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# CURRENT PROBLEMS AND PROSPECTS OF POULTRY INDUSTRY: INNOVATIVE VECTOR

# ҚҰС ШАРУАШЫЛЫҒЫ САЛАСЫНЫҢ ӨЗЕКТІ МӘСЕЛЕЛЕРІ МЕН ПЕРСПЕКТИВАЛАРЫ: ИННОВАЦИЯЛЫҚ ВЕКТОР

# АКТУАЛЬНЫЕ ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ ПТИЦЕВОДЧЕСКОЙ ОТРАСЛИ: ИННОВАЦИОННЫЙ ВЕКТОР

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**Abstract. Poultry farming in Kazakhstan is one of the most progressive and dynamically developing areas of agriculture, which is profitable and quickly pays off. *The goal* is to study the economic indicators of poultry farming industry, develop directions for its development, and analyze government support measures. *Methods* – statistical analysis, comparison and generalization, observation with subsequent conclusions. *Results* - the authors show the state of poultry farms, identify problems and factors that negatively affect the growth of production volumes, and consider issues of subsidizing producers. It is noted that poultry production, including chickens and eggs, has increased, which is important to meet the growing demand for these food products. Efforts are being made to develop the domestic poultry sector through various initiatives, including investment in infrastructure, improvement of technological processes, and government assistance. These measures are aimed at reducing dependence on imported poultry meat and increasing self-sufficiency in poultry products. Vaccination programs are being implemented and biosafety protocols and monitoring systems are being improved. The republic's poultry farmers are introducing modern production methods and technologies to**

optimize labor efficiency and productivity. This is, first of all, the use of innovations in genetics, integrated diets, and more advanced housing and management systems. *Conclusions* - based on the experience of developed countries, it is proposed to raise the level of poultry farming in Kazakhstan through investment in research and development, introduction of advanced technologies, efficient production methods, wide access to markets and compliance with high quality standards. However, achieving results in poultry farming depends on specific geographical, economic and cultural factors. The stable development and expansion of poultry farming sector provides a number of undeniable advantages: a new level of small and medium-sized businesses; additional jobs; providing the population of the republic with high-quality products of domestic production; a real opportunity to refuse similar imported products; quite a large flow of investment.

**Аңдатпа.** Қазақстандағы құс шаруашылығы - ауыл шаруашылығының үнемді және тез сатып алынатын, неғұрлым прогрессивті және серпінді дамып келе жатқан салаларының бірі. *Мақсаты* – құс шаруашылығы саласының экономикалық көрсеткіштерін зерделеу, оны дамыту бағыттарын әзірлеу, мемлекеттік қолдау шаралары талданады. *Әдістері* – статистикалық талдау, салыстыру және жалпылау, бақылау, кейінгі қорытындылар. *Нәтижелері* – авторлар құс шаруашылықтарының жай-күйін көрсеткен, өнім көлемінің өсуіне теріс әсер ететін проблемалар мен факторлар анықталған, өндірушілерді субсидиялау мәселелері қарастырылған. Құстардың, соның ішінде тауықтар мен жұмыртқалардың өндірісі өскен, бұл осы азық-түлікке деген өсіп келе жатқан сұранысты қанағаттандыру үшін маңызды. Инфрақұрылымға инвестицияларды, технологиялық процестерді жетілдіруді, мемлекеттің көмегін қоса алғанда, түрлі бастамалар арқылы отандық құс шаруашылығы секторын дамытуға күш салынуда. Бұл шаралар құс етінің импортына тәуелділікті азайтуға және құс өнімдерімен өзін-өзі қамтамасыз етуді арттыруға бағытталған. Вакцинация бағдарламалары іске асырылуда, биоқауіпсіздік хаттамалары мен мониторинг жүйелері жетілдірілуде. Республиканың құс өсірушілері еңбек тиімділігі мен өнімділігін оңтайландыру үшін заманауи өндірістік әдістер мен технологияларды енгізуде. Бұл, ең алдымен, генетикадағы инновацияларды, кешенді диеталарды, жақсартылған құрамды және басқару жүйелерін пайдалану. *Қорытындылар* – дамыған елдердің тәжірибесі негізінде зерттеулер мен әзірлемелерге, озық технологияларды, өндірістің тиімді әдістерін енгізуге, нарықтарға кеңінен қол жеткізуге және жоғары сапа стандарттарын сақтауға инвестициялар есебінен Қазақстанда құс шаруашылығы деңгейін көтеру ұсынылады. Алайда, құс шаруашылығында нәтижеге жету нақты географиялық, экономикалық және мәдени факторларға байланысты болады. Құс шаруашылығы саласының тұрақты дамуы мен кеңеюі бірқатар талассыз артықшылықтар береді: шағын және орта бизнестің жаңа деңгейі; қосымша жұмыс орындары; Республика халқын отандық өндірістің сапалы өнімдерімен қамтамасыз ету; ұқсас импорттық өнімдерден бас тартудың нақты мүмкіндігі; инвестициялардың жеткілікті ауқымды ағыны.

