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## FOOD MARKETS AND FOOD SECURITY: SCIENTIFIC BASIS OF FORMATION

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**Abstract.** Today, the publicity and the scientific community, businessmen and officials pay much attention to the food security problem. However, despite this, it is not solved. This problem has even become global. An analysis of the existing approaches to the definition of “food security” is given in the article. A more systematic and comprehensive definition of this term is formulated on the basis of this study. Moreover, the legislation of the world’s countries, in particular Ukrainian legislation, aimed at solving the food security problem are investigated. A food market forming mechanism is first proposed in the work. It depends on the impact of international politics and political conditions in the country, as well as on the state structure and level of state regulation. This mechanism includes three main interrelated elements: the organizational and economic food production mechanism, the degree of technological development, and the population’s lifestyle. Also a model is developed for the formation of food security through the formation of food markets.

**Key words:** food security, food markets, food products, technology, quality, production

## ПРОДОВОЛЬЧІ РИНКИ ТА ПРОДОВОЛЬЧА БЕЗПЕКА: НАУКОВІ ОСНОВИ ФОРМУВАННЯ

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**Анотація:** На основі аналізу вітчизняних та зарубіжних літературних й нормативно-правових джерел розглянуто різні підходи до визначення поняття «продовольча безпека», системи формування та шляхів вирішення даної проблеми. Сформульовано нове, власне визначення терміну «продовольча безпека», де одним із основних чинників є формування продовольчих ринків. Проведено аналіз підходів щодо виділення структурних елементів продовольчої безпеки країни. Досліджено стан розвитку законодавства країн світу та України щодо вирішення проблеми продовольчого забезпечення. Встановлено, що сьогодні, Україна є однією з країн, де механізм державної підтримки питань продовольчої безпеки ще не є сформованим. Запропоновано механізм формування продовольчих ринків, що залежить від впливу міжнародної політики та політичних умов у країні, а також державного устрою, рівня державного регулювання та включає в себе три основні взаємопов’язані елементи: організаційно-економічний механізм виробництва харчових продуктів, ступінь розвитку технологій та спосіб життя населення. Розроблено модель формування продовольчої безпеки. Вказано основні елементи, від яких залежить рівень продовольчої безпеки країни, серед яких одне з центральних місць посідає саме процес формування продовольчих ринків.

**Ключові слова:** продовольча безпека, продовольчі ринки, модель формування, технології, виробництво, доступність.



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### Introduction. Formulation of the problem

The food security problem has existed since the ancient times, but it has only become world-wide in the second half of the 20<sup>th</sup> century. Today, this question is reflected in the economy of any country in the world, because food products are essential in each person’s life [1]. Nowadays, there is more than 7,6 billion people on Earth. Every year the world population is increasing by more than 89 million [2].

According to the Food and Agriculture Organization of the United Nations, more than 800 million people suffer from hunger, namely every ninth inhabitant of the planet [3]. Every 10 seconds hunger kills one person, and most victims are children [4]. By contrast, in developed countries, people suffer from obesity: in

the United States it is 2/3 of the population, in Europe it is every seventh resident [5].

The fact that today there is no state not concerned about food security confirmed the relevance of researching the problems of providing people with food [1]. This includes food products production, distribution, import-export relations, consumption, etc. However, each country has its own tasks in supplying food to population, that depend on the level, reached in solving this problem.

### Analysis of recent research and publications

The evolution of views on the level and quality of providing food to the planet’s population has caused putting into circulation the concept of “food security”. The first time the term appeared after the grain crisis in 1972–1973. And in 1974, the term “food security”, in a

United Nations General Assembly resolution, was defined as “availability of adequate world food supplies of basic foodstuffs at all times, to sustain a steady expansion of food consumption and to offset fluctuations in production and prices” [6].

Today, among the fundamental international instruments that regulate food security problem the following ones can be noted: the WTO Uruguay Round Agreement on Agriculture (an annex to the Marrakesh Agreement establishing the World Trade Organization, 1994) [7], and Rome Declaration on World Food Security (FAO World Food Conference, 1996, Rome) [8]).

English economist T. Malthus began research in the field of food security problem. He pointed out the need to provide humanity with food as the main means of living [9]. Various aspects of this issue were considered in the works by such classics as A. Smith [10], D. Ricardo [11], A. Maslow [12], and others. Today, scientific research in the food security field is carried out quite actively. So, nowadays, the food security problems are the subject of works by such domestic and foreign scientists as N. Basirkina [13], O. Goychuk [14], I. Mitsenko [15], N. Balienger [16], S. Barraclough [17] etc.

