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FOOD SELF-SUFFICIENCY OF THE ABAI REGION OF THE REPUBLIC OF KAZAKHSTAN: PROBLEMS, RISKS, AND SOLUTIONS

ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ АБАЙ ОБЛЫСЫНЫҢ АЗЫҚ ТҮЛІК ӨЗІН ӨЗІ ҚАМТАМАСЫЗ ЕТУІ: МӘСЕЛЕЛЕР, ТӘУЕКЕЛДЕР ЖӘНЕ ШЕШУ ЖОЛДАРЫ

ПРОДОВОЛЬСТВЕННАЯ САМОДОСТАТОЧНОСТЬ ОБЛАСТИ АБАЙ РЕСПУБЛИКИ КАЗАХСТАН: ПРОБЛЕМЫ, РИСКИ И ПУТИ РЕШЕНИЯ

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Abstract. *The goal* is to analyze the current state of the agro-industrial complex of the Abai region and assess the level of food security in the region. *Methods* – analysis, synthesis, and statistical methods were used to systematize information on food self-sufficiency; inductive and deductive methods were applied to identify trends based on regional data and build hypotheses. *Results* – the dynamics of production of main types of agricultural products for 2022–2024 are presented, along with the structure of food consumption compared to scientifically grounded norms. Data on food imports and exports are provided, as well as the physical and economic accessibility of food. Problems and risks affecting food self-sufficiency indicators are identified, and proposals have been developed to improve the efficiency of the agrarian sector. *Conclusions* – the agro-industrial complex of the Abai region has significant potential in crop and livestock production; however, it is used inefficiently due to a persistent imbalance between production and meeting needs. Despite surpluses in certain categories (meat, eggs, grain), there is a shortage of dairy, fruit and vegetable, and fish products, which necessitates stimulation of these sectors. The structure of the diet does not meet recommended physiological standards, especially in terms of dairy products, vegetables, fruits, and eggs. Dependence on imports persists in key food categories, while food remains economically inaccessible to certain segments of the population. Effective foreign economic policy and a financially justified customs-tariff mechanism are required; measures for state regulation of prices; consideration of demand conditions; and widespread use of innovative technologies and technical means in crop and livestock production, as well as in the food and processing industries. Implementing these directions will help optimize nutrition quality, balance it in terms of nutrients and energy, and consequently improve quality of life.

Аңдатпа. ***Мақсаты*** **– Абай облысының агроөнеркәсіптік кешенінің қазіргі жағдайы талданып, өңірдің азық-түлік қауіпсіздігін қамтамасыз ету деңгейіне баға берілді.** ***Әдістері*** **– талдау, синтез және статистикалық азық-түлік өзін-өзі қамтамасыз ету туралы ақпаратты жүйелеу үшін қолданылады; аймақтық деректер мен гипотезалар негізінде тенденцияларды анықтау кезінде индуктивті және дедуктивті.** ***Нәтижелер*** **– 2022-2024 жылдардағы ауыл шаруашылығы өнімдерінің негізгі түрлерін өндіру динамикасы, ғылыми негізделген нормалармен салыстыра отырып, азық-түлікті тұтыну құрылымы көрсетілген. Азық-түлік тауарларының импорты мен экспорты ұсынылған: азық-түліктің физикалық және экономикалық қолжетімділігі. Азық-түлікпен өзін-өзі қамтамасыз ету көрсеткіштеріне әсер ететін проблемалар мен тәуекелдер белгіленді, аграрлық сектордың тиімділігін арттыру бойынша ұсыныстар әзірленді.** ***Қорытындылар*** **– Абай облыстың АӨК өсімдік және мал шаруашылығы салаларында айтарлықтай әлеуетке ие, дегенмен, ол тиімсіз пайдаланылады, өйткені өндіріс процесі мен қажеттіліктерді қанағаттандыру арасындағы теңгерімсіздік сақталады. Бірқатар позициялар бойынша (ет, жұмыртқа, астық) артық болғанына қарамастан, сүт, жеміс-көкөніс және балық өнімдерінің тапшылығы байқалады, бұл өз кезегінде осы бағыттарды ынталандыруды талап етеді. Диетаның құрылымы ұсынылған физиологиялық нормаларға сәйкес келмейді, әсіресе сүт өнімдерін, көкөністерді, жемістерді және жұмыртқаны тұтыну үшін. Негізгі азық-түлік санаттары бойынша импортқа тәуелділік сақталады, бұл ретте азық-түлік халықтың кейбір топтары үшін экономикалық тұрғыдан қолжетімсіз болып қалады. Пәрменді сыртқы экономикалық саясат және экономикалық негізделген кедендік-тарифтік тетік; бағаларды мемлекеттік реттеу жөніндегі шаралар; сұраныс жағдайын есепке алу; өсімдік шаруашылығы мен мал шаруашылығында, тамақ және қайта өңдеу өнеркәсібінде инновациялық технологиялар мен техникалық құралдарды кеңінен қолдану талап етіледі. Осы бағыттарды іске асыру тамақтану сапасын оңтайландыруға, оны тағамдық компоненттер мен энергия бойынша теңестіруге, демек, өмір сүру сапасын жақсартуға мүмкіндік береді.**

