DOI: 10.2478/vjbsd-2019-0012

FEATURES OF ORGANIC AGRICULTURAL PRODUCTS FUNCTIONING IN EU AND UKRAINE

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Organic agriculture ensures a balanced state of the ecosystem, which is the key to sustainable development of the economic and social spheres of society. European countries are in the process of historical development reached an understanding on the need for its further ecological progress. That is why the world market for organic products has formed. Studies show that the development of organic production began in the 20's of the twentieth century. Since then, markets for organic products began to grow rapidly in many countries. Among the world's regions, the largest areas of organic land are located in Oceania and Europe. The article is devoted to the study of foreign experience in the development of ecological agriculture. The variety of names of ecological systems of management in the countries of the world and the principles which are included in the concept "ecological agriculture" are studied. The history of the emergence of organic agriculture has been explored. The analysis of the development of organic agricultural production at the world level, the countries of Europe and the European Union (EU) and individual countries has been analyzed. A grouping of organic farms in Europe has been organized in terms of size. Ukraine, with its significant natural and economic potential in the future may also be one of the important subjects that will form a proposal in this market. The environmental policy of the country has an important influence on the efficiency of organic farms.

Keywords: sustainable development; agriculture; organic production; ecology

Introduction

Solving the environmental problems of humanity remains the main task of modern development. This is because the most important issue of our time is the safety of the existence of human civilization in general. During the last two centuries, humanity has chosen a model of existence that foresees significant contradictions between the receipt of public benefits from the use of natural resources, the use of technologies that are risky and environmentally damaging.

The scientific and technological revolution has complicated the relationship of society with the environment. Widespread and unpredictable human impact on all components of the biosphere without exception is now reaching its height, leading to a crisis in the environment in the world and Ukraine as well. Today, most people in Ukraine has a problematic provision of natural rights, breathe clean air, drink clean water, eat quality food, to have healthy children.

One of the areas of greening of agriculture is the production of agricultural products using alternative technologies. Among them, the most widespread in the world was organic agro-production, which in Ukraine, despite its potential, is only at the stage of implementation. That is why it is important to evaluate the peculiarities of the functioning of the market of organic agricultural products in Ukraine and EU countries in order to formulate the environmental and economic policies of the countries and to identify factors that contribute to the formation of an environmentally friendly market economy. This is the purpose of our study.

In addition to traditional farming practices, ecological agriculture is developing and growing in the world, with the role to produce agricultural products with minimal use of chemicals and minimal environmental impact. Consumers are willing to pay a higher price for products that are less harmful in terms of health.

The Slovak researcher Paška (2001) points out that organic farming is, first of all, not just the production of agricultural products to certain standards, but the philosophy of returning to nature. This balanced agro ecosystem long duration is based on use of renewable resources.

Problems of the negative impact of agricultural activity on the environment are being explored by many domestic and foreign scientists. For example, the Polish researcher Kędziora (2007) indicates that farmers seeking to increase crop yields are transforming ecological systems. He was supported by a team of scientists from the Slovak Agricultural University led by Lacko-Bartošová (2005), which indicate the need for a balanced use of modern technology in agriculture and avoiding dangerous elements activities that may harm the environment. The importance of the ecological environment in terms of sustainable development emphasizes also Pondel (2013) and a detailed assessment of world agriculture in the context of the twelve major crops in the world and environmental issues was held by Clay (2013).

Also, problems of greening agricultural production were investigated by McNeely and Scherr (2003) and Binswanger, Hazell and McCalla (1998) and others. Among the studies of Ukrainian authors, Zinovchuk (2006), Nagirna and Savchuk (2014), Gevko (2017) deserve attention. In addition, a great deal of research is related to the need for sustainable agricultural development, one of which is the environmental aspect itself.

The world uses various names of farming systems (about 16) to describe organic farming. Thus, the adjective "organic" is commonly used in the UK, while the adjective "biological" or "ecological" often describe ecological agriculture in Europe and America. The term "organic farming" is sometimes used in some parts of Asia, but it is not defined by law and therefore there is a more commonly used term "organic farming".

These names are generally considered synonymous with the principles set out in the basic document of the International Federation of Organic Farming Movements (IFOAM):

- the principle of health – Organic agriculture must support and improve the health of soil, plants, animals, humans and the planet as one and indivisible whole;
- the principle of ecology – organic agriculture should be based on the principles of natural ecological systems and cycles, working, co-operating with and supporting them;

- the principle of fairness – Organic agriculture must be based on relationships that guarantee fairness, taking into account environmental interests and vital opportunities;
- the principle of care – Organic agriculture management should be preventative and responsible in protecting the health and well-being of both present and future generations and the environment.