International organizations also pay attention to this important issue. According to experts from the Food and Agriculture Organization of the United Nations (FAO), “food security exists if all people at all times have physical and economic access to a sufficient amount of safe and nutritious food that corresponds to their dietary and food preferences to ensure an active and healthy life” [18, 19].

The World Bank defines “food security” as access by all people at all times to enough food for an active, healthy life [20].

The world leading countries consider food security an important condition for a country’s internal political, social, and economic stability and its external independence. That is why they pay much attention to the development of the system of its state regulation.

In the United States, for example, the main directions of ensuring “food security” are the following:

1. Farmer Support Program called “Farm incomes stabilization”. It consumes up to 50% of all agrarian budget allocations. It includes the programs “Dairy Price Support Program”, “Crop Insurance”, “Farm Loan Programs”.

2. Support for vulnerable populations by providing food assistance to pensioners and unemployed people, free food in schools, etc.

According to the US Department of Agriculture, one of nine Americans uses food stamps [21].

A White Paper on Food Security was developed in the context of the European Union Food Policy implementation. This document provides a number of measures to improve the current system and ensure full control over the turnover from forage up to the moment when the food product reaches the consumer. Moreo-

ver, supporting farmers financially is one of the main mechanisms for ensuring food security in the EU [22].

Japan is holding a rigorous protectionist food security policy. In this country, there is a policy of restricting food imports (by setting high import barriers) for products whose import can compete with domestic production. For example, rice import is almost completely prohibited (despite the fact that the government buys it on the domestic market with the prices much higher than the world ones) [23].

In Mexico, the government has been subsidizing the supply of food for the poorer sections of the population since the late 1930s. It is distributed through a network of specialized stores of the state-owned food company. The company buys up agricultural products from small producers. So it controls about half of the national market of basic foodstuffs (maize, beans, rice, wheat, soybeans, etc.). This company supports the retail prices at a relatively low level accessible to the public [21].

The Republic of Belarus approved at the legislative level the basic provisions of the food security policy in 2004 by formulating the National Food Security Concept. According to this document, the country’s food security is determined as a condition for not only preserving the sovereignty and independence of the state, but also for supporting the national and regional food markets, providing people with a balanced diet at an adequate level, developing foreign trade in food and raw material, strengthening the export orientation of the agro-industrial complex [24].

Unfortunately, Ukraine remains among the few countries that have not yet formed a national system ensuring food security. Considering the category “Ukrainian legislation on food security”, it is advisable to distinguish two stages of its formation and development: the Soviet one (1927–1991), and the modern one [25].

At the Soviet stage, the issue of legislative regulation of food production was paid much attention to. Thus, since the 1920s, a number of decisions of the All-Union Communist Party congresses were devoted to the problems of providing the population with agricultural products. Investments in agriculture amounted to about 1/3 of all investments in the country’s economy. In the early 80’s, it was noted that the food problem was a major one, and a special integrated Food program was found necessary, but this program was not developed [25].

At the present stage of independent Ukraine’s development, the Constitution of Ukraine is the only legal basis on food security regulation. The law “On food safety” was once passed, but then suspended [25].

Today, there are many definitions of the term “food security”. But most of them consider this concept globally, namely as a protective mechanism in the fight against hunger and malnutrition all around the world.

In the course of N. Bellinger’s study, K. Mabs-Zeno identified three types of food security, which is determined globally, nationally, and locally. Thus,

global food security requires that the amount of food be enough to feed all people in the world. National food security is determined by the authors as a reasonable probability that food for consumption in the country meets the levels of biological needs throughout the year. Local food security is defined as the ability of each person to purchase food [16].

Quite a broad and comprehensive definition was suggested by S. Barraclough and P. Yuting. According to the authors, the normative concept of food security includes the following elements: ensuring the supply and distribution of food to all social groups and individuals; a sufficient level of food quality to meet the nutritional needs; and an effective demand, which should be higher than the minimum required for a financial ability to purchase food.

The authors determined that the food system for food security should have the following characteristics: 1) the ability to generate sufficient domestic production levels, to have a capacity for storing food reserves and imports in order to meet basic food needs of all social groups and expand the effective demand; 2) maximum autonomy and self-determination, low vulnerability to international market fluctuations and external political pressure; 3) a reliable system for preventing food shortages, which minimizes seasonal and cyclical changes in the access to food; 4) the possession of long-term stability; 5) ensuring equity, that is a reliable access to sufficient quantities of food for all social classes, groups, and population strata [17].