Аннотация. ***Цель*** **– проанализировано современное состояние агропромышленного комплекса области Абай, дана оценка уровня обеспечения продовольственной безопасности региона.** ***Методы*** **– анализа, синтеза и статистический использованы для систематизации информации по продовольственной самодостаточности; индуктивный и дедуктивный при выявлении тенденций на основе региональных данных и построения гипотез.** ***Результаты*** **– показаны динамика производства основных видов сельскохозяйственной продукции за 2022-2024гг., структура потребления продуктов питания в сопоставлении с научно обоснованными нормами. Представлены импорт и экспорт продовольственных товаров: физическая и экономическая доступность продовольствия. Обозначены проблемы и риски, влияющие на показатели продовольственной самодостаточности, разработаны предложения по повышению эффективности аграрного сектора.** ***Выводы*** **– АПК области Абай обладает значительным потенциалом в растениеводческой и животноводческой отраслях, однако используется неэффективно, поскольку сохраняется дисбаланс между производственным процессом и удовлетворением потребностей. Несмотря на избыток по ряду позиций (мясо, яйцо, зерно), наблюдается дефицит по молочной, плодоовощной и рыбной продукции, что, в свою очередь, требует стимулирования этих направлений. Структура рациона не соответствует рекомендуемым физиологическим нормам, особенно по потреблению молочных пищевых продуктов, овощей, фруктов и яйца. Сохраняется импортозависимость по ключевым продовольственным категориям, при этом продовольствие остается экономически недоступным для некоторых слоев населения. Требуются действенная внешнеэкономическая политика и экономически обоснованный таможенно-тарифный механизм; меры по государственному регулированию цен; учет состояния спроса; широкое применение в растениеводстве и животноводстве, пищевой и перерабатывающей промышленности инновационных технологий и технических средств. Реализация этих направлений позволит оптимизировать качество питания, сбалансировать его по пищевым компонентам и энергии, а следовательно, улучшить качество жизни.**

Keywords: agriculture, food, export, import, import dependence, food self-sufficiency, physical and economic accessibility, food product competitiveness.

Түйінді сөздер: ауыл шаруашылығы, азық-түлік, экспорт, импорт, импортқа тәуелділік, азық-түліктің өзін-өзі қамтамасыз етуі, азық-түліктің физикалық және экономикалық қолжетімділігі, бәсекеге қабілеттілігі.

Ключевые слова: сельское хозяйство, продовольствие, экспорт, импорт, импортозависимость, продовольственная самодостаточность, физическая и экономическая доступность, конкурентоспособность продуктов питания.

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Introduction

The agro-industrial complex plays a key role in ensuring food security, sustainable socio-economic development and improving the well-being of the population. In the context of global challenges - economic crises, climate change, disruptions in supply chains and an unstable geopolitical situation - the importance of the agricultural sector is increasing many times over. The development of agriculture is becoming not only a factor in economic growth, but also a strategic element of national security.

The Republic of Kazakhstan, with its vast agricultural resources, continues to implement long-term strategies aimed at modernizing the agro-industrial complex. The agricultural sector should become one of the main drivers of economic growth, a source of high-quality exports and a guarantor of the country's food independence (President K.-J. Tokayev`s State…) [1].

This study pays special attention to the regional aspect of food security using the example of the Abay region, which, despite the presence of natural and climatic potential, faces a number of systemic problems in the agro-industrial complex. The region has vast pasture lands suitable for the development of livestock farming, and agricultural lands suitable for grain and forage farming. However, the production results of the region remain uneven: for a number of indicators, the region demonstrates both a surplus (meat, grain, eggs) and a pronounced deficit (milk, vegetables, fruits, fish).

