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ROLE OF POULTRY INDUSTRY IN PUBLIC FOOD SUPPLY

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ABSTRACT

Within the framework of implementation of overarching national tasks, special attention is paid to the food production and the matter of keeping up with the consumer demand for quality food, which is of national significance. The poultry industry is able to make its fairly considerable contribution into solving the problems of the consumer demand for valuable healthy food products; and to create conditions for the national food security owing to this industry economic growth based on its production potential development and strengthening. The domestic and foreign practice clearly demonstrates that it is possible to provide the population with quality food within a relatively short term, primarily due to the increase of egg and poultry meat production. The poultry industry is not only the most dynamic and fast-growing branch of the livestock farming, but also it has the most intensive production methods. The aim of this article is to determine the influence and the role of the poultry industry on providing the population with food supplies in present-day conditions in the world.

Keywords: livestock, poultry industry, poultry meat, egg, food supplies
JEL code: Q13

INTRODUCTION

The dynamic development of the humankind sets rather complicated tasks. One of them is how to solve an issue of providing the world population with food supplies, in particular, with foods of animal origin. It is a global problem, which requires considering a combination of different overlapping factors – demographic, economic, social, political, technological ones.

Within the past few decades, we can observe the growth of the livestock production. This growth both in developed and developing countries is due to the increase in the poultry production where modern intensive production methods, achievements in genetics, disease control and biological safety precautions strengthening take place; as well as due to the growth of population and urbanization.

The poultry industry and poultry processing industry are very efficient branches of economy that provide the population with valuable meat and eggs. The poultry products contain protein and micronutrients, such as B vitamins, iron and zinc, which make an important contribution to the health and nutrition of consumers. The share of poultry products in the total volume of animal protein is more than 40%.

THEORETICAL AND METHODOLOGICAL BACKGROUND

Theoretical and methodological background to the research is works of domestic and foreign academic

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economists on the most topical issues and trends of the poultry industry development in Russia as well as on key directions of government control of the industry in Russia and countries abroad.

In tackling certain tasks and reasoning the fundamental concepts of the research, abstract logical and graphical methods have been used. Several practical proposals have been elaborated using statistical methods of processing economic data on totality of coverage and SWOT analysis.

RESULTS AND DISCUSSION

The poultry industry is specialized, large-scaled and dynamically developing. It includes a set of interrelated organizational, economic and social units.

In the world food culture, a tendency has already been formed to understand that poultry meat, eggs and products of their processing are one of the cheapest sources of high-grade protein (FAO, 2013). Especially, it refers to the protein of chicken eggs which is taken as a standard of nutrition and biological value.

In many countries, the poultry industry is the only livestock sector that has managed to be successfully adapted to the market economy conditions. The governments of many developed countries strongly supported the industry during this period (Dankvert, 2002). The growth of the poultry meat and egg production was ensured not only by the increase in poultry population, but also by the transfer of the industry to an intensive industrial basis.

FAO experts reasonably believe that the poultry meat will be the main product of the planet. This meat consumption growth will occur in key regions of the world; and within 8–10 years it will make 40% (Semin, 2014).

The poultry meat market includes the following kinds of meat: chicken, turkey, waterfowl meat, guinea fowl meat, quail and other poultry meat.

The most common and the cheapest type is broiler chicken meat, the production of which makes up more than 82% in the world. The competitive advantage of the broiler chicken production is the fact that it is the most effective 'converter' of fodder protein into meat protein.

The production of turkey is growing, mainly in Europe and North America, as well as the production of duck meat in China.

World meat consumption, according to OECD and FAO projections is expected to average 34.4 kg by 2020, an increase of 0.9 kg compared with 2010. Poultry meat consumption is 13.9 kg.

Increases in poultry consumption are primarily linked to four key factors namely population growth, improvements in incomes, chicken prices relative to those for competitive meats and dietary preferences.

For many millennia, the leading types of meat in the human diet were beef and lamb. But in a short period of time there happened something which had seemed impossible before. The demand for meat in economically developed countries grows; beef as the main food has given the way to pork and poultry meat. Changes in the structure of all types of meat production affected the development of grain industry and its structure.