Globally, of course, there is no harmonized rules for ecological agriculture, but in this area there are different organizations. The most important of these is the IFOAM, which covers the international scope of organic farming, has 750 member organizations in 127 countries and the Food and Agriculture Organization of the United Nations (FAO), which is represented today in 130 countries. They represent the basic level of regulation, establish the general principles of management, production and trade in organic food, control and certification. Production of individual countries can implement international trade only if their national laws and directives unions meet basic standards and that they are accredited in accordance with the criteria of IFOAM.

There are other organizations in the world, but they are not globally recognized in terms of the functioning of an ecological farming system. Among them are the Research Institute of Organic Agriculture (FiBL) and Organic Farming Information System (AIMS).

Investigating the history of organic agriculture, we can conclude that it began to develop in the 20's of the twentieth century. With the creation by the Austrian philosopher Steiner of the theory of anthroposophy, the essence of which is to find the harmony of man with the outside world (Humeniuk, 2010). As a result of the spread of this theory in the 1940s, the ecological farms in Germany, Switzerland, the United Kingdom, Denmark and the Netherlands started to be established. In other countries, this farming system has only been widespread since the 1970s, when the first organic farms began to emerge. However, the founder of the organic movement in the world is still considered by the Japanese philosopher Mokishi Okada (Yarmilka, 2010; Burlyai and Gutsalenko, 2013).

The real "boom" in organic production began with the adoption in 1991 of Council Regulation (EC) 2092/1991 on organic production and labeling of agricultural products and food. It was the first piece of legislation that regulated organic farming practices and determined the required control mechanisms, certification and labeling. Since then, organic markets have grown rapidly in many countries around the world. At the beginning of 2018, the world area under organic agriculture was 69.8 million hectares in over 2.9 million certified organic farms, accounting for 1.4% of the total agricultural area of 181 countries.

Opportunities for the development of organic agriculture are also being created in Ukraine. Thus, in 2014 the Law on Production and Turnover of Organic Agricultural Products and Raw Materials came into force, according to which, during organic production, the use of chemical fertilizers, pesticides, genetically modified organisms (GMOs), preservatives, etc., and at all stages of production (cultivation, processing) the methods, principles and rules laid down in this Law are applied to obtain natural (environmentally friendly) products, as well as the conservation and restoration of natural resources. On August 2, 2019, the Law of Ukraine "On Basic Principles and Requirements for Organic Production, Circulation and Labeling of Organic Products" was put into effect.

It is important to note the importance of signing the Association Agreement between Ukraine and the EU countries on the ecological management of agricultural production and compliance with all relevant standards. This Agreement provides for the development of cooperation on environmental protection and the improvement of the quality of natural resources, promoting modern and sustainable agricultural production, taking into account the need to protect the environment and animals, in particular, the widespread use of organic production methods and the use of biotechnology, the introduction of best practices in these fields, etc.

Material and methods

The theoretical and methodological basis of the research is the modern economic theory, the systematic approach to the study of economic and environmental aspects of agricultural development, scientific works of domestic and foreign scientists on sustainable agricultural development and the organic produce market. In the process of research, general scientific and economic methods were used: monographic method; calculation-constructive method and extrapolation method (in substantiating the supply dynamics and forecasting main economic indicators); methods of analysis and synthesis, induction and deduction in order to theoretically deepen ideas about organic agricultural production. In addition, the methods used are: historical, analytical methods: tabular and graphical (for presentation of calculations and results in visual-graphical form), comparative analysis, grouping, etc. The information base of the research was materials of the State Committee of Statistics of Ukraine, personal researches of the authors.

Results and discussion

The analysis of organic agriculture in the EU and Europe generally shows the rapid development of organic production and the market. Thus, over the past two decades, organic farming in Europe has expanded from 100,000 hectares to 13.5 million hectares, and in 2017 it accounted for 21% of the world's total organic area. The most dynamic development of organic farming occurred in the 1990s. Although the pace of growth has slowed somewhat recently, the forecast for the next decade implies a further increase in the share of green land by 3–5% from the current state.