The decrease in the volume of livestock exports and the growth of imports for a number of commodity items indicate increasing import dependence, which, in the context of external restrictions, can create food risks. An additional factor affecting the food security of the region is the decrease in the purchasing power of the population. In 2024, the poverty level in the region was 7.6%, which exceeds the national average (5.0%).

The share of food expenses in the structure of consumer spending remains high and amounts to about 52%, which indicates low economic accessibility of food (Bureau of National Statistics of the Agency…) [2]. This highlights the need to analyze production and consumption imbalances, assess vulnerable groups and develop strategies to reduce import dependence and increase food availability. Particular attention should be paid to measures to stimulate local production and improve the efficiency of food chains at the regional level.

Thus, the relevance of the study is determined by the need for a comprehensive analysis of the state of the agro-industrial complex of the Abay region, assessment of production potential, consumption structure, level of food security, as well as the impact of economic factors on the availability of food. Of particular importance is the development of comprehensive recommendations for increasing the region's food self-sufficiency, the introduction of innovative technologies and the adaptation of successful international experience.

Literature review

The problem of food security remains one of the most important for the regions, especially in the context of modern challenges - economic crises, climate change and unstable geopolitical situation. According to the FAO, food security is when all people, at all times, have access to sufficient, safe and nutritious food necessary for an active and healthy life (FAO. The State of Food Security …) [3].

Many researchers emphasize the importance of taking into account the specifics of each region - climate, economy, level of infrastructure development. Thus, Manning L., Soon J.M. [4] notes that the sustainability of the agricultural sector depends on a comprehensive approach: government support, market instruments and the introduction of new technologies.

Fanzo J., Haddad L., Schneider K. R. et al. [5] and other co-authors emphasize that food security cannot be achieved solely through increased production – issues of distribution, logistics, accessibility, and eating habits must be taken into account. This is especially important for rural areas where infrastructure is poorly developed. Muhangi J., Ainaman H., Opio F [6] show that the sustainability of the food system depends on self-sufficiency, diversity of agricultural products and access to markets.

Small farms play an important role in this. Béné C., Frankenberger T., Griffin T. et al. [7] and Campi M., Dueñas M., Fagiolo G. [8] propose a comprehensive approach to assessing food security, including not only accessibility but also resilience to external threats, which is especially important for regions with severe climatic conditions. At work Bozsik N, Cubillos T.JP. Stalbek B et al. [9] emphasizes the role of the state. They believe that well-thought-out policies aimed at developing infrastructure, supporting farmers and creating food reserves to help the region cope with crises.

Djanibekov N., Djanibekov U., Villamor G.B [10] research is relevant for Kazakhstan and the former USSR countries and Hornidge A.-K., Shtaltovna A. [11] where the conse-

quences of the transition from a planned to a market economy are considered. The studies emphasize the need for modernization of agriculture and improved monitoring of the food situation.

Thus, global experience shows that ensuring food security at the regional level requires an integrated approach combining economics, technology, social support and sustainable resource management. The use of such strategies, taking into account local conditions, can significantly increase the food sustainability of the region.

Materials and methods

In the course of the study, general scientific methods were used, including analysis, synthesis, induction and deduction, as well as applied statistical methods of data processing and interpretation. The empirical base of the study was formed on the basis of official statistical materials for 2022-2024, including data from the Agency of the Republic of Kazakhstan for Strategic Planning and Reforms, the Ministry of Agriculture of the Republic of Kazakhstan, the Kazakh Academy of Nutrition, reports of the Akim of the Abay region, as well as analytical and scientific-expert publications covering issues of agro-industrial development and food security.

The analysis of production and consumer statistics indicators was conducted in comparison with the standards of rational nutrition approved by the Kazakh Academy of Nutrition, as well as in a comparative context with the general Kazakhstan indicators. To assess the economic availability of food, such indicators as the level of nominal and real monetary income of the population, the cost of living, the poverty level, as well as the ratio of the cost of the minimum consumer basket to per capita income were used. This made it possible to comprehensively assess not only the physical, but also the economic availability of food in the region.

Results

The agro-industrial complex (AIC) is considered one of the key drivers of economic growth, a priority for both the public sector and private business. The development of the agro-industrial complex is of crucial importance for ensuring the country's food security and also directly affects the quality of life of the rural population (Improving the quality of life of the rural …) [12].

