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**Shebanina Olena**, Doctor of Economics, Professor, Dean of the Faculty of Management, Mykolayiv National Agrarian University, Mykolayiv, Ukraine

**ORCID ID:** 0000-0001-7663-5991

**e-mail:** shebanina@mnau.edu.ua

**Burkovska Anna**, PhD (Economics), assistant of the department of management and marketing, Mykolayiv National Agrarian University, Mykolayiv, Ukraine

**ORCID ID:** 0000-0003-0563-6967

**e-mail:** anna.burkovskaya12@gmail.com

**Lunkina Tetiana**, Doctor of Economics, Associate Professor, Professor of the Department of Finance, Banking and Insurance, Mykolayiv National Agrarian University, Mykolayiv, Ukraine

**ORCID ID:** 0000-0001-7252-3239

**e-mail:** lunkina\_tanya@i.ua

**Burkovska Alla**, PhD (Economics), Associate Professor of the Department of Finance, Banking and Insurance, Mykolayiv National Agrarian University, Mykolayiv, Ukraine

**ORCID ID:** 0000-0003-4158-1721

**e-mail:** allaburkovska2010@gmail.com

### **Global Aspects of Food Security in the World: Economic Dimensions**

**Abstract. Introduction.** Food security is the basis of national security of any country. The definition of food security is based on four main dimensions, which include the physical availability of food, the economic availability of food, the quality and safety of products, and the environmental sustainability of food production. Thus, if the measurements of the physical availability of food, its quality and environmental safety are mainly related to the sphere of regulation of the system of technologies and sciences related to the production of agricultural products, then the question of the economic availability of food belongs to the sphere of scientific research by economists who develop recommendations for reforming state policy to improve this indicator. The vast majority of studies on the issue of the economic availability of food concern the provision of rational standards of consumption of the nutritional and energy composition of food products. At the same time, the consequences of not complying with these standards of consumption both in the short-term and in the long-term, which lead to the deterioration of the health and productive forces of the population, require a more in-depth study.

**Purpose.** The purpose of the study is to define and analyze the basic aspects of food security through the prism of the economic dimension in order to form a map of bottlenecks in ensuring food security in the world and to find solutions for their elimination.

**Results.** Full provision of food security is possible only under the condition of ensuring its main components: availability, quality, safety of food, as well as economic availability of food products. It is possible to ensure the ability of citizens to purchase the necessary nutrients through a comprehensive policy of increasing the level of real incomes of the population, as well as through the development of agricultural technologies. Decreasing the quality of the diet leads to systemic problems with the health of the population, which affects the composition and quality of labor resources in the country, and, as a result, affects the development of productive forces.

**Conclusions.** The insufficient level of food security, which is based on the economic impossibility of providing adequate nutrition for the population, leads to systemic health problems and reduces productive potential. In addition to the crisis caused by the epidemiological consequences, the outbreak of hostilities in Ukraine led to the deepening of the global economic and food crisis. The significant rapid growth of the consumer price index for food confirms the fact that food prices have risen, which forces many consumers to review their consumption habits. This change in consumption habits often leads to a deterioration of the diet, which in developing countries leads to malnutrition, and in developed countries can serve as a cause of obesity, even among children. To eliminate the negative effects of unhealthy nutrition, states should take care of the use of advanced agricultural technologies that would help ensure high harvests and reduce food prices.

**Keywords:** food security; economic availability of food; consumer price index; malnutrition; obesity; public policy.

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**Шебаніна Олена**, д-р. екон. наук, професор, декан факультету менеджменту Миколаївського національного аграрного університету, м. Миколаїв, Україна

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**Бурковська Анна**, доктор філософії з економіки, асистент кафедри менеджменту та маркетингу Миколаївського національного аграрного університету, м. Миколаїв, Україна

**Лункіна Тетяна**, д-р. екон. наук, доцент, професор кафедри фінансів, банківської справи та страхування Миколаївського національного аграрного університету, м. Миколаїв, Україна

**Бурковська Алла**, канд. екон. наук, доцент кафедри фінансів, банківської справи та страхування Миколаївського національного аграрного університету, м. Миколаїв, Україна

