

# THE IMPACT OF REGIONAL FOOD SELF-SUFFICIENCY ON STATE SECURITY

**Gulshat Amangeldievna Aiesheva, Zhangir Khan West Kazakhstan Agrarian Technical University**

**Aigul Mamayevna Kazambayeva, Zhangir Khan West Kazakhstan Agrarian Technical University**

**Saltanat Mutigollaevna Yessengaliyeva, Zhangir Khan West Kazakhstan Agrarian Technical University**

**Mira Koblandievna Begeyeva, Zhangir Khan West Kazakhstan Agrarian Technical University**

**Tatiana Akhtamovna Baimisheva, Samara State Agrarian University**

## ABSTRACT

*Ensuring the food security of a particular region (country) requires the effective use of its resource potential. The crucial role in ensuring food security is played by economic development, growing production, and the competitiveness of agricultural products, labor productivity, and the ability to quickly adapt to new socio-economic conditions.*

*This article presents the results of studying agro-industrial production and substantiates options for the development of production in a certain region (the West Kazakhstan Region).*

**Keywords:** Food Security, Commodity Market, Agri-Food Complex, Agriculture, Region.

## INTRODUCTION

The article is based on the theory and practice of ensuring the food security of a particular region through the use of its resource potential. It also studies the issues of agricultural production, evaluates the efficiency and sustainable development of the agricultural sector, the current food market, and its export opportunities based on scientific works prepared by Russian and foreign scholars.

The food security of the Republic of Kazakhstan is among the key issues associated with the impact of global crises and a decline in production in many economic sectors. When the world prices for oil and raw materials are uncertain, agriculture becomes a promising direction. Its enormous potential is evidenced by a substantial volume of farmland, whose total area is 223 million ha (including 24 million ha of arable land); a high labor potential of villages (more than 47% of the country's population live in rural areas); favorable climatic conditions for the cultivation of grain, leguminous crops, potatoes, and vegetables; vast pasture areas (85% of all land plots).

Providing the country's population with food is the basis of its economic, social, and political security. Food security reflects the ability of the agro-industrial complex to ensure balanced and sustainable economic development (Trjascin, 2013; Trjascin & Oborin, 2013). At the same time, the optimal balance of domestic production and import supplies is essential for

food security. In 2019, food products worth 3.2 billion tenge were imported to the Republic of Kazakhstan.

At the national level, state interests in the field of food security are reduced to food independence. The latter is the state's ability to produce food products, raw materials, equipment, and other elements of the production process in such an amount that is necessary to supply the internal market and do not depend on imports (Kaigorodtsev, 2006; Zyablikova & Terzova, 2010; Kriulina & Gorbatko, 2017, 2018).

Thus, the article aims at assessing food self-sufficiency in the West Kazakhstan Region and determining a set of measures to improve it.

The study objectives are as follows:

- To analyze the development of the agri-food complex in the West Kazakhstan Region and identify the most profitable types of agricultural products;
- To determine possible options for developing production in the above-mentioned region based on the optimal use of its resource potential and economic specialization;
- To assess the level of food self-sufficiency in this region and determine the main measures to improve it.

## MATERIALS AND METHODS

The study was conducted with the use of such scientific methods as:

- The abstract-logical method to disclose theoretical and methodological aspects, as well as trace the development of methodological approaches to assessing food security and self-sufficiency in food products;
- The monographic method to analyze the efficiency of agricultural production and determine the main features of agricultural processes and phenomena;
- The method of economic statistics to determine trends in the development of agricultural production, assess their dynamics, identify imbalances and contradictions, and predict their further development;
- The sustainability method to select the optimal ratio of industries and products in the agri-food complex, identify factors of their integrated development, and determine opportunities for participation in interregional and foreign trade.

In the course of the study, we also used comparative, index, calculation, and constructive methods.

## RESULTS AND DISCUSSION

The term “*food security*” was introduced at the World Food Conference held under the auspices of the UN Food and Agriculture Organization in 1974 after the world grain prices tripled. Food security is defined in the following manner: “*availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices*” (UN General Assembly, 1974). Back then, it was believed that measures to increase food production and stabilize prices in global food markets could provide all people in the world with enough food products.