Currently, there is clearly a tendency to replace beef, pork, lamb meat with poultry meat. In the world structure, the production of poultry meat is slightly inferior to pork production and is ranked second (FAO, 2015). Nevertheless, the dynamics of recent years indicates a high rate of growth of the poultry meat production and its further rising in the world structure of production of all types of meat.

The world production of meat is steadily growing: as of from 1990 to 2017, it has increased by 83% (Table 1), including beef production – by 30%, pork meat production – by 63% (FAO, 2015). During this period, the poultry meat production has demonstrated the most intensive increase – it has tripled (OECD/ /FAO, 2015).

In 2017, as compared to 2010, the poultry meat production has increased by 17% and made up 118.1 million tonnes (Table 2). The production increase is mainly due to its growth in four countries (the USA, China, Brazil, and Russia); it makes about 50% of the world's total poultry production or 59.3 million tonnes (OECD/FAO, 2018). The increase in production in the above-mentioned countries is due to the steady growth of domestic demand in China, as well as the development of export in the USA, Brazil and Russia. Moreover, the increase in production in China

Table 1. Structure of world production of main types of meat in dynamics (%)

Specification	1990	2000	2010	2015	2017	2020*
Poultry	23.0	30.0	34.8	37.3	36.8	37.0
Pork	39.0	37.0	37.8	37.3	36.8	36.6
Beef	30.0	25.6	22.8	21.7	21.8	21.7

* Forecasts.

Source: FAO (2018).

Table 2. Poultry meat production in the world (million tonnes of slaughter weight)

Specification	1990	2000	2010	2015	2017	2020*
World	41.0	68.5	101.0	114.3	118.1	122.5
USA	10.8	16.2	19.3	20.5	21.3	21.7
China	3.7	11.9	16.6	18.4	19.2	20.2
Brazil	2.4	6.1	12.6	13.5	14.0	14.4
Russia	1.8	0.8	2.8	4.5	4.9	5.5

* Forecasts.

Source: FAO (2018).

and Brazil is also due to the fact that these countries have huge reserves of important components for the poultry industry development — corn and soybean (Fisinin, 2016).

According to OECD forecast, in 2020, the world production of poultry meat will be 122.5 million tonnes (OECD/FAO, 2018). Starting from 2017, the annual increase will make up 1.3%. Experts believe that the increase in production will take place due to the intensive development of the industry in China and Brazil (5 and 3% respectively).

The USA remains to be the world's largest producer of poultry meat; its share in the world's total production is about 18%. Such leadership will be kept in future, but rather volatile dynamics should be noted.

Over a ten-year period, the share of Russia in the world production of poultry meat has changed: from 2.8% in 2010 up to 4.5% in 2020. This has become possible due to a set of measures taken by the government to stabilize the poultry production and create a basis for the dynamic development of the industry. A key event in the development of the poultry industry in Russia was the priority national project Development of the AIC (2006–2007). The State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Foodstuffs Market for 2008–2012 also enabled to significantly improve the poultry industry and reach the threshold of food security for poultry meat in 2011 (87%).

Beside the poultry production, the poultry industry includes the production of eggs. A chicken egg is natural and valuable food.

Over the past few years, the production of eggs in the world has reached new milestones. The world production of eggs increases by 2–3% yearly. According to the latest data, in 2017, 1,526.9 million of eggs were produced in the world, which is by 18% more compared to 2010 (FAO, 2018). This growth became possible mainly due to the development of poultry industry in developing countries (Table 3).

The volume of the world production will increase with the same growth rates. According to forecasts, by 2020 egg production will grow by 7% and will make up 1,626.7 million pcs. Asian countries are leading in production of eggs with a large margin. The largest

Table 3. Egg production in the world (billion pcs)

Specification	1990	2000	2010	2015	2017	2020*
World	682.5	1 019.6	1 288.6	1 441.8	1 526.9	1 626.7
China	156.1	429.0	533.4	579.1	625.5	659.2
USA	68.1	84.7	91.8	97.2	104.7	113.5
India	21.1	36.6	61.4	78.5	87.3	101.6
Mexico	20.2	35.6	47.6	53.1	56.0	61.0
Brazil	25.0	31.2	41.7	49.8	50.8	56.3
Russia	47.5	35.3	40.6	42.6	44.5	47.7

* Forecasts.

