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Indicators of the level of food security in Ukraine

Summary. The article analyzes the domestic and world methods of assessing the level of food security. The national peculiarities of food security are considered, its level in Ukraine is analyzed according to the indicators of daily energy value of human diet, consumption of different types of food per capita, food structure and food independence. The calculated indicators of adequacy of consumption for certain foods are quite low, in particular: fish and fish products; fruits, berries and grapes; milk and dairy products; meat and meat products. These indicators are evidence of an imbalance in the diet of the population, which is trying to provide their own energy needs through more affordable products. The key problem of food security in Ukraine today is the affordability of products. It is the low purchasing power of the population that in some way hinders the development of production and the economy as a whole.

Key words: food security, food security indicators, food consumption, accessibility, solvency

Introduction

The country's food security has a strategic importance, which determines not only food but also national security. Ensuring the country's food security determines the general foundations of domestic and foreign policy, social stability in society, solving the demographic problem and improving the quality of life.

The concept of national food security is closely related to the concept of food independence (self-sufficiency), security, satisfaction of food needs of the population through the required level of own production.

The problem of food security becomes especially acute in modern conditions of economic downturn, accompanied by inflation, falling living standards, rising social tensions.

The effectiveness of solving this problem reflects the level of development of the agro-industrial complex and the economy as a whole, political independence and stability, the ability of the state to satisfy one of the urgent needs of its citizens – the need for food.

Methodology

The state of food security at the level of an individual country is influenced by many factors: from production to weather conditions, geographical location and even corruption. Based on this, the calculation of the level of food security requires taking into account many factors and forming on the basis of a certain overall rating.

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Taking the main factors into account, in 2012 the research unit of the Economist magazine proposed The Global Food Security Index¹. The Global Food Security Index considers the main issues of food availability, accessibility and quality in 113 countries. The index is a dynamic quantitative and qualitative benchmarking model built on 28 unique indicators that measures the importance of these food security factors in both developing and developed countries.

The index till 2016 consisted of three general indicators: quality and safety, financial affordability and physical affordability of food. In 2017, a fourth indicator was added – natural resources and sustainability. This category assesses a country's exposure to the impacts of a changing climate; its susceptibility to natural resource risks; and how the country is adapting to these risks. This change in the calculation methodology is due to the fact that in 2017, for the first time in five years, there was a deterioration in global food security. In addition to traditional risks, global warming and adverse weather conditions are playing an increasingly important role².

Assessment of the state of food security of Ukraine is carried out in accordance with the Methodology for determining the main indicators of food security, approved by the Cabinet of Ministers of Ukraine dated 05.12.2007 no 1379 Some issues of food security³. Such indicators of food security are:

- daily energy value of the human diet;
- providing the human diet with the main types of products;
- adequacy of grain stocks in state resources;
- economic availability of products;
- differentiation of the cost of food by social groups;
- capacity of the domestic market of individual products;
- food independence for a particular product.

According to a certain method, the indicators that characterize the state of food security of the state (region) are calculated for the following main groups of food products: bread and bakery products; potato; vegetables, watermelons, melons and gourds; fruits, berries and grapes; sugar; oil; meat and meat products; milk and dairy products; fish and fish products; eggs. In this case, the method of evaluation of indicators involves determining their optimal, threshold and threshold levels.

Research results

Since 2014, Ukraine's position in the rating of the Global Food Security Index has been declining. In 2018, the country ranks 63rd with a total of 55.7. However, it should be noted the increase in indicators of availability and quality/safety of food – 73 and 46 places, respectively.

¹ The Global Food Security Index, <https://foodsecurityindex.eiu.com/> (access: 20.03.2020).

² What is world food security and why Ukraine ranks 63rd in the ranking, <https://bakertilly.ua/news/id44424> (access: 25.03.2020).

³ Some food security issues. Resolution of the Cabinet of Ministers of Ukraine of December 5, 2007, no 1379, <https://zakon.rada.gov.ua/laws/show/1379-2007-%D0%BF> (access: 25.03.2020).