### Глобальні аспекти продовольчої безпеки у світі: економічні виміри

Продовольча безпека є основою національної безпеки будь-якої країни. Визначення продовольчої безпеки базується на чотирьох основних вимірах, які включають фізичну доступність їжі, економічну доступність їжі, якість і безпечність продуктів та екологічну стійкість виробництва харчових продуктів. Таким чином, якщо вимірювання фізичної доступності продовольства, його якості та екологічної безпеки в основному належать до сфери регулювання системи технологій і наук, пов'язаних з виробництвом сільськогосподарської продукції, то питання економічної доступності продовольства належить до сфери наукових досліджень економістів, які розробляють рекомендації щодо реформування державної політики щодо покращення цього показника. Переважна більшість досліджень з проблеми економічної доступності харчових продуктів стосується забезпечення раціональних норм споживання харчового та енергетичного складу харчових продуктів. Водночас потребують більш поглибленого вивчення наслідки недотримання цих нормативів споживання як у короткостроковій, так і в довгостроковій перспективі, які призводять до погіршення здоров'я та продуктивних сил населення.

Повноцінне забезпечення продовольчої безпеки можливе лише за умови забезпечення основних її складових: наявності, якості, безпеки харчових продуктів, а також їх економічної доступності. Забезпечити можливість громадян придбати необхідні поживні речовини можна шляхом проведення комплексної політики підвищення рівня реальних доходів населення та за допомогою розвитку агротехнологій. Зниження якості харчування призводить до системних проблем зі здоров'ям населення, що позначається на складі та якості трудових ресурсів країни, і, як наслідок, позначається на розвитку продуктивних сил.

Недостатній рівень продовольчої безпеки, в основі якого лежить економічна неможливість забезпечити повноцінне харчування населення, призводить до системних проблем зі здоров'ям та зниження виробничого потенціалу. Крім кризи, викликаної епідеміологічними наслідками, початок бойових дій в Україні призвів до поглиблення світової економічної та продовольчої кризи. Значне швидке зростання індексу споживчих цін на харчові продукти підтверджує факт зростання цін на них, що змушує багатьох споживачів переглянути свої споживчі звички. Ця зміна споживчих звичок часто призводить до погіршення дієти, що в країнах, що розвиваються, призводить до недоїдання, а в розвинених країнах може служити причиною ожиріння навіть у дітей. Щоб усунути негативні наслідки нездорового харчування, держави мають подбати про використання передових агротехнологій, які б допомогли забезпечити високі врожаї та знизити ціни на продовольство.

**Ключові слова:** продовольча безпека; економічна доступність продовольства; індекс споживчих цін; недоїдання; ожиріння; державна політика.

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**Formulation of the problem.** One of the main components of the national and economic security of the state is its food security. Along with other problems of economic development in modern conditions, the problem of food security is becoming more and more acute and occupies an increasingly important role in the structure of economic security. This includes food security of different countries and regions, food independence, food safety for the life and health of the population. Solving the problems of food security and its provision is important and must be considered at the regional and state levels.

In the modern state, food security is considered as a component of national security and is one of the main priorities of economic policy. Given the lack of study of the issue, the perspective of further research is the global experience of raising the standard of living of the population through increasing real incomes to increase the economic availability of food

products and ensure food and social stability in society.

**Analysis of recent research and publications.** Problems of economic provision of food security in the world are widely studied by domestic and foreign scientists. Thus, in particular, V. Mrdalj and H. El Bilali [1] considered the issue of ensuring food security through the rationalization of trade logistics and strengthening the influence of state regulation on them. The potential for the development of agricultural technologies to ensure food affordability and reduce costs in the industry is explored in the works by T. Cankurtaran-Komurcu and N. Bilgili [2] and R. De Noia, F. Ewert, F. Webber, P. Martre, T. Hertel, M. Ittersum and S. Asseng [3].