In 2017, organic land in the EU countries amounted to 12.8 million hectares, which is 6.4% more than in the previous year and is more than 90% of European organic area (Figure 1). In 2017, in ten European countries, at least 10% of agricultural land was organic. However, the situation in organic farming is very different among EU Member States. Thus, the largest areas of organic land in Europe are located in Spain (2.1 million hectares), Italy (1.9 million hectares) and France (1.7 million hectares). On the other hand, Malta, Luxembourg, Cyprus are only at the beginning of the promotion of organic farming, and the share of arable land here is quite small. Ukraine is an important member of the European market for organic products and has significant potential for development of organic agricultural production. Natural and climatic conditions, qualitative composition of the country's land (8% of the world's black earth reserves) and geographical location have a favorable influence on the development of alternative agricultural systems. Today we see intensive development of organic agricultural production. However, it should be noted that in comparison with European countries the historical development of this sector of Ukraine dates back to 15–20 years later – from the end of the 90s of the twentieth century. The area of organic land in Ukraine is only 1.2% of the total amount of land. Currently, the Ukrainian system of organic agriculture includes 421 thousand hectares of organic land, which represents the eleventh place among European countries and the twentieth among all countries in the world. However, there is a trend

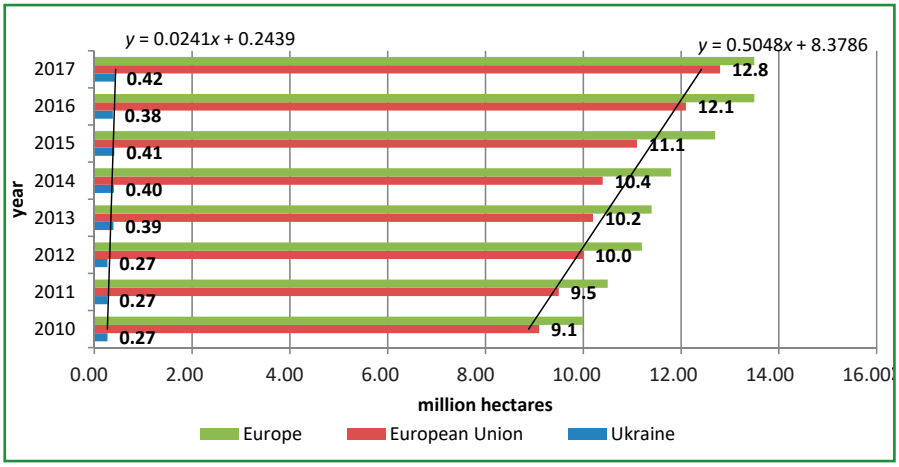

Figure 1 Dynamics of organic areas in Europe and Ukraine, million hectares
Source: processed by authors according to data from http://www.ukrstat.gov.ua, https://www.organic-world.net/yearbook.html

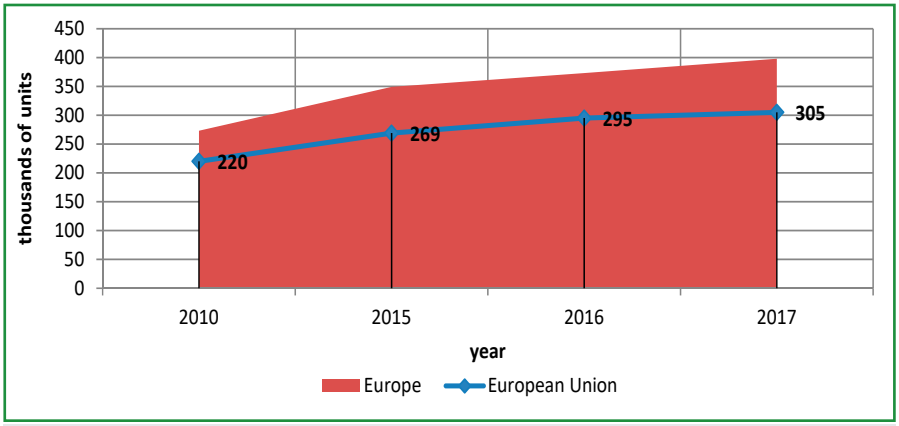

Figure 2 Dynamics of changes in the number of organic producers in Europe and the EU for the years 2000–2017 (thousands of units)
Source: processed by authors according to data from https://www.organic-world.net/yearbook.html

of 73% increase in certified organic areas over the period from 2010, ie an average of 24.1 thousand hectares per year ($y = 0.0241x + 0.2439$).