N. Basurkina asserts that food security can be considered ensuring a certain level of domestic production, based on the principles of country full self-sufficiency, or maintaining a food production critical minimum [13].

O. Goychuk believes that food security is a state's guaranteed ability to ensure self-sufficiency of basic food products, provided that they are economically and physically accessible, regardless of the influence of external and internal factors, to meet the needs of the population, in the person of each citizen, in the required amount, assortment, and quality of food products, at the level that provides the citizen's health and intellectual development [14].

Professor M. Mitsenko believes that "food security is domestic producers' ability to provide the population of the state with nutrition in the amount and caloric content that correspond to scientifically substantiated rational norms and guarantee socio-political stability, general stability, economic development, and independence in the event of an armed conflict, or natural disasters" [15].

Having made a critical analysis of the current definitions of the concept of "food security", we can conclude that our colleagues, when providing these definitions, did not take into account such factors as the food status of the population, the formation of food markets, the state and development of technologies, and import dependence.

Most researchers see the food problem as a multifaceted phenomenon that has an impact on all aspects of society and therefore should be considered in conjunction with the economic system, political system, national traditions of management, and so on. After all, the construction of an efficient system of food supply for a country's population depends on the analysis of these factors and the correct and timely response to them. But, unfortunately, today, it can be said that modern scientists who deal with the food problem do not agree about its structure. And, as a result, there are almost no propositions about a food security model.

**The aims and objectives of the study.** Our study's aim was to analyze the current state of the conceptual apparatus of the term "food security" and to generalize the factors that influence the food security of the country. To achieve this goal, the following tasks have to be solved:

- 1) research of the issue of modern variations in the definition of the term "food security" and the formulation of our own concept;
- 2) analysis of the state and legal aspects of food security in the world countries and in Ukraine;
- 3) generalization of factors, that influence the process of food markets formation;
- 4) building a food security model.

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#### Research materials and methods

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In the research, we used such research methods as system analysis and synthesis, as well as the methods of scientific abstraction, prognosis, the method of comparative analysis and expert assessments, economic, statistical, and other methods of organizational and economic models analysis and mega-technology systems.

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#### Results of the research and their discussion

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In this paper the maximum number of factors influencing the formation of a country's food security level were analyzed. This allowed formulating a new, more systematic definition of this concept.

Thereby, "food security" of a country is a political situation, and an organizational and economic mechanism, and a level of technology, and a way of the population's lifestyle, when every individual, regardless of their income, age, sex, health, religious and other differences, at every moment, has a physical and economic access to sufficient (in quantitative terms) quality and safe food products necessary for active and healthy life on condition of their sustained competitive production which implies a minimal risk of the impact of import-dependent technologies, products, or their individual components.

The organizational and economic mechanism which can ensure a high food security level of a country's population is manifested in the mechanism of food markets formation which can satisfy the population's food status. And this makes it possible to receive

a certain amount of exchange energy, nutrients, and biologically active substances that are necessary for active and healthy life.

Food is provided to people with the help of the food products market. From an economic point of view, a food market is formed under the influence of supply and demand factors. But, if we consider the formation of the food market from a complex point of view, the numerous factors and conditions that are ambiguous in

their meaning, character, and priorities should be taken into account.

In this work, it was assumed that food markets are formed depending directly on the three complex factors: the organizational and economic mechanism of food production, the level of technological development, and the population's lifestyle. And all this happens under the global influence of the state system and international politics in every country (Fig. 1).