In the Abay region, active implementation of agricultural development programs continues. In 2024, the area under agricultural crops reached 760.2 thousand hectares, which became possible due to the diversification of production and the introduction of water-saving technologies. In particular, the area of forage crops was increased by 17.1 thousand hectares, potatoes - by 2.3 thousand hectares (Bureau of National Statistics of the Agency…) [2]. This not only increased the volume of feed production, but also contributed to the development of livestock farming.

Thus, based on the analysis of the dynamics of production of basic food products for 2022-2024, heterogeneous trends were identified that directly affect the level of food security in the Abay region. According to table 1, there is a steady increase in meat production: from 81.3 thousand tons in 2022 to 84.7 thousand tons in 2024. Such stable positive dynamics indicate progress in animal husbandry, which has a positive effect on food sustainability and reduces dependence on imports of meat and dairy products. There is an increase in milk production, which in 2024 amounted to 2.5% and Thus 5%, compared to 2023 and 2022, respectively.

However, there is an unstable trend in egg production, as in 2024 there was an increase in production compared to 2023, which amounted to 58.6 million eggs, an increase of 3%. However, compared to 2022, when the volume of egg production was 61.4 million pieces, there is a noticeable decline, which amounted to almost 5%. This trend is associated with a decrease in the productivity of birds, as the average yield of eggs per laying hen in 2024 decreased compared to 2023 from 183 pieces to 173 pieces, which affects the availability of inexpensive protein for the population (Bureau of National Statistics of the Agency…) [2].

In addition, the production of grain and leguminous crops in 2024 showed a sharp increase (47.0 thousand tons) compared to previous years (32.7 and 33.7 thousand tons), increasing by 44% and 40%, respectively, which may indicate an expansion of soown areas and an increase in the yield of these crops. In addition, in the production of oil crops, an increase was noted from 31.7 thousand tons to 44.5 thousand tons over two years - a positive trend, which contributes to the expansion of vegetable oil production and a decrease in imports.

Thus, according to the report of the Akim of the Abay region, the area of irrigated land in 2024 amounted to 30.1 thousand hectares, of which 13.8 thousand hectares were used using sprinkler and drip technology. These measures have increased the yield of grain and oilseed crops from 12 to 15 centners per hectare (Statistical Report of the Akim of the Abay Region…) [13]. Increasing the volume of grain is extremely important for strategic reserves and

ensuring domestic demand, especially in the context of unstable imports and climate change.

However, in the production of vegetable and melon crops, there is a steady decline in production: from 16.2 thousand tons in 2022 to 13.9 thousand tons in 2024, which is a cause for concern. This may affect the seasonal availability of vitamins and the quality of nutri-tion of the population. Potato data show a sig-nificant decline, especially in 2023, amounting to 78 tons, a decrease of 30%. This may indi-cate a crisis in the industry, which is risky given the role of potatoes as a staple food.

Table 1 - Dynamics of production of basic food products in the Abay region

Food products	Year				
	2022	2023	2024	2024 in % to	
				2022	2023
Cereals (including rice) and legumes (weight after processing) (thousand tons)	32.7	33.7	47.0	144	140
Meat and meat products (slaughter weight, thousand tons)	81.3	83.9	84.7	104.1	101
Eggs and egg products (million pcs.)	61.4	56.8	58.6	95.3	103
Vegetables and melons (thousand tons)	16.2	15.4	13.9	85.4	90
Potatoes (tons)	1 710.0	780.2	1 241.1	72.6	159
Vegetable oil (thousand tons)	31.7	37.9	44.5	140.5	117.5
Milk (thousand tons)	282.8	289.6	297.0	105.0	102.5

Note: compiled on the basis of data from the (Bureau of National Statistics of the Agency…) [2]

Overall, the data show a contradictory picture: in a number of areas (grain, meat, eggs, oilseeds) there is growth, which has a positive effect on food self-sufficiency. However, the decrease in the production of vegetables and potatoes may negatively affect the rationality and balance of the diet, especially in socially vulnerable groups of the population.

According to the data in table 2, the analysis of food consumption in the Abay region in comparison with the Republic of Kazakhstan for 2022–2024, in relation to the established standards, is characterized by the following data (Bureau of National Statistics of the Agency…; Kazakh Academy of Nutrition…) [2,14]:

- consumption in the Abay region is consistently lower than the average for the Republic of Kazakhstan, in almost all product categories;
- there is an increase in consumption, but in many categories, it is minimal, and it is still far from reaching the standards;
- the most lagging product categories are: fruits, vegetables, dairy products, eggs;
- products close to the standards: bread products, meat, fish, oils and fats.

