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THE IMPACT OF THE LEVEL OF FOOD INDEPENDENCE ON THE ASSESSMENT OF AGRI-FOOD RISKS

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Abstract. This article examines important issues that cover the problems of establishing food independence, ensuring maximum food security of the state, diagnosing and reducing agri-food risks. The authors assess the physical availability of food to the residents of the republic, calculate the coefficients of coverage of imported products (imports) in order to clarify the level of ensuring the specified availability of food products. This article examines important issues that cover the problems of establishing food independence, ensuring maximum food security of the state, diagnosing and reducing agri-food risks. The authors assess the physical availability of food to the residents of the republic, calculate the coefficients of coverage of imported products (imports) in order to clarify the level of ensuring the specified availability of food products. An important place in the work is occupied by analytical calculations concerning indicators reflecting self-sufficiency (food independence) for basic foodstuffs. The article presents the dynamics of the overall level of food independence of our country for the period 2015-2019. This article presents the results of the analysis of agri-food risks (SWOT-risk analysis), which identified a number of possible risks, grouped into five main blocks, then presents the results of an expert assessment of these agri-food risks, which identified the most dangerous of them for the food security of the Republic of Kazakhstan. The integral assessment of each risk was carried out by multiplying the impact points by the risk probability coefficient. At the end of the work, some measures are proposed to increase the levels of food availability and self-sufficiency, as well as to reduce the risks that accompany agricultural production.

Key words: food, physical accessibility, food security, food independence, agri-food risks, self-sufficiency

Introduction. Society's development nowadyays, assuring the food security of the territory is becoming increasingly vital, becoming one of the key global questions, its solution is an important condition for creating a condition of stability and well-being both in the world as a whole and in each individual country.

Throughout the history of humanity, food security issues have always been touched upon, although indirectly, while the main human need was the need for immediate food.

Therefore, in 1798, the English economist and priest T. Malthus for the first time thoroughly examined the problem of food security. Study by T. Malthus allowed us to make conclusion that the provide of food to the inhabitants of the state is the foundation for the existence of people, and simultaneously, this situation does not always allow a person to exist normally [1]

For the first time since the birth of the human right to food, the President of the United States spoke about the inalienable right of a person to food. Roosevelt in 1941gave clear formulations of the «four freedoms», namely, «freedom of speech, freedom of religion, freedom from want and freedom from fear» [2].

Afterwards, the first remark of food security issues appeared (1948) at the international degree - the Universal Declaration of Human Rights: everyone has the freedom to a reference of living, including food, which is needful for the health and welfare of his family and himself [3].

The requirement for food security to ensure national security at the legislative level is enshrined in the Law of the RK «On National Security of the Republic of Kazakhstan» [4].

In the Strategy «Kazakhstan-2050», the threat to global food security is identified on the list of the ten global challenges for our country [5].

The problem of food safety is particularly relevant in the situation of the progress of globalization course - Kazakhstan's admission to the EEA and the WTO [6].

According to David Beazley, Executive Director of the United Nations World Food Programme (WFP), «2020 was the most critical year in terms of food security and humanitarian crisis since the Second World War. Due to the coronavirus pandemic, the number of people on the verge of starvation has increased from 135 million to 270 million» [7].

Assessing the level of food security. In order to find out the status of physical accessibility of foodstuffs, we will use the methodology of Olovannikov J.G. [8, pp. 22] according to which the physical accessibility of foodstuffs is articulated through the food import cover ratio (Cr)calculated as the ratio of exports to imports of food products.

Now, we will analyze the export and import indicators of the Republic of Kazakhstan for food products and calculate the import coverage ratio (Table 1)

Table 1. Assessment of the degree of physical availability of food products in the RK by the coefficient of import coverage

Indicators	Unitofmeasurement	2015	2016	2017	2018	2019
E	milliontons	2,639	3,597	4,119	4,556	4,085
Export	\$billion.	1,001	1,058	1,242	1,366	1,337
T	milliontons	6,761	7,409	7,383	7,387	7,508
Import	\$billion.	2,958	2,677	3,013	3,095	3,287
Coverageratio (Cr)		0,4	0,5	0,6	0,6	0,5

Next, we will reveal the levels of the coverage coefficient [8, p. 22] (Table 2)

Table 2. Coverageratiolevels

	Criteria	Degree				
		High	Acceptable	Low	Unacceptable	
Coverageratio (Cr)		1,00	0,75-0,99	0,30-0,75	Below 0,30	

As can be seen from Tables 1, 2, the physical availability of food products in the RK, expressed in terms of the import coverage ratio, is at a low level.

We will fully analyze the indicators of exports and imports of foodstuffs in monetary terms in Figure 1.