Ecological aspects of the impact on agricultural production and their economic consequences became the subject of research by W. Halecki and D. Bedla [4]. The possibility of using crop production waste to provide feed base in animal husbandry is the central

hypothesis of scientific works by K. Abeliotis, C. Chroni, K. Lasaridi, E. Terzis, F. Galliou and T. Manios [5]. Technological innovations capable of increasing agricultural productivity are studied by M. Nijmeh, A. Ragab, M. Emeish B. And Jubran [6]. The use of effective technologies for the processing of food production waste served as the topic of research by K. Ominski, T. McAllister, M. Kim, E. Genet Kebebe, F. Omonijo, M. Cordeiro, G. Legesse and K. Wittenberg [7], as well as C. Agaton C. [8].

**Formulation of research goals.** The purpose of the study is to define and analyze the basic aspects of food security through the prism of the economic dimension in order to form a map of bottlenecks in ensuring food security in the world and to find solutions for their elimination.

**Outline of the main research material.** Food security is a socio-economic and ecological state in the state in which all its citizens are stably and guaranteed to be provided with food in the required quantity, assortment and appropriate quality. One of the fundamental conditions of food security is a sufficient level of economic availability of food, so finding out the reasons for the increase in consumer food prices is an urgent research problem.

The state of food security is also often correlated with changes in the consumer price index for food, as affordability is one of the basic components of food security. Unfortunately, starting from 2020, the global statistics of changes in the consumer price index for food are not optimistic (Fig. 1), which is due to the post-pandemic effect, as well as the systemic crisis in the world.

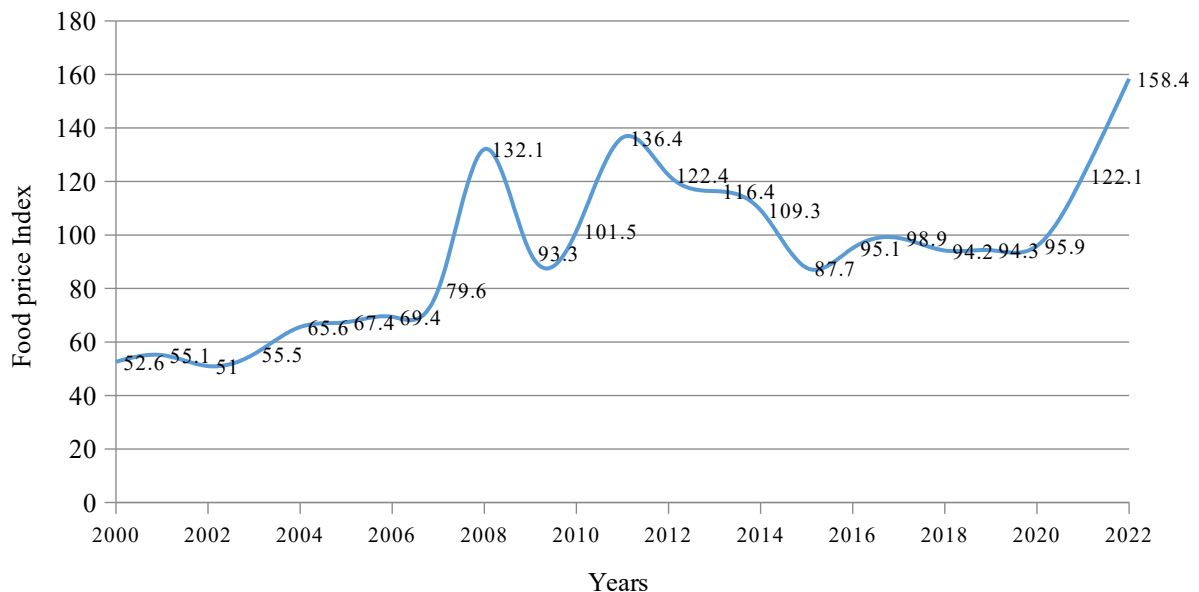


Figure 1 – Monthly food price index from 2000 to 2022

Source: built by the authors on the basis [9]

The FAO Food Price Index (FFPI) averaged 158.4 points in March 2022, up 18.6 points from February 2022 and 36.3 points higher than its level in the corresponding month last year. This marks the highest value for the index for the past 22 years. After the initial price explosion, following the military invasion of Ukraine, the index returned to levels similar to the beginning of 2022 [9].