In the EU for the same period 2010–2017, the area of organic land increased by 29%, which indicates a certain stabilization in the distribution of this type of production.

Similar situation is also observed with the number of organic producers. For example, in Europe in 2017 there were almost 400,000 organic producers (almost 305,000 in the EU), which is 7% more than in the previous year (Figure 2). The leading producer countries are Turkey (over 75,000 units) and Italy (over 68,000 units). The outsider countries in terms of organic farms include Malta (13 units), Iceland (33 units) and Liechtenstein (45 units). There is also an increase in organic market operators in Ukraine, including manufacturers. For the period 2002–2017 the number of certified producers of organic agricultural products increased 12 times – from 31 to 375 farms. However, a sharp increase in the number of producers compared to the previous year occurred in 2016 – by 150 farms (71%). If current trends persist, in five years the area of organic agricultural land in Ukraine will be 560 thousand hectares, on which 510 farms will be engaged in growing organic crops.

The total number of eco-producers in a country depends, first of all, on the level of development of the country, its size and soil and climatic conditions. It is therefore important to compare the average farm size by country (Table 1).

Table 1 Europe Organic Farming Groupings by Size, 2017

1 group	2 group	3 group	4 group	5 group
up to 20 ha	20–40 ha	40–60 ha	100–200 ha	more 200 ha
Kosovo	Bulgaria	Bulgaria	Denmark	Estonia
Serbia	Norway	Norway	Latvia	Great Britain
Malta	Switzerland	Switzerland	Lithuania	Moldova
Bosnia and Herzegovina	Croatia	Croatia	Czech Republic	Slovakia
Montenegro	Poland	Poland	Sweden	Iceland
Macedonia	Austria	Austria		Ukraine
Cyprus	Italy	Italy		Russia
Liechtenstein	Turkey	Liechtenstein		
Albania	Romania			
Slovenia	Netherlands			
	Belgium			

Source: processed by authors according to data from https://www.organic-world.net/yearbook.html

We found that the average area of an organic farm in Europe in 2017 was 36.6 hectares, and in the EU – 41.9 hectares. Data from our grouping show that in almost half of European countries, organic farming averages between 20 and 40 ha. However, in some countries – Estonia, the United Kingdom, Moldova, Slovakia, Iceland, Ukraine and Russia – the average size of organic farming exceeds 200 hectares due to the high proportion of permanent pastures.

In 2017, there were 210 certified organic farms in Ukraine, with an average size of about 2,000 hectares. However, it should be noted that for the period from 2002 to 2017 the average size of organic farms in Ukraine decreased almost 5 times – from 5.3 hectares to 1.1 hectares of land. Among the regions of the country in 2017, the leaders in terms of the average size of organic farming are Odessa (2.34 thousand hectares), Dnipropetrovsk (1.64 thousand hectares), Chernihiv (1.47 thousand hectares), Kherson (1.21 thousand hectares) and Kirovograd (1.16 thousand hectares). According to the data presented by Khodakivska (2015), in 2015, in the structure of certified organic lands, 76.4% occupied arable land, 21% pasture and about 1% occupied the area under perennial plantations.

It is important to note that a prerequisite for the transition to organic farming is compliance with a transition (conversion) period, which will allow producers to adapt to the use of organic production technologies. Conversion is the transition from the traditional to the organic method of management in a certain period of time, during which the rules and principles of organic agro-production are applied. During the transition period, new market strategies need to be developed and traditional economic processes aligned with the requirements of organic production. In some cases, this is due to the complete substitution of more sustainable varieties of animals and plants on farms, which significantly increases the cost of production and increases the risk of organic farming losing its position in competition (Shumeiko, 2016).

The duration of the transition depends on the area of organic production:

- crop production: at least 2 years before sowing for annual crops, not less than 3 years before harvesting in case of perennial (except forage) and at least 2 years before harvesting for forage crops;
- livestock: at least 1 year for ruminant meat; six months for pigs, small ruminants and dairy cattle, poultry for meat – 10 weeks, for egg production – 6 weeks. Beekeeping – from 1 year;
- aquaculture cultivation: from 6 months to 2 years, depending on the method of processing the finished product.

To date, more than 91 thousand hectares of land (24%) in Ukraine have the status of "land of transition to organic production", which indicates a considerable potential for the progress of organic agricultural production. These data allow us to conclude that soil, climate, economic and political conditions are favorable for the development of organic production in the countries of Europe and the EU. Organic farming is one of the priorities of the EU Common Agricultural Policy. That is, alternative systems of agricultural production are becoming a diversifying element in farms and, at the same time, a system of sustainable development, especially in rural areas.

