

STUDY OF THE PROBLEM OF ENSURING FOOD SECURITY OF THE COUNTRY IN CONDITIONS OF EXTERNAL ENVIRONMENT VOLATILITY

A.Zh. Asainov^{ORCID}, A.K. Butkenova^{✉ ORCID}, K.K. Bokenchin^{ORCID}, B.M. Bayadilova^{ORCID}, Zh.N. Sadu^{ORCID}

Kazakh University of Technology and Business named after K. Kulazhanov, Astana, Kazakhstan,

✉ *Correspondent-author: Butkenova@mail.ru*

The article is devoted to the consideration of methodologies for determining the level of food security, both at the global and regional levels. The article presents the developments of the world's largest organizations engaged in ensuring food security, both on the world stage and within individual states. The international experience of determining the level of food security, as well as indicators of food security is considered. Based on the analysis of indicators, it was concluded that in many countries the methodologies are very similar, but there is no single concept that could form the basis of a unified system and that could unite disparate indicators together.

As the world population continues to grow, much more effort and innovation is urgently needed to increase agricultural productivity in a lean manner, improve the functioning of the global value chain, reduce food losses and food waste, and ensure that all people suffering from hunger and malnutrition have access to adequate nutrition. Many members of the international community are convinced that hunger can be eliminated in the next generation and are working together to achieve this goal.

There was a need to increase the productivity of agricultural systems worldwide and to reduce the generation of agricultural waste. Restorative agricultural practices must be holistically and comprehensively implemented and food systems, including both food production and consumption, must be restorative.

Land, healthy soils, water and plant genetic resources are essential inputs for food production, and their careful use and sustainable management is becoming a high priority given their increasing scarcity in many parts of the world. Increasing the productivity of existing farmland, including restoring degraded land through regenerative agriculture practices, will also help to counter the need to clear forests for agriculture. Maintaining the productivity of drylands can be helped by judicious exploitation of scarce water resources through improved irrigation and storage technologies coupled with the development of new drought tolerant crop varieties.

Keywords: food security, food independence, system of food security indicators, food security criteria, system of food security category indicators.

ИССЛЕДОВАНИЕ ПРОБЛЕМЫ ОБЕСПЕЧЕНИЯ ПРОДОВОЛЬСТВЕННОЙ БЕЗОПАСНОСТИ СТРАНЫ В УСЛОВИЯХ НЕСТАБИЛЬНОСТИ ВНЕШНЕЙ СРЕДЫ

А.Ж. Асаинов, А.К. Буткенова[✉], К.К. Бокенчин, Б.М. Баядилова, Ж.Н. Саду

*Казахский университет технологий и бизнеса им.К.Кулажанова, Астана Казахстан,
e-mail: Butkenova@mail.ru*

Статья посвящена рассмотрению методик определения уровня продовольственной безопасности, как на глобальном, так и на региональном уровнях. В статье представлены разработки крупнейших мировых организаций, занимающихся обеспечением продовольственной безопасности как на мировой арене, так и в рамках отдельных государств. Рассмотрен международный опыт определения уровня продовольственной безопасности, а также индикаторы продовольственной безопасности. На основе анализа показателей сделан вывод, что во многих странах методики очень похожи, но нет единой концепции, которая могла бы лечь в основу единой системы и объединить разрозненные показатели воедино.

Поскольку население планеты продолжает расти, необходимо срочно приложить гораздо больше усилий и инноваций, чтобы бережно повысить производительность сельского хозяйства, улучшить функционирование глобальной производственно-сбытовой цепи, сократить потери продовольствия и пищевые отходы, а также обеспечить всем людям, страдающим от голода и недоедания, доступ к полноценному питанию. Многие члены международного сообщества убеждены, что голод может быть ликвидирован уже в следующем поколении, и совместно работают над достижением этой цели.

Необходимо повысить производительность сельскохозяйственных систем во всем мире и сократить образование сельскохозяйственных отходов. Восстановительные методы ведения сельского хозяйства должны применяться комплексно и всесторонне, а продовольственные системы, включая как производство, так и потребление продуктов питания, должны быть восстановительными.

Земля, здоровые почвы, вода и генетические ресурсы растений являются важнейшими факторами производства продовольствия, и их бережное использование и устойчивое управление становятся первоочередной задачей, учитывая их растущую нехватку во многих частях мира. Повышение продуктивности существующих сельскохозяйственных угодий, включая восстановление деградировавших земель с помощью методов регенеративного сельского хозяйства, также поможет противостоять необходимости вырубки лесов для нужд сельского хозяйства. Поддержанию продуктивности засушливых земель может способствовать разумная эксплуатация скудных водных ресурсов путем совершенствования технологий орошения и хранения воды в сочетании с выведением новых засухоустойчивых сортов сельскохозяйственных культур.