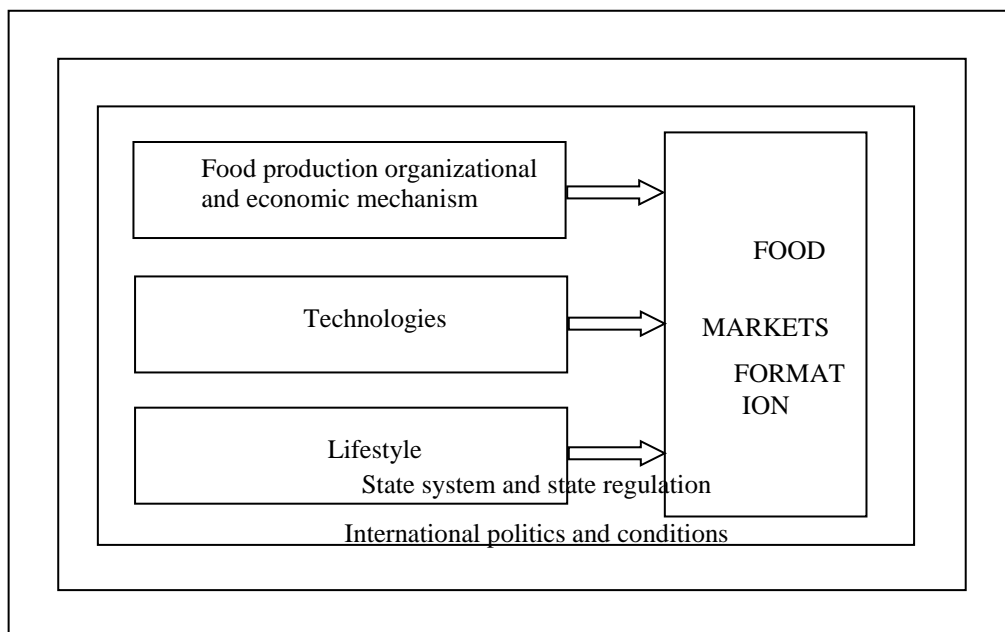


Fig.1. Food markets formation mechanism

The appropriate food security level is characterized by several key indicators: food products quantity, and their physical and financial availability, quality, and safety. The quantity, quality and safety of food products are determined by the situation on national and regional food markets and by the export-import balance. So, food markets formation influences the food security level. And such factors as strategic goods formation, food products supply and distribution, the technology level, production features and raw materials have an effect on food markets formation.

Raw material is formed on the basis of such strategic industries as animal husbandry, poultry and fish farming, and plant production.

As a result of the implementation of these approaches, we have developed a food security model, which is based on the process of food markets formation (Fig. 2).

The model takes into account the peculiarities of food markets formation and the interaction between various groups of factors in the light of import dependence.

The new definition of food security, formulated in this paper, is of a systemic nature. It implies a systematic combination of the political situation, the organiza-

tional and economic mechanism, the level of technology and lifestyle, in which each individual, regardless of their income, age, sex, health, religion, or other differences, at any time, has a physical and economic access to sufficient (quantitatively) quality and safe food products necessary for active and healthy life, provided that their production is stable and competitive, involving a minimal risk of an impact of import-dependent technologies, products, or their individual components.

The analysis of the definitions of "food security" in the review confirms the importance of such a factor as food products availability, or their turnover or distribution control, which is usually carried out through the formation and efficient functioning of food markets. However, food production and import dependence are equally important, although there are no such components in the well-known definition of "food security".

Thus, the definition we have developed more fully embraces all the important components of food security formation and points to their close interrelationship, reflected in the suggested national food markets formation mechanism (Fig. 1), according to which the international policy and conditions of international cooperation should determine the effectiveness of state regulation of the level of production of food raw materials

and food products and export-import surplus food. As a result of this regulation, the organizational and economic food and food products mechanism should be improved. State regulation is reflected in the level of technologies for the production of food raw materials and food products and in the way of people's lifestyle,

since in this case it can ensure the introduction of highly efficient energy and resource-saving technologies and the formation of people's preferences, with regard of disease prevention and improvement of life quality and expectancy.