In 1983, the UN Food and Agriculture Organization introduced the concept of access to food for vulnerable people, laying special emphasis on the balance between supply and demand. In other words, all people should have both physical and economic access to basic food at all times (FAO, 1983).

In 1986, the World Bank's Strategy Reducing Poverty and Hunger distinguished between persistent insecurity (linked to the issues of persistent or structural poverty and low incomes) and transitory food insecurity (periods arisen from natural disasters, economic crises, or conflicts) (World Bank, 1986).

In 1996, the World Food Summit developed four basic features of food security: availability, access, use, and stability of food supply (FAO, 1996).

The evolution of the term “*food security*” was complemented by the term “*nutrition security*”. In 2012, the UN Food and Agriculture Organization developed a comprehensive concept: “*Nutrition security exists when all people at all times consume food of sufficient quantity and quality in terms of variety, diversity, nutrient content and safety to meet their dietary needs and food preferences for an active and healthy life, coupled with a sanitary environment, adequate health, education and care*”.

Currently, the Committee on World Food Security and the UN Food and Agriculture Organization use the combined term “*food and nutrition security*”. Thus, food production, commodity markets, and socio-economic aspects reflecting the essence of food security are complemented by the biological approach based on an adequate level of nutrition for a person balanced in proteins, vitamins, minerals, and calories, as well as the compliance with sanitary standards and the necessary level of medical care (FAO, IFAD, UNICEF, WFP, WHO, 2019, 2020).

Under the auspices of the UN Food and Agriculture Organization, the World Summit on Food Security was held in Rome and its members adopted the Declaration in November 2009. The most important part of the Declaration was the so-called “*Five Rome Principles*”. They provide a powerful strategic underpinning for coordinated action by all stakeholders at the global, regional, and country levels while embracing the twin-track approach to fighting hunger:

The dependence of the country's food supply system on food imports (without sufficient financial support from the total volume of export operations), humanitarian supplies, concessional tied loans, and other forms of international economic assistance can be an obstacle to achieving food security (Bogoviz et al., 2018; Shaitan, 2018; Schaars, 2010; Rasmussen, 2011).

Ensuring food security is one of the most significant tasks in both political and socio-economic terms. The role of agricultural production in the food security system and the need for innovation are reflected in scientific works of Vinogradov & Denisova (2015); Baldov & Suslov (2016); Generalov & Smirnov (2015); Parmakli (2015); Ryabova & Suslov (2016), etc.

In modern conditions, indicators of food self-sufficiency of the regions of Kazakhstan are crucial for their socio-economic status. There is a real need for the even distribution of local consumer goods among such regions.

Food self-sufficiency is understood as the optimal provision of food products using the region's resources (Tribushinina & Kurkina, 2014).

The agro-industrial complex of the West Kazakhstan Region is one of the largest and most important sectors of the region's economy. It is based on agriculture that accounts for 7.5% of the gross regional product (Committee on Statistics of the Republic of Kazakhstan, 2019a, 2019b).

In 2019, most cultivated areas were sown with cereal crops (249.6 thousand ha, or 48%), oilseeds (39.5 thousand ha, or 7.7%), potatoes, vegetables, and cucurbits (9.6 thousand ha, or 1.8%), and forage crops (178.1 thousand ha, or 34.4%).

Due to the diversification of production, the land area under cereal crops decreased to 249.6 thousand ha (by 53.3%). In 2019, 217.6 thousand ha (77%) were sown with other seasonal crops if compared to 2010. The grain industry specializes in the cultivation of spring and winter wheat, barley, millet, and rye. Natural and climatic conditions allow growing wheat high in protein which is in constant demand in the grain market.

The average annual volume of grain production in 2010-2019 was 209.4 thousand tons, with the highest gross harvest obtained in 2017 (368.6 thousand tons). Between 2010 and 2019, the gross yield of grain crops increased three times due to the efficient use of irrigated land, intensive varieties and hybrids, modern agricultural techniques.

