

**Методика исследования.** Используются общенаучные методы: диалектический - для анализа научных трудов учёных; абстрактно-логический подход - при обобщении результатов исследования и формулировании выводов; эмпирический - для оценки современного состояния и развития объекта исследования; а также метод факторного анализа, прогнозирования экономического моделирования - эконометрическую динамическую модель частичного равновесия AGMEMOD.

**Результаты исследования.** Исследование основывается на предположении, что при наличии соответствующих рамочных условий в части достижения Национальной индикативной цели потребления биотоплива на транспорте рассмотрены возможности Украины в достижении целей по потреблению жидкого биотоплива транспортным сектором, проанализирована ситуация с производством жидкого биотоплива в Украине, выявлены препятствия в части достижения индикативной цели потребления биотоплива и оценена реалистичность выполнения взятых Украиной международных обязательств по моторному биотопливу, а также предложены меры для возможности достижения вышеуказанных обязательств. Для количественной оценки выполнения определенных целей была использована модель AGMEMOD.

**Элементы научной новизны.** Заключаются в моделировании проекций развития рынка жидкого биотоплива в Украине до 2030 г. с помощью модели AGMEMOD при введении поддержки производителей биотоплива в виде прямых дотаций и налоговых преференций, реализация которых обеспечит стремительное развитие рынка, прежде всего благодаря увеличению производства биотоплива и широкого его использования в Украине.

**Практическая значимость.** Впервые проведено моделирование рынка жидкого биотоплива в Украине с помощью модели AGMEMOD до 2030 г. и предложены меры по достижению индикативной цели 10 % использования биотоплива в общем потреблении топлива и мероприятия по восстановлению производства и дальнейшего развития отрасли. Табл.: 3. Библиогр.: 24.

**Ключевые слова:** моделирование; жидкое биотопливо; индикативная цель; модель AGMEMOD; биоэтанол; биодизель; моторное топливо альтернативное.

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## Self-sufficiency of the Ukrainian domestic food market

*The purpose of the article is to research the importance of agro-food sector of Ukraine in fulfilling the domestic food market needs.*

*Research methods.* In the research process the following scientific methods have been used: theoretical generalization for studying essence and ways of achieving country's food security; analysis and synthesis for comprehensive assessment of the level of food supply in Ukraine and determination of production share of certain crop, animal, and processed products in consumption funds; comparative evaluation for comparing volumes of domestic and imported products in Ukraine's food market; balance sheet for separation products' use on food and non-food purposes; tabular for visualization statistical results of the research.

*Research results.* The structure of Ukraine's internal food market in context of main food groups has been considered. There have been determined the commodities characterized by high level of import dependence, and food supply features on the domestic market have been presented. High level of fulfilling domestic Ukrainian market needs by native agricultural production has been proved, forecast on development of the domestic food market for the nearest future has been given.

*Elements of scientific novelty.* Objective reasons for increasing capacity of Ukraine's food market and possibilities of reducing import purchase's impact on its stable functioning have been substantiated.

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**Practical significance.** The article is aimed at identifying actual trends in the Ukrainian food market, making an assessment for value of its own and foreign products, and bringing these data to state authorities and industrial producers. Tabl.: 3. Refs.: 8.

**Keywords:** food; market capacity; balance; production; food expenditures; prospect.

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**Scientific problem.** Food security is traditionally one of the most important governmental functions, achievement of which testifies the correctness and efficiency of chosen policy in this field. It is determined by the actual availability of necessary food quantity internally for existing consumption level and the ability of the population to buy it in accordance with its purchasing power. Food supply is formed, first of all, by the potential of domestic agricultural production. In case of its insufficiency, as a rule, supplies from abroad are used. Optimal situation takes place when domestic food market needs are satisfied by agrarian sector completely or almost completely, leaving a small share for import and forming a high level of self-sufficiency. Typically, the food market structure of a certain country is a combination of self-sufficiency for some goods with import dependence on others. Therefore, it is important for Ukraine not only to develop its dominant industries, but also to identify groups of agricultural products supplied by foreign countries in large volumes in the context of their strategic prospects.

**Analysis of recent researches and publications.** Issues of food supply at the global and national levels, the functioning of domestic food market meet dedication at publications of Ukrainian scientists, in particular P.T. Sabluk [4], O.M. Shpychak [6, 7], Yu.O. Lupenko [6], V.I. Vlasov [4], V.I. Boyko [2] and others, as well as thematic statistical reports [1, 3, 8].