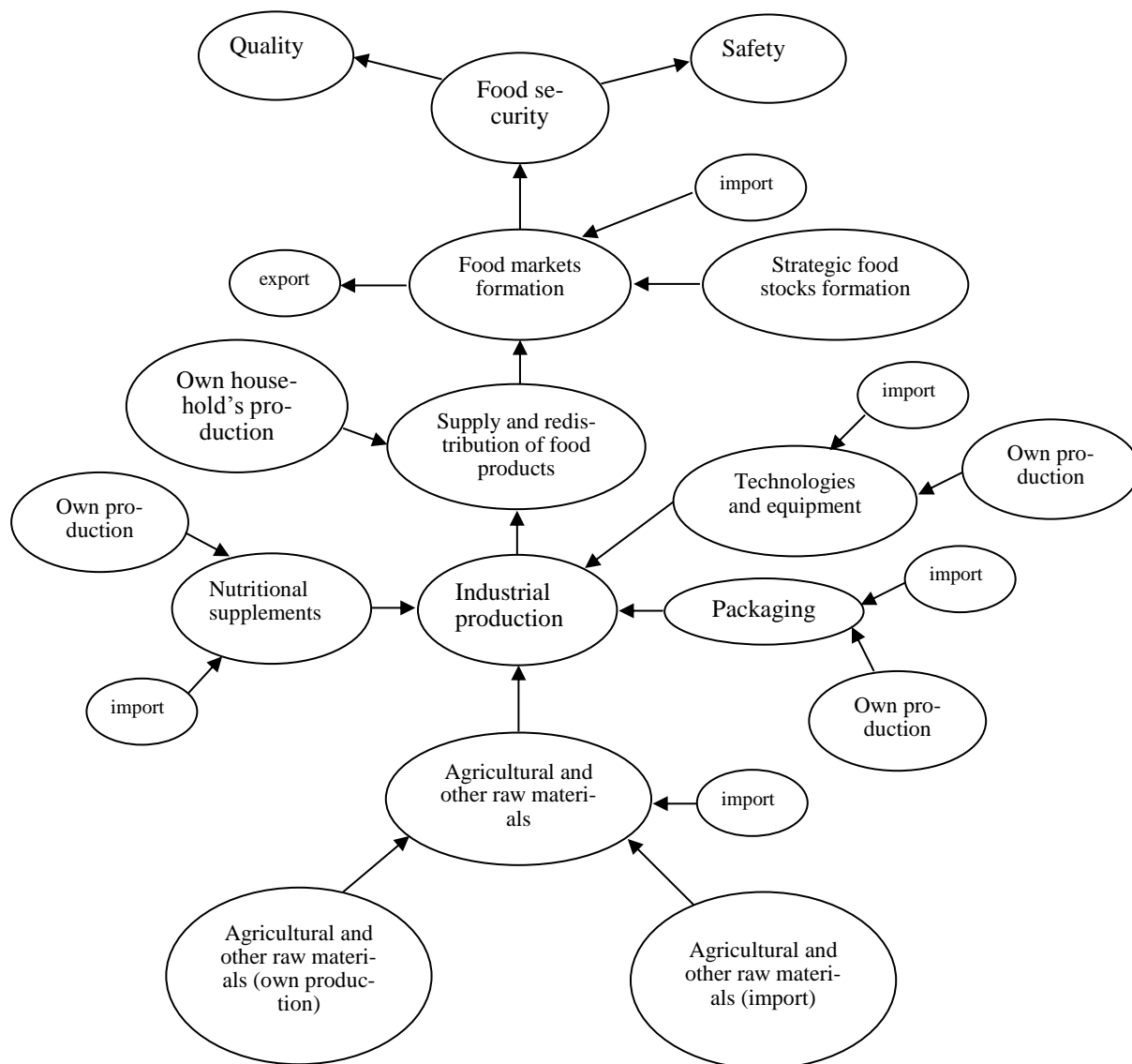


Fig. 2. Food security formation model

The introduction of a mechanism for the food markets formation requires not single regulatory acts, but systematic actions to ensure high activity of national food markets, which will increase the level of food security of the country.

In addition, further analysis of the definitions and characteristics of the formation of food security showed the critical importance of domestic production of food raw materials and foodstuffs [23, 24], and food markets formation peculiarities. This became the basis of food security model proposed in the paper (Fig. 2). The leading role in this model is played by the food

markets forming process and its functioning peculiarities.

Food markets formation is based on the supply and redistribution of food produced by industrial enterprises and by domestic households, on export-import operations with food raw materials and food products, and on strategic food stocks formation.

The basis of industrial food production is: agricultural raw materials, food additives, technologies, equipment, and packaging. Imported components, equipment, elements, etc. are used at each stage. And it is very important to minimize the use of these imported

components, especially the ones that influence greatly the production capability, quality, safety, and competitiveness of food products.

### Conclusions

1. Literary and legal sources have been analyzed. On this basis, the relevance and importance of solving the problem of raising the level of the country's food security has been determined. Moreover, the term "food security" has been analyzed and a proper system definition of this term has been suggested, with food markets formation as one of the main factors.

2. The state of legislation in world countries and in Ukraine on the solution of the food supply problem has

been examined. It has been established that today, Ukraine is one of the countries where the mechanism of state support of food security is not yet formed.

3. The food markets formation mechanism has been suggested. It depends on the impact of international politics and conditions, as well as on the state structure and state regulation. This mechanism includes three main interrelated elements: an organizational and economic mechanism of food production, a level of technology, and people's lifestyle.

4. A food security model has been developed in the work. In this model, one of the central places is taken by food markets formation.

