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EXPEDIENCY OF RETURNING TO THE EXTENSIVE POULTRY INDUSTRY IN THE PRODUCTION OF ORGANIC PRODUCTS

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Poultry farming is one of the most technologically advanced and efficient sectors of the agricultural sector, which today ensures food security for a large part of the world's population. Analysing the dynamics of the poultry industry, it should be noted that poultry farming for meat, eggs and feathers has been the main source of food production since the advent of agriculture. Historically, human activity of raising poultry on backyard plots for personal consumption was widespread throughout the world. However, over time, systems have been industrialised and intensified to the level of industrial poultry production to meet growing market demand for meat or eggs.

Poultry production has demonstrated dynamic and efficient growth over the years. Thus, according to the Food and Agriculture Organisation of the United Nations (FAO), global egg production peaked in 2020 at 1.65 trillion eggs, and global meat production totalled 342 million tonnes. Of this, poultry accounted for 39%, pigs for 32%, cattle and buffaloes for 21%, and sheep and goats for 5% [16].

Thus, the poultry industry, which produces and provides the world's ever-growing population with sufficient quantities of high-quality animal food, is tasked with reducing the negative impact on the environment, ensuring the safety of poultry facilities and the safety of products for human health. These requirements for the poultry industry are a common problem that is related not only to the problem of food supply, but also to climate change, global warming, increased greenhouse gas emissions, land and water pollution and the use of antimicrobials.

Given the general problems associated with environmental protection, the Natural Resources Defense Council (NRDC) was established in 1970 in New York,

which functions as a national environmental group that seeks to protect the environment for future generations. Analysing the problems with the safe life of mankind over the past decades, experts in this field note that global warming is increasing along with the growth of the world's population, which, together with rising temperatures and increasing greenhouse gas emissions, is dangerous for people. This has been known since the beginning of intensive industrial development in 1990. Data from the European Council's report (EASAC, 2022) show that in 2019, the energy sector accounted for the largest share of greenhouse gas emissions (77%), with transport accounting for one third. In Europe, the share of emissions from industry was 9.1% and from agriculture 10.5%, while in the US, the share of emissions from agriculture was only 8%. Thus, these data do not support the idea that livestock production is mainly responsible for global warming [7].

Of all the livestock sectors, ruminants are considered by "environmentally minded" people to be the main contributor to greenhouse gas emissions, global warming and environmental stress, as they are significant users of limited land and water resources and produce methane. According to them, negative processes are mostly characteristic of intensive livestock systems (EASAC, 2022). At the same time, "domestic" animals also contribute to greenhouse gas emissions, but this issue has only recently been addressed [15].

So, according to the data above, the largest polluting sectors are industry and transport. It is true that agriculture is also a large consumer of energy and that transport also plays an important role in this. However, this data does not support the idea that livestock farming is mainly responsible for global warming [21].

It is important to consider the impact of the poultry industry on the global environment, taking into account both the extensive and industrial development of this industry. Initially, most laying hens and other poultry were kept outdoors before the dominant style of keeping poultry in indoor houses emerged in the late 1950s [6].

It should be emphasised that, unlike other livestock sectors, poultry productivity depends on light and temperature factors, i.e. on the natural conditions of keeping: favourable in the spring and summer period, compared to limited in the autumn and winter period. The progressive work of breeders and technologists who have succeeded in creating highly productive chicken crosses with an average egg production of 300-310 eggs per hen by providing favourable conditions in windowless poultry houses with a regulated microclimate throughout the year. This means that by providing a "spring-summer period" throughout the year, hens are able to lay as many eggs as possible throughout the year. Chickens have the natural ability to produce a large number of eggs. The number of follicles (yolks) in a hen's ovary reaches up to 3,000, but the number of

eggs laid is limited by the time it takes for the eggshell to form, which takes 24-27 hours. In general, throughout the existence of mankind, humans have been making discoveries and implementing them in production activities by observing wild birds and animals.