**The objective of the article** is to analyze the current situation on the Ukrainian food market, consider the formation of food supply for its needs from national and foreign producers and assess the aspects of its development for the coming years.

**Research methodology.** For evaluation the origin of food products on Ukraine's domestic food market, the balances of ten major groups of agricultural products, in particular plant, livestock and processed products in 2017, were considered. The indices of produc-

tion, food consumption, external trade and non-food utilization were analyzed. As a result, products from domestic, domestic and foreign (fruit), as well as goods mainly from foreign suppliers (fishery products) were found. In determining the size of food market were taken into account actual and estimated household expenses for food, non-alcoholic drinks and food, consumed outside home. The obtained figure was multiplied by the number of households in Ukraine. Data on the total value of agricultural imports to Ukraine, indicated in US dollars, transmitted into the national currency according to official exchange rate. This made it possible to calculate the share of products of foreign origin in the domestic food market last year.

**Statement of the main results of the study.** Considering the situation globally, it should be noted that the absolute majority of countries in varying measures depend on foreign food suppliers. This is also facilitated by quick development of international trade, overall increase of income and the expansion of consumer preferences. In addition, many countries have insufficient natural resources or unfavourable natural and climatic conditions to produce the required quantity of food. In this case, contrary, imports have a decisive influence on the capacity of domestic market.

For a comprehensive assessment of the food supply level it is appropriate to consider it by comparing production, consumption and foreign trade for main product groups. The most prominent in this context is bread and bakery products (in the equivalent of cereals) as the basis of human nutrition. The rest of the goods are produced by plant cultivation, livestock and food industries - potatoes, vegetables, fruits and berries, meat products, fish, dairy products, eggs, sugar and oil.

It is worth to underline that there is a serious difference between production volumes and consumption levels concerning certain product groups, when the first indicator is timely higher than the second [1]. This is the typical situation with cereals, using of which

in Ukraine for food consumption in recent years is less than 10% of gathered harvest. The explanation of this comes from the fact that not all produced grain is suitable for food, its most share is exported and used for feeding animals. Objectively, for food purposes can be used only part of total produced volumes, in the first turn, food wheat. Thus, in 2017, 61.9 million tons of cereals were produced in Ukraine, the consumption fund was

only 5.7 million tons, while 42.5 million tons of grain was exported abroad and 11.0 million tons was used for feed. A similar situation takes place with potatoes balance, although this product has other ways of utilization. Last year production of potatoes reached 22.2 million tons, on food products were destined 6.1 million tons. In addition, feeding, seeding and non-food purposes together used 15.7 million tons (Table 1).

**Table 1. Balances of plant products in 2017, 1000 tons**

Production	Food Consumption	Export	Import
<i>Cereals</i>			
61917	5655	42499	255
<i>Potatoes</i>			
22208	6091	18	24
<i>Vegetables and melons</i>			
9721	6783	444	129
<i>Fruit, berries, grape</i>			
2458	2242	291	819

Source: Data from [1].

Interesting peculiarities are noted in vegetables and fruits balances. If from almost 10 million tons of vegetables and melons grown in the last year food consumption accounts for 70% of the production, then animal feeding was more than 15% of production, and more than 1 million tons were lost. The highest dependence on imports among plant production is for the group "Fruit, Berries, Grape". Due to purely arithmetic we produce enough fruits to meet the domestic food needs of them, but the presence of exports, processing for wine, use as a feed along with losses leads to the fact that the imported products in the fund of consumption of fruits and berries reaches about a third part. Interesting, that main part in the import structure in Ukraine is exotic fruit for our natural and climatic conditions, such as bananas and citrus, which for the long time have become habitual in the diet, clearly demonstrating the impact of global trend [5].

For meat products in Ukraine domestic production fully meets the needs of food mar-

ket, and its volume of foreign trade is characterized by a slight predominance of exports over imports and does not significantly affect the supply level. We produce dairy products more than we consume, although about 20% of more than 10 million tons are exported and used for feed, while the rest is a consumption fund. The same is true of the balance of eggs and egg products in Ukraine: the quantities produced are consumed on the domestic market, exported, serve for incubation and feeding [1]. The worst situation has occurred with fish and seafood. The combined production of aquatic bioresources does not even provide a half of domestic demand, and import supplies account for two-thirds of the consumption fund [5]. That is, this group of products is the most import-dependent on the domestic food market (Table 2). The main reason for this is the timely-counted drop of fish catches during independence period.