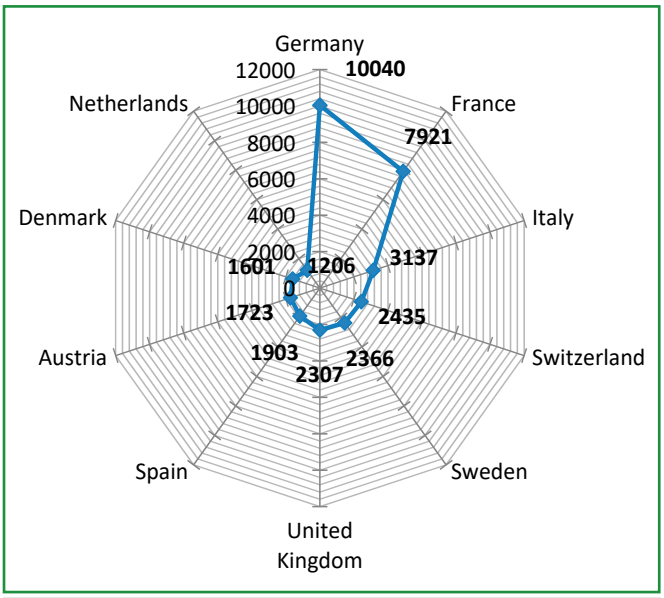

Figure 3 EU countries with the largest organic market in 2017, EUR million
Source: processed by authors according to data from https://www.organic-world.net/yearbook.html

Thus, the organic market in Europe in 2017 was estimated at 37.3 billion euros (34.3 billion euros in the EU). Among the European countries, the organic market for the largest development was acquired in Germany (EUR 10 billion), France (EUR 7.9 billion) and Italy (EUR 3.1 billion) (Figure 3). That is, the relationship between the quantitative indicators of organic production in Europe and the volume of the market is traced. At the same time, Switzerland, Denmark and Sweden are the largest consumers of organic products per capita.

As for Ukraine, the predicted result of an increase in organic land and the number of organic market participants in Ukraine is an increase in organic agricultural market volumes (Table 2).

Movement of Ukraine

The above figures show a clear upward trend in the organic market in Ukraine over the period from 2005 to 2018, which is quantitatively reflected in an increase in its volume by 165 times from 0.2 million euros in 2005 to

Table 2 Organic Agriculture Market Volume in Ukraine

Year	Market volume (EUR million)	Growth rate of organic market volume (%)	Per capita market volume (EUR)
2005	0.2	–	0.004
2010	2.4	100.0	0.052
2015	17.5	20.7	0.408
2016	21.2	21.1	0.496
2017	29.4	38.7	0.690
2018	33.0	12.2	0.779
Level 2018 to 2005 data (times)	165	–	184

Source: processed by authors according to data from IFOAM and the Federation of Organic

Table 3 Ukraine's role in shaping the European organic market for agriculture in 2005–2017

Indicator	EU countries				Ukraine			
	2005	2010	2015	2017	2005	2010	2015	2017
Number of certified organic farms (pcs.)	164,000	220,000	269,000	305,000	72	142	210	375
Area of land certified for organic production (thousand hectares)	6,760.3	9,276.6	12,100	12,800	242	270	410	420
The share of certified in the total area of agricultural land (%)	3.5	4.8	6.7	7.2	0.6	0.7	0.9	1
Average size of farm (ha)	36	42	45	42	3,361	1,903	1,952	1,120
The volume of the organic produce market (EUR million)	11,000	18,500	30,700	34,300	0.2	2.4	17.5	29.4

Source: processed by authors according to data from http://www.ukrstat.gov.ua, https://www.organic-world.net/yearbook.html

33 million euros in 2018. It should be noted that the growth rate of the market volume decreases annually, which indicates a slowdown in its development.

At the same time, the calculations show extremely low per capita figures – only € 0.779 per person in 2018. For comparison, according to IFOAM in Europe, this figure in recent years is at the level of about 40 euros, and in North America it is 117 euros. These facts lead to the conclusion that despite the overall growth, the level of development of the organic agricultural market in Ukraine is at a very low level. In our view, despite the public's understanding of the importance of using organic production technologies to preserve the environment and consume high-quality environmentally friendly products, the main factors that impede the development of the organic market are high production costs, which directly correlate with the price of production and demand for it.