**Аннотация.** Птицеводство в Казахстане – одна из наиболее прогрессивных и динамично развивающихся сфер сельского хозяйства, рентабельная и быстроокупаемая. *Цель* – изучение экономических показателей отрасли птицеводства, разработка направлений ее развития, анализируются меры государственной поддержки. *Методы* – статистического анализа, сравнения и обобщения, наблюдения с последующими выводами. *Результаты* – авторами показаны состояние птицеводческих хозяйств, выявлены проблемы и факторы, негативно влияющие на рост объемов продукции, рассматриваются вопросы субсидирования производителей. Отмечается, что производство птицы, в том числе цыплят и яиц, возросло, что важно для удовлетворения растущего спроса на эти продукты питания. Прилагаются усилия для развития отечественного птицеводческого сектора посредством различных инициатив, включая инвестиции в инфраструктуру, совершенствование технологических процессов, помощь государства. Эти меры направлены на снижение зависимости от импорта мяса птицы и повышение самообеспеченности птицеводческой продукцией. Реализуются программы вакцинации, совершенствуются протоколы биобезопасности и системы мониторинга. Птицеводы республики внедряют современные производственные методы и технологии для оптимизации эффективности и производительности труда. Это, прежде всего, использование инноваций в генетике, комплексные рационы питания, более совершенные системы содержания и управления. *Выводы* – на основе опыта развитых стран предлагается поднять уровень птицеводства в Казахстане за счет инвестиций в исследования и разработки, внедрения передовых технологий, эффективных методов производства, широкого доступа к рынкам и соблюдения высоких стандартов качества. Однако достижение результатов в птицеводстве зависит от конкретных географических, экономических и культурных факторов. Стабильное развитие и расширение птицеводческой сферы дает ряд

**неоспоримых преимуществ: новый уровень мелкого и среднего бизнеса; дополнительные рабочие места; обеспечение населения республики качественными продуктами отечественного производства; реальная возможность отказаться от аналогичной импортной продукции; достаточно обширный поток инвестиций.**

**Key words: agricultural sector, poultry farming, meat and egg production, innovative feeding technologies, maintenance, investments, small and medium-sized businesses, import substitution.**

**Түйінді сөздер: аграрлық сектор, құс шаруашылығы, ет, жұмыртқа өндірісі, азықтандырудың инновациялық технологиялары, ұстау, Инвестициялар, шағын және орта кәсіпкерлік, импортты алмастыру.**

**Ключевые слова: аграрный сектор, птицеводство, производство мяса, яиц, инновационные технологии кормления, содержания, инвестиции, мелкое и среднее предпринимательство, импортозамещение.**

## Introduction

Poultry farming is the practice of raising domesticated birds such as chickens, ducks, turkeys, and geese to produce meat, eggs and feathers. It is an important agricultural activity worldwide and plays an important role in meeting the global demand for poultry products. Depending on the purpose, poultry farming is divided into two types - meat and egg. For meat production, meat chickens, ducks, geese, and turkeys are raised. and to obtain edible eggs, they contain egg-laying chickens, as well as quails.

As Kulasheva informs the essence of poultry farming is the raising and management of poultry, usually chickens, ducks, turkeys or geese, for the production of meat, eggs or feathers (Kulasheva A.) [1]. Poultry farming is an important agricultural activity and we have presented some key aspects that highlight the essence of poultry farming: food production; Poultry farming plays an important role in meeting global demand for meat and eggs. It provides a reliable source of high-quality, protein-rich food for human consumption; Efficient conversion of feed into meat and eggs makes poultry a cost-effective and sustainable source of protein.

Poultry farming offers economic opportunities to individuals, communities, and countries, which is a lucrative business venture that creates income and employment opportunities in rural and urban areas. Poultry farms contribute to the local economy through revenue generation, taxes, and trade. Poultry farming is versatile and adaptable to different production systems, scales, and geographic regions. It can be practiced on small farms or large commercial enterprises. Poultry can be raised in a variety of conditions, including free range, semi-intensive or intensive systems, making it accessible to a wide range of farmers. The Global Poultry Market size was reasonably estimated to be approximately USD 378 840 Million in 2023 and is poised to generate revenue over USD 628 510 Million by the end of 2030, projecting a CAGR of around 7.50% from 2023 to 2030.

Over the past two decades, poultry has become the most consumed livestock commodity in the world, especially in developing and emerging markets where production prospects have been relatively limited. As demand for poultry products grew in these markets during the period from 2001 to 2021, global imports increased. Poultry is expected to remain the world's largest imported livestock commodity by volume over the next 10 years.

To meet rising demand, several countries increased domestic poultry production. Brazil, the United States, the European Union, and Thailand emerged as major poultry exporters. Rising demand for poultry products and the related increase in poultry imports can be attributed to a variety of factors. A central component is a rise in real Gross Domestic Product (GDP) per capita in emerging and developing economies. Real GDP is GDP adjusted for inflation, and real GDP per capita is a proxy for income. As incomes have risen, consumers have bought more animal-based proteins.

*The purpose* - to study the economic indicators of poultry farming, analyze state support and develop directions for the development of the industry. Poultry production, including chickens and eggs, has increased to meet the growing demand for poultry products in the country.

Objectives – study literature, state policy on poultry farming economics and make suggestions on meet demand.

Hypothesizes – poultry farming subsidies are only for robust farmers, egg and meet production innovations has not been improving.

*Methods* - Scientific abstraction and statistical analysis.

*Results* - the authors studied the state of poultry farming and identified problems and factors that negatively affect the development of poultry farming, state subsidies for poultry farming.

*Conclusions* - Based on the experience of developed countries, through investments in research and development, the introduction of advanced technologies, efficient production methods, broad access to markets and compliance with high quality standards, it is proposed to raise the level of poultry farming in the country. However, it is important to note that the success of each country in poultry farming depends on specific geographical, economic, and cultural factors.

**Literature Review**

Poultry farming in the Republic of Kazakhstan has been rapidly increasing the pace of quantitative and qualitative development in recent years. The number of livestock and poultry is increasing at a steady pace. As of January 1, 2023, compared to last year, the bird population increased by 3.8% and amounted to 49.6 million heads. As of January 1, 2023, of the total number of 23.9% in households; 1.1% in peasant or farm enterprises and individual entrepreneurs; 75% in agricultural enterprises (About the results of the work…) [2].

The poultry industry in Kazakhstan is expanding its production capacity to meet growing demand. Steady revenue growth reflects the poultry industry's investment in infrastructure