According to the data of Index, the main advantages of the country include a relatively small percentage of people below the global poverty line (99.8 points out of a maximum of 100). In addition, strengths include food safety indicators (98.4 points), low food losses, moderate tariffs on agricultural imports, low production volatility and the availability of food security programs. Among the most serious problems, experts attributed the low level of GDP per capita, insufficient funding for research and development in the agricultural sector, as well as the risks of political instability. Ukrainian farmers also have problems with access to cheap loans⁴.

In the 2019 ranking, compared to the previous year, Ukraine slightly improved its overall score – 57.1, however, the growth rate of many other countries was much higher, as a result of which Ukraine ranked 76th.

In 2019, as in the previous year, the first three leading positions in food security remained Singapore (87.4 points), Ireland (84 points) and the United States (83.7 points), despite the fact that new indicators have been added to the rating, including food expenditures, agricultural infrastructure and food standards⁵.

Analysis of one of the main indicators of the level of food security in Ukraine shows that in 2018 the average daily energy value of the diet of the average Ukrainian continues to decline, as in previous 2015–2017 (Fig.1). It should be noted, that till 2014 there was an increase in this indicator compared to the level of 2000, for which the average daily caloric intake was 2661 kcal, or 106.4% of the limit criterion.

In 2018, the average Ukrainian consumed 2706 kcal per day, which is 233 kcal less than in 2014, for which the level of this indicator was the highest and amounted to 2939 kcal. The caloric content of the diet is still 8.2% higher than the established limit criterion (physiological minimum) – 2500 kcal (1375 kcal – animal products and 1125 kcal – vegetable products)⁶.

The energy value of the average daily diet is formed mainly with the help of plant products consumption, respectively, plant products in the structure of the diet in 2018 accounted for 70.9%, and animal – only 29.1%, which is 25.9% lower than the established average daily physiological minimum for humans (products of animal origin should be 55% in the structure of average daily consumption).

The optimal situation is when the actual consumption of food by a person during the year corresponds to the rational norm, namely, the ratio between actual and rational consumption is equal to one. In recent years, we have noticed a violation of the structure of nutrition due to insufficient actual consumption of high-calorie foods – milk and dairy products, meat and meat products, fruit and fish products, the average annual consumption per capita is much lower than scientifically sound physiological standards.

⁴ The results of the Global Food Security Index 2018, Information and analytical newspaper Agribusiness Today, <http://agro-business.com.ua/agrobusiness/item/11949-oholosheni-rezultaty-doslidzhennia-hlobalnoho-indeksu-prodovolchoi-bezpeky-2018.html> (access: 25.03.2020).

⁵ The Global Food Security Index, <https://foodsecurityindex.eiu.com/> (access: 20.03.2020).

⁶ Some food security..., op. cit.