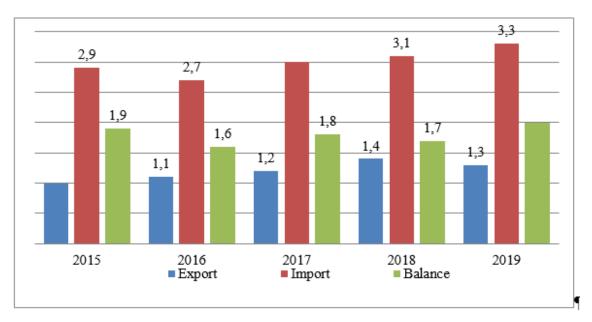


Figure 1. Export, import and balance of food products in the Republic of Kazakhstan (billion US dollars)

Note: [9] compiled by authors based on literature

The analysis shows that imports are to a large extent present in the domestic food market.Imports encompass a wide range of food products, including those groups of foodstuffs which have historically been produced in domestic enterprises, for example, butter, cheese and cottage cheese.

From variety of methods there is a way in which the level of food security is measured by assessing food consumption from the point of view of whether actual consumption meets food value yardsticks, determination of the level of food deprivation, that is, the percentage of the inhabitants below the minimum level of dietary energy consumption.

In this regard, countryor region is considered protected from the point of view of food protection when the fraction of inhabitants misery from hunger is very low (which is less than 5%). When there is a situation, in which the level of food destitution exceeds 35%, the country or region faces the problem of struggling hunger. Eating at the level of 2150 calories characterizes the conditions of constant malnutrition. The normal averaged level for a person is 2,600 calories [10].

Following the above, we will calculate the overall level of food independence (GPO). We will use the formula: $OPN = [1 - (I-E): RNP] \times 100$, where I is the cost of imports; E is the cost of exports; RNP is the cost of the country's population for food [11].

Table 3. Determination of the overall level of food independence (self-sufficiency) of Kazakhstan

	Exports of	Impo		Balance of in	mports and	Population	Overall level of
ear	food products,	rts of food		exports		spending on	food independence
	million US	products,	million	average	billionten	food, billion	(self-sufficiency),
	dollars	million US	USD.	annual	ge	tenge	%
		dollars		exchange			
				rate of			
				USD			
2015	1001	2958	957	222	434,5	2821,4	84,6
2016	1058	2677	619	342	553,7	4194,7	86,8
2017	1242	3013	771	326	577,3	4693,5	87,7
2018	1366	3095	729	345	596,5	4929,7	87,9
2019	1337	3287	950	383	746,9	6329,6	88,2

The pervasive opinion in the recent economic literature that the weakening of the national currency constantlyprovides to the growth of domestic production and the reduction of imports, and consequently to the rise of the country's foodautonomy, is not so obvious [11, p. 24].

Thus, the increase in the dollar exchange rate in 2016 compared to 2015 by 35% (from 222 to 342 tenge) actually led to a reduction in the balance of food imports and exports from 1957 million dollars to 1619 million dollars. In parallel, food independence of the RK increased from 86.8% to 84.6%. Most likely, this can be clarified by the fact that the quantity of foreign exchange costs for imports, despite the reduction, in terms of tenge increased to a greater extent than the cost of domestic products spended. Between 2016 and 2019, food independence ranges from 84.6% to 88.2%.

Let's consider the pointers of food freedom of individual food products.

Table 4. Degree of food freedom for basic food products in the RK for 2017-2019 (in %)

Appellation	2017	2018	2019
Flour	228	223	224
Bread and bakery products	104	99	101
Cereals and cereals products	121	119	117
Polished rice and milled rice	132	130	126

			1
Pasta products	58	66	68
Meat and meat products	84	87	88
Sausage goods	68	70	70
Poultry meat	47	56	55
Fish and fish products	67	61	63
Dairy produce	93	94	95
Cheese, cottage cheese	59	60	58
Butter	74	75	75
Vegetable oil	84	88	87
Margarine and fats	74	70	71
Eggs	101	104	105
Potato	107	90	91
Vegetables	61	76	77
Fruits and berries	48	51	53
Sugar	69	67	66
Confectionery products made of chocolate and sugar	74	72	74

As evidenced from the data in Table 4, over the past three years, complete food independence (self-sufficiency) in our country is maintained for flour, cereals and cereals products, rice and food eggs [9].

As for food products, it should be mentioned that Kazakhstan has always largely (about 80%) supplied itself through agriculture and production of agricultural products. However, for some food produces, due to the insufficient evolution of the production of processed products, a high share of imports was detected. Inadequate saturation of the market was observed in such groups as poultry meat, cheeses and cottage cheese, sausages, sugar, fish, processed vegetables, fruits. [12].

The country's agriculture, as an indispensable basis for food security, is subject to numerous, often difficult to predict risks.

