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Competitive growth of layer poultry farming in Ukraine in the context of European integration

Abstract. The problem of competitive growth of the Ukrainian layer poultry farming products is conditioned by expansion of the European integration relations and high rates of growth of the overall production in this sector. The article is aimed at substantiating of competitive advantages of enterprises occupied in the layer poultry farming sector and at determining the vectors of implementation of the European Union requirements by the domestic enterprises. The authors cover organisational and economic features of the sector, as well as the ways to unlock its potential, and perform economic assessment of the balance of edible eggs. We have identified the need to adapt and retarget domestic enterprises at the European and international market based on the analysis of the level of egg production and consumption per capita, as well as the saturation of the domestic market with egg products. The authors of the article have studied the balance of eggs and egg products, the dynamics of production and trends in export growth of eggs produced in Ukraine. On the basis of a sales pattern of edible eggs produced by agricultural enterprises, we have identified weaknesses in the area and made proposals on how to improve statistical reporting forms. It has been established that high European market requirements regarding the quality and conditions of poultry production represent a challenge for the domestic layer poultry farming to develop at a new qualitative level, based on implementation of new enhanced power-saving and environmentally safe technologies and organic production. The article describes prospects for the use of competitive advantages of Ukrainian enterprises in order to extend the European integration of the sector.

Keywords: Egg Market; Competitiveness; Production; Consumption; Balance of Eggs and Egg Products; Sales Pattern; Quality; European Integration; Export; Competitive Advantages

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Підвищення конкурентоспроможності яєчного птахівництва України у світлі європейського напрямку інтеграції

Анотація. Проблема підвищення конкурентоспроможності продукції яєчного птахівництва України обумовлена розширенням європейських інтеграційних зв'язків і швидкими темпами зростання обсягів виробництва в галузі. Метою статті є обґрунтування конкурентних переваг підприємств галузі та визначення напрямів упровадження вимог Євросоюзу на вітчизняних підприємствах. Висвітлено організаційно-економічні особливості галузі та можливості реалізації її потенціалу, проведено економічну оцінку балансу харчових яєць. На основі аналізу рівня виробництва та споживання яєць на одну особу, насичення внутрішнього ринку яєчною продукцією встановлено необхідність адаптації та переорієнтації вітчизняних підприємств на європейський і світовий ринок. Досліджено баланс яєць і яєчних продуктів, проліюстровано динаміку виробництва й тенденції зростання експорту яєць з України. На основі структури реалізації харчових яєць сільськогосподарськими підприємствами визначені недоліки й надані пропозиції щодо удосконалення форм статистичної звітності.

Встановлено, що високі вимоги європейського ринку до якості й умов утримання курей стануть стимулом для нового якісного рівня розвитку вітчизняного яєчного птахівництва на підставі впровадження нових, удосконалених, енергозберігаючих та екологічних технологій, органічного виробництва. Запропоновано перспективи використання конкурентних переваг українських підприємств із метою розширення європейського напрямку інтеграції галузі.

Ключові слова: ринок харчових яєць; конкурентоспроможність; рівень виробництва і споживання; баланс яєць і яйцепродуктів; структура реалізації; якість; євроінтеграція; експорт; конкурентні переваги.

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Повышение конкурентоспособности яичного птицеводства Украины в свете европейского направления интеграции

Аннотация. Проблема повышения конкурентоспособности продукции яичного птицеводства Украины обусловлена расширением европейских интеграционных связей и быстрыми темпами роста объемов производства в отрасли. Целью статьи является обоснование конкурентных преимуществ предприятий отрасли и определение направлений внедрения требований Евросоюза на отечественных предприятиях. Освещены организационно-экономические особенности отрасли и возможности реализации ее потенциала, проведена экономическая оценка баланса пищевых яиц. На основе анализа уровня производства и потребления яиц на душу населения, насыщения внутреннего рынка яичной продукцией установлена необходимость адаптации и переориентации отечественных предприятий на европейский и мировой рынок. Исследован баланс яиц и яичных продуктов, проиллюстрированы динамика производства и тенденции роста экспорта яиц из Украины.

На основе структуры реализации пищевых яиц сельскохозяйственными предприятиями определены недостатки и даны предложения по совершенствованию форм статистической отчетности. Установлено, что высокие требования европейского рынка к качеству и условиям содержания кур станут стимулом для нового качественного уровня развития отечественного яичного птицеводства на основании внедрения новых, усовершенствованных, энергосберегающих и экологических технологий, органического производства.

Предложены варианты использования конкурентных преимуществ украинских предприятий с целью расширения европейского направления интеграции отрасли.