However, as part of the programme to limit the negative impact on the environment, the poultry industry has also begun to gradually transform, with the aim of returning to the extensive so-called "natural" conditions of poultry keeping, which supposedly allows for the production of natural "organic" products. Consumers' assessment of the quality of organic products is based on three main dimensions: 1) the safety of poultry keeping facilities; 2) the safety of organic products for human health; 3) the safety of organic production for the environment.

Thus, in terms of the first point regarding the requirements for organic poultry farming, in recent decades, the cage battery system has been negatively assessed in both the US and Europe due to the fact that it is detrimental to the welfare of chickens and restricts their behaviour [11]. That is why the EU Council initially adopted minimum regulatory standards for conventional cages, banned the introduction of new cage systems since 2003, and completely banned the keeping of poultry in cage batteries from 1 January 2012 [5].

Traditional cage housing systems are being systematically replaced by alternative housing systems such as enriched cage batteries, which offer a potentially more humane environment for laying hens while maintaining productivity [11], and consumer preferences are now requiring poultry producers to develop other production systems such as free-range and pasture systems that allow poultry to be raised in less confined outdoor areas of the poultry farm [19]. Although the terms "confined" and "pasture" are commonly used interchangeably, they are by definition different. Confined poultry are poultry that are raised and kept in a household poultry house and have limited access to the outdoors. In Ukraine, this system is most common in private households. In the US, this system is regulated by the US Department of Agriculture [23]. Whereas the term "pasture housing" includes poultry that are raised and kept in a small building, but have at least 108 sq. ft. (i.e. 100 m2) of open space. However, the pasture-based system is not regulated by the US Department of Agriculture [20].

When analysing different poultry housing systems, it should be noted that, indeed, free-range poultry housing not only provides space, fresh air and direct sunlight, but also allows birds to exhibit natural behaviours such as dust bathing, food searching, running, flying, while reducing pecking frequency by reducing the density of housing [1].

In recent years, confined and pasture-based poultry systems have gained in general commercial appeal and market advantages, being perceived by

consumers as an industry that produces organic, antibiotic-free products, high-quality eggs and desirable meat flavour [2]. However, the analysis of the literature shows that there are problems in the production of organic products related to the influence of environmental factors (temperature, daylight hours, etc.), the innate incubation instinct, which significantly affects both the productivity of poultry, its safety, physiological condition, and the economic efficiency and cost of this type of product.

The welfare and productivity of free-range poultry, firstly, depends on the season, age of the bird and various weather conditions (temperature, rain, sun, wind) [12]. Secondly, increased mortality can be the result of many factors: predation, contact with wildlife, and parasitic invasions, which has a significant impact from an economic point of view [14]. Thus, the pasture environment can serve as a source of pathogens (parasites, pathogenic bacteria or viruses) originating from wildlife [19]. Of course, several factors should be considered when implementing free-range or pasture-based systems, many of which depend on the bird's gastrointestinal tract, as well as the digestion and metabolism of variable food sources [3]. In conventional industrial poultry farms, predation is minimal, as poultry houses are monitored and inspected daily. However, when poultry have free access to outdoor areas and pasture, predation can be much more frequent, leading to economic losses [10]. Thus, for several reasons, the cost of organic products obtained from pasture-raised chickens is almost twice as high as that of products obtained from poultry in other systems.

Some consumers are willing to pay double the price for so-called "organic" eggs, believing them to be "eco-friendly", although no regulations define small farm products as such [8]. Despite the problems of "organic" poultry farming, the US and EU are increasingly committed to a complete ban on caged chickens and a return to natural extensive poultry farming. At the same time, a survey of food egg producers in the US showed that limited consumer (retail) demand, high capital costs and trade-offs with environmental sustainability and food security goals are the most common barriers to implementing this programme. Along with selling a range of high-priced eggs that must be certified as "organic", there is still the challenge of supplying chicken eggs to large branded food processing companies that have 1 to 5-10 ingredients, including eggs. According to producers, such consumers do not consider it advisable to switch to extensive egg production, as this will double their cost and the cost of their products [4].