Agri-food risk assessment. The inherent factors and characteristics of agricultural production are uncertainty and risk. Since the main resources are purchased from foreign suppliers (machinery, fertilizers, chemicals, etc.), agricultural enterprises depend on the policies of other states and our state in relation to them, the exchange rate and other factors that increase the costs of our enterprises, and lead to a wider range of risks that agricultural firms may face. [13]

With the help of SWOT analysis, you can identify the main risks.

Table 5. **SWOT-analysis of risks**

Strengths		Opportunities			
•	Considerable size of land resources Ne		Newtechnologiesinproduction		
•	Availability of modern greenhouse complexes		Introduction of new products to the market		
	with an automated microclimate and irrigation		Introduction of a ban on imported goods		
	system	• The emergence of new customers in			
•	Own production of seed material connection with the growth of the dom		connection with the growth of the domestic		
•	Availabilityoflaborpotential	food market			

Weaknesses	Threats			
 Seasonality of production Currencyexchangeratejumps 				
 High cost of fixed assets of production 	• The emergence of new players in the market			
 High cost of monopolistic energy carriers 	A disease of plants, disease of cattle			
	• Economic downturn, falling purchasing			
	power			
	Tighter regulation by the state			

To study the agri-food risks of food security, there is a developed method of expert assessment. Let's consider its essence on the example of the agroindustrial complex of Kazakhstan.

In view of the fact that the agro-industrial systems of the countries of the same region are mostly exposed to the same strategic risks, the experience of the Russian Federation was used to determine the risks.

Previously, 20 strategic risks were identified for the agroindustrial complex in five main groups (blocks). A 10-point scale was used to estimate the impact of risks on the development of the agroindustrial complex. Appropriate coefficients were used to assess the probability of risk occurrence.

As usual, the integral assessment of each risk is the result of multiplying the impact points by the risk probability coefficient.

Table 6 provides a list of the most dangerous food security risks, based on exceeding 45% of the maximum possible level.

Table 6. List of the most dangerous agri-food risks

No॒	Risks	The integral evaluation	Rating in relation to the maxim level (%)
		of risk,	(17)
		scores	
1	Economic, production, management		
1.1	Cutting in the amount of financial support for the agricultural sector, inefficient agricultural policy	5,0	50
1.2	Widening the lag in labor productivity of agriculture of the Republic of Kazakhstan from developed countries	4,7	47
1.3	Stagnation or decline in the level of agricultural output by technological lag	4,5	45
2	Marketrisks		
2.1	The steady growth ofdelay in market infrastructure and logistics	5,2	52
2.2	Monopolization processes of specific segments of the food market of the RK	4,8	48
2.3	Use of ineffective or delayed measure tools of state regulation of the food market	4,7	47
3	Innovativerisks		
3.1	Absence of a clear strategy for innovative development and modernization of the agroindustrial complex of the RK	6,2	62
4	Socialrisks		
4.1	Decrease in the reference of living and health of the rural	4,8	48

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	population, disappearance of rural settlements in many regions		
	of the country		
4.2	High degree of unemployment in rural areas in several regions	4,3	43
5	Natural and climatic, weather risks		
5.1	Drought in large spatial areas with the loss of 30% of the	3,3	33
	average annual grain harvest in the country		
	Generalintegralassessment	47,5	47,5

Experts in this areaconsider that the most hazardous risk is an insufficiently clear strategy for innovative development and modernization of the agroindustrial complex - 62%.

The next most significant risk is the growing lag in market infrastructure and logistics, which is 52%.

This is followed by the risk of a decrease in the level of financial support for the agricultural sector, ineffective agricultural policy, which is 50%.

The least low percentage of danger has the risk of drought in large areas with a loss of over 30% of the average annual grain harvest in the country - 33%. But afore of climate change, the percentage of danger of this risk may increase.

The remaining 10 risks are not considered as the most dangerous and are rated at the maximum level not exceeding 33%.

Conclusions. Summing up the above, we will determine that in order to enhance the degree of economic security and existence of food, to diminish the identified risks of agricultural products, it is necessary:

- carry on creating conditions for domestic food to join foreign markets, to stimulate the export of grain and its processed products;
- to shield the population of the country from poor standard products by developing the work of standardization and certification of goods;
- to upgrade the infrastructure and logistics of the agroindustrial complex, to create not only in large aglomerations wholesale food markets, but also in small regional centers;
- to resume the work of a network of acquisition points in all rustic settlements of the state, removed areas with a high concentration of sources of agricultural raw materials;
 - > stabilize the food mart by organizing procurement and commodity interventions;
- improve the systems of staff, scientific and notification support of enterprises of the agroindustrial complex;
- to conduct steady monitoring of the food mart and food protection of the specific regions and the country as a whole, in order to create arrangement for public control over the expediency of imports and the quality characteristics of imported food.