Over the last period, the world community has significantly intensified the discussion on the prevention of food price escalation as a dangerous phenomenon for the economies of many countries. Emphasis is placed on the importance of improving financial mechanisms for

the organization of trade in basic raw agricultural goods, therefore the initiatives of many international organizations, in particular the World Bank, are aimed at encouraging companies in developing countries to insure against sharp fluctuations in food prices on derivatives markets. At the same time, as a result of the ineffective reform of the agricultural sector and the reduction of monetary incomes of the citizens of many countries, it has led to an imbalance in the domestic market, a drop in consumer demand and the impoverishment of the population, which endangers the provision of food security in the countries of the world.

Food products play a special role in human life. Experts believe that during the lifetime of the current generation, the food problem can turn into a deep international crisis. The central element of food security is the supply of food products, and four components should be distinguished in its structure. Food availability comes in three forms. Physical availability involves the simple availability of essential products on the consumer market, economic availability includes the financial

ability to obtain them, and social availability - minimal differentiation in the consumption of the main groups of products among different segments of the population. Unfortunately, due to hostilities on the territory of Ukraine, there is a situation where millions of citizens face the problem of insufficient food consumption (Fig. 2). This problem manifests itself especially acutely in regions where hostilities are directly taking place.

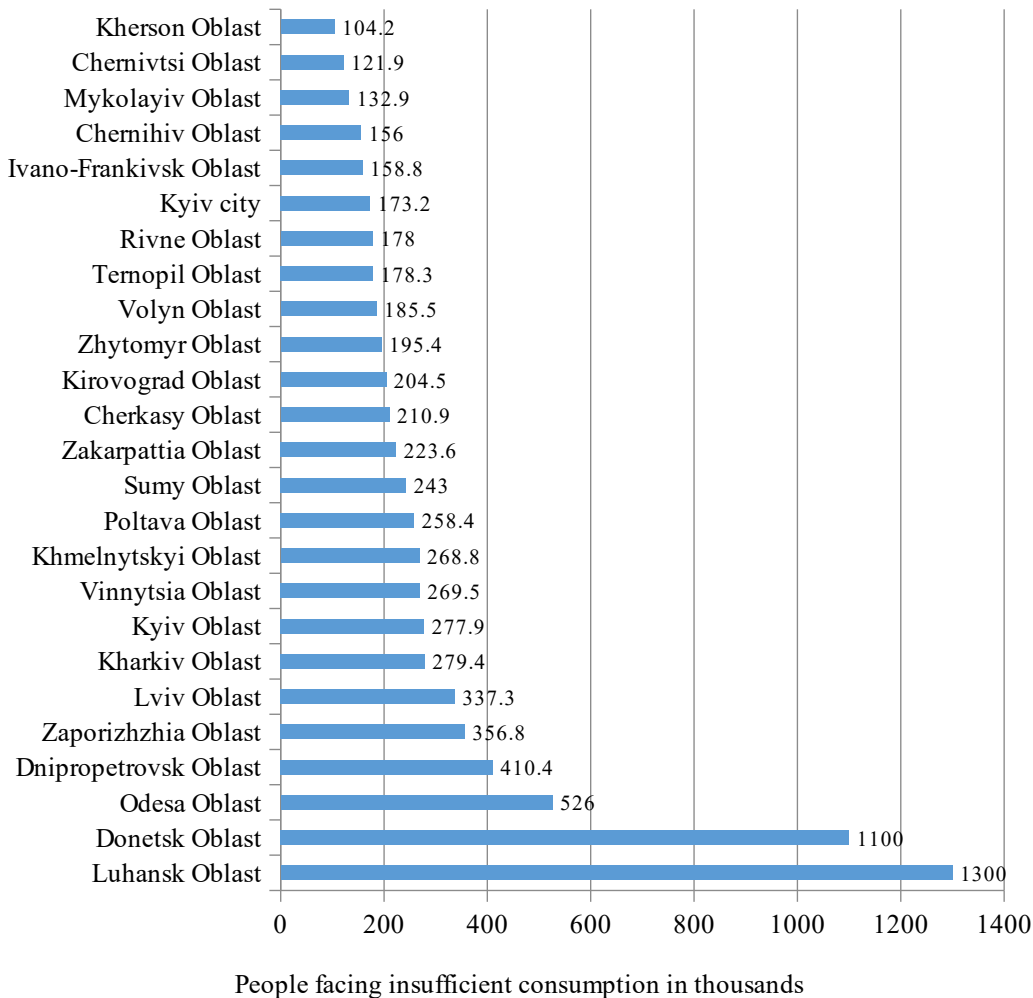


Figure 2 – Number of people facing insufficient food consumption in Ukraine as of June 7, 2022, by region (in 1,000s)