Ключевые слова: рынок пищевых яиц; конкурентоспособность; уровень производства и потребления; баланс яиц и яичепродуктов; структура реализации; качество; евроинтеграция; экспорт; конкурентные преимущества.

1. Introduction

Production of edible eggs is one of the strategic sectors of the Ukrainian farming industry; its development level has a significant impact both on the quality of nutrition of the population, food security of the country and its ranking in the global market. The volumes of egg production in Ukraine grow by more than 10% every year. According to data provided by the State Statistical Service of Ukraine, they exceeded one million tons per year in 2011-2014. Intensification of European integration processes offers the Ukrainian layer poultry farming additional challenges consisting in an increase in large-scale egg export to European countries.

2. Brief Literature Review

Issues of competitiveness of poultry farming products have always been an object of thorough studies and scientific investigations. In his scientific works, F. O. Yaroshenko determined principal components of the economic mechanism of the poultry farming sector in Ukraine and its competitive growth in the domestic and the foreign markets [1]. O. V. Ulianchenko investigates the competitive growth of the layer poultry farming under the conditions of the clusterization of both the agricultural sector and the integration progress [2]. The works by V. S. Zabolotnyi and O. F. Kyryliuk deal with analytical assessment and progress forecast for the sector [3]. N. O. Avercheva, V. O. Boiko and L. O. Boiko suggest ways to improve economic efficiency and forecast the production of poultry products by 2020 [4]. Other scientists use practical calculations and mathematical methods of analysis to forecast the industry development [5].

Y. B. Ishchenko emphasises competitive power of poultry enterprises. In particular, the author offers a multipurpose technique for the assessment of competitive advantages of entities by the relative consolidated competitive power index [6], creating a ranking of Ukrainian poultry farms by net income [7]. He studies up-to-date systems of poultry management and product security monitoring systems at domestic enterprises [8; 9].

World trends in the poultry industry have been thoroughly examined by A. A. Mahjoor [10], who proves that the countries, which widely use advanced achievements, are at the forefront of development. The main factors of the industry development are investments, technical upgrading, expansion of production capacities of enterprises, qualitative improvement of breeding resources and improvement of the

economic efficiency of egg production and broiler production [11]. Foreign scholars pay great attention to the structured marketing system to provide consumers with affordable, safe and qualitative poultry products [12-13].

Publications by foreign authors draw attention to the implementation of new poultry management systems in different countries, as well as to trends in alternative egg production, involving free poultry management and organic production [14]. They forecast a decreasing demand for edible eggs due to low population growth in Europe as opposed to the growth of egg products consumption rate on the average from 20% to 27%. Furthermore, an increase in real earnings in the developed countries will boost demand for food products. Along with this, European enterprises producing edible eggs do not pay enough attention to the promotion of the relevant products by advertising and marketing events [15; 16]. In his report about the competitiveness of the EU egg industries, Peter Van Horniz (the Research Institute of Agriculture, the Netherlands) emphasised that the EU had decreased its share in the market of edible eggs from 70% to 64% within a decade, while Ukraine had been increasing the volumes of production by more than 7% per year. Moreover, the cost of production in Ukraine is about 79% of the EU level. However, the production expenses will increase by more than 15% as a result of the adoption of legislation in the area of environmental protection, poultry management and food safety, high transport and import rates, which will adversely affect the competitiveness of edible eggs. Back in 2000, the Ukrainian egg industry was ranked the 8th in Europe with its volume of production being less than a quarter of that of Russia's production. After 2010, Ukraine has been able to hold a strong position as the second producer in the region with the equivalent of almost 50% of the Russian production rate [17].

The present research is particularly relevant due to the need to determine the current economic problems impeding the process of European integration of the layer poultry sector and to find ways to improve the competitive power of Ukrainian poultry farms.

3. The purpose of the article is to substantiate competitive advantages of enterprises operating in the sector, to perform an economic evaluation of the balance of edible eggs and to determine the problems relating to domestic enterprises' compliance with requirements of the European Union.