Thereby, Kazakhstan Republic has all the opportunities to implement reserves aimed at increasing the production of food products of higher quality and, therefore, growing the level of

food safety and reducing and eliminating several agri-food risks. Above all, this is the broad introduction of the achievements of the NTP into production. For most manufacturers, an important task is to cooperate with global manufacturers, which is possible on the basis of their innovative development. In many cases, the strategy of participating in alliances with world leaders can work as an alternative to independent access to foreign markets.

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АЗЫҚ-ТҮЛІК ТӘУЕЛСІЗДІГІ ДЕҢГЕЙІНІҢ АГРАРЛЫҚ АЗЫҚ-ТҮЛІК ТӘУЕКЕЛДЕРІН БАҒАЛАУҒА ӘСЕРІ

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Аңдатпа. Жариялауға ұсынылып отырған мақалада азық-түлік тәуелсіздігін орнату, мемлекеттің ең жоғары азық-түлік қауіпсіздігін қамтамасыз ету, аграрлық азық-түлік тәуекелдерін диагностикалау және азайту мәселелерін қамтитын маңызды мәселелер зерттеледі. Авторлар республика тұрғындарына азық-түліктің нақты қолжетімділігін бағалауды жүзеге асырады, азық-түлік тауарларының көрсетілген қолжетімділігін қамтамасыз ету деңгейін нақтылау үшін әкелінетін өнімдерді (импортты) жабу коэффициенттерін есептейді. Жұмыста негізгі азық-түлік тауарлары бойынша өзін-өзі қамтамасыз етуді (азық-түлік тәуелсіздігі) көрсететін көрсеткіштерге қатысты талдамалық есептеулер маңызды орын алады. 2015-2019 жылдар аралығындағы еліміздің азық-түлік тәуелсіздігінің жалпы деңгейінің динамикасы ұсынылған.осы мақалада агроазық-түлік тәуекелдеріне жүргізілген талдау нәтижелері (SWOT-тәуекелдерді талдау) келтірілген, оның көмегімен бес негізгі блокқа топтастырылған бірқатар ықтимал тәуекелдер анықталған. Содан кейін ҚР азық-түлік қауіпсіздігі үшін ең қауіптісін анықтаған осы агроазық-түлік тәуекелдерін сараптамалық бағалау нәтижелері келтірілген. Бұл ретте әрбір тәуекелді интегралды бағалау әсер етуді көрсететін балдарды тәуекел ықтималдығының коэффициентіне көбейту арқылы жүзеге асырылды. Жұмыс соңында азық-түлік пен өзін-өзі қамтамасыз етудін

қол жетімділік деңгейін арттыру, сондай-ақ аграрлық өндірісті сүйемелдейтін тәуекелдерді азайту бойынша кейбір шаралар ұсынылады.

Түйін сөздер: азық-түлік, физикалық қолжетімділік, азық-түлік қауіпсіздігі, азық-түлік тәуелсіздігі, азық-түлікпен қамтамасыз ету, аграрлық азық-түлік тәуекелдері, өзін-өзі қамтамасыз ету

ВЛИЯНИЕ УРОВНЯ ПРОДОВОЛЬСТВЕННОЙ НЕЗАВИСИМОСТИ НА ОЦЕНКУ АГРОПРОДОВОЛЬСТВЕННЫХ РИСКОВ

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Аннотация. В публикуемой статье исследуются важные вопросы, охватывающие проблемы установления продовольственной независимости, обеспечения максимальной продовольственной безопасности государства, диагностирования и снижения агропродовольственных рисков. Авторами осуществляется оценка физической доступности жителям республики продовольствия, рассчитываются коэффициенты покрытия завозимых продуктов (импорта) для того, чтобы уточнить уровень обеспечения указанной доступности продовольственных товаров. Важное место в работе занимают аналитические выкладки, касающиеся показателей, отражающих самообеспечение (продовольственную независимость) по основным продтоварам. Представляется динамика общего уровня продовольственной независимости нашей страны за период 2015-2019 г.г. В данной статье приводятся результаты проведенного анализа агропродовольственных рисков (SWOTанализ рисков) с помощью которого был установлен целый ряд возможных рисков, сгруппированных в пять основных блоков Затем представляются итоги экспертной оценки этих агропродовольственных рисков, выявившей наиболее опасные из них для продовольственной безопасности РК. Проводимая при этом интегральная оценка каждого риска осуществлялась путем умножения баллов, отражающих воздействие, на коэффициент вероятности риска. В завершении работы предлагаются некоторые меры по повышению уровней доступности продовольствия и самообеспечения, а также по снижению рисков, сопровождающих аграрное производство.

Ключевые слова: продовольствие, физическая доступность, продовольственная безопасность, продовольственная независимость, продовольственное обеспечение, агропродовольственные риски, самообеспечение