Source: built by the authors on the basis [10]

The highest number of people facing insufficient food consumption in Ukraine resided in the Luhansk and Donetsk Oblasts, at 1.3 million and 1.1 million, respectively. Furthermore, in the Odesa Oblast, an estimated 526 thousand population did not eat staples and vegetables on a daily basis and never or very seldom consumed foods rich in protein [10].

The number of people in Ukraine suffering from an insufficient amount of food consumption in 2022 remained stably high, but passed its peak at the end of

the spring period and showed a tendency to stabilize (Fig. 3).

The right to decent food, which is a socio-economic human right, is guaranteed and ensured within the framework of the implementation of the state's food policy. The social function of the state can be structurally imagined as a complex of elements, each of which finds expression in a specific direction of the state's social activity. Ensuring food security is one of these elements

and in today's conditions is gaining considerable relevance [11].

Ensuring the effective functioning of the food security system directly depends on: stability of the supply subsystem; structural changes in the agricultural sector, investment policy, formation of the technical subsystem

provision, improvement of tax legislation, the organization of banking services, the creation of stockpiles of material and technical means, the current system of insurance of crops and property of agro-industrial complex enterprises, scientific and information support.

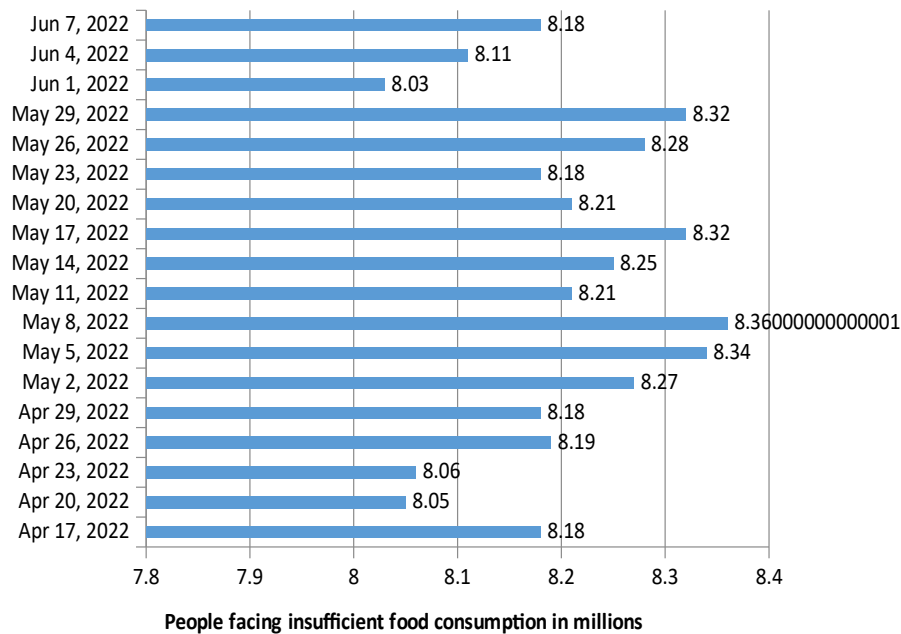


Figure 3 – Number of people facing insufficient food consumption in Ukraine from April 17 to June 7, 2022

Source: built by the authors on the basis [11]

Ensuring an adequate level of food security stimulates the economy of the state - both with the help of scientific and technological progress, and through the support of food producers, stimulating them to improve technologies. Therefore, a very important role is played by the growth of real incomes of the population, their purchasing power, and a stable economic situation in the state.