According to statistics in the Abay region, as well as in the republic as a whole, bread is a strategically important product, its consumption tends to grow, so in 2024, the consumption of bread products and cereals increased by 2%, and exceeded scientifically based consumption standards by 13%. The highest level of consumption of bread products was noted in 2023, when 124.1 kg per capita per year, with a standard of 109 kg. However, it should be noted that this figure is below the national average, which was 128 kg.

The next category of products for which there is an excess of consumption standards are sweets (sugar, jam, confectionery, etc.). In 2024, in the Abay region, there were about 40 kg of sweets per capita, exceeding the norm by 21%.

For all other products, the region has a deficit in consumption per capita, for meat, fish, oils and fats it is from 14 to 8%, below the standard. The lowest consumption of vegetables, berries, potatoes, where the consumption level is 60-70% below the standard. Thus, the Abay region demonstrates positive dynamics, but for most categories it has not yet reached the recommended standards. The most undernourished categories are vegetables, fruits, potatoes, eggs. Overeating sweets is an alarming signal: the standards are exceeded. Dairy products are the region's strong point, especially in 2024.

Table 2 - Consumption of basic food products by the population, on average per capita, kg

	Bakery and cereal products	Meat and meat products	Fish and seafood	Milk and dairy products	Eggs (pcs.)	Oils and fats	Fruits	Vegetables (without potatoes)	Potato	Sugar, jam, honey, chocolate, confectionery
2022 year										
RK	128.0	78.2	14.1	226.4	194.6	15.7	73.0	77.6	45.0	41.1
Abay region	120.6	66.3	12.0	216.5	169.3	13.3	50.2	54.2	29.6	32.3
%	110.6	84.6	85.7	71.9	63.9	79.6	38.0	36.4	29.6	97.9
2023 year										
RK	124.4	80.1	14.0	227.2	202.0	15.6	76.3	78.5	45.0	42.3
Abay region	124.3	72.1	12.5	227.5	191.5	14.1	53.9	56.3	28.7	35.9
%	114.0	92.0	89.3	75.6	72.3	84.4	40.8	37.8	28.7	108.8
2024 year										
RK	124.1	82.8	14.3	232.9	206.4	15.7	80.4	80.8	45.4	43.4
Abay region	123.2	72.4	12.6	244.3	186.6	14.3	55.9	58.0	30.6	39.9
%	113.0	92.3	90.0	81.2	70.4	85.6	42.3	38.9	30.6	120.9
Standard	109.0	78.4	14.0	301,0	265.0	16.7	132.0	149.0	100.0	33.0

Note: compiled by the authors based on data from sources (Bureau of National Statistics of the Agency…; Kazakh Academy of Nutrition…) [2,14]

All the data provided indicate the presence of serious structural problems in ensuring the physical availability of food products. The solution to these problems is associated, first of all, with the need to increase the level of food self-sufficiency of both the region and the republic as a whole for key types of products. In addition, the current structure of food consumption is irrational: many healthy products, including organic products, are consumed in insufficient quantities compared to the scientific recomendations of the Kazakh Academy of Nutrition.

Thus, according to the data of the Department of the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan for the Abay Region in 2023 On average, agricultural products were produced per capita in the amount of 709.9 thousand tenge, which is 10% lower than the 2022 figure, while in crop production this figure is growing, and in livestock production a decline of 20% was noted (Bureau of National Statistics of the Agency…) [2].

In Kazakhstan, a certain share of food products necessary to meet the needs of the population comes from imports.

Let's analyze the data based on the diagram, figure 1, comparing the export and import of the Abay region by product categories for 2023 and 2024: in 2024, the Abay region has seen a significant decrease in the export of animals and animal products, against the backdrop of an increase in imports:

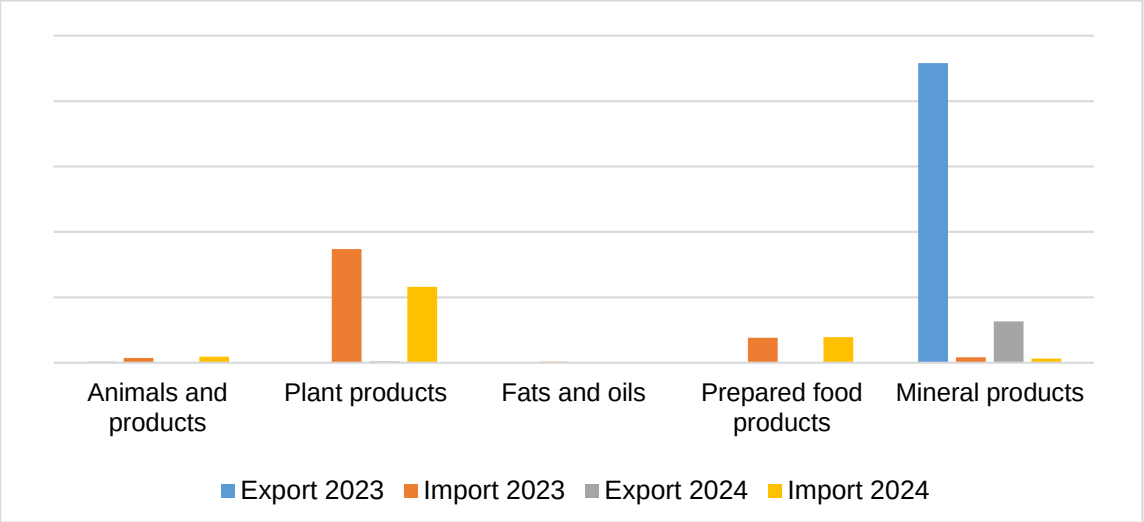
- exports fell from $657.2 thousand to $89.0 thousand (a decrease of more than 7 times);
- imports, on the contrary, increased from 3 692.7 thousand dollars to 4 595.1 thousand dollars;
- almost all imports and exports are with Russia.

Thus, the region began to export significantly less animal products, and its dependence on imports, especially from Russia, increased.

If we consider the market of plant products, a positive trend can be traced here, a decrease in imports of products from 87 172.2 thousand dollars to 58 334.7 thousand dollars is noted, against the background of export growth. Exports have increased more than 2 times: from 425.2 thousand dollars to 919.6 thousand dollars. At the same time, the main trading partner is Russia, the share of Kyrgyzstan is minimal.

In the category "fats and oils" the data have remained almost unchanged, export and import remain at a low level. At the same time, all trade is with Russia. In general, the segment is stable, but remains small in volume. In the category of finished food products, beverages, tobacco, a decrease in export was noted: from 431.2 thousand dollars to 389.1 thousand dollars, and import increased slightly: from 18 923.2 thousand dollars to 19 309.9 thou-

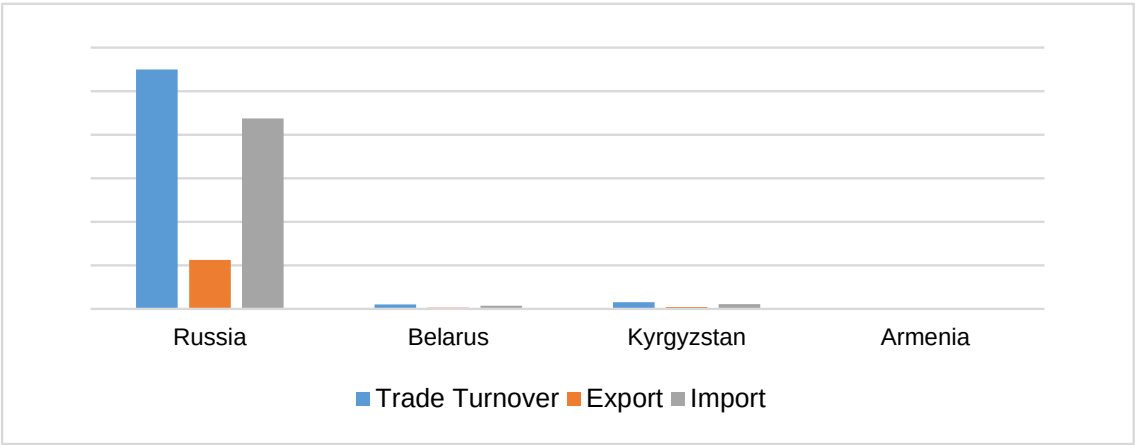
sand dollars. Russia is the main partner. These categories of goods are exclusively exported to Kyrgyzstan, the volume in 2024 amounted to 292.8 thousand dollars, Belarus is also one of the partners, but the volumes are not so significant.