### List of references

1. Румик І.І. Понятійні аспекти продовольчої безпеки як складової національної безпеки України // Вчені записки Університету «КРОК». 2014. №35. С. 22–32.
2. Current World Population [Електронний ресурс]. Режим доступу до ресурсу: <http://www.worldometers.info/world-population>
3. The State of Food Security and Nutrition in the World 2017 [Електронний ресурс] – Режим доступу до ресурсу: <http://www.fao.org/3/a-I7695E.pdf>.
4. Hunger and World Poverty [Електронний ресурс]. Режим доступу до ресурсу: <http://www.poverty.com/index.html>.
5. Obesity Update 2017 [Електронний ресурс]. Режим доступу до ресурсу: <https://www.oecd.org/els/health-systems/Obesity-Update-2017.pdf>.
6. Report of the World Food Conference, Rome 5-16 November 1974. New York: United Nations [Електронний ресурс]. Режим доступу до ресурсу: [http://aei.pitt.edu/15701/1/SEC\\_\(74\)\\_4955\\_final.pdf](http://aei.pitt.edu/15701/1/SEC_(74)_4955_final.pdf)
7. WTO Uruguay Round Agreement on Agriculture – April 1994, Marrakesh, Morocco [Електронний ресурс] – Режим доступу до ресурсу: <http://www.fao.org/docrep/003/w3613e/w3613e00.htm>
8. Rome Declaration on World Food Security. 13-14 November 1996, Rome, Italy [Електронний ресурс]. Режим доступу до ресурсу: [https://www.wto.org/english/docs\\_e/legal\\_e/14-ag.pdf](https://www.wto.org/english/docs_e/legal_e/14-ag.pdf).
9. Thomas Malthus An Essay on the Principle of Population, <http://www.esp.org/books/malthus/population/malthus.pdf>
10. Smith A. An Inquiry into the Nature and Causes of the Wealth of Nations Reprint [Електронний ресурс] / Adam Smith – Режим доступу до ресурсу: [http://files.libertyfund.org/files/220/0141-02\\_Bk.pdf](http://files.libertyfund.org/files/220/0141-02_Bk.pdf).
11. Ricardo D. On the principles of political economy and taxation [Електронний ресурс] / D. Ricardo – Режим доступу до ресурсу: <http://www.efm.bris.ac.uk/het/ricardo/Principles.pdf>.
12. Maslow A. H. A Theory of Human Motivation [Електронний ресурс] / A. H. Maslow. 1943. –Режим доступу до ресурсу: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.318.2317&rep=rep1&type=pdf>.
13. Басюркіна Н. Й. Забезпечення продовольчої безпеки в умовах трансформації економіки України // Вісник соціально-економічних досліджень : зб. наук. праць. 2008. №29. С. 89–98.
14. Гойчук О. І., Курило В. І. Продовольча безпека та необхідність її правового забезпечення // Адвокат. 2006. №3. С. 3–5.
15. Миценко І. М. Продовольча безпека України: оцінка стану та світовий досвід вирішення проблеми // Кіровоград: Центрально-Українське видавництво, 2001. 204 с.
16. Balienger N., Mabbs-Zeno C. Targeting Food Security and Food Aid Issues at the GATT // Food Policy. 1992. №17. С. 264–276.
17. Barraclough S. Food Security Trends and Prospects in Latin America [Електронний ресурс] / S. Barraclough, P. Utting. 1987. Режим доступу до ресурсу: [https://kellogg.nd.edu/sites/default/files/old\\_files/documents/099\\_0.pdf](https://kellogg.nd.edu/sites/default/files/old_files/documents/099_0.pdf).
18. World Food Security: a Reappraisal of the Concepts and Approaches. Director General's Report. Rome [Електронний ресурс]. 1983. Режим доступу до ресурсу: <http://www.fao.org/forestry/13128-0e6f36f27e0091055bec28ebe830f46b3.pdf>.
19. The State of Food Insecurity in the World 2001. Rome: [Електронний ресурс]. Режим доступу до ресурсу: <http://www.fao.org/docrep/003/Y1500E/Y1500E00.htm>.
20. Poverty and Hunger [Електронний ресурс]. Режим доступу до ресурсу: [http://www.worldbank.org/mdgs/poverty\\_hunger.html](http://www.worldbank.org/mdgs/poverty_hunger.html).
21. World Bank. 1986. Poverty and Hunger: Issues and Options for Food Security in Developing Countries. A World Bank Policy Study. [Електронний ресурс]. Режим доступу до ресурсу: <http://documents.worldbank.org/curated/en/166331467990005748/pdf/multi-page.pdf>.
22. Олійник В. О. Державне регулювання у сфері забезпечення продовольчої безпеки: зарубіжний досвід / В. О. Олійник. // Державне управління та місцеве самоврядування: зб. наук. пр. 2012. №1. С. 103–111.
23. Бадуев Б. В. Продовольственная безопасность Японии : автореф. дис. на здобуття наук. ступеня канд. ек. наук : спец. 08.00.14 / Бадуев Б. В. Москва, 2007.
24. Постановление Совета Министров Республики Беларусь "О концепции национальной продовольственной безопасности Республики Беларусь" [Електронний ресурс]. Режим доступу до ресурсу: <http://pravo.levonevsky.org/bazaby11/republic34/text337.htm..>
25. Кордзая Н. Р., Єгоров Б. В. Український та зарубіжний досвід державного регулювання продовольчої безпеки // Товари та ринки. 2016. №2. С. 45–47.
26. Лябіна З. М. Продовольча безпека: тенденції та перспективи // Білоруська думка. 2009. №3. С. 22–31.
27. Зеленська О.О., Зеленський С.М., Алешугіна Н.О. Класифікація факторів продовольчої безпеки національного та регіонального рівнів // Збірник наукових праць ДЕТУТ, Серія «Економіка і управління». 2015. №31. С. 215–219.