One of the most important factors influencing consumer behavior is, of course, the income of a specific person or family. The amount of savings, volume and quality of purchased goods and services depends on it in accordance with existing tastes and preferences. Income is also an indicator of the level and quality of life of the population. It should be noted that the part of income that remains at their direct disposal is important for citizens. Wages occupy a prominent place in household income. Earning salary belongs mainly to regular

incomes, so the tendency to decrease its share in the overall structure of household incomes is absolutely undesirable. Hence, state authorities and management should make maximum efforts to increase the welfare of the population, increase the share of wages in the structure of income and GDP, restore the reproductive function of wages, strengthen state social guarantees for the payment of wages.

Often, the reduction of real incomes of the population against the background of rising prices in the world leads to a change in consumer habits of households (Fig. 4). However, such changes are often accompanied by insufficient satisfaction of nutritional needs or satisfaction of these needs at a level lower than rational, which in the long run can have a negative effect on the health and restoration of productive forces of citizens.

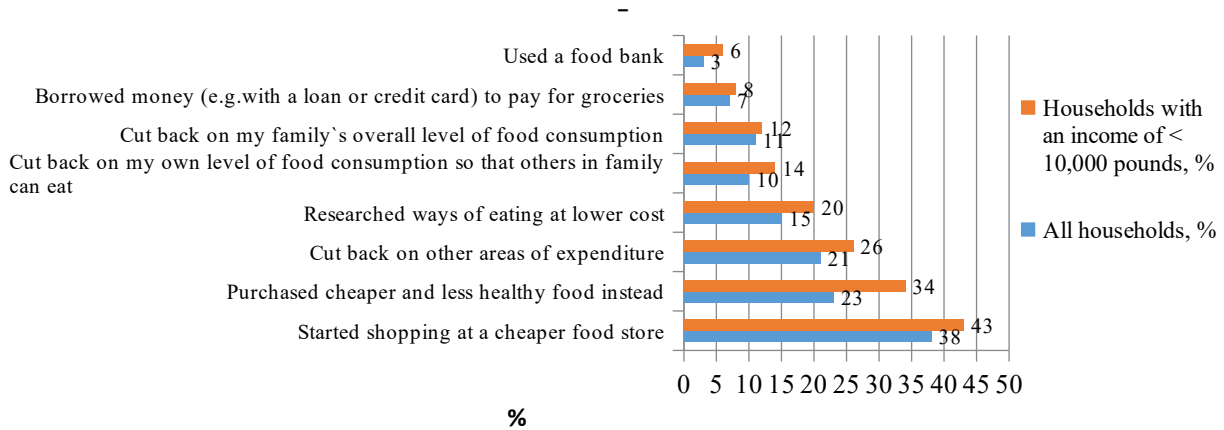


Figure 4 – How UK households tackle unaffordable food prices

Source: built by the authors on the basis [12]

As our chart shows, the most common change made is pretty innocuous - starting to shop in a cheaper store - however 7% of respondents said they have borrowed money to pay for food and 10% have had to resort to consuming less so that other members of their family can eat. Food banks have been used by 3% of all households, while this rises to 6% for those earning £10,000 or less per year [12]. Based on this, it is worth noting that consumption is the main indicator of assessing material well-being, which, with the improvement of working and living conditions, contributes to the growth of working capacity and improving the cultural level of people,

and consumer spending, forming the crucial share of total household spending, plays an important role in macroeconomic processes, since satisfying the consumer demand of the population is, ultimately, the goal for which, in fact, the economic system of the state functions.

Poor nutrition, caused by an unsatisfactory state of food security, can lead to both weight loss and exhaustion, as well as obesity in cases of metabolic disorders in the body. While undernutrition is a common problem in developing countries, the problem of overweight, including among children, is widespread in developed countries (Fig. 5).