Ключевые слова: продовольственная безопасность, продовольственная независимость, система показателей продовольственной безопасности, критерии продовольственной безопасности, система показателей категории продовольственной безопасности.

СЫРТҚЫ ОРТАНЫҢ ТҰРАҚСЫЗДЫҒЫ ЖАҒДАЙЫНДА ЕЛДІҢ АЗЫҚ ТҮЛІК ҚАУІПСІЗДІГІН ҚАМТАМАСЫЗ ЕТУ ПРОБЛЕМАСЫН ЗЕРТТЕУ

А.Ж. Асаинов, А.К. Буткенова ✉, К.К. Бокенчин, Б.М. Баядилова, Ж.Н. Саду

*Қ.Құлажанов атындағы технология және бизнес университеті, Астана, Қазақстан,
e-mail:Butkenova@mail.ru*

Мақала жаһандық деңгейде де, аймақтық деңгейде де азық-түлік қауіпсіздігі деңгейін анықтау әдістерін қарастыруға арналған. Мақалада әлемдік аренада да, жекелеген мемлекеттер шеңберінде де азық-түлік қауіпсіздігін қамтамасыз етумен айналысатын ірі әлемдік ұйымдардың әзірлемелері ұсынылған. Азық-түлік қауіпсіздігі деңгейін анықтаудың халықаралық тәжірибесі, сондай-ақ азық-түлік қауіпсіздігі индикаторлары қарастырылды. Көрсеткіштерді талдау негізінде көптеген елдерде әдістер өте ұқсас, бірақ біртұтас жүйенің негізін құрайтын және әртүрлі көрсеткіштерді біріктіретін Бірыңғай тұжырымдама жоқ деген қорытындыға келді.

Планета халқы өсіп келе жатқандықтан, ауыл шаруашылығының өнімділігін Мұқият арттыру, жаһандық өндіріс және сату тізбегінің жұмысын жақсарту, азық-түлік шығындары мен азық-түлік қалдықтарын азайту, сондай-ақ аштық пен тамақтанбаудан зардап шегетін барлық адамдарға толық тамақтануға қол жеткізу үшін шұғыл түрде көп күш пен инновация қажет. Халықаралық қоғамдастықтың көптеген мүшелері аштықты келесі ұрпақта жоюға болатынына сенімді және осы мақсатқа жету үшін бірлесіп жұмыс істейді.

Дүние жүзіндегі ауыл шаруашылығы жүйелерінің өнімділігін арттыру және ауыл шаруашылығы қалдықтарының түзілуін қысқарту қажет. Ауыл шаруашылығын қалпына келтіру әдістері жан-жақты және жан-жақты қолданылуы керек, ал азық-түлік жүйелері, соның ішінде азық-түлік өндірісі де, тұтыну да қалпына келтірілуі керек.

Жер, сау топырақ, су және өсімдіктердің генетикалық ресурстары азық-түлік өндірісінің маңызды факторлары болып табылады және оларды ұқыпты пайдалану және тұрақты басқару әлемнің көптеген бөліктерінде олардың жетіспеушілігін ескере отырып, бірінші кезектегі міндет болып табылады. Қолданыстағы ауылшаруашылық жерлерінің өнімділігін арттыру, соның ішінде регенеративті ауыл шаруашылығы әдістері арқылы деградацияға ұшыраған жерлерді қалпына келтіру де ауыл шаруашылығының қажеттіліктері үшін ормандарды кесу қажеттілігіне қарсы тұруға көмектеседі. Құрғақ жерлердің өнімділігін сақтауға дақылдардың құрғақшылыққа төзімді жаңа сорттарын өсірумен бірге суару және суды сақтау технологияларын жетілдіру арқылы тапшы су ресурстарын ұтымды пайдалану ықпал етуі мүмкін.

Түйін сөздер: азық-түлік қауіпсіздігі, азық-түлік тәуелсіздігі, азық-түлік қауіпсіздігі көрсеткіштері жүйесі, азық-түлік қауіпсіздігі критерийлері, азық-түлік қауіпсіздігі санаты көрсеткіштері жүйесі.