**Table 2. Balances of livestock products in 2017, 1000 tons**

Production	Food Consumption	Export	Import
<i>Meat products</i>			
2318	2195	351	233
<i>Milk</i>			
10281	8496	835	132
<i>Eggs</i>			
896	670	155	7
<i>Fish, seafood</i>			
93	460	5	296

Source: Data calculated by the author from [1] and [5].

Sugar is also provided by our own production. At the same time, last year, 30% of the output sent for export, and almost all the rest was used for food needs. There is a clear tendency of increasing volumes of vegetable oil production in Ukraine, which in 2017 amounted 6.3 million tons. Simultaneously, the consumption fund is even gradually decreasing, last year fixed at the

level of 0.5 million tons [1]. The main use of this resource is exports (6.0 million tons in 2017). This is easily explained, because our country is stably holding the first place in the world among suppliers of sunflower oil. On the other hand, half of domestic consumption is provided through import of palm oil, widely used in the food industry (Table 3).

**Table 3. Balances of processed products in 2017, 1000 tons**

Production	Food Consumption	Export	Import
<i>Sugar</i>			
2043	1290	617	7
<i>Oil</i>			
6277	496	5988	239

Source: Data from [1].

Thus, in Ukraine there is a partial dependence on fruit imports, which, however, is not critical, but a serious impact of fish products import, volume of which is mainly forming the consumption fund in the domestic market.

The total ratio of own and imported goods on the domestic food market will be more indicative. Its full capacity includes money expenditures by people on food, estimation the value of products actually consumed, but not in commodity-monetary relations, and the cost of food outside the home [6]. According to official statistics, based on actual total domestic households expenditures for food products in 2017 (3424 UAH/month), the estimated capacity of the Ukrainian domestic food market was 637 billion USD [3]. We have historical fact that rural population, which plays a significant role in the production of milk, eggs, vegetables, potatoes, fruits and berries, using these products for own consumption, the potential cost of these product groups is about 15% of the domestic food market capacity. At the same time, import value of agricultural products to Ukraine last year amounted to 4.3 billion dollars, which in terms of the national currency amounted to 114 billion UAH. Thus, the share of domestic production in the internal food market is 82%, while imported goods occupy only 18%.

Taking into account all the above facts, it can be argued that Ukraine in general mostly satisfies needs of the domestic market by existing agricultural production, while import purchases just supplement overall supply of food products. That why the situation seems to be practically optimal, as the money of our consumers come mainly to domestic food producers. The domestic food market in Ukraine is more secure and stable, because the forming of

supply is carried out by economic units located on its territory, which significantly increases the efficiency of its filling. Moreover, we have opportunities for some mitigation the impact of imported products on separate markets. If it is practically impossible for exotic fruits due to the natural and climatic conditions in Ukraine, but the situation is different for fish products. Since the beginning of independence, during ten years, production of aquatic biological resources in Ukraine was at the level of 350-400 thousand tons. Gradually this indicator declined, reaching its minimum in 90 thousand tons after losing the Crimea, because the bulk of fish was caught in the marine zone [5]. During the analyzed period also decreased fish production in internal water objects. For today very fast results can not be achieved here, but through gradually increasing the potential of inland water resources, which are mostly used inefficiently, it will be possible to stabilize the level of own extraction of fish and by-products. Our country will remain significantly dependent on imports of marine fish and seafood from the Northern European countries, but will provide a wider assortment of domestic products on a permanent basis.

The dynamics of recent years shows that capacity of the domestic food market in Ukraine is constantly growing. If in 2013 it was 352 billion UAH [7], then already in 2017 it increased to 637 billion UAH. This was due to the influence number of factors, including military actions in the East of Ukraine, rapid devaluation of national currency and economic inefficiency for many producers of agricultural raw materials and processed food products. As usual, the current inflation processes and the permanent increase in production costs as a result of rising tariffs for electricity, water and gas, which led to an increase in

sales prices, took place additionally. It became especially noticeable for enterprises that use imported raw materials or equipment for production. In the short term, having absence of significant socio-economic shocks in Ukraine, capacity of the domestic food market will continue to grow smoothly, most likely within 10% per year. In addition to the factors listed above, such global trends as diversification of consumer tastes and the development of international trade, which will lead to increasing the value of imported food in Ukraine, almost is confirmed by monitoring information in 2018. However, changes in the role of the domestic agricultural sector for food market will not happen, we continue to provide our own needs in the majority of key product groups on our own. This is all the more important, as today the world has seen a tendency in increasing the number of undernourished people [4, 8], while for our country this problem is irrelevant.