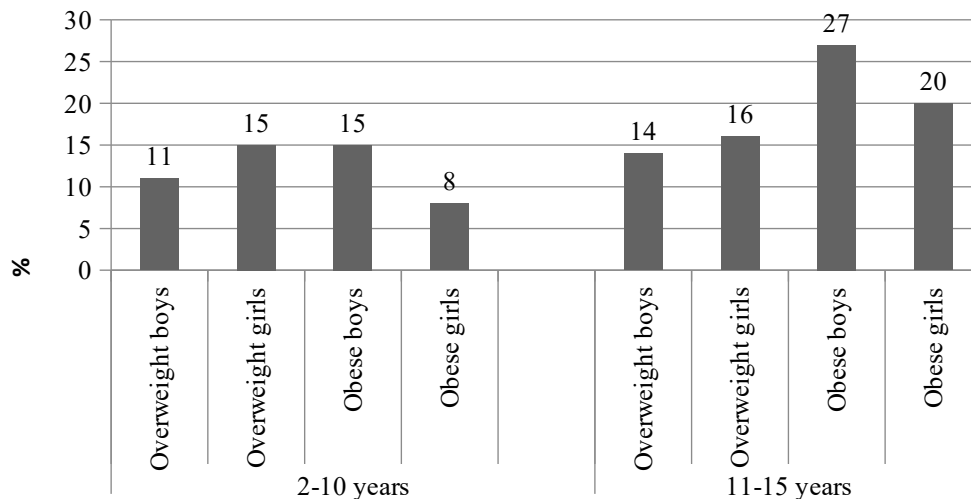


Figure 5 – Overweight and obesity prevalence among children in England 2019, by gender and age

Source: built by the authors on the basis [13]

In 2019, 27% of boys and 20% of girls aged between 11 and 15 years in England were classed as obese. Additionally, in the age group 2 to 10 years old, 15% of boys and 8% of girls were obese.

Modern people do not suffer from any disease as often as obesity. According to the latest WHO estimates [13], more than 1 billion people in the world are overweight. This problem is relevant regardless of social and professional affiliation, area of residence,

age and gender. In economically developed countries, almost 50% of the population is overweight, of which 30% are obese. In Ukraine, on average, 20% of people of working age are obese and 25% are overweight. The fact that the number of children and adolescents suffering from obesity is increasing every year is of particular concern. Impressive data show that at least 2.8 million people die annually as a result of being overweight or obese. WHO considers obesity a global epidemic affecting millions of people.

In recent decades, the standard of living in many countries has increased, the structure of nutrition has changed, and the consumption of high-calorie foods with a high fat content and low fiber content has increased. All this contributes to the consumption of excess energy, which means the spread of obesity

among an increasing number of people. According to the study [13], more women than men are affected by obesity in developing countries. This is due to the fact that they simultaneously deal with family and work, and they do not have enough time to monitor their weight. But in developed countries, more men than women are overweight. Men spend more time commuting to work, this is due to the fact that more and more people are moving to live outside the city, spending more time at the computer.

In an effort to overcome the problem of childhood obesity, a system of free school lunches is being implemented in developed countries, which are designed to provide children with a comprehensive set of useful nutrients. Statistics show the growing pace of development of such initiatives (Fig. 6).