Introduction. The term «food security» was first introduced into international circulation after the grain crisis of 1972-1973. The UN General Assembly in 1974 adopted a resolution «International Obligations to Ensure Food Security in the World». In this case, world food security was understood mainly as «maintaining stability in the markets of food products with the availability of basic foodstuffs for all countries of the world» [1, 2]. However, a single categorical apparatus was not developed at that time. The main activities were recognized as follows: creation of food reserves at the level of individual states; organization of monitoring and early warning of food shortages; provision of food aid to countries in need; involvement of developing countries in international trade in agricultural products and food products. A combination of imports and assistance from developed countries was seen as a means of solving the food problem of most countries.

In the subsequent period, the world food problem has only worsened. Annual increase in the world population, reduction and degradation of cultivated areas, growth of world prices for raw materials and foodstuffs due to the world crop failure in the countries-exporters of agricultural products, depletion of natural resources, deterioration of ecological situation - these and other factors began to hinder further development of world production of food products and agricultural raw materials. The quantitative side of the problem did not become fundamental (according to estimates of the International Food and Agriculture Organization of

the United Nations - FAO, the world is able to feed 2 times more people living on Earth), because at this time the differences in the provision of countries with food, inequality increased. Under the influence of these processes, a new approach to the problem of food security emerged, according to which the achievement of food security on a global scale became possible only through ensuring the latter in each individual state [3, 4]. In connection with the new approach to solving the food problem, special attention began to be paid to food security programs and improving nutrition on the ground.

According to the UN, the COVID-19 pandemic, widespread supply chain disruptions, climate crisis and extreme weather have resulted in 193 million people in need of emergency assistance losing access to food security. Globally, the food security situation is worsening. Humanity is failing to meet the UN hunger elimination targets: 828 million people - the number of hungry and malnourished people in the world in 2022. EDB analysts expect a prolonged period of high food prices as a result of population growth and increased consumption in rapidly developing countries, as well as under pressure from the adverse effects of climate change, high prices for energy and its derivatives (including fertilizers), shortage of skilled labor and new agricultural land. Against this backdrop, reduced food availability increases the value of food resources.

Eradicating hunger and malnutrition is one of the greatest challenges facing humankind. A person is considered «food secure» when he or she has

physical, social and economic access to adequate, safe and nutritious food that meets his or her dietary needs and food preferences for an active and healthy life (as defined by the UN Committee on World Food Security). Urgent action is needed to address global food security as recognized in the UN Sustainable Development Goals (SDGs). The UN Secretary-General launched the Zero Hunger program in 2012 during the Rio+20 World Conference on Sustainable Development . Zero Hunger was launched to inspire a global movement for a world free of hunger within a generation.

In 2021, UN Secretary-General António Guterres convened a Summit on Food Systems as part of the

Decade of Action to achieve the 2030 Sustainable Development Goals (SDGs). The Summit launched bold new actions to make progress on all 17 SDGs, all of which depend to some extent on healthier, more resilient and more equitable food systems. Guided by five action lines, the Summit brought together key players from the worlds of science, business, politics, health and academia, as well as farmers, indigenous people, youth organizations, consumer groups, environmental activists and other key stakeholders. The SDGs set targets to eradicate hunger, achieve food security, improve nutrition and develop sustainable agriculture by 2030. These are critical challenges for the world, requiring international cooperation and policy reform.