Source: FAO (2018) and Russian Poultry Union.

producer of eggs in both Asia and the world is China, whose production amounts to 625.5 million pcs (it is 41% of the world total production), which is due to large-scale investments in the industry (FAO, 2018). It is worth noting that almost all the products are consumed by the domestic market, only less than 0.3% of the total volume is exported.

The world's second biggest producer of eggs is the USA, whose annual production output is six times less than in China. Nevertheless, the United States is steadily increasing its production volumes at an average rate of 2% per year (FAO, 2018).

There is a significant increase in production in Mexico, which has grown by 18% since 2010. However, according to FAO, in 2012, compared to 2011 there was a decline in production caused by outbreak of highly pathogenic avian influenza. It became possible to restore the previous production volumes as early as in 2013.

During 5 years, top ten world producers of eggs have increased production volumes by 20%. Their share in the world production has grown from 70% in 2010 to 71.6% in 2017. This was mainly due to a significant increase in egg production in China, as well as in the USA, India, Mexico and Brazil (FAO, 2018). It is predictable that the world's three largest egg producers will continue to provide more than half of the world's egg production in the coming years. The share of Russia in the world production is 2.8%, it is ranked the sixth.

The predictable increase in life expectancy in Asian countries will increase the demand for eggs and egg products.

According to experts, the production of eggs and egg products can play an important role in providing the world's population with valuable protein foods. Moreover, there is a growing demand for a wide variety of egg products to meet the demand and significantly save labour costs. The increase in demand for convenient food has led to increased sales and transportation of eggs in a liquid and a dried form, which meets the demands on the part of food industry entrepreneurs and provides greater opportunities for disease prevention and hygiene compliance (USDA AMS, 2017). Pasteurization, daily quality control of products, ensuring compliance with market criteria enable to obtain a safer and more convenient product than just eggs in the shell.

Furthermore, production of egg products with improved functional properties, including their binding ability of whipping, nutritional qualities, is predicted. This will lead to the further growth of the foodservice sector.

Peculiarities of the poultry industry, its intensive development and increased demand for poultry products allowed the countries to actively develop the exports. In 2017, compared to 2010, the export of the poultry meat has increased by 18% and amounted to 12.4 million tonnes (ITC, 2018).

Brazil, the world's largest poultry exporter, has supplied 4.4 million tonnes (35.7% of total poultry

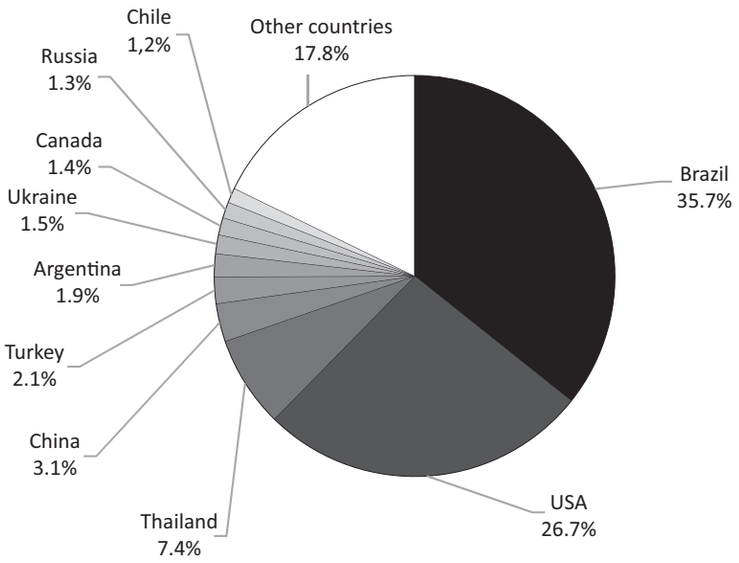

Figure 1. Structure of poultry meat exports by countries in 2017

Source: OECD/FAO (2018), ITC (2018).

exports) (ITC, 2018). The significant growth of the poultry meat exports in Brazil is mainly due to the growth of the world's demand for Brazilian meat, especially in connection with avian influenza in a number of countries. The poultry industry in Brazil features low feed prices due to bumper crop of corn and more stable raw material prices. The bumper corn and soybeans crops significantly reduced feed costs in 2017, as corn and soybeans account for more than 70% of the cost price of broilers. All these factors make Brazilian poultry more competitive in the world market.