4. Results

Layer poultry farming is one of the Ukrainian agricultural sectors which is able to ensure expanded production due to implementing up-to-date technologies and supplying competitive products to the global market. Competitive advantages of the industry, as compared to other livestock farming sectors, are based on the following characteristics:

- edible eggs are a unique protein product essential for the food ration of people all over the world, thus the sector is oriented at the world market;
- edible eggs is a finished product for final consumption, not requiring additional processing and may be sold directly by a trading network due to which a manufacturer directly obtains the final profit;
- the relevant production is isolated from environmental influence to the maximum extent, it is highly concentrated and located in large complexes ensuring maximum satisfaction of the physiological requirements of poultry, which allows achievement of the highest production rates;
- the optimal structure of technological process ensures continuous and regular supply of egg products to the market, which guarantees stable money income of enterprises and strong trade relationships with business partners;
- the sector is adaptable to innovations: implementation of up-to-date energy and resource saving technologies, highly mechanised and automated lines for feeding, veterinary attendance, control over technological parameters, cleaning of poultry houses, grading and packing of eggs have a direct impact on the production of edible eggs, their cost and competitive power in the world market;
- qualitative characteristics of the products may be significantly enhanced due to adding certain useful ingredients to the poultry feeding diet, in particular vitamins, selenium and iodine;
- egg processing allows prolonged storage and comfortable transportation of eggs and solves the problem of overproduction in the country.

Scientists and nutrition specialists have established that a reasonable consumption rate for eggs made 290 pieces per capita annually. Ukraine reached the level in 2010. In 2016, the level of egg consumption in Ukraine was 267 pieces per capita, which is by 1.8% less as compared to the year 1990 and by 7.9% less than the index in 2010. The industry potential is much higher - the leading poultry producers are capable of further increasing the volumes of edible egg production and entering new product markets. According to data provided by the State Statistics Service of Ukraine, the egg production in 2016 made 354 pieces per capita. As compared to the figures of the year 1990, the level of production increased by 12.7%; however, it has decreased by 4.8% since 2010.

The market of edible eggs in Ukraine is characterised by permanent growth of consumption level with its peak level in the 2012-2014 period when the average consumption per capita made from 307 to 310 eggs (Table 1).

During the whole period under study, the ratio between egg production and consumption per capita is more than 1 and reaches 1.47 in the 2013-2015 period, i.e. domestic production exceeds domestic consumption by 47%, which is an additional evidence of the need for egg production enterprises to enter foreign markets. Such enterprises may consider the saturation of the domestic market to be an additional challenge to adapt and reorient to the world market.

Foreign analysts of the market of edible eggs state that price is an important factor influencing the demand in Ukraine, since its per capita income is rather low if compared to per capita income in the

Tab. 1: Level of egg production and consumption in Ukraine (per capita per annum, pcs.)

Indexes	Years									2016, % of 1990	2016, % of 2010
	1990	1995	2000	2010	2012	2013	2014	2015	2016		
Production	314	183	179	372	419	431	456	392	354	112.7	95.2
Consumption	272	171	166	290	307	309	310	280	267	98.2	92.1
Ratio between production and consumption indexes	1.15	1.07	1.08	1.28	1.36	1.39	1.47	1.40	1.33	+0.18 p.	+0.25 p.

Source: Calculated by the authors based on [18]

European Union member states. In Ukraine, private households spend more than 50% of their total income to purchase food products. Thus, the egg consumption decreased from 310 to 267 pieces in 2015-2016 [15].

According to information provided by the Ukrainian Agrarian Confederation (UAC), the export of edible eggs reached the highest level in 2014, and the largest share in the growth in export volumes among all livestock products belonged to edible eggs. A research on the balance of edible eggs shows that there has been a sharp increase in the export in recent years, its share in the volumes of production has risen to 13%. Over the period from 2000 to 2007, the export was very insignificant. In 2013-2016, it exceeded 100,000 tons. In 2016, the export volume made 112,000 tons, which was almost by 50% more than the figures of the year 2010 (Table 2).

Leading enterprises have considerably expanded the external product markets and processing facilities. In particular, AVANGARDCO IPL, the largest egg producer in Ukraine, has set a goal to become the world leader at the expense of putting large specialised poultry farms into operation, with regard to the new poultry complexes in Kherson and Khmelnytskyi regions with their total production capacity of 3.5 billion eggs and 11.2 million laying hens and the volumes of egg processing equal to 6 million pieces per day. This is a hundred times more than the average size of similar poultry farms in Germany, for example [19].

AVANGARDCO IPL is one of the leading agro-industrial companies in Ukraine specialising in producing eggs and dried egg products. It is the top producer of eggs and dried egg products in Ukraine and Europe and has had its 31% share in production of commercial eggs and a share of 64% in dried egg products in Ukraine in the first half of 2017. The total production capacity is 8.6 billion eggs and 30.1 million hens. It is one of the leading exporters of eggs and dried egg products with its share of 39% in exporting eggs and egg products in the first half of 2017. Its export share of eggs is 14%, and the export share of dried egg products is 86%. The sales volume to the EU countries is 40%, while the Near East and North Africa (MENA) account for 47.8%, the Far East - 10%, Africa to the south of the Sahara - 0.2% and CIS - 2%.