Note: compiled on the basis of data from the (Bureau of National Statistics of the Agency…) [2]

Figure 1 - Comparison of exports and imports of food products of the Abay region by category, 2023, 2024

In 2024, there is an increase in the export of plant products, a significant decrease in the export of mineral resources and animal products. At the same time, imports remain high in most categories, especially in finished food and plant products. The main trading partner of the Abay region for these categories of goods is Russia (figure 2). It accounts for 99.6% of the total trade turnover, while the volume of imported agricultural products from Russia in 2024 amounted to 82 813 thousand dollars, and exports were only 1 105.5 thousand dollars. Kyrgyzstan is the main export destination, which accounts for 20% of the total volume of exported products of the region, 80% for Russia.



Note: compiled on the basis of data from the (Bureau of National Statistics of the Agency…) [2]

Figure 2 – Structure of trade between Abay region and EAEU countries, 2024

An analysis of the indicators of physical availability of food shows that, on average, the Republic of Kazakhstan annually imports from 400 to 500 kg of agricultural products per capita. In categories such as bakery and cereal products, meat and meat products, as well as milk and dairy products, the country remains import-dependent. In this regard, constant monitoring of the ratio of imports and exports of food products is necessary. In particular, in 2022, the ratio of excess imports over exports in Kazakhstan as a whole and in the Abay region was 0.8, which indicates an excess of export volumes in physical terms (In 2023, agriculture of Abay region…) [15].

However, in addition to physical availability, it is important to consider the economic availability of food products as an integral element of food security in the region and the country as a whole. Products should not only be available, but also affordable for the population. One of the key indicators is the share of income spent on food. In 2022, the ratio of the subsistence minimum to the average per capita income was 3.6, which means that on average, a Kazakhstani can purchase 3.6 minimum consumer baskets per month on their available income.

According to the analysis of indicators of economic accessibility of food and well-being of the population of the Abay region in comparison with the Republic of Kazakhstan for 2022–2023 (table 3).

The population of the Abay region by the end of 2023 was 607.6 thousand people, which is slightly lower than the 2022 figure (610.2 thousand people). This indicates a slight population decline, probably due to migration or natural decline.

Average monthly nominal incomes in the Abay region in 2023 reached (164 138 tenge), which is 20% lower than the average in the Republic of Kazakhstan (189 953 tenge). Despite this, incomes in the region increased by almost 20% or 53 083 tenge compared to 2022.

The cost of living in the Abay region also increased - from 43 273 tenge in 2022 to 47 828 tenge in 2023, but remained lower than the average in the Republic of Kazakhstan. However, the economic affordability indicator improved - from 3.16 to 3.43, but if we take into account the impact of inflation, which amounted to 9%, then this indicator in actual terms even decreased and amounted to 3.14, indicating that incomes began to cover less of the basic expenses.

In 2023, the share of the population with incomes below the subsistence level in the Abay region increased from 5.9% to 8.0%, while in the Republic of Kazakhstan this figure remained stable (5.2%). In absolute terms, this is 48.6 thousand people - 12.6 thousand people more than in 2022.

Table 3 - Indicators of economic accessibility of food security in the Abay region

Indicators	2022		2023	
	RK	Abay region	RK	Abay region
Population at the end of the year, thousand people	19 766.8	610.2	20 033.8	607.6
Nominal per capita monetary income of the population per month, tenge	164 438.0	136 870.0	189 953.0	164 138.0
Minimum subsistence level, tenge	43 566.0	43 273.0	48 738.0	47 828.0
Economic accessibility index	3.77	3.16	3.89	3.43
The share of the population with incomes below the subsidence minimum, %	5.2	5.9	5.2	8.0
Number of people with incomes below the subsistence level, thousand people	1 027.9	36.0	1 041.0	48.6
Share of average per capita cash expenditure per month on food products, %	51.1	51.7	51.1	50.2
Income used for consumption, on average per capita per month, tenge	79 223.0	64 900.0	91 020.0	78 293.0
Depth and the severity of poverty	0.8 0.2	0.9 0.2	0.9 0.3	1.9 0.7
The share of the population below the SPK (**%** of families whose income not only does not reach the subsistence minimum, but also turns out to be below the cost of the food basket)	0.1	0.1	0.2	1.1
Note: compiled on the basis of data from the (Bureau of National Statistics of the Agency…) [2]				

More alarming are the poverty depth and severity indicators, which in 2023 in the Abay region reached 1.9 and 0.7, respectively - these are the highest values, indicating not only an increase in poverty, but also its worsening.

The share of the population below the cost of the food basket (CFB) in the Abay region increased from 0.1% to 1.1%, indicating an expansion of the food vulnerability zone. At the same time, the share of food expenses in the family budget decreased from 51.7% to 50.2%, which may indicate savings on food in conditions of limited resources.