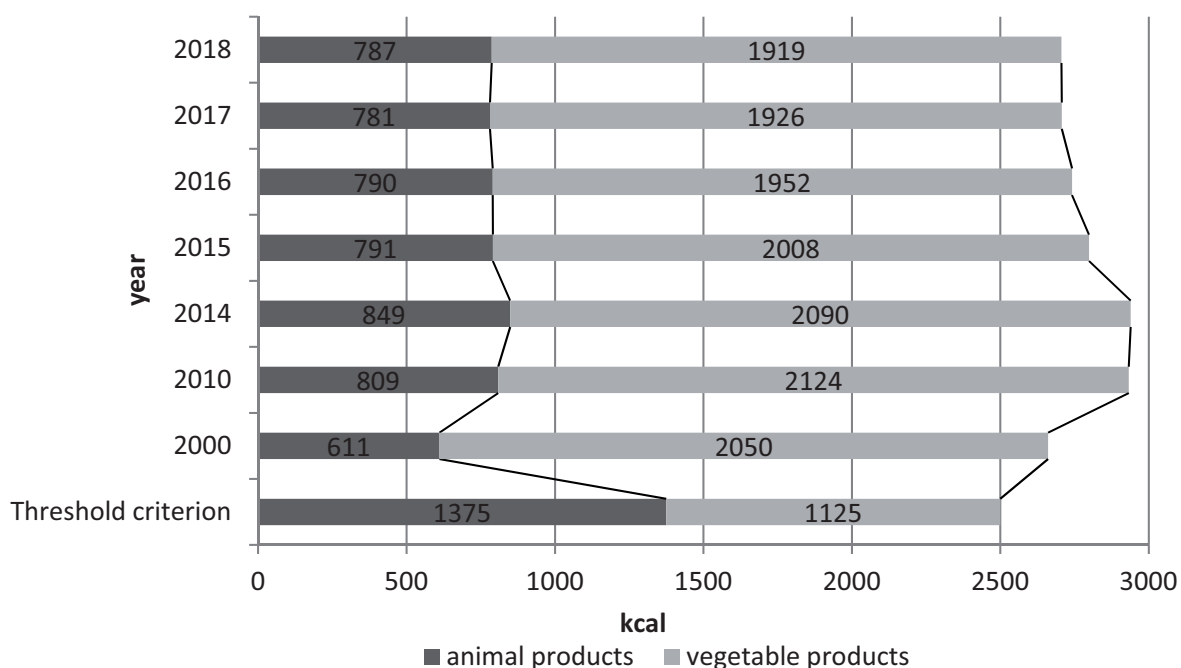


Figure 1. Dynamics of caloric content of average daily food consumption by the population of Ukraine for 2000–2018 per capita [kcal]

Source: made by the author based on data Agriculture of Ukraine 2018: Statistical Yearbook, State Statistics Service of Ukraine, http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/09/Zb_sg_2018%20.pdf (access: 18.03.2020).

Analysis of consumption of basic food products per capita, per year shows that, despite the growth in the dynamics, the food market in Ukraine operates in conditions of low demand of the vast majority of the population for almost all food products except bread, potatoes and vegetables. Thus, the calculation of indicators of adequacy of consumption of basic food products by the population of Ukraine to determine the ratio between actual consumption and rational consumption norms showed that the actual level of consumption during 2000–2018 of most foods does not reach the recommended level (Tab. 1).

Source: calculated by the author according to the data Agriculture of Ukraine 2018: Statistical Yearbook, State Statistics Service of Ukraine, http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/09/Zb_sg_2018%20.pdf (access: 18.03.2020). During the investigation period, the largest lag of actual consumption from the rational was observed for: fruits, berries and grapes – 36 (62%), milk and dairy products – 36 –(48%); meat and meat products – 31 –(59%); fish and fish products – 27 –(58%).

At the same time, the consumption of the least expensive products (eggs, oil, potatoes, bread and bread products) reached or exceeded the recommended level. During the economic crisis, due to a significant increase in food prices, the population limits itself in the consumption of meat and dairy products, fish and fish products, and fruits, as their cost is much higher than other foods. Accordingly, the consumption of cheap bakery products, eggs, potatoes and vegetables is increasing. Therefore, the energy needs of the population are provide by increasing the consumption of cheap (more af-

Table 1. Indicators of adequacy of annual food consumption per one person

Products	Rational norms* [kg]	2000	2010	2014	2015	2016	2017	2018
Meat and meat products	80	0.410	0.650	0.676	0.636	0.643	0.646	0.660
Milk and dairy products	380	0.524	0.543	0.586	0.552	0.639	0.526	0.520
Eggs (pcs)	290	0.572	1.000	1.069	0.966	0.921	0.941	0.948
Bread products	101	1.237	1.102	1.074	1.022	1.000	0.998	0.985
Potato	124	1.092	1.040	1.137	1.109	1.127	1.156	1.124
Vegetables, water-melons, melons and gourds	161	0.632	0.891	1.014	0.999	1.017	0.988	1.018
Fruits, berries and grapes	90	0.326	0.533	0.581	0.566	0.552	0.587	0.642
Fish and fish products	20	0.420	0.725	0.555	0.430	0.480	0.540	0.590
Sugar	38	0.968	0.976	0.955	0.940	0.876	0.800	0.784
Oil	13	0.723	1.138	1.008	0.946	0.900	0.900	0.915