Currently, the USA is ranked second in the poultry meat exporters' rating. At the same time, in 2017, its share in the poultry meat exports declined due to the loss of the Russian market of 138 thousand tonnes as a result of the prohibitive measures in 2014. Brazil occupied some part of this vacated market. Moreover, the United States lost another two important consumers of American chicken meat – China and South Korea because of the detected strain of avian influenza H5N8.

In total, Brazil and the United States occupy 62.4% of the world poultry meat market. Nevertheless, the share of each country in the structure of the world exports declines.

The trade may be affected by the emergence of new players in the market. For example, Thailand is gradually restoring its export opportunities after a significant decline caused by avian influenza.

Russia's share in the export of poultry meat is still insignificant. However, Russia has every opportunity to develop this business line. Russia has been increasing production volumes for several decades, and by 2020 it may increase exports to 360,000 tonnes, which will enlarge the share of Russia in the world exports to 2.7% (Karlsson, 2014).

The world trade in edible eggs has been developing rapidly since the 2000s. In 2017, about 33.1 million pcs of edible eggs were exported, which is 2.7% more than it was in 2016. (ITC, 2018). The main exporters of edible eggs are the countries of Europe (more than 65% of world exports) and Asia (about 25%).

The largest exporter of edible eggs is the Netherlands. In 2017, the country exported 7,585 million pcs of the edible egg worth USD 556.7 million, which is 7% more than it was in 2016. (ITC, 2018). It is expected that the Netherlands will keep the first position in export of edible eggs in 2020, increasing it by 23% to 9,319 million pcs. The Netherlands mainly supplies to Germany (75% of the total export of

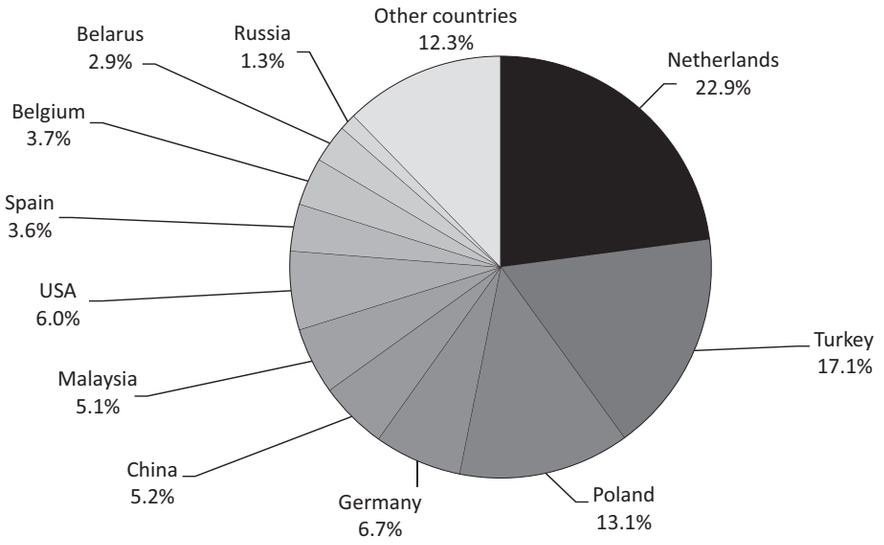

Figure 2. Structure of exports of edible eggs by countries in 2017

Source: OECD/FAO (2018), ITC (2018).

edible eggs from the Netherlands), Belgium (10%), and Switzerland (4.5%).

Malaysia also plays a significant role in the trade in the East Asia. The production of eggs and egg products is growing rapidly in Malaysia, which makes this industry one of the leading agricultural industries in the country and allows for active export of edible eggs. In 2017, Malaysia exported 1,163 million pcs of eggs worth USD 110.9 million (ITC, 2018). The largest importer of eggs from Malaysia is Singapore, where about 1,439 million pcs were exported. (85% of Malaysia's total egg exports).