Assessing the pace of development of organic poultry products in Ukraine, it should be noted that, gradually moving towards EU standards, in 2018 Ukraine adopted the Law "On Basic Principles and Requirements for Organic Production, Circulation and Labelling of Organic Products" and, subsequently, the Resolution

of the Cabinet of Ministers of Ukraine in 2019 approved the "Procedure (detailed rules) for organic production and circulation of organic products", which provides more detailed requirements and rules for the production of organic products in the country [24].

After a detailed analysis of the law's rules, the transition to cage-free poultry "using limited pasture" and "pasture-based" can be technologically considered as an industry that produces organic products, but many questions arise regarding the forms of management. In order to obtain the status of "organic products" and sell them for business, a prerequisite is to officially obtain a certificate for the products, to document all operations related to the cultivation and keeping of poultry in order to confirm the certification of organic products. However, if you do not raise poultry for the purpose of obtaining organic products for business interests, but keep it for yourself in private family farms, such products can be accepted as organic, but not confirmed at the legislative level (without a certificate).

Having significant disadvantages in the production of organic products when returning to extensive poultry farming, the US and the EU continue to implement a programme of production of supposedly "organic" products, despite a significant increase in their cost and selling price. At the same time, producers, after the survey, suggest that organic eggs will be sold in restaurants and cafes in greater quantities than in large food companies [4].

Thus, the return to extensive housing conditions will supposedly ensure the safety of poultry facilities, the safety of organic products for human health, and the safety of organic production for the environment. Despite the increase in the cost of such products, the gross production of eggs for Europe and the US will be sufficient, given the prospects of a decline in the population of these countries over the coming decades.

At the same time, according to the United Nations Department of Economic and Social Affairs (UNDESA), by 2050, the population will not only increase to 10 billion, but also improve welfare and increase demand for animal products [22]. At the same time, population growth rates vary significantly between countries and regions. More than half of the projected global population growth by 2050 will be concentrated in just eight countries: The Democratic Republic of the Congo, Egypt, Ethiopia, India, Nigeria, Pakistan, the Philippines, and the United Republic of Tanzania. The most populous countries in the world are China and India. The largest relative population decline, with losses of 20% or more, is expected by 2050 in Bulgaria, Latvia, Lithuania, Serbia and Ukraine. Also, most European countries are not expected to see a significant excess of births over deaths. At the same time, the population of sub-Saharan Africa is expected to continue to grow until 2100 and account for more than half of the global population growth expected by 2050. The

population of many of them is projected to double between 2022 and 2050, which will put additional pressure on resources and pose challenges to achieving the Sustainable Development Goals [23].

Thus, global population growth is exceeding most forecasts and threatens sustainable future scenarios and, according to Jane N. O'Sullivan, if we do not take a more proactive approach to halting population growth in the near future, we will lose the last chance to avoid a hungry, greenhouse world [13].

Given the problems of providing food for a growing population, it is important for many countries to reduce their dependence on food and energy imports in order to improve their economic situation [9].

Thus, keeping poultry in private households in less developed countries will not only contribute to food supply, but also to employment, especially for women, and limit the possibility of further population growth in these countries. Women play an important role in less developed countries [8,18], as they can manage birds on their own. This can include activities such as feeding the birds, collecting eggs, cleaning cages and selling by-products, thereby contributing to food production and the family economy [17]. It also strengthens their position in the family and community, especially if they are vaccinators or poultry advisors [8].

Conclusions. Alternative organic poultry farming, intended for households and farms, can produce a range of food products that meet the criteria of "organic" eggs and "organic" meat. To ensure the safety of this industry, it is necessary to implement innovative management methods that contribute to the safety and productivity of poultry and reduce the cost of organic products. "The Procedure (Detailed Rules for Organic Production and Circulation of Organic Products) should be revised to focus not only on the use of free-range pasture systems, but also on increasing the percentage of confined housing systems, while prohibiting the use of antibiotics, growth accelerators, other chemicals and the use of organic roughage, green or dry feed. At the same time, the products produced can be accepted as organic by checking for the absence of negative components.

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