### References

1. Rumy`k I. Ponyatijni aspekty` prodovol`choyi bezpeky` yak skladovoyi nacional`noyi bezpeky` Ukrayiny`. Vcheni zapy`sky` Universty`tetu «KROK». 2014;(35):22–32.
2. Current World Population [Internet]. World Population Clock: 7.6 Billion People (2017). Worldometers. [cited 2017 Dec11]. Available

- from: <http://www.worldometers.info/world-population/>
3. The state of food security and nutrition in the world [Internet]. FAO. 2017 [cited 2017]. Available from: <http://www.fao.org/3/a-I7695E.pdf>
  4. Hunger and World Poverty [Internet]. Poverty.com - Hunger and World Poverty. [cited 2017Mar11]. Available from: <http://www.poverty.com/index.html>.
  5. Obesity Update 2017 – OECD [Internet]. [cited 2017Mar11]. Available from: <http://www.bing.com/cr?IG=A87A731B1C044EBFA95226AAB136D2A3&CID=23DD5BE32AAF6B312122504C2B006A2E&rd=1&h=awHsQjJ1KhDCo4eNkqwn-GAI6LeWtK4wqHPneS9ygv1&v=1&r=http%3a%2f%2fwww.oecd.org%2f%2fhealth-systems%2fObesity-Update-2017.pdf&p=DevEx,5067.1>
  6. Report of the World Food Conference, Rome, 5-16 November [Internet]. [cited 2017Nov17]. Available from: [http://www.bing.com/cr?IG=B0CDB3CC3BFF4131AD8876FBCDE75BF1&CID=2F086E5BFACA6752204C65F4FB656669&rd=1&h=0khJnGlXd8c3zM8UwTXAeXP5Z2MyY6\\_oSgiyeNjT69c&v=1&r=http%3a%2f%2fwww.worldcat.org%2f%2freport-of-the-world-food-conference-rome-5-16-november-1974%2foclc%2f2931387&p=DevEx,5066.1](http://www.bing.com/cr?IG=B0CDB3CC3BFF4131AD8876FBCDE75BF1&CID=2F086E5BFACA6752204C65F4FB656669&rd=1&h=0khJnGlXd8c3zM8UwTXAeXP5Z2MyY6_oSgiyeNjT69c&v=1&r=http%3a%2f%2fwww.worldcat.org%2f%2freport-of-the-world-food-conference-rome-5-16-november-1974%2foclc%2f2931387&p=DevEx,5066.1)
  7. WTO Uruguay Round Agreement on Agriculture [Internet]. fao.org. [cited 2017Jan22]. Available from: [https://www.wto.org/english/docs\\_e/legal\\_e/14-ag.pdf](https://www.wto.org/english/docs_e/legal_e/14-ag.pdf).
  8. Rome Declaration on World Food Security [Internet]. fao.org. [cited 2017Jun13]. Available from: <http://www.fao.org/docrep/003/w3613e/w3613e00.htm>
  9. Malthus TR. First Essay on Population 1798. 1966; Available from: <http://www.esp.org/books/malthus/population/malthus.pdf>
  10. Smith A. An Inquiry into the Nature and Causes of the Wealth of Nations. Wolfram Research Data Repository [Internet]. Available from: [http://files.libertyfund.org/files/220/0141-02\\_Bk.pdf](http://files.libertyfund.org/files/220/0141-02_Bk.pdf).
  11. Ricardo D. On the principles of political economy and taxation [Internet]. Kitchener. Available from: <http://www.efm.bris.ac.uk/het/ricardo/Principles.pdf>.
  12. Maslow AH. A theory of human motivation. 1943.
  13. Basiurkina NY. Zabezpechennia prodovolchoi bezpeky v umovakh transformatsii ekonomiky Ukrainy . Visnyk sotsialno-ekonomichnykh doslidzhen : zb nauk prats. 2008;(29):89–98.