Average consumer spending in the Abay region increased from 64 907 tenge to 78 293

tenge per capita per month, but still remains lower than the national average, which was 91 020 tenge in 2023.

Thus, in the Abay region, there is a deterioration in the socio-economic situation, expressed in a decrease in the economic availability of food and a general deterioration in the living conditions of the population. This is confirmed by the following trends:

– increasing the proportion of the population living below the poverty line;

– deepening and intensifying manifestations of poverty;

– the growth of the population that does not have access to even the minimum necessary food.

In this situation, the implementation of measures aimed at supporting socially vulnerable categories of the region's population is particularly relevant. As possible solutions, it is advisable to consider the adaptation of effective practices successfully applied in international practice. Table 4 presents the key areas for solving the identified problems, where the proposed measures are aimed at achieving food self-sufficiency in the region, taking into account the application of effective foreign practices.

Table 4 - Increasing food self-sufficiency of the region taking into account foreign experience

Problem	Proposed solution	Foreign experience
Import dependence, shortages of a number of food products	- subsidies and incentives for producers of products in short supply; - development of greenhouse and fish farms	Poland **–** state support for small farmers and processing Israel **–** intensive agricultural technologies: greenhouses, drip irrigation
Unbalanced nutritional structure	- healthy eating program; -subsidies on fresh food for vulnerable groups	Japan **–** balanced school meals with priority on local produce Finland **–** support for the “health basket”
Economic inaccessibility of food and the growth of poverty	- targeted food aid; -subsidies for low-income people; -social canteens and cooperatives	USA – SNAP (food assistance cards) program Brazil - the program "Zero Hunger", purchases from farmers for social food support
Low level of mechanization and innovation in agriculture	- implementation of agricultural technologies (drones, sensors, IT); - digitalization and re-equipment programs	Germany - precision farming and Smart Villages Netherlands – automated greenhouses and AI-based management of agricultural production
Personnel shortage, weak qualifications in the agro-industrial complex	- dual education; - agrotechnoparks and agricultural schools; - advanced training courses for farmers	Austria **–** dual training for farmers Canada – free consultations for farmers through Farm Business Advisory Services
Note: compiled by the authors based on data from sources (Bozsik N, Cubillos T.JP, Stalbek B. et al.; Reports and Analytical Materials of FAO…) [9,16]		

Discussions

The region has significant natural resources - vast pastures favorable for the development of livestock farming, as well as farmland suitable for growing grain and forage crops. However, the results of agricultural production are characterized by heterogeneity: along with an excess of certain types of products (meat, grain, eggs), a noticeable deficit is recorded in other categories - dairy products, vegetables, fruits and fish.

The reduction in livestock exports amid growing imports indicates increasing dependence on external supplies, which increases the region's vulnerability to global challenges and trade restrictions. Additional pressure on food security is exerted by the decline in the purchasing power of the population. In 2024, the poverty level in the region reached 7.6%, which exceeds the national average (5.0%). The high share of food expenditure in the consumption structure - about 52% indicates low economic accessibility of food (Bureau of National Statistics of the Agency…) [2]. All this indicates a rise in social inequality and emphasizes the need to implement targeted social initiatives aimed at supporting the most vulnerable segments of the population.

Conclusion

1. The agro-industrial complex of the Abay region has high potential, especially in crop production and livestock farming, but it is used inefficiently – is an imbalance between production and consumption. For a number of items (meat, eggs, grain), the level of self-sufficiency is exceeded, but there is a deficit of milk, vegetables, fruits and fish. The dietary structure does not meet the standards, especially for dairy products, vegetables and fruits.

2. Import dependence remains in key categories (dairy and fruit and vegetable products). Despite the growth in production, low economic accessibility remains, especially in villages. Agriculture suffers from low mechanization, lack of innovation and qualified personnel.

3. Food security depends on the state of the agro-industrial complex, population incomes and adaptability. A high share of food costs, growing imports and declining purchasing power create risks that require systemic solutions.

4. To achieve food self-sufficiency in the region, it is necessary to: strengthen support for local production; modernize storage, logistics and marketing; improve the effectiveness of state support; implement agricultural technologies and digital solutions; develop personnel training and access to knowledge.

5. It is important to integrate international experience and develop interregional cooperation. An integrated approach will help reduce risks and create a sustainable model of rural development based on efficiency and social justice**.**

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