*Food consumer basket – 2016 VS rational norms, <http://edclub.com.ua/analytika/prodovolchyy-spozhyvchyy-koshyk2016-vs-racionalni-normy> (access: 18.03.2020).

fordable) products, which indicates an imbalance in the diet of the population. Moreover, the reduction in consumption of some products may be due, not only economic, but also ethical and religious reasons.

In general, there is a tendency to increase the food adequacy index. Despite these positive changes, the level of consumption of most products still remains lower than the recommended norms. The highest level of consumption and the most balanced diet is observed in 2014.

The level of consumption of such important for the human body products as meat, fish, fruits and berries, although it has a general tendency to increase during 2000–2018, but in 2018 does not ensure the achievement of not only rational physiological norms of consumption, but even minimal, forming a food consumer basket (Tab. 2).

The determining cause of insufficient consumption of certain foods is the decline in real incomes. Average wages have risen by almost 110% over the past eight years, while basic food prices have risen by 270 to 490%, depending on the species. Thus, in 2015, Ukrainians could afford to buy 1.5–2.5 times less products than in 2008 (the year of the global crisis), the worst since the Great Depression⁷.

⁷ The purchasing power of Ukrainians is declining, https://antikor.com.ua/articles/70185_kupiveljna_spromohnistj_ukrajintsiv_vse_biljshe_padaje (access: 25.03.2020).

Table 2. The level of annual food consumption in 2018 per one person [kg]

Products	Food consumer basket*	Rational norms (MOH)	Food consumer basket compared to the rational norm		Actual consumption in 2018	
			+; – [kg; pcs]	%	+; – [kg; pcs]	in to the rational norm [%]
Meat and meat products	51.9	80	–28.1	64.9	52.8	66.0
Milk and dairy products	327.6	380	–52.4	86.2	197.7	52.0
Eggs (pcs)	220	290	–70	75.9	275	94.8
Bread products	94.7	101	–6.3	93.8	99.5	98.5
Potato	95	124	–29	76.6	139.4	112.4
Vegetables, water-melons, melons and gourds	110	161	–51	68.3	163.9	101.8
Fruits, berries and grapes	85.2	90	–4.8	94.7	57.8	64.2
Fish and fish products	13.7	20	–6.3	68.5	11.8	59.0
Sugar	30.6	38	–7.4	80.5	29.8	78.4
Oil	8.1	13	–4.9	62.3	11.9	91.5

*B. Paskhaver: The food dimension of poverty alleviation, The economy of Ukraine 2004, no. 10, p. 71–76.

Source: calculated by the author according to the data Agriculture of Ukraine 2018: Statistical Yearbook, State Statistics Service of Ukraine, http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/09/Zb_sg_2018%20.pdf (access: 18.03.2020).

The next indicator that characterizes the food security of the state is the economic affordability of food – products a stable opportunity for the population to purchase basic food products of appropriate quality in the quantity and range needed to ensure nutrition. This indicator is defined as the share of food expenditures in the sum of total expenditures of households.

In 2018, the total expenditures of households was, on average, UAH 7438.06 per month, which is 19.5 % more than in the previous year. Of this total, households spent UAH 3366.96 per month on food, or 45.3% of total cash expenditures⁸. In 2014, on average, households spent UAH 1766.14 per month on food, which was 47.8% of the amount of money spent⁹. Thus, the indicator of food availability in 2014 reached 47.8%, with its 60 percent threshold, and in 2018 it was 45.3% In the overall structure of food expenditures, the highest share was occupied by the costs of: meat and meat products

⁸ Statistical Yearbook, Expenditures and resources of households in Ukraine 2018, http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/06/zv_vrdu2018.pdf (access: 18.03.2020).