To provide the Kazakh market with fruits and vegetables of its own production, certain measures were taken to develop vegetable farms. In 2019, 64.5 thousand tons of potatoes (an increase of 41.1% in comparison with 2010) and 58.5 thousand tons of vegetables (an increase of 46.6%) were harvested. Drip irrigation was used in vegetable farms in an area of 24.8 ha. During the period under consideration, the region demonstrated a stable growth of gross crop production.

The regional livestock sector tends to increase the number of cattle and domestic birds, except for pigs. If compared to 2010, the number of cattle increased by 40.6%, sheep and goats by 34.3%, horses two times, poultry by 50.8% in 2019. The number of pigs decreased by 34% due to the growing cost of fodder-grain crops.

Over the past nine years, there has been an increase in the production of livestock products, except for milk, which is associated with a decrease in the number of dairy cattle. In 2019, all categories of farms produced 51.4 thousand tons of meat (134.5% if compared to the level of 2010), 181.5 million of eggs (138.9%), and 2,119 tons of sheep wool (123.3%).

Among branches of animal husbandry, the most developed are livestock, sheep, and herd horse breeding. Poultry farming is widespread in suburban areas, while camel farming is common to semi-deserts.

In general, the processing industry was characterized by unstable production from 2010 to 2019. During this period, the production of meat and food by-products decreased by 40.2%, sausages by 16.5%, and canned meat by 25.1%.

Despite the increase in production, the share of processed agricultural products remains low. The bulk of meat, milk, vegetables, and fruits are sold in food markets in a raw and unprocessed form. Due to its production, the agricultural sector of the West Kazakhstan Region fully satisfies the population's need for meat, milk, potatoes, vegetables, and eggs.

After analyzing production growth rates, it is possible to classify directions of developing branches of the agro-industrial production in the West Kazakhstan Region

The most rapidly developing industries and products include all crops (except for oats), the production of meat, milk, eggs, sunflower oil, butter, and flour.

To enhance the development of the agro-industrial complex, it is necessary:

- To introduce water-saving technologies into agricultural production;
- To ensure regional food security through the use of their rural lands, pastures, etc.;
- To hold events for exchanging experience with foreign countries having similar climatic conditions and introduce innovative technologies in agricultural production.

The favorable geographical position of the West Kazakhstan Region in the center of Eurasia, the proximity to large economic and cultural centers of Eastern and Western Europe,

and the use of the Ural River to reach the Caspian's coastal countries determine its strategic importance for the Republic of Kazakhstan.

In 1990, the land sown with grain crops amounted to 1,556.4 thousand ha. In 29 years, the area under grain crops decreased by 83% or six times. In 2019, the total arable land of grain crops was 249.6 thousand ha. At the same time, the area sown with wheat decreased by 64% against 536.4 thousand ha in 1990 (191.5 thousand ha in 2019). The sown area of forage crops has decreased by 58% over the years (if compared to 436.1 thousand ha in 1990). The West Kazakhstan Region has a large natural potential for the development of agriculture, therefore, it is recommended to increase the area under barley, rye, and grain fodder crops. This measure is necessary to ensure agri-food security (rye and rye-wheat bread amounts to 61% of the recommended consumption of bread products) and form a fodder base for animal husbandry. Taking into account agricultural risks, we propose to increase the area of arable lands by 3% every year and the total area of arable lands by 30% in 10 years (Table 1).

Based on the expanded reproduction of herds (up to 85 calves and 100 lambs per 100 females), it is possible to increase the number of cattle by 65%, sheep and goats by 90%, pigs and horses by 61%, poultry by 62%. In this regard, it is advisable to increase the sowing areas of grain and fodder crops to 274 thousand ha, silage crops (corn, sorghum, Sudan grass, and sunflower). The production of succulent fodder should reach 18 thousand ha. It is necessary to utilize 521,230 ha of hayfields, 211,958 ha of arable lands, and 315,000 ha of pastures with a total area of 1,048,188 ha. Additional measures are to ensure the rational use of farmlands and improve hayfields and pastures on an area of 1 million ha.