**Conclusions.** Food security for the country is always a priority in the domestic state policy. To achieve this goal almost all available resources are subordinated. The main ways to achieve food security for the country – self-sufficiency or import of food products. From the point of view

economic efficiency, it is often more beneficial to import food products than to produce. Most countries in the world import goods, that they can not manufacture and cultivate (critical imports), or that they produce much more expensive than traditional suppliers. However, many states consider the situation deeper, stimulating their agriculture anyway (for example, the European Union), thus make reinsurance from unforeseen external circumstances.

Ukraine is in a distinguished position as a net exporter of food with a significant excess of exports over imports. We provide the much bigger share of domestic food market needs by our agricultural production, in particular, in grain as a strategically important food resource. Dependence on external supplies of exotic fruits and fish products is objective, but does not significantly affect food security. Total value of the internal food market in Ukraine, as before, more than 4/5 consists of domestic products, although its capacity is steadily increasing. In the near future, this situation will not change, volumes and assortment of own food products will only be supplemented by import supplies, although the market will continue to demonstrate pronounced growth dynamics.

#### Literature

1. Баланси та споживання основних продуктів харчування населенням України. URL : [http://www.ukrstat.gov.ua/druk/publicat/kat\\_u/2018/zb/07/zb\\_bsoph2017\\_pdf.pdf](http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/07/zb_bsoph2017_pdf.pdf).
2. Бойко В. І. Продовольча безпека України в контексті глобалізації проблеми. Київ : ННЦ «ІАЕ», 2007. 30 с.
3. Витрати і ресурси домогосподарств України у 2017 році. URL : [http://www.ukrstat.gov.ua/druk/publicat/kat\\_u/2018/zb/07/zb\\_vrdu2017\\_pdf.pdf](http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/07/zb_vrdu2017_pdf.pdf).
4. Глобальна продовольча безпека / Білорус О. Г., Зубець М. В., Саблук П. Т., Власов В. І. Київ : ННЦ «ІАЕ», 2009. 486 с.
5. Державна служба статистики України. URL : <http://www.ukrstat.gov.ua>
6. Методичні рекомендації щодо оцінки ємності внутрішнього ринку сільськогосподарської продукції та продовольства / Шпичак О. М., Лупенко Ю. О., Жук В. М. та ін. ; за ред. О. М. Шпичака. Київ : ННЦ «ІАЕ», 2015. 56 с.
7. Шпичак О. М., Боднар О. В. Проблеми ємності внутрішнього споживчого ринку сільськогосподарської продукції та продовольства в Україні в контексті купівельної спроможності населення. *Економіка АПК*. 2013. № 6. С. 5-13.
8. The State of Food Security and Nutrition in the World 2018. URL : <http://www.fao.org/3/I9553EN/i9553en.pdf>.

#### References

1. Balansy ta spozhyvannia osnovnykh produktiv kharчування naselenniam Ukrainy [Balances and consumption of basic food products by the population of Ukraine]. Retrieved from: [http://www.ukrstat.gov.ua/druk/publicat/kat\\_u/2018/zb/07/zb\\_bsoph2017\\_pdf.pdf](http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/07/zb_bsoph2017_pdf.pdf) [In Ukrainian].
2. Boiko, V.I. (2007). *Prodovolcha bezpeka Ukrainy v konteksti hlobalizatsii problemy* [Food safety of Ukraine in the context of globalization problem]. Kyiv: NNTs "IAE" [In Ukrainian].
3. Vytraty i resursy domohospodarstv Ukrainy u 2017 rotsi [Expenditures and resources of households in Ukraine in 2017]. Retrieved from: [http://www.ukrstat.gov.ua/druk/publicat/kat\\_u/2018/zb/07/zb\\_vrdu2017\\_pdf.pdf](http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/07/zb_vrdu2017_pdf.pdf) [In Ukrainian].
4. Bilorus, O.H., Zubets, M.V., Sabluk, P.T., & Vlasov, V.I. (2009). *Globalna prodovolcha bezpeka* [Global food security]. Kyiv: NNTs IAE [In Ukrainian].
5. Derzhavna sluzhba statystyky Ukrainy [State Statistics Service of Ukraine]. Retrieved from: <http://www.ukrstat.gov.ua> [In Ukrainian].
6. Shpychak, O.M., Lupenko, Yu.O., Zhuk, V.M., et al. (2015). *Metodychni rekomendatsii shchodo otsinky yemnosti vnutrishnoho rynku silskohospodarskoi produktsii ta prodovolstva* [Methodical recommendations for estimation the capacity of internal agricultural and food market]. O.M. Shpychak (Ed.). Kyiv: NNTs "IAE" [In Ukrainian].
7. Shpychak, O.M. & Bodnar, O.V. (2013). Problemy yemnosti vnutrishnoho spozhyvchoho rynku silskohospodarskoi produktsii ta prodovolstva v Ukraini v konteksti kupivelnoi spromozhnosti naselennia [Problems of capacity the domestic agricultural and food consumer market in Ukraine in purchasing power of the population context]. *Ekonomika APK*, 6, pp. 5-13 [In Ukrainian].
8. The state of food security and nutrition in the world 2018. (2018). *Food and Agriculture Organization of the United Nations*. Retrieved from: <http://www.fao.org/3/I9553EN/i9553en.pdf> [In English].