⁹ Statistical Yearbook. Expenditures and resources of households in Ukraine 2014, http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/06/zv_vrdu2018.pdf (access: 18.03.2020).

– 21.9% in 2014, and in 2018 increased to 22.9%; bread and bakery products – 15.3% and 16%, respectively, as well as 10.5% for milk and dairy products (Figs 2, 3).

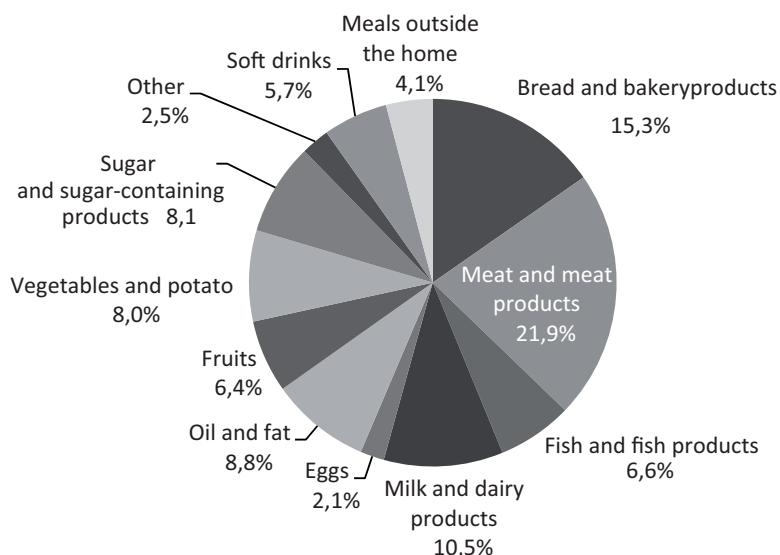


Figure 2. Structure of food expenditures of Ukrainian households in 2014 [%]

Source: made by the author based on the data Statistical Yearbook, Expenditures and resources of households in Ukraine 2014, http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/06/zb_vrdu2018.pdf (access: 18.03.2020)

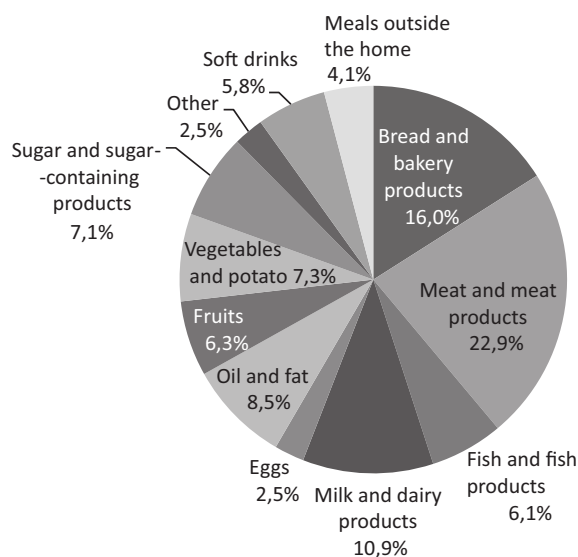


Figure 3. Structure of food expenditures of Ukrainian households in 2018 [%]

Source: made by the author based on the data Statistical Yearbook, Expenditures and resources of households in Ukraine 2018, http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/06/zb_vrdu2018.pdf (access: 18.03.2020)

The availability of food is limited by the solvency of the population. In 2014, the average monthly cost of a set of products was 47.8% of the average monthly salary, in 2018 the cost of food (including meals outside the home) was 45.3%, which is 2.5 percentage points less than in 2014, however, these figures are twice the data for the EU, where the share of food costs is determined in the range of 20–25%¹⁰.