We have summarized the main reasons for the slow development of organic agricultural production in Ukraine:

1. Consumers' attitude to organic food. In Ukraine, the negative or neutral attitude of buyers towards organic products continues to prevail, and people have distrust toward organic food and organic production as a whole due to the effects of objective and subjective actions. This is the reason why the country has poorly developed domestic consumer market for organic products, and the export orientation of producers prevails. Exports are mainly directed to Italy, Austria, Germany, the Netherlands, Poland, France, Denmark, the USA, Canada and Switzerland.
2. The purchasing power of the population. This is one of the most serious problems in the development of organic agriculture in Ukraine. Low incomes cause lack of interest and insufficient demand for organic farming products. This, in turn affects the structure and quantity of organic producers. They only produce as much as the market can absorb. People make buying decisions based on price and quality. However, the price of organic products is often several times higher than price of traditional agricultural products.
3. Low level of state support, which is manifested not only in the absence of cash assistance (subsidies, preferential loans and preferential vacations, etc.). Given the difficult environmental situation and the state's declaration of sustainable development, it should also contribute to improving the legal framework, informing consumers, raising public awareness of the environmental impact of environmental technologies and enhancing research in organic farming.
4. Lack of infrastructure for storage, processing and transportation of organic products. There is a shortage of specially prepared premises for the storage of organic products in the country, there are problems with the international transportation of organic products, it is possible to state the insufficient level of transport logistics support and so on. In the absence of cooperation with processing enterprises, the export orientation of organic producers prevails. Most of the organic products are exported as raw materials and only there are processed directly into organic products intended for consumers, resulting in a loss of value in Ukraine. The farmer-processor-market-customer infrastructure, with the support of government organizations is still under-built. Therefore, it is important to create an internal market with the parameters adopted by the manufacturer, processor, intermediary and consumer. If this chain works, given the potential, a real boom in organic agriculture in Ukraine can be expected.
5. Insufficient awareness of producers about technologies of organic production and features of sale of organic products. Only a small number of farmers have the necessary knowledge and experience of production in the organic farming system. However, it should be noted that in this field, agro-producers are constantly improving and trying to apply new modern technological processes suitable for organic farming, so it is necessary to join forces of the state, organic farmers and environmental associations to improve education and information on organic products.
6. Narrow range of organic products and lack of marketing research. The range of organic food in the Ukrainian market is largely limited, which can be another problem in the development of organic production. This is due to the fact that the technological process in the production of organic products is much more demanding than in the conventional system.
7. High production costs. Organic farmers produce their organic products at a higher cost than the conventional system. This is due to the greater dependence on natural conditions and the involvement of more labor in the production process. Due to the non-use of chemicals in production, there is often a decrease in production levels, so the specific costs increase. Another reason for the high costs is seasonal processing, as production is not stored chemically and needs to be checked regularly. All these reasons cause an increase in costs in the eco-management system, which should subsequently be reflected in prices in the organic market.

Table 3 compares the main indicators for the development of the organic agricultural market in Ukraine and the EU.

In comparison with the EU countries, the development of organic agriculture in Ukraine is much slower. As of 2017, there were 375 producers certified as organic according to EU regulations. They managed an area of 357 thousand hectares, but the share of certified organic land in the total area of agricultural land in Ukraine is only about 1%, while in the EU countries it

is 7.2%. The average size of the organic farm in Ukraine and the EU countries differs sharply: in Ukraine it is 1,120 hectares, in the EU countries – only 42 hectares. The organic market in Ukraine equals EUR 29.4 million, which is 0.9% of the indicator across the EU.

At the same time, it is possible to state the positive dynamics in the progress of the domestic market of organic agricultural products for the period under study and its considerable potential.

Conclusion

The production of organic agricultural and food products in the countries of the EU and Ukraine has a strong status and traditions, although its assortment and importance in the nutrition of the population differ from country to country. In some countries the organic agricultural market is well developed (Germany, UK, France), but there are also countries with low levels of organic agricultural production (Greece, Ireland).

In Ukraine, the organic market is only in its formation stage, has a history of about 20 years and is lagging behind the EU market by basic indicators. Despite this, the country shows positive development trends and significant natural, economic and geographical potential

Organic market development is hampered by higher market prices in comparison to traditional foods. However, interest in their consumption is steadily increasing as a result of improving the standard of living and health of the population.

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