By the financial results for nine months in 2017, the company's profit has decreased from USD 64.777 million to USD 54.706 million. The company's accounting profit has increased from USD 2.676 million to USD 12.073 million, whereas the operating profit fell from USD 20.973 million to USD 17.807 million, with its EBITDA decreasing from USD 12.608 million to USD 8.984 million.

The enterprise has high product quality and bio-protection standards. The quality management system Avangardco is certified according to ISO 9001: 2015. The main production capacities are certified according to ISO 22000: 2005 to ensure food safety. During the past several years, the company

Tab. 2: Balance of eggs in Ukraine (including egg products), thousand tons

Indexes	Years										2016, % of 2000
	2000	2005	2010	2011	2012	2013	2014	2015	2016		
Production	508	753	985	1079	1104	1133	1131	969	862	169.7	
Import	2	5	7	3	4	5	7	11	5	250.0	
Export	0	1	75	83	82	105	147	126	112	x	
Export ratio in production	0.0	0.1	7.6	7.7	7.4	9.3	13.0	13.0	13.0	x	
Consumption fund	471	647	767	818	810	813	771	694	659	139.9	
per capita, pcs	166	238	290	310	307	309	310	280	267	160.8	

Source: Calculated by the authors with an average weight of one egg of 57.75 taken for calculation, based on [18]

has invested considerable capital to expand its production capacities, which will allow it to meet the growing world demand for eggs and dried egg products [20].

The group of companies known as Ovostar Union N.V. (WSE: OVO) owns the most famous egg brand in Ukraine, which is *Yasensvit*TM and the brand of the first egg products in Ukraine, which is *Ovostar*TM. It is also the largest producer of liquid egg products for the Ukrainian food industry. The group has developed a vertically integrated business model that allows offering a diverse product portfolio, maintaining competitive advantages due to the rigorous control over the production costs and product quality at each stage of the production process.

According to the financial results for nine months in 2017, the company's profits have increased by 12% as compared to the same period in (from USD 53.7 million to USD 60.2 million). The gross profit made USD 15.2 million corresponding to 25% of the gross margin. In 2016, it was USD 16.3 million, which accounts for 30%. The export sales made USD 27.7 million, which is by 42% more. The share of export sales was 46% of the total profit for the accounting period.

The operating profit decreased by 19%, (from USD 12.4 million to USD 10.1 million), EBITDA made USD 12.2 million with its 20% profitability. In 2016, it was USD 14.2 million, which accounts for 26%. For the accounting period, the cash flow from the operating activities was USD 11.8 million. The net profit for the period made USD 8.0 million.

Despite the difficult market conditions for the egg industry, the group has ensured an increase in export sales along with positive price dynamics and stable results of the year 2017 [21].

A considerable part of poultry farming products is consumed by the domestic market, i.e. 659 out of 862 thousand tons, which is 76.4%. Ukraine has significant potential and can export 1.5 billion pieces of eggs and egg products without a detrimental impact on the domestic market (Figure 1).

In general, Ukraine is a country with developed poultry farming and export vector. With its competitive price, high quality domestic egg production and rising demand in Africa and the Middle East, Ukraine continues to maintain a leading position in the egg export. Today, Ukraine is exporting eggs to 22 countries. According to the data provided by scientists from the Institute of Agrarian Economics, the United Arab Emirates has been the biggest importer of the domestic eggs for several years. For five years, the UAE has increased the import volumes almost twentyfold. In 2016, the country bought 20.9 thousand tons of eggs from Ukraine. It is forecasted that the export volume of eggs to UAE may reach its record level in 2017. So far, Ukraine has exported more than 34 thousand tons of eggs to the UAE since the beginning of the year. The share of the UAE in the total export volume of eggs in January-October 2017 made 47.6%. Iraq (18%), Qatar (8%), Liberia (4.9%) and Sierra-Leone (4.9%) are also among the biggest importers of the Ukrainian eggs. However, the world prices for eggs fell last year. The average price for the export of edible eggs from Ukraine in January-October 2017 was USD 721 per ton. Therefore, considering the fact that the prices in the domestic market exceed those of the world market, it is more profitable for the domestic egg producers to sell their products in their own country [22].

Thus, Ukraine has a potential to increase exports, for it is one of the leading producers of grain crops and sunflowers which, in turn, are key components of compound feed for laying hens. Therefore, the relatively low production cost of eggs gives Ukrainian producers a significant competitive advantage in the global and European markets.

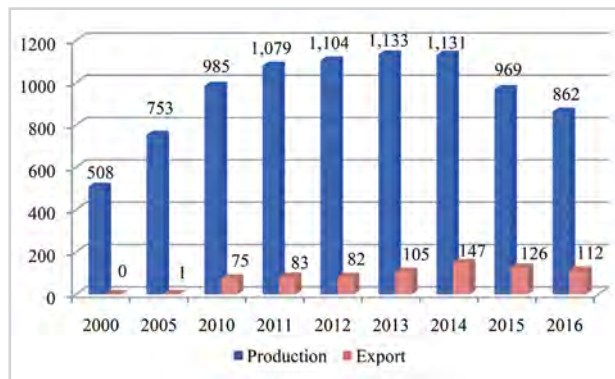


Fig. 1: Dynamics of egg production and export in Ukraine, thousand tons
Source: [18]

As supply in the Ukrainian market exceeds demand, while reserves to increase the domestic demand are unavailable, market analysts and leading industry experts forecasted collapse in prices for edible eggs and, correspondingly, a decrease in the production profitability as a result of overproduction [6], which happened in 2016.

Our studies of the pattern of edible eggs sale by the Ukrainian agricultural enterprises over the period from 2013 to 2015 evidence that other economic entities have the highest ratio (from 82% to 93%). At that, only 2.4-3.5% of products are sold to processing enterprises. Sales on the market and through own trading networks demonstrated a significant decrease, i.e. from 15.1% in 2013 to 4.8% in 2015. In 2016-2017, the existing statistical report forms were simplified: they did not reflect the marketing channels, considering only the structure by regions, monthly prices and categories of enterprises.

In our opinion, the of statistical report forms used to prepare the statistical bulletin «Product Sales by Agricultural Enterprises» should be made more specific. In particular the forms should:

- contain the volumes of domestic egg processing by poultry farming enterprises, agricultural holdings and their integration associations;
- display export sales volumes for other economic entities;
- should have a paragraph to indicate direct sales to commercial enterprises and wholesale intermediary agents.

The sales volumes of eggs by agricultural enterprises in 2016 made only 62.8% of 2013 (Table 3).

Tab. 3: Sale of eggs by agricultural enterprises of Ukraine

Indexes	Years					2016,% by 2013
	2013	2014	2015	2016	2017 (January-October)	
Total sales volume, thousand pieces	11,322,369	11,735,269	8,897,326	7,112,149	5,947,863	62.8
Average price for 1,000 eggs	656.7	782.4	1,333.2	1,108.7	1,029.0	156.7
Profitability level, %	47.6	58.8	60.9	0.6	--	-47.1

Source: Calculated by the authors based on [24]

The main reason for a reduction in the sales volumes of the product is a decline in the profitability level in 2016. According to O. Yaroslavskyi, an expert of the Public Council of the Ministry of Agrarian Policy and Food of Ukraine, the decline in the profitability is caused by a reduction in prices and a 23% increase in expenditures by in the poultry industry caused the reduction in the price by 9%, which led to a reduction in the profitability level from 60.9% to 0.6% [23].

The experts forecast that the level of egg consumption all over the world will constantly grow. As for the European integration prospects of the producers of edible eggs, Ukraine can supply at least 1 billion of eggs amounting to over USD 133 million to the EU annually, as the market participants state. Furthermore, Ukraine could supply to the European market about 14-15 thousand tons of egg

products amounting to USD 90 million USD in the short term. Thus, the cumulative export potential of Ukraine regarding the supply of eggs and egg products to the EU may constitute over USD 223 million. The free-trade agreement supposes that Ukraine will be able to supply up to 3 thousand tons of eggs and egg products to the EU annually. Taking into account the current prices, we can talk about duty-free import of eggs and egg products amounting to 15-20 million USD [25].

State Service of Ukraine on Food Safety and Consumers Protection (SSUFSCP) introduced a list of questions for enterprises dealing with egg production to check their compliance in terms of veterinary and sanitary requirements with regard to exports to the EU countries; the list consists of 15 chapters with the requirements beginning with documentation and process requirements and ending with eggs storage, packaging and marking. The questions are very detailed and serve enterprises as an information basis for the European standards implementation in production [26].

A generalised list of tariff quotas is given in Association Agreement, Supplement to Annex I-A [27], in particular it contains the following information about egg products (Table 4). The text of the Supplement is published on the site of the Cabinet of Ministers of Ukraine.

If the egg exports exceed the quota, the import duty rate is set at EUR 30.4 for every 100 kg of net weight. Under such duties, supply of Ukrainian products is unprofitable, in the opinion of the Union of Poultry Breeders of Ukraine.

The EU sets clear requirements for quality and class of eggs. According to the Regulation (EC) No. 589/2008, A-class eggs are the eggs having the qualitative characteristics as follows:

- the shells and the put amen should be of normal shape, clean and undamaged;
- the air cell: height should not exceed 6 mm, should be fixed; however, for eggs that are sold as «extra class», it may not exceed 4 mm;
- egg yolk: visible as a shadow only when candling, without clearly noticeable outline, slightly moving when turning the egg and returns to the central position;
- egg white: pure, transparent;
- egg embryo: no signs of development;
- sided substance: not permitted;
- foreign smell: not allowed [28].

Another requirement of the EU is related to egg labelling. For eggs to be exported to the EU member states, eggs should have a clear labelling of the country of origin in accordance with ISO 3166.

A - class eggs are marked by correct size. The weight marking is to be marked with the specified letters or definitions, or a combination thereof. In addition, a weight range may be specified.

XL - very large: weight > 73 g

L - large: weight > 63 g and <73 g

M - medium: weight > 53 g and <63 g

S - small: weight <53 g

The manufacturer's code should be easy to recognise, the height should be not less than 2 mm. in the case of export (para. 1 of art. 4/p1. Part A, III Annex XIV of EU Regulation 1234/2007, paragraph 2 of article 30 of the EU Regulation 577/2008).

B-class eggs are all the eggs that do not meet the quality characteristics of the A-class eggs. In turn, the B-class eggs are labelled so that they are easily distinguished from the A-class eggs, with a manufacturer's code and/or with other reference and meets the following criteria: the B letter in a circle with a diameter of at least 12 mm, height of at least 5 mm or a spot of colour which is clearly visible with a diameter of at least 5 mm.

However, requirements to poultry management are the biggest obstacle for the domestic producers of eggs to advance to the markets of the European Union. According to

Tab. 4: Indicative complex of tariff quotas for import to the European Union

Products	Code per combined nomenclature (CN)	Volume
Eggs and albumins		
0407 - Shell poultry eggs, fresh, tinned or boiled.	0407 00 (30)	1,500 tons/year with gradual increase within 5 years to 3,000 tons/year
0408 - Shell-less poultry eggs and egg yolks, fresh, dried, boiled in water or steamed, formed, frozen or otherwise tinned, with or without sugar or other sweeteners.	0408 11 (80) 0408 19 (81-89) 0408 91 (80) 0408 99 (80)	
3502 - Albumins (whites) (inclusive of concentrates of several whey proteins with 80% content by weight of whey proteins on a dry basis); albuminates and other albumin derivatives.	3502 11 (90) 3502 19 (90) 3502 20 (91-99)	
		+ 3,000 tons/year (for CN code 0407 00 (30))

Source: [27]

Directives No. 2002/4/ECC, a mandatory labelling of eggs specifying the country code and the production method is adopted:

0 - organic;

1 - free-range;

2 - alternative management;

3 - cage management.

In Europe, starting from 1 January 2012, egg production is allowed only in improved cages and in the systems using free-range (poultry run) and organic production. Since Ukraine is moving towards European integration, the country needs to upgrade most poultry farms according to the requirements and standards of the EU. The farms with outdated technologies of poultry management will not be able to obtain a license for their production [26].

In our opinion, these high requirements of the European market will be an impetus for a new level of qualitative development of domestic layer poultry farming.

Firstly, the facilities should be transferred gradually to the new free-range or confined conditions for laying hens by using improved cage systems.

Secondly, organic egg production, which is in high demand in the European market, should be increased.

Thirdly, new energy-saving and environmental technologies, which provide a higher level of competitiveness of products, should be introduced.

The advantages obtained by the producers subject to the requirements of the European market of edible eggs are seen as follows:

- growth in exports of eggs under the conditions of overproduction and increasing currency earnings;
- extension of partnerships and the number of consumers of edible eggs under the conditions of reducing trade relations with some CIS countries;
- increase in exports of edible eggs with high standards of quality and safety;
- strengthening of sanitary and phytosanitary measures at farms;
- attraction of investments and implementation innovative technologies in the industry based on cooperation with the European partners;
- introduction of environmentally friendly system of production in compliance the European requirements;
- strengthening of the country's position in the world market;
- increasing capacities of egg processing;
- creation of a logistics system according to modern requirements.

In addition, Ukraine has a number of competitive advantages over other countries which should be considered when developing a strategy for the poultry industry in terms of European integration. This should provide:

- lower production costs;
- development of fodder production in Ukraine; reorientation of the export flows of grain to the domestic market, which will provide lower prices for mixed feed for poultry and increase competitiveness of the relevant products;
- low pesticide use in growing crops, which will promote organic trends in layer poultry farming;
- deepening specialisation of poultry farms with regard to their location, available material and technical basis with

a possibility of rapid technological upgrading according to the European requirements, availability of labour and skilled personnel.

5. Conclusions

When studying trends, which are observed in the market of edible eggs, the following recent changes should be noted. Ukraine's egg production has been increasing annually, for example by 14.8% in the 2010-2014 period. Domestic consumption corresponds to the well-grounded standards and product exports are increasing (from 75 to 126 thousand tons). The relevant product has a high level of competitiveness in price and quality, gaining access to markets of Africa and the

Middle East. Imports of edible eggs have been significantly decreasing; mainly hatching eggs are imported from abroad.

An increase in the exports of edible eggs to the European market is possible due to the improvement poultry management systems, implementation of quality and safety control systems at farms, expansion of the range of organic products and enhanced egg processing.

To increase the competitiveness of Ukrainian poultry farms in order to ensure the European integration, we propose to use the competitive advantages based on the high potential of the country in terms of natural, labour and feed resources.

References

1. Yaroshenko, F. O. (2004). *Poultry farming of Ukraine: state, problems and development prospects*. Kyiv: National Scientific Center «Institute of Agrarian Economy» (in Ukr.).
2. Ulianchenko, O. V., Kucher, A. V., & Chertkov, D. D. (2012). *Organizational and economic principles of effective development of egg poultry*. Kharkiv: Digital printing house No. 1 (in Ukr.).
3. Zabolotnyi, V. S., & Kyrlyuk, O. F. (2013). *Competitive poultry of Ukraine: analytical assessment, development prognosis*. Kyiv: KOMPRINT (in Ukr.).
4. Boiko, L. O., Boiko, V. O., & Avercheva, N. O. (2016). The Forecast and the Development Prospects of Poultry Industry by 2020. *Tekhnologicheskii Audit i Rezervy Proizvodstva (Technological Audit and Production Reserves)*, 4/6(30), 34-40 (in Ukr.). doi: <https://doi.org/10.15587/2312-8372.2016.74815>
5. Lisetskiia, F., & Pichura, V. (2016). Steppe Ecosystem Functioning of East European Plain under Age-Long Climatic Change Influence. *Indian Journal of Science and Technology*, 9(18), 1-9. doi: <https://doi.org/10.17485/ijst/2016/v9i18/93780>
6. Ishchenko, Yu. B. (2016). *Definition of consolidated indicators of competitiveness on the basis of expert assessment and weighting coefficients*. Poultry Market. Retrieved from <http://market.avianua.com/?p=4160> (in Ukr.)
7. Ishchenko, Yu. B. (2016). *Top 30 rating of poultry farms in Ukraine by net income in 2015*. Poultry Market. Retrieved from <http://market.avianua.com/?p=4187> (in Ukr.)
8. Ishchenko, Yu. B., & Riabinina, O. V. (2016). *Implementation of HACCP system at enterprise - 12 steps*. Poultry Market. Retrieved from <http://market.avianua.com/?p=4183> (in Ukr.)
9. Ishchenko, Yu. B., & Riabinina, O. V. (2016). *Modern systems of laying hen management*. Poultry Market. Retrieved from <http://market.avianua.com/?p=4181> (in Ukr.)
10. Mahjoor, A. A. (2013). Technical, Allocative and Economic Efficiencies of Broiler Farms in Fars Province, Iran: A Data Envelopment Analysis (DEA) Approach. *World Applied Sciences Journal*, 27(10), 1427-1435. Retrieved from https://www.researchgate.net/publication/278334971_Technical_Allocative_and_Economic_Efficiencies_of_Broiler_Farms_in_Fars_Province_Iran_A_Data_Envelopment_Analysis_DEA_Approach
11. Nmadu, J. N., Ogidan, I. O., & Omolehin, R. A. (2014). Profitability and Resource Use Efficiency of Poultry Egg Production in Abuja, Nigeria (Text). *Kasetsart Journal of Social Sciences*, 35, 134-146. Retrieved from https://www.researchgate.net/publication/273845989_Profitability_and_Resource_Use_Efficiency_of_Poultry_Egg_Production_in_Abuja_Nigeria_Profitability_and_Resource_Use_Efficiency_of_Poultry_Egg_Production_in_Abuja_Nigeria
12. Begum, I. A., Buysse, J., Alam, M. J., & Van Huylbroeck, G. (2010). Technical and Economic Efficiency of Commercial Poultry Farms in Bangladesh. *Worlds Poultry Science Journal*, 66, 465-476. doi: <https://doi.org/10.1017/S0043933910000541>
13. Razia Khatun, Shamim Ahmed, Md. Amirul Hasan, Md. Saiful Islam, A. S. M. Ashab Uddin, & Mohammad Showkat Mahmud (2016). Value Chain Analysis of Processed Poultry Products (Egg and Meat) in Some Selected Areas of Bangladesh. *American Journal of Rural Development*, 4(3), 65-70. Retrieved from https://www.researchgate.net/publication/317686415_Value_Chain_Analysis_of_Processed_Poultry_Products_Egg_and_Meat_in_Some_Selected_Areas_of_Bangladesh
14. The Poultry Site (2017, January 25). *EU Creates New Platform for Animal Welfare*. Retrieved from <http://www.thepoultrysite.com/poultrynews/38096/eu-creates-new-measures-for-animal-welfare>
15. The Meat Site (2013, April 29). *Global Poultry Trends: Static Egg Consumption in Europe*. Retrieved from <http://www.themeatsite.com/articles/1948/global-poultry-trends-static-egg-consumption-in-europe>
16. The Meat Site (2012, April 12). *Global Poultry Trends: EU's Share of European Egg Total in Decline*. Retrieved from <http://www.themeatsite.com/articles/1628/global-poultry-trends-eus-share-of-european-egg-total-in-decline>
17. The Meat Site (2013, April 8). *Global Poultry Trends: Russia and Ukraine Produce One in Three of Europe's Eggs*. Retrieved from <http://www.themeatsite.com/articles/1936/global-poultry-trends-russia-and-ukraine-produce-one-in-three-of-europes-eggs>
18. State Statistics Service of Ukraine (2017). *Balances of core product consumption by population of Ukraine*. Statistical Yearbook. Kyiv: State Statistics Service of Ukraine. Retrieved from <http://www.ukrstat.gov.ua> (in Ukr.)
19. Aratta (2012, September 3). *European vector is not noticeable. Will poultry farming bring «golden eggs» to the economy of Ukraine?* Retrieved from http://aratta-ukraine.com/text_ua.php/doc/doc/phorum/text_ua.php?id=2524 (in Ukr.)
20. Avangardco (2017). *Financial results for the first half of 2017*. Retrieved from http://avangardco.ua/fileadmin/files/INVESTOR_RELATIONS/Presentations/AVGR_H1_2017_Presentation_final.pdf
21. Ovostar (2017). *Financial results for the nine months ended 30 September 2017*. Retrieved from http://www.ovostar.ua/en/press-center/press-releases/2017/11/press-releases_1587.html
22. UNIAN (2017, November 28). *Exports of eggs from Ukraine will increase by 1.5 times - experts*. Retrieved from <https://economics.unian.ua/agro/2266829-eksport-kuryachih-yaets-z-ukrajini-zbilshitsya-v-1.5-razi-eksperti.html> (in Ukr.)
23. Shuvar (2017, June 14). *Egg production in Ukraine - profitability decreased by 100 times*. Retrieved from <https://shuvar.com/news/1500/Vyrobnytstvo-yayets-v-Ukrayini-rentabelnist-vpala-u-100-raziv> (in Ukr.)
24. State Statistics Service of Ukraine (2017). *Product sales by agricultural enterprises in 2016*. Statistical Bulletin. Kyiv: State Statistics Service of Ukraine (in Ukr.).
25. Tyzhden.ua (2013, July 25). *EU opened the market to meat and eggs of Ukrainian chickens, but producers do not hurry*. Retrieved from <http://tyzhden.ua/News/85407> (in Ukr.)
26. State Service of Ukraine on Food Safety and Consumers Protection (SSUFSCP) (2017). *Export requirements*. Retrieved from http://www.consumer.gov.ua/ContentPages/Sertifikati_Na_Eksport_Z_Ukraini/201 (in Ukr.)
27. All about Accounting (2017). *Indicative aggregate of tariff quotas for imports into the European Union*. Retrieved from http://vobu.ua/images/pdf_files/integration2/asd3.pdf (in Ukr.)
28. UIAMP (2013). *Import permit for poultry products from Ukraine to the EU countries: ranking by UIAMP*. Retrieved from <http://uiamp.org.ua/uk/dozvil-na-vvezennya-produkciji-ptahinyctva-z-ukrajiny-do-krayin-yevropejskogo-soyuzu> (in Ukr.)

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