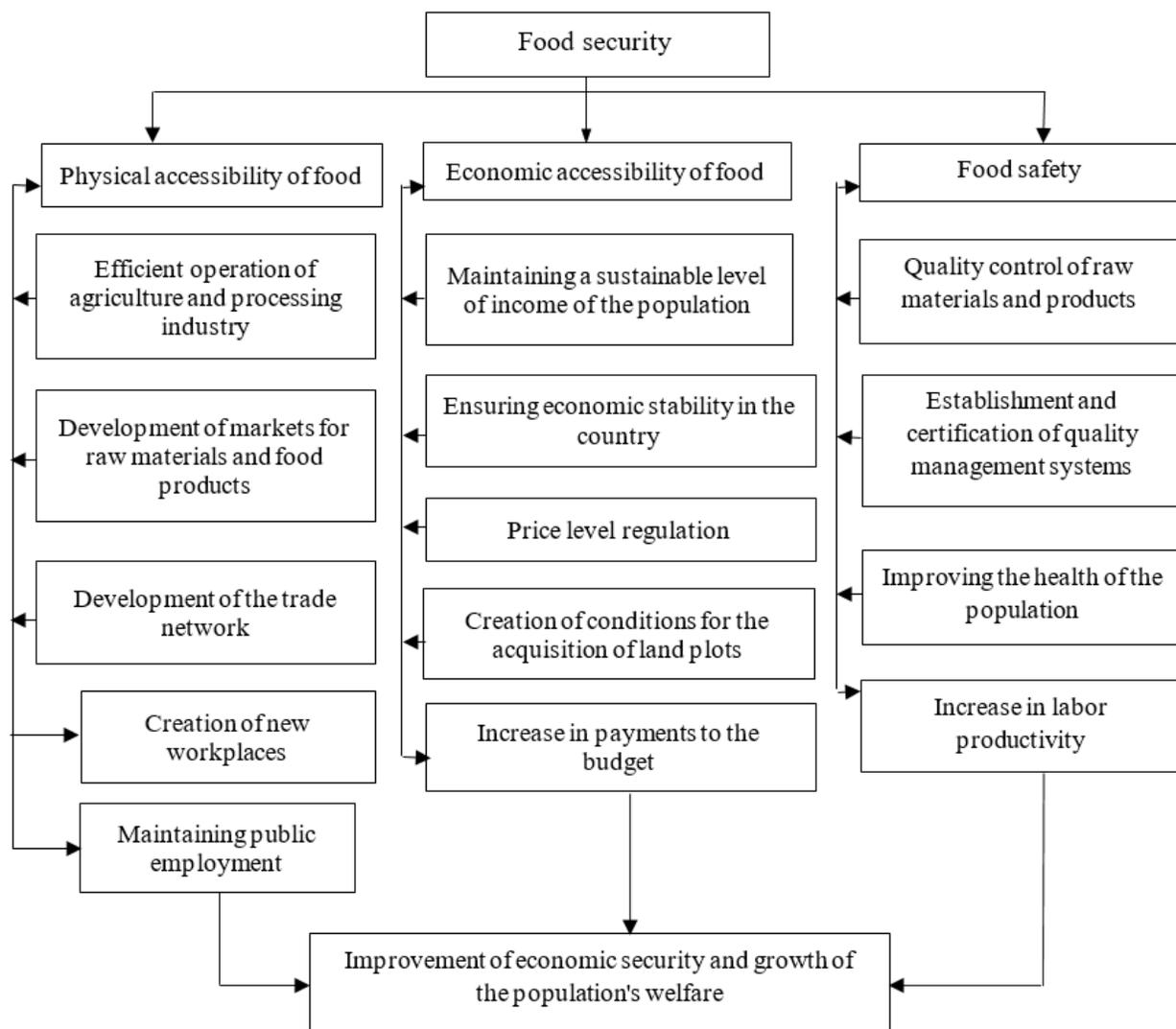


Fig. 1 - Food security

While progress has been made in improving food security over the years, the pandemic has reversed many of these gains, which were already uneven across countries and regions. The UN Food and Agriculture Organization estimates that COVID-19 has led to a dramatic increase in malnutrition among populations. Per capita food availability is projected to increase by 4% by 2030, but achieving the zero hunger SDGs will be a challenge. Uneven growth in food availability across regions will result in consumers in middle-income countries increasing their food consumption most significantly, while diets in low-income countries will remain largely unchanged. This has serious implications for undernourished and severely food insecure populations who need it most.

Materials and methods. The article uses methodological tools, including system analysis, correlation and regression analysis, summaries and groupings, analysis of empirical distribution series, multivariate classification, time series analysis and forecasting, graphical and tabular methods of analysis. The materials for the study were the analysis of domestic and foreign literature devoted to the study of food security.

Results and discussions. The problem of food security has attracted the attention of the world community since the 70s of the XX century, when the deficit of the world's food resources was revealed. This problem is global in nature: production, distribution and trade of foodstuffs concern every state regardless of whether its population suffers from hunger and malnutrition or is provided with foodstuffs in sufficient or excessive quantities. The reason for its relevance can be explained in the words of A. Brijе-Savarin: «The fate of nations depends on how they eat».

Food security is a flexible concept and is usually applied at three levels of aggregation: national, regional, household or individual, Figure 1.

Food safety is recognized as a priority area of research at the international level. In February 2001, the World Health Organization (WHO) held a strategic meeting on food safety planning in Geneva to discuss the development of the Global Food Safety Strategy [5,6]. The international organization

Codex Alimentarius deals with the problems of quality, food safety and standards for components of goods. The standards developed by this organization are fundamental for the countries-participants of the General Agreement on Tariffs and Trade (GATT), if they do not have the ability to scientifically confirm a higher level of protection of goods.