Reducing the share of food costs does not allow us to conclude that improving the affordability of food for the population of Ukraine. Taken the analyzed previous indicators on the caloric content of the diet and the adequacy of consumption of certain products, where there is a marked deterioration, it should be understood, that it is not about improving economic access to food by increasing the purchasing power of Ukrainians, but the reorientation of family budgets due to the quality and quantity of food (confirmed by indicators 1 and 2).

Low purchasing power of the population in some way hinders the development of production and the economy, as a whole. Solvent demand is an important component that forms the basis for the formation of food market capacity. With limited solvency, a significant part of production is produced on personal farms of the population and consumed directly by producers, i.e. passes the stage of exchange, which reduces the demand for the value determined by the consumption of own products.

Another important indicator for assessing the level of food security, which is included in the domestic Methodology, is the country's import dependence on a particular product. The limit criterion for this indicator is set at 30%. In 2018, satisfying the needs of the population in food, within its purchasing power, is almost entirely provided by domestic products, with the exception of fruits and berries. It should be noted, that Ukraine is increasing grain exports. With the increase in exports, imports of some types of products are also growing. Imports of fruits, berries and grapes, as well as meat and meat products, increased the most. The share of imports by these groups in total consumption is very high and in 2018 is 35.9% with a 30 percent threshold criterion), as well as oils (the share of imports – 51.7%) and meat and meat products share of imports – 12.7%)¹¹. In part, a significant percentage of imports of fruits, berries and oil is determined by the import into Ukraine of products that are not produced in our natural and climatic conditions: tropical fruits, olive oil, so on.

Providing food security in Ukraine requires the maintenance of an appropriate level of food self-sufficiency, which involves the use of state support for domestic agricultural producers and the use of measures to control imported products to protect their own producers from foreign competition.

¹⁰ І.В. Кошкалда: Питання продовольчої безпеки в контексті міжнародної інтеграції аграрного сектору економіки України. Матер. наук. практ. конф. "Сучасні проблеми та перспективи міжнародної інтеграції" аграрного сектору економіки України". Київ: ННЦ "ІАЕ" 2015. С. 144–148.

¹¹ Agriculture of Ukraine 2018: Statistical Yearbook. State Statistics Service of Ukraine, http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/09/Zb_sg_2018%20.pdf (access: 18.03.2020).

Conclusions

Food security is the most important component of the national security of any state. In the context of active European integration, on the one hand, and, at the same time, a large-scale socio-economic crisis and hostilities in the east, Ukraine faces significant challenges in ensuring its food security.

The defining requirement of food security both at the international level and at the state level is a stable supply of food in sufficient quantities. However, just ensuring sufficient food production does not guarantee an adequate level of food security. Market equilibrium is always maintained in such a way that production is ready to increase at any time as soon as effective demand increases, but actually produces as much as real (primarily financial) demand allows. It is because of its decline in Ukraine that the physical volume of the social product is constantly declining.

The analysis of food security indicators showed, that Ukraine is able not only to ensure food security in the domestic market, but also to strengthen its position at the global level. Ukraine's position in the Global Food Security Index can be significantly improved due to "non-food" factors – achieving political stability, improving macroeconomic indicators, increasing incomes, overcoming corruption, stimulating and financing research and innovation, so on.

To ensure the stability of Ukraine's food security, it is necessary to focus on a comprehensive problem solving. This approach should cover economic, political, legal, innovative and social aspects. On the one hand, it is the ability to mobilize domestic resources and agro-industrial potential of the country to produce sufficient food, on the other – the ability to provide the food needs of the population, increasing its income. A sufficient number of food products, their availability provide social and political stability in society, creating conditions for economic development of the state.

Based on the experience of economically developed countries, we note that the state must provide price support for the income of agricultural producers, eliminating price disparities in trade between industry and agriculture, between urban and rural areas.

An integrated approach to solving the problem guarantees not only the country's food security based on the development of agriculture and the food sector as a whole, but also the stability of the entire economy.

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