Indicator	2019	2030	
		Inertial option	Resource option
Plant growing, thousand tons			
The gross yield of grain crops, including:	242.2	424.6	395.0
– Wheat	195.4	453.0	298.7
– Barley	32.0	154.2	75.8
– Oat	0.4	2.1	1.0
– Millet	2.2	10.3	3.9
– Rye	7.3	27.2	15.6
Sunflower	58.5	73.1	66.5
Vegetables	54.5	121.1	112.0
Cucurbits	26.5	63.1	58.0
Potatoes	64.5	123.8	131.8
<b>Livestock breeding</b>			
Live-weight meat production, thousand tons	96.9	175.3	170.7
Carcass-weight meat production, thousand tons	51.4	90.6	85.4
Milk production, thousand tons	236.5	465.8	378.4
Egg production, million pieces	181.5	588.2	559.4
Wool production, tons	2,119.0	3,990.4	3,390.4
Pelt production, tons	647.8	1,232.0	1,068.9
<b>Food processing and production, tons</b>			
Fresh or chilled meat	119.0	409.3	202.3
Frozen poultry	4,025.0	5,484.8	6,077.8
Sausages and similar meat products	147.0	286.7	292.5

Ready-made and canned products made from meat and meat by-products	4,034.3	9,241.4	6,535.6
Refined sunflower oil	781.1	1,554.3	1,179.5
Processed liquid milk and cream	894.4	1,540.4	1,431.1
Butter	28.0	78.1	41.2
Wheat or meslin flour	125,975.0	219,887.3	202,819.8
Pasta, noodles, couscous and similar products	17,742.0	31,833.7	26,790.4
Ready-made foodstuffs for farm animals	14,801.3	26,230.0	25,162.2

The average per capita consumption of basic food products in the West Kazakhstan Region indicates that the local food market continues to function in the conditions of limited demand, i.e. the average per capita level of food consumption is lower than the norms recommended by the Ministry of Healthcare of the Republic of Kazakhstan, except for the consumption of bread products and sunflower oil. The analysis of food consumption reveals the following pattern: a decrease in the amount of protein products in one's diet is compensated by an increase in the volume of foods high in carbohydrates. In the above-mentioned region, the level of food self-sufficiency is low (less than 60%): potatoes (53%), vegetables and cucurbits (55%), fruit (52%), and eggs (60%).

Thus, the analysis of food self-sufficiency shows how many products should be imported into the region to meet the minimum consumption standards. Considering the specialization and potential of the region's natural resources, as well as the introduction of modern technologies into the production of final goods, self-sufficiency in the West Kazakhstan Region during the forecast period is as follows: bread products/grain (221.8%), potatoes (158.8%), and vegetables (137.4%). To fully satisfy the needs of the population for potatoes and vegetables, it is necessary to diversify vegetable growing.

Based on 2030 forecasts, we calculated that the West Kazakhstan Region would achieve self-sufficiency in many consumer goods throughout its inertial development in 10 years. These are as follows: bread products/grain (336.4%), potatoes (149%), vegetables (148.8%), meat (139%), milk (186%) and eggs (267%). The inertial forecast is based on the method of trend extrapolation with due regard to the average growth rate of production (Table 2).

Products	Volume of consumption in 2019, kg/year	Standards of the Ministry of National Economy, kg/year	Inertial option – 2030			Resource option – 2030		
			Consumption, thousand tons	Production, thousand tons	Self-sufficiency, %	Consumption, thousand tons	Production, thousand tons	Self-sufficiency, %
Grain products/bread corn	137.8	109	134.7	210.0	156	134.7	223	165
Potatoes	53.5	100	83.0	123.8	149.1	83.0	131.8	158.8
Vegetables and cucurbits	82.4	149	123.7	184.2	148.8	123.7	170.0	137.4
Meat	78.1	78.4	65.1	90.6	139.1	65.1	85.4	131.1
Milk	247.3	301	250.0	465.8	186.3	250.0	378.4	151.4
Egg, pieces	161.6	265	220.1	288.2	131	220.1	259.4	118