Thus, food security is a state of a country's economy in which a stable supply of agricultural raw materials for the processing industry and sufficient safe and nutritious food for the population, taking into account their incomes, as well as relative independence from imports of raw materials and food, are guaranteed.

Food is at the heart of the Sustainable Development Goals (SDGs), the UN's development agenda for the 21st century. The second of the 17 UN Sustainable Development Goals is «End hunger, achieve food security and improved nutrition and promote sustainable agriculture». Achieving this goal by 2030 will require profound changes in the global food and agriculture system. Some of the components of this goal are:

- ending hunger and ensuring that all people have access to safe and nutritious food;
- ending all forms of malnutrition;
- doubling agricultural productivity and incomes of small-scale food producers;
- ensuring sustainable food production systems;
- increasing investment in agriculture;
- correcting and preventing trade restrictions and distortions in world agricultural markets;
- taking measures to ensure the proper functioning of food commodity markets.

At the current stage of development, the meaning of the concept of food security has significantly expanded (compared to the first version of 1996) [5, 6]. In 2009, the World Food Summit gave a comparative concept of food security: «Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life», and after 2009, food security began to be understood not only

as physical and economic access to food, but also as social. Based on this definition, food security is based on four main dimensions, presented in Figure 2.

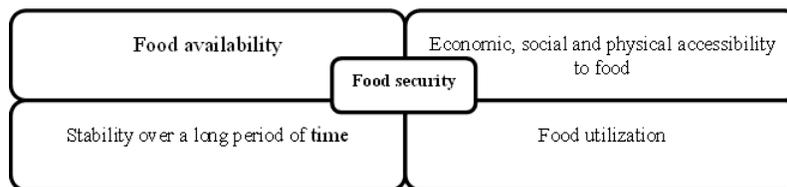


Fig. 2 - The concept of food security based on the four main dimensions

In the process of developing the concept of food security, the term nutritional security was introduced, which was interpreted by the International Food Policy Research Institute (IFPRI) «as an adequate level of nutrition in terms of protein, calories, vitamins and minerals for all household members at all times». In turn, the Food and Agriculture Organization (FAO - from FAO, Food and Agriculture Organization) of the United Nations in 2012 proposed the following definition of nutrition security:

Global food security is maintained by 35 international organizations, which try to solve not only the above-mentioned problems, but also the problems of production efficiency, export-import balance, organization of food aid to the poor population. The world institutional structure of modern food security began to take its shape and actively formed immediately after the Second World War, when the enthusiasm of mankind was filled with the desire to qualitatively change the world for the better and harmonize it in terms of justice and security. The foundation of the world food system of food security was the establishment in 1945 under the auspices of the UN Food and Agriculture Organization – FAO (Food and Agricultural Organization). Forty-four countries took part in the creation of a specialized international institution in the field of nutrition, food and agriculture, which approved the Charter and laid the foundation for a new milestone in the formation of world food security.

The key international organization dealing with food security is the Food and Agriculture Organization of the United Nations (FAO).

The Food and Agriculture Organization of the United Nations (FAO) plays an important role in the management of global world food security, providing food assistance in 75 countries around the world. FAO, in accordance with its goals, is called to solve the problem of food deficit worldwide and its mission «for a world without hunger» determines its importance in the system of global world economic regulation of the food sphere.

The current vectors of FAO's development are in two directions:

- world food security and access to food for everyone living on the planet;
 - on the basis of innovative achievements of mankind to form high-tech, sustainable development of food production in balance with social development of rural areas.
- These vectors are aimed at amortization of global challenges of the modern world:
- uncontrollably rapid growth of the world's population with great risks of hunger for the population of poor countries;
 - inevitable depletion of the planet's natural resources against the background of growing demand for food;
 - great competition in the agricultural market, leading to falling prices and ruin of agricultural producers;
 - globalization of the agricultural market and dominance of transnational corporations in it;
 - growing dependence of developing countries on imported products;
 - reduction of food consumption in poor countries

against the background of increased consumption in developed countries. To ensure world food security FAO forms its budget from two sources - mandatory contributions of participants and voluntary contributions. It is noteworthy that

recently there has been an upward trend in voluntary contributions.

Table 1 compares FAO' s food security assessment indicators with those used by the U.S. Department of Agriculture.

