2010 to 7.4% in 2019).

Restoring and building up a dairy herd requires significant financial investments with a long payback period. However, even in terms of limited state opportunities, the task of developing the dairy subarea should be identified as a priority. In agricultural industry, this should be considered as a factor contributing to increase in the number of jobs in rural areas, not only in cattle breeding, but also in fodder production, as well as effective use of arable land from the standpoint of increasing the acreage of agricultural crops and possibilities of increasing its fertility through introduction of rational crop rotations and availability of our own organic fertilizers. At the same time, fresh dairy products (without use of all kinds of conservants) are the basis for organizing healthy nutrition for people. Thus, increasing milk production, bringing it closer to consumption places is an important element both in the food security system and in import phaseout (Altukhov et al., 2015).

Comparably low initial solvent demand during the reforming period in agri-food market, high-cost agricultural production left over from the Soviet period open borders for importing food products and agricultural raw materials led to a sharp decrease in production of domestic agricultural products and corresponding increase in food imports. Under the current conditions, the issue of ensuring food security was solved not by developing domestic competitive agricultural production, but by increasing food imports. At the same time, large financial investments and highly qualified regulation in the system of macroeconomic processes were not required, including elimination of negative consequences from the increased unequal interindustry exchange. However, this led to deterioration in the social-economic situation of a significant part of rural population, loss of food independence of the country (Altukhov et al., 2015).

Over the past ten years, there have been stable, multidirectional trends in milk production: decrease in households and increase in farms and at agricultural enterprises (table 4) (“Statistical collection ...”, 2019).

**Table 4.** Actual production of all types of milk by household categories in RK, thousand tons

Categories	2010		2015		2018		2019	
	Thousand tons	%	Thousand tons	%	Thousand tons	%	Thousand tons	%
Overall	5381.2	100	5182.4	100	5686.2	100	5865.1	100
Agricultural enterprises	181.4	3.4	265.8	5.1	384.6	6.8	414.2	7.1

Peasant farms	382	7.1	790.7	15.3	1120.4	19.7	1182.7	20.2
Households	4817.8	89.5	4125.9	79.6	4181.3	73.5	4268.3	72.8

Milk production was equal to 5865.1 thousand tons in all categories of farms in 2019, while household farms occupy a significant share in total milk production - 72.8%, peasant farms - 20.2% and agricultural enterprises - 7.1 %.

Milk production increased at agricultural enterprises by 3.7% in 2019 comparing to 2010, peasant farms - by 13.1%. In households, for the same period, there was a decrease of 19.7%.

For the analyzed period, increase in milk production in all categories of farms was 9%.

Dairy cattle breeding is mainly concentrated on household where there is no stable fodder base; low productivity is noted and there is no effective sales system and integration relations with processing industry enterprises. Increasing feed costs are not offset by product price.

But despite economic inexpediency, it is necessary to take into account the social significance of this category of agricultural producers. Therefore, in short and medium terms, first of all, it is necessary to support retention and development of personal subsidiary plots, contributing to labor self-employment of rural population, its food self-sufficiency. In the future, this category of farms will, to a certain extent, contribute to retention of the territorial integrity of the state (Altukhov et al., 2016).

In current macroeconomic conditions (low employment, low incomes of rural population), even a positive solution to the issue of import phaseout by increasing the production of these products in agricultural organizations will not reduce risks of ensuring food security of rural population (in terms of economic accessibility). In order to solve the problem of saving and developing households, it is necessary to officially recognize this category of farms as an equal and necessary (while maintaining prevailing macroeconomic conditions) form of organizing social production, to provide sufficient state support (including financial) to the formed supply, sales and credit cooperatives with wide involvement farms of the population, to create conditions for attracting rural and urban population of the working age to peasant farms with the aim of subsequent transformation of these farms into commodities (Bashmachnikov et al., 2018).

It can be agreed that the role of households in ensuring state food security is officially underestimated. And this, in turn, frees government from obligations of their full-scale support, at least in the area of selling a part of their products (Altukhov et al., 2016).

With low incomes of rural population ensuring its food security, products manufactured in households are becoming increasingly important.

Nevertheless, government should decide on saving and developing this category of farms. That is important from the standpoint of rural population food self-sufficiency and growth of its income (due to increase in marketability of these farms), and retention of rural population (Abdula-Zade et al., 2015; Chernyaev & Zavorotin, 2014).

In our opinion, maintaining the comfortable level of food self-sufficiency of rural population based on retention and development of peasant farms should be considered as a guarantor of food security for more than a quarter of country's population (Bashmachnikov et al., 2018).

The situation in agriculture has noticeably improved in recent years, but not enough yet. One of the main tasks of government is ensuring effective development of agriculture, since agricultural products are the main source of human life.

Realization of the export potential of the agro-industrial complex will allow Kazakhstan to strengthen state food security and increase its importance in ensuring world food stability. However, the role of Kazakhstan in the world food economy in the coming years will depend on effectiveness of the state support for national producers of agricultural products, raw materials and food, effectiveness of programs for agricultural development (Saparova et al., 2016).

## 7. Conclusion

Currently, in agriculture of Kazakhstan, there are three main forms of organizing production of agricultural products (agricultural enterprises, peasant farms and households). They differ in scale and purpose of production, the role and contribution to ensuring food security, import phaseout, development of rural areas, in the size and volume of financial support provided by the state. Each of these categories of agricultural producers has its own dynamics of development, occupies its own niche in agricultural market, contributes to milk production and ensuring food security of the country.

The balance of resources and use of milk and dairy products for the analyzed period indicates an increase in the resource part of the balance, which became possible due to increase in the production with simultaneous decrease in stocks at the beginning of the year and imports. Milk resources in the country are formed at the expense of its own production.

Milk producers in the country are agricultural enterprises, peasant farms and households. But their contribution to milk production is different. The article sets a goal to evaluate the contribution of various categories of agricultural producers to food security and determine their role in social-economic development of rural areas of the country.

Analysis of the self-sufficiency level showed that the country is self-sufficient in milk and dairy products. There is a decrease in import dependence during the analyzed period. With the identified trends in import dependence and import consumption, the level of exportability in the country increased. The share of milk and dairy products import in sales decreased by 1.22 points.

Condition analysis of the dairy industry in Kazakhstan showed that the main problem remains the underdevelopment of the raw material base. The proportion of cows in the country amounted to 50.7% of the total cattle population in 2019. For development of raw milk production, it is necessary to increase the proportion of cows and the number of total cattle livestock.

Over the past ten years, there have been stable multidirectional trends in milk production: decline in households and increase in the category of farms and agricultural enterprises.

Despite economic inexpediency of milk production in households, it is necessary to take into account social significance of this category of agricultural producers. With low incomes of people in rural areas, in ensuring its food security, products manufactured precisely in households are becoming increasingly important. Households help on labor self-employment of rural population and its food self-sufficiency. In the future, however, this category of farms will, in some ways, contribute to retention of country's territorial integrity.



Maintaining an adequate level of food self-sufficiency of rural population based on retention and development of households should be considered as a guarantor of food security for rural people of the country. Therefore, it is necessary to save and develop this category of farms, which is important both from the standpoint of food self-sufficiency of rural population, growth of its income, and retention of rural population.

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