In general, it can be argued that the West Kazakhstan Region will have achieved self-sufficiency in basic food products by 2030. Within the framework of the inertial and resource

development, it is possible to produce 31% of additional meat, 51.4% of additional milk, and twice as many eggs. In this regard, we consider it expedient to provide more financial resources for local producers, build partnerships between agricultural producers and processors in the region, and increase the utilized capacity of processing facilities.

Food self-sufficiency is achieved through the fullest possible use of the region's natural, labor and material resources, its social development (namely, in rural areas), ensuring ecological balance, and increasing employment and the level of income among the population. Taking into account the main problems, it is recommended to develop the specialization and interregional division of labor based on climatic and economic conditions create joint ventures with regional producers, build mutually beneficial interregional cooperation, and exchange experience and technologies (Attolico, 2014; Ivanova & Nikitin, 2018).

It is necessary to develop integration processes and increase the efficiency of agricultural production. This will help better realize the economic interests of a particular region and increase the share of its products on external food markets. There is also a need to reduce or, on the contrary, to increase those industries that will ensure a more efficient division of labor over various regions.

Each of the above-mentioned measures is accompanied by state activities, influencing the formation and functioning of the food market; therefore, it is necessary to develop a special program ensuring the country's food security.

The main directions of state policy in the field of ensuring food security should be as follows:

- To increase the productivity of crops; to preserve, restore, and increase the fertility of agricultural land; to ensure the rational use of agricultural land and compliance with crop production technologies; to bring unused arable lands into farming business (it is necessary to review the existing legislative framework, to gradually increase taxes on unused land, etc.);
- To implement a set of measures aimed at ensuring the biological safety of the country's territory, including the implementation of antiepidemiological measures;
- To ensure the sustainable development of animal husbandry, pedigree farming, line breeding, and seed production;
- To create a network of wholesale distribution centers for purchasing products from agricultural producers, their additional processing, storage, and sale through the system of retail trade and purchase for state needs.

## CONCLUSION

Food provision of the population is among the main problems of the socio-economic development of the Republic of Kazakhstan and its regions.

To provide the population of the chosen region with the necessary amount of food corresponding to rational standards, it is necessary to import products, whose production is limited by certain conditions for developing the country's agriculture.

Considering the resource potential of the region in question, the existing territorial organization of agriculture, the optimization of the raw material zones owned by processing enterprises, and outlined shifts in food self-sufficiency, it can be argued that there will be a positive trend in food consumption shortly. The traditional underestimation of the territorial factor violates the consistency and complexity of agricultural and food policy measures.

The imbalance between inner food production and food imports, and the need to ensure food independence require the further improvement of state policies aimed at the development of regional agri-food markets in the Republic of Kazakhstan.

Food independence can be achieved mainly through the development of cattle breeding and poultry farming, which will increase the supply of meat and meat by-products. The production of potatoes, vegetables, fruits, and berries, typical of many private and farmer households, should be partially reoriented to large-scale intensive production. High indicators will also enhance the production potential of the agro-industrial complex, including a high share of the rural population in the country's population and large areas of agricultural and arable land.

In the future, these conditions will allow not only to meet the needs for the main types of agricultural products, raw materials, and foodstuffs but also to increase their export potential. In this regard, it is necessary to take certain measures for increasing the investment attractiveness of agriculture, ensuring its financial stability, and improving profitability. These include attracting investment loans, strengthening competitiveness in the spheres of lending, insurance, and leasing, coordinating the interests of manufacturers at the stages of production, processing, storage, transportation, and sale of their products.