Table 1 - Food security indicators [7, 8]

U.S. Food Security Indicators	FAO Food Security Indicators
Availability	
Average dietary energy supply Average caloric intake Share of dietary food, root crops and tuber crops Average protein content Average protein content of animal origin	Average energy value of the diet Average food production Share of cereals, root and tuber crops in the energy value of the diet Average protein intake Average animal protein intake
Physical access	
Percentage of paved roads out of total number of roads Railroad density Road density	Percentage of paved roads in relation to all roads Gross domestic product per capita (purchasing power equivalent)
Economic access	
Index of domestic food price level	Domestic food industry price index
Utilization	
Access to improved water resources Access to improved treatment services	Access to improved water sources Access to improved sanitation facilities
Outcomes	
Inadequate access to food Prevalence of undernutrition Proportion of expenditure on food by the poor Depth of food deficiency Prevalence of food inadequacy	Prevalence of malnutrition Share of food expenditures in the budget of poor households Extent of food insecurity Prevalence of food insecurity
Utilization	
Proportion of children under 5 years of age with dystrophy Proportion of children under 5 years of age with atrophy Proportion of children under 5 years of age who weigh less than the normal weight Proportion of adults who weigh below the norm	Percentage of wasting in children under 5 years of age Percentage of children under 5 years of age who are stunted Percentage of children under 5 years of age who are underweight Percentage of adults who are underweight Anemia among pregnant women Anemia among children under 5 years of age Vitamin A deficiency in the population Iodine deficiency
Vulnerability/Stability	

Domestic food price volatility index Variability of food production per capita Variability of food supply per capita Political stability and absence of violence/terrorism Volume of imported food in total merchandise exports Percentage of arable land equipped with Irrigation facilities Level of dependence on imported cereals	Volatility of domestic food prices Variability of food production per capita Variability of food supply per capita Political stability and absence of violence/terrorism Share of food imports in total imports of goods Percentage of arable land with irrigation equipment Degree of dependence on cereal imports
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As can be seen from the table below, both methodologies are quite similar and there are only differences in some individual items.

Table 2 - UNICEF indicators for assessing food security and nutrition at national and regional levels [9, 10]

Factors taken into account	Indicator	Intended for diagnostics
nutritional status	Percentage of body weight deficiency	Moderate and severe degree – less than minus two standard deviations from the average weight for a given age among the surveyed population;
	Percentage of growth deficit	Moderate and severe degree – less than minus two standard deviations from the average height for age among the surveyed population
	Percentage of hypotrophy	Moderate and severe degree – less than minus two standard deviations from the average weight for height among the surveyed population
	Vitamin A deficiency	The percentage of children aged 6 to 59 months who received at least one capsule of high-dose vitamin A in a given year
	Percentage of mothers with a low body mass index (BMI)	The percentage of women whose BMI is less than 18.5, where BMI is an indicator of an adult’s nutritional status.
food ration	Calorie consumption	Average daily calorie intake – if possible, detailed by age, gender and stage of life cycle
Health status	Low birth weight	Percentage of newborns with a body weight of less than 2,500 g
	Under-five mortality	The probability of death from the moment of birth to 5 years per 1,000 live births
	rate Infant mortality	Probability of death from birth to 1 year per 1,000 live births
	The prevalence of common diseases	Incidence of diarrhea 5 per 1,000: number of children with diarrhea per 1,000 among the surveyed population.
	Vaccination rate	Percentage of surviving children aged 12-23 months who received the measles vaccine (line A), three DPT vaccinations (DPT) (line B), all vaccinations, namely BCG, three DPT vaccinations, oral polio vaccine, measles vaccine (line C); children who were not vaccinated (line D).

	The prevalence of HIV/AIDS in the adult population	The percentage of the adult population (15-49 years old) living with HIV/AIDS.
	Estimated number of people living with HIV/AIDS	Estimated number of adults and children living with HIV/AIDS
	HIV prevalence among pregnant women	Percentage of blood samples taken from pregnant women aged 14-24 who tested positive for HIV in unrelated anonymous studies
	Children whose parents died of AIDS	Estimated number of children (from 0-14 years old) at the end of the year, one or both of whose parents died of AIDS
	Total Fertility Rate (TFR)	The average number of children born to one woman during her lifetime, according to the average fertility rate in her age group for each age.
	Water supply and sanitation	Percentage of household members with drinking water supply. Percentage of household members using latrines or toilets
Education	Adult literacy rate	The percentage of the literate population aged 15 years and above
	The level of education	The percentage of the population in this age group who has received any level of education
	Literacy rate	The illiterate part of the population (in %) is considered to be people aged 20 and above who did not go to school or attended primary school for some time.
	Net percentage of primary school students / attendance	Percentage of boys and girls enrolled in primary school according to UNESCO (UNESCO Institute of Statistics) reports
Food availability	Population	The total number of people. The projected population data is based on various predictive models
	Annual population growth rate	The rate at which the population grows/decreases in a single year, expressed as a percentage of the size of the base population.
	Average household size	The average number of people in each household, which is why a household is considered to be a person or a group of people living in a common dwelling (or part of it) at least 4 days a week, and who jointly provide themselves with food and basic necessities – in other words, living together as a family unit.
	Food production	Climate indicators: - amount of precipitation (magnitude, distribution); t temperature (average annual average, temperature range throughout the year); wind; floods, droughts; Crop production and production system: - the main crop (food, cash); production system, etc. Land and soil: soil quality (depletion, desertification); availability/shortage of land The main diseases of livestock and crops; Methods of production/agriculture/animal husbandry Shortage of workers