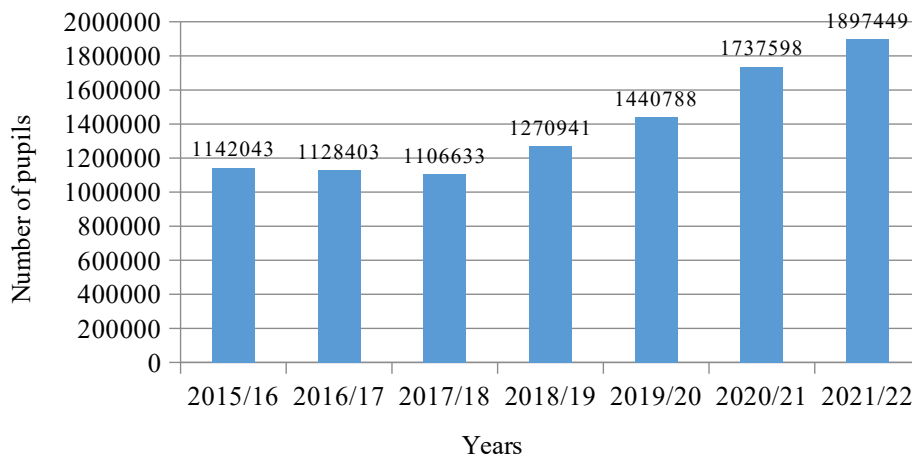


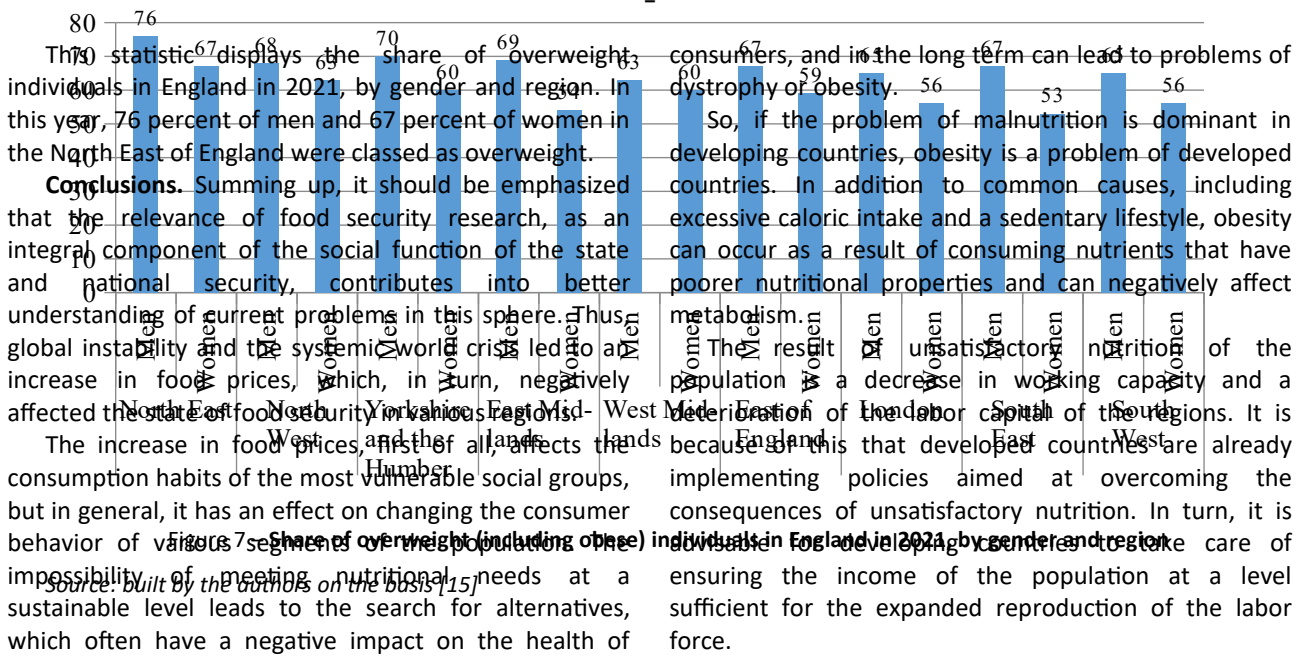
Figure 6 – Number of pupils known to be eligible for free school meals in England from 2015/16 to 2021/22

Source: built by the authors on the basis [14].

Many children and teenagers use the services of "fast food" cafes and restaurants, which offer products with a very high fat content (up to 50%). At the same time, according to nutritionists' recommendations, the fat content in a child's diet should not exceed 30%. Over 1.89 million pupils were eligible for free school meals in England in the 2021/22 academic year, compared with 1.73 million pupils in 2020/21 [14]. The issue of free school meals came to the fore during the Coronavirus pandemic of 2020, when free school meals were replaced by a voucher scheme in the lockdown and Easter holidays.

The problem of obesity leads to serious economic consequences in connection with a decrease in labor

productivity and consequences of a social nature. It is no coincidence that in highly developed countries the costs for the treatment of diseases and complications reach from 2 to 8% of the annual health care budget [16]. Prevalence of obesity in adults and children in many countries over the past 10 years averaged 75% and acquired the character of a non-infectious epidemic (Fig. 7). The social significance of the problem of obesity is determined by the threat of disability of young patients (the number of obese children doubles every 30 years) and a decrease in overall life expectancy due to the frequent development of serious concomitant diseases [17].



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