  14. Hoichuk OI, Kurylo VI. Prodovolcha bezpeka ta neobkhdnist yii pravovoho zabezpechennia. Advokat. 2006;(3):3–5.98.
  15. Mytsenko I. Prodovolcha bezpeka Ukrainy: otsinka stanu ta svitovyi dosvid vyrishennia problemy . Kirovohrad: Tsentralno-Ukrainske vydavnytstvo; 2001.
  16. Ballenger N, Mabbs-Zeno C. Treating food security and food aid issues at the GATT. Food Policy. 1992;17(4):264–76.
  17. Barraclough S, Utting P. Food Security Trends and Prospects in Latin America [Internet]. The Kellogg Institute. 1987 [cited 2017Mar11]. Available from: [https://kellogg.nd.edu/sites/default/files/old\\_files/documents/099\\_0.pdf](https://kellogg.nd.edu/sites/default/files/old_files/documents/099_0.pdf).
  18. Policy Brief Food Security - Food and Agriculture Organization [Internet]. fao.org. [cited 2017Jun12]. Available from: <http://www.fao.org/forestry/13128-0e6f36f27e0091055bec28ebe830f46b3.pdf>.
  19. The State of Food Insecurity in the World 2001 [Internet]. fao.org. [cited 2017Nov25]. Available from: <http://www.fao.org/docrep/003/y1500e/y1500e00.htm>
  20. Poverty and Hunger [Internet]. The World Bank Working for a World Free of Poverty. [cited 2017Nov25]. Available from: [http://www.worldbank.org/mdgs/poverty\\_hunger.html](http://www.worldbank.org/mdgs/poverty_hunger.html).
  21. Bank TW. Poverty and hunger : issues and options for food security in developing countries [Internet]. Poverty and hunger : issues and options for food security in developing countries (English) | The World Bank. 1986 [cited 2017Apr20]. Available from: <http://documents.worldbank.org/curated/en/166331467990005748/Poverty-and-hunger-issues-and-options-for-food-security-in-developing-countries>
  22. Oliinyk V. Derzhavne rehuliuвання u sferi zabezpechennia prodovolchoi bezpeky: zarubizhnyi dosvid. Derzhavne upravlinnia ta mistseve samovriaduvannia : zb nauk pr. 2012;(1):103–11.
  23. Baduev B. Prodovolstvennaia bezopasnost Yaponyy : : avtoief. dys. na zdobuttia nauk. stupenia kand. ek. nauk : spets. 08.00.14 . Moskva; 2007.
  24. Postanovlenye Soveta Mynystrov Respublyky Belarus ot 10.03.2004 N 252 "O Kontseptsyy natsyonalnoi prodovolstvennoi bezopasnosti Respublyky Belarus" [Internet]. Levonevsky. 2011 [cited 2017 Dec12]. Available from: <http://pravo.levonevsky.org/bazaby11/republic34/text337.htm>.
  25. Kordzaia N, Yehorov B. Ukrainskyi ta zarubizhnyi dosvid derzhavnoho rehuliuвання prodovolchoi bezpeky. Tovary ta rynky. 2016;(2):45–7.
  26. Iliina Z. Prodovolcha bezpeka: tendentsii ta perspektyvy . Biloruska dumka. 2009;(3):22–31.
  27. Zelenska O, Zelenskyi S, Aleshuhina N. Klyasifikatsiia faktoriv prodovolchoi bezpeky natsionalnoho ta rehionalnoho rivniv . Zbirnyk naukovykh prats DETUT, Seriiia «Ekonomika i upravlinnia». 2015;(31):215–9.

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