Economic indicators	Food expenses	- general expenses; - food expenses; - share of food expenses
	Infrastructure	- Availability of roads (km of roads); - availability of schools (number of schools/residents); - medical care (number of hospital beds, degree of vaccination, etc.); - markets (distance to local/regional markets), etc.
	Markets	- Types of goods in local/regional markets; - Prices for basic food products; - Price fluctuations , etc.
	Gross national income per capita	GNI per capita is the gross national income divided by the average annual population.
	GDP per capita	Gross domestic product (GDP) is the amount of value added produced by all resident producers plus any taxes on products (minus subsidies) not included in the cost of products. GDP per capita is the gross domestic product divided by the average annual population.
	Percentage of the population living below the poverty level	The usual method of measuring poverty is based on income or consumption level. A person is considered poor if his level of consumption or income is below a certain minimum level that allows him to meet basic needs.
	Purchasing Power Parity (PPP)	Purchasing power parity measures the relative purchasing power in currencies of different countries
	The Gini coefficient	The Gini coefficient is a measure of income inequality. It is a number from 0 to 1, where 0 means complete equality (all people's income is the same), and 1 means complete inequality (i.e. one person gets all the income, everyone else gets nothing).
	Social and political environment	- Political stability; - migration rate; - conflicts/ uprisings

International and national organizations have also developed standards for per capita food consumption. These indicators have different values in different countries and in different years. This is due to peculiarities in the composition and structure of the population by years, which is reflected in the average values of indicators; with differences in natural and climatic conditions and traditions of the population; with changes in scientific data on the structure of nutrition and the amount of food consumed; other reasons (social, political, etc.).

In the USA, Japan, most countries of the European Union the issues of food supply have been generally solved, and the remaining problems

are connected with social, ecological, medical and cultural aspects; whereas in many developing countries the problem of hunger remains acute, as it was mentioned above 4, caused by poor development of agrarian production, poverty, low incomes of the population and military conflicts.

Food security in Canada, is not as volatile as in other countries and factors such as inflation and COVID-19 have significantly affected food security in the country. According to Statistics Canada's 2022 report, about 18.4 percent of residents in 10 Canadian provinces face food insecurity. The percentage of households experiencing food insecurity increased in all provinces – an increase

from pre-Covid-19 data in 2019.

While Covid-19 has dramatically contributed to worsening food insecurity, millions of people have already been affected. According to the Global Food Crisis Report, countries affected by conflict, economic crisis and climate change are most at risk: the Democratic Republic of Congo, Ethiopia, Afghanistan, Nigeria, Yemen, Myanmar, Syria, Sudan, Ukraine and Pakistan are among the top 10 most vulnerable countries.

The PRC leadership has pursued a food security policy since 1978. In 1996, the White Paper on China's Food Problem was developed and a red line was set for the country's food self-sufficiency at a level of at least 95% 24; 25. To achieve this goal, the PRC has adopted a number of legislative acts, medium- and long-term programs: the Law of the PRC on Agriculture, the Program for Support and Development of Poor Rural Areas, the Program for Development of Food Production and Improvement of its Nutritional Quality, the Program for Development of Agricultural Science and Technology, and others.