## REFERENCES

- Attolico, A. (2014). Building resilience through territorial planning: the experience of Province of Potenza. *Procedia Economics and Finance*, 18, 528-535.
- Baldov, D.V., & Suslov, S.A. (2016). Methods for determining the level of food security. *Vestnik NGIEI*, 1(56), 13-26.
- Bogoviz, A., Popkova, E., & Svistunova, I. (2018). The innovative model of agro-industrial production in the conditions of Industry 4.0: specific features and perspectives. *Agro-industrial Complex: Economics, Management*, 5, 4-10.
- Committee on Statistics of the Republic of Kazakhstan. (2019a). Agriculture, forestry and fishery in the Republic of Kazakhstan..
- Committee on Statistics of the Republic of Kazakhstan. (2019b). Agriculture, forestry and fishery in the West Kazakhstan Region.
- FAO, IFAD, UNICEF, WFP, WHO. (2019). The UN food and agriculture organization report the state of food security and nutrition in the world 2019. Retrieved from <http://www.fao.org/3/ca5162ru/ca5162ru.pdf>
- FAO, IFAD, UNICEF, WFP, WHO. (2020). The UN food and agriculture organization report the state of food security and nutrition in the world 2020. Retrieved from <http://www.fao.org/documents/card/en/c/ca9692en>
- FAO. (1983). World food security: A reappraisal of the concepts and approaches: Director-General's report. Rome, FAO.
- FAO. (1996). Rome declaration of world food summit plan of action. Retrieved from <http://www.fao.org/3/w3613e/w3613e00.htm>
- Generalov, I.G., & Smirnov, N.A. (2015). Grain processing as a means of increasing the competitiveness of agricultural organizations. *Bulletin of NGIEI*, 1(44), 10-18.
- Ivanova, E., & Nikitin, A. (2018). Cluster-cooperative project of innovative development of agriculture. *Journal Quality-access to Success*, 19(52), 8-14.
- Kaigorodtsev, A.A. (2006). Self-sufficiency as an indicator of national food security. *National Interests: Priorities and Security*, 4(7), 72-77.
- Kriulina, E.N., & Gorbato, I.A. (2017). The clustering of rural territories as a means of their integration into agriculture. *Achievements of Science and Technology of the Agro-Industrial Complex*, 10, 89-93.
- Kriulina, E.N., & Gorbato, I.A. (2018). The role and significance of integration in the management of agricultural development. *Agro-industrial Complex: Economics, Management*, 4, 28-36.
- Parmakli, D.M. (2015). Methodological aspects of evaluating the efficiency of marketed commodities. *Vestnik NGIEI*, 11(54), 75-79.
- Rasmussen, W.D. (2011). Farmers, cooperatives, and USDA: a history of agricultural cooperative service.

- Ryabova, I.V., & Suslov, S.A. (2016). Methods for assessing regional food security. *Research Azimuth: Economics and Management*, 5(3(16)), 173-177.
- Schaars, M.A. (2010). Cooperatives, principles and practices. Madison: University of Wisconsin.
- Shaitan, B. (2018). Transferring scientific results into agriculture. *Agro-industrial Complex: Economics, Management*, 2, 22-28.
- Tribushinina, O.S., & Kurkina, N.R. (2014). Assessing the level of regional food self-sufficiency. *Basic research*, 6(5), 1023-1027.
- Trjascin, M.M. (2013). Sustainable development management of the regional food market. *World Applied Sciences Journal*, 23(4), 466-472.
- Trjascin, M.M., & Oborin, M.S. (2013). Social and economic aspects of the current state of food in dependence of the region (as exemplified by the Perm region). *Middle East Journal of Scientific Research*, 15(5), 618-621.
- UN General Assembly. (1974). The Universal Declaration on the Eradication of Hunger and Malnutrition.
- Vinogradov, N.V., & Denisova, N.V. (2015). The agro-industrial complex: state structures and their functioning in modern conditions. *Vestnik NGIEI*, 9(52), 39-42.
- World Bank. (1986). Poverty and hunger: Issues and options for food security in developing countries. Washington DC: World Bank.
- Zyablikova, O.A., & Terzova, G.V. (2010). Forming and using a resource potential in agricultural organizations.