### *Духницький Б.В. Самозабезпеченість внутрішнього продовольчого ринку України*

**Мета статті** - дослідити значення агропродовольчого сектору України у забезпеченні потреб внутрішнього ринку харчових продуктів.

**Методика дослідження.** Використано методи: теоретичного узагальнення - для вивчення суті і способів досягнення продовольчої безпеки країни, аналізу та синтезу - для комплексної оцінки рівня продовольчого забезпечення України і визначення частки виробництва у фондах споживання окремих видів рослинницької, тваринницької і переробленої продукції, порівняльної оцінки - для зіставлення обсягів власної та імпортової продукції на продовольчому ринку України, балансовий - для розподілу використання виробленої продукції на харчові та нехарчові цілі, табличний - для наочного відображення статистичних результатів дослідження.

**Результати дослідження.** Розглянуто структуру внутрішнього продовольчого ринку України за основними групами продуктів харчування, визначено товарні позиції, які характеризуються високим рівнем імпортозалежності, наведено особливості формування пропозиції продовольства на вітчизняному ринку, доведено високий рівень забезпечення потреб внутрішнього ринку України за рахунок власного сільськогосподарського виробництва, зроблено прогноз розвитку вітчизняного ринку продовольства на найближчу перспективу.

**Елементи наукової новизни.** Обґрунтовано об'єктивні підстави для зростання ємності ринку продуктів харчування України та можливості зниження впливу імпортних закупівель на його стабільне функціонування.

**Практична значущість.** Положення статті спрямовані на виявлення актуальних тенденцій розвитку продовольчого ринку України, оцінку вартості власної та зарубіжної продукції на ньому і доведення цих даних до профільних органів влади та галузевих виробників. Табл.: 3. Бібліогр.: 8.

**Ключові слова:** продовольство; ємність ринку; баланс; виробництво; витрати на харчування; перспектива.

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### *Духницький Б.В. Самообеспеченность внутреннего продовольственного рынка Украины*

**Цель статьи** - исследовать значение агропродовольственного сектора Украины в обеспечении потребностей внутреннего рынка пищевых продуктов.

**Методика исследования.** Используются методы: теоретического обобщения - для изучения сути и способов достижения продовольственной безопасности страны, анализа и синтеза - для комплексной оценки уровня продовольственного обеспечения Украины и определения доли производства в фондах потребления отдельных видов растениеводческой, животноводческой и переработанной продукции, сравнительной оценки - для сопоставления объемов собственной и импортной продукции на продовольственном рынке Украины, балансовый - для разделения использования продукции на пищевые и непищевые цели, табличный - для наглядного отображения статистических результатов исследования.

**Результаты исследования.** Рассмотрена структура внутреннего продовольственного рынка Украины по основным группам продуктов питания, определены товарные позиции, которые характеризуются высоким уровнем импортозависимости, приведены особенности формирования предложения продовольствия на отечественном рынке, доказан высокий уровень обеспечения потребностей внутреннего рынка Украины за счет собственного сельскохозяйственного производства, сделан прогноз развития отечественного рынка продовольствия на ближайшую перспективу.

**Элементы научной новизны.** Обоснованы объективные основания для роста емкости рынка продуктов питания Украины и возможности снижения влияния импортных закупок на его стабильное функционирование.

**Практическая значимость.** Положения статьи направлены на выявление актуальных тенденций развития продовольственного рынка Украины, оценку стоимости собственной и зарубежной продукции на нем и приведение этих данных профильным органам власти и отраслевым производителям. Табл.: 3. Библиогр.: 8.

**Ключевые слова:** продовольствие; ёмкость рынка; баланс; производство; расходы на питание; перспектива.

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