To ensure food security, cooperation between countries within the CIS can be considered important. The CIS leadership is working to achieve and maintain food security of its member states. This is considered one of the priority areas of interstate cooperation and the most important factor in ensuring national security of the states, is based on the processes of interstate specialization and integration in the sphere of agro-industrial complex, the development of exports within the Commonwealth and the provision of targeted assistance to improve the nutrition of various segments of the population through the implementation of programs: «school meals», «summer meals», «food stamps», «mother and child» nutrition, etc.; unification of legislative normative and other documents, state quality standards for raw materials and food products; organization of quality and safety control of products along the entire technological chain and border control; stimulation of production of high-quality products and their certification, etc. The Concept and Complex of Joint Measures to

Improve Food Security of the CIS members have been developed and adopted. They provide for a fuller and more efficient use of natural, production, economic and financial resources. To achieve a synergetic effect and find adequate concessions in solving problems related to agriculture, water resources, energy, land resources and climate change, it is necessary to more actively involve decision-making processes on an integrated basis at the national and regional levels.

Conclusion. Foreign experience in ensuring food security and sustainable development of agriculture indicates that increasing the competitiveness of the relevant branch of the national economy is impossible without an effective mechanism of state support for agricultural producers. The systematic study of various aspects of ensuring long-term sustainability of the food system is of paramount importance for improving public policy for the development of the agro-industrial complex of the country and its regions.

There is a need to increase the productivity of agricultural systems worldwide and to reduce agricultural waste generation. There is a need to adopt sustainable agricultural practices in a holistic and integrated manner and to achieve sustainable food systems, including both food production and consumption.

Ensuring food security requires the development of theoretical foundations, including precise definitions of the conceptual apparatus (food security and nutrition security; food independence, etc.), correlation of terms; allocation of levels and definition of principles for ensuring food security at different levels of governance, etc. The theoretical framework should be developed.

For practical realization of theoretical results of scientific research it is necessary to study the available international and domestic experience in ensuring food security. Given the global nature of the modern economy and the basic importance of the problem, it is advisable to link its solution to the issues of international cooperation in the field of providing the population with food.

In the coming decades, climate change,

global population growth, rising food prices and environmental stressors will have a significant but uncertain impact on food security. Humanity faces the need for adaptation strategies and policy responses to global change, including options for addressing water allocation, land use patterns, food trade, post-harvest food processing, and food prices and safety.

Cooperation of the post-Soviet countries within the framework of international associations will make it possible to confront international challenges and other risks, ensuring food security of each state.

Ensuring food security of the country, it is necessary to introduce the latest technologies and move to a digital economy in the agro-industrial complex, to develop unified high quality requirements for products within the framework of international organizations (EAEU, etc.), to establish export and import quotas, ensuring, as a priority, the food security of their country and allied countries. Income plays an important role in ensuring food security of the family and each person, preserving his/her efficiency and health: the level of wages, pensions and benefits, etc.; which requires attention at all levels of the management hierarchy.

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Information about the authors

Asainov A. Zh.- PhD student at the Higher University of Mongolia, Senior Lecturer at the Kazakh University of Technology and Business named after K. Kulazhanov, Astana, Kazakhstan, arhat_asainov@mail.ru;

Butkenova A.K. - Doctor of Science, Associate at the Kazakh University of Technology and Business named after K. Kulazhanov, Astana, Kazakhstan, Butkenova@mail.ru;

Bokenchin K.K. - PhD, Associate Professor at the Kazakh University of Technology and Business named after K. Kulazhanov, Astana, Kazakhstan, bokenchin.k@mail.ru;

Bayadilova B.M.- PhD; Associate Professor Kazakh University of Technology and Business named after K. Kulazhanov, Astana, Kazakhstan, e-mail: melisovna@mail.ru;

Sadu Zh.N.- Ph.D. (Econ.), Senior Lecturer, Kazakh University of Technology and Business named after K. Kulazhanov, Astana, Kazakhstan, e-mail: sdm_2008@mail.ru

Сведения об авторах

Асаинов А.Ж.- докторант Высшего университета Монголии, старший преподаватель Казахский университет технологии и бизнеса имени К. Кулажанова, Астана, Казахстан, arhat_asainov@mail.ru;

Буткенова А.К - доктор по профилю, ассоциированный профессор Казахский университет технологии и бизнеса имени К. Кулажанова, Астана, Казахстан, Butkenova@mail.ru;

Бокенчин К.К.- доктор PhD, ассоциированный профессор Казахский университет технологии и бизнеса имени К. Кулажанова, Астана, Казахстан, bokenchin.k@mail.ru;

Баядилова Б.М. -доктор Ph.D; ассоциированный профессор Казахский университет технологии и бизнеса имени К. Кулажанова, Астана, Казахстан, e-mail: melisovna@mail.ru;

Саду Ж.Н.- к.э.н, старший преподаватель, Казахский университет технологии и бизнеса имени К. Кулажанова, Астана, Казахстан, e-mail: sdm_2008@mail.ru