The largest exporter of edible eggs to the countries of the Middle East and the second exporter in the world is Turkey, which delivered to the market 5,663 million pcs of edible eggs worth USD 248.1 million in 2017. Main supplies are made to Iraq (87% of Turkey's total egg exports), Syria (5%), UAE (3%), and Saudi Arabia (1.5%).

During recent years, the share of Russia in the world export of edible eggs has grown and amounted to 1.3%. According to the Federal Customs Service of the Russian Federation, in 2017, Russia exported 423 million pcs of edible eggs, which is almost 2 times more than in 2016 (+198 million pcs)[2]. Nevertheless, the geography of supplies is still limited: Ukraine (28%), Mongolia (28%), and Tajikistan (20%). However, currently, Russia is actively developing its exports to the countries of the Middle East; and since 2017 has been supplying edible eggs to the UAE (12% of the total Russian export of edible eggs) due to significantly low price and high quality.

In the immediate future, the demand for poultry products will continue to increase, primarily in developing countries (China, India), which is caused by the growth of population, customers' incomes and consumer preferences in these countries. This will be an incentive for increasing exports.

Success in the poultry industry is a fundamentally new and to some extent an unexpected trend in the world and domestic agriculture. It can be called a 'poultry-farming revolution', which has embraced and continues to encompass the whole world and which is characteristic not only for developed, but also for developing countries.

[2] Federal Customs Service of Russia website http://stat.customs.ru/apex/f?p=201:2:3937097560654130::NO [Accessed 05.04.2018].

The key aspects of the world poultry industry development were the use of the achievements of scientific and technological progress of the 20th century in the field of genetics, nutritional science, veterinary science, technology of stock-keeping, etc.

Besides, in many economically developed countries, the government played an important role, it developed and implemented the state policy to support poultry producers, including locating production sites taking into account natural and climatic conditions and social & economic development.

Moreover, some countries (North America, Europe) changed the structure of the land use and crops cultivation in favour of forage crops of intensive type; created large fodder bases with significant investments, material and labour resources.

Many countries still continue to direct huge financial resources to increase the production capacity of feed manufacturers for the industry, install processing equipment and conduct training for workers at farms.

The poultry products can reasonably be called consumer goods, which is confirmed both by retail prices and data on the availability of these products to various strata of population.

Compared to other agricultural branches, such a rapid development of the poultry industry is also ensured by its beneficial peculiarities, as follows:

- the ability to increase the output of production within a few months after investing in it, i.e. the rapid industry payback, including a quick return on feed (it is required to spend twice as much of fodder grain per 1 kg of pig's weight gain compared to per 1 kg of poultry weight gain, and the feeding of cattle livestock is even more expensive) (Kelemetov, 2009).
- less dependence on natural environment and climatic conditions;
- relatively low retail and consumer prices for poultry meat as compared to pork and beef meat prices. This is due to lower costs of resources (labour, financial);
- industrial type of production, R&D and dynamics intensity of the industry sector;
- wide range of products made of poultry and eggs, which became possible due to the high technical, technological and organizational level of production;
- healthy properties of poultry meat;
- absence of religious and cultural restrictions among the population in terms of consumption of poultry meat and eggs;
- less harmful impact on the environment in comparison with other livestock husbandry, and utilization of less amount of water.

CONCLUSIONS

Agriculture and food industry aim at providing population with high-quality food products, which is one of the government's tasks. Poultry industry is able to contribute to meeting population's needs in nutritious and healthy foods at the same time helping to increase food security through the development and strengthening of the industry's production capacity. Poultry industry is one of the few very specialized branches of agro industrial complex that was created as a complex integrated system providing all processes from poultry reproduction to selling the final products: meat, eggs, etc. The choice of poultry industry development direction takes into consideration international tendencies, scientific achievements and advanced experience. The important factor providing the branch's industrialization is its early maturity and short payback period of investments. It is hard to imagine what the current balance of meat, the world market and the quality of nutrition of the world population, in general, could be, if in the past half a century there had not been such an unprecedented growth of the poultry meat and egg production. The development trends of the poultry industry in Russia and abroad pose challenges to the government in terms of changing the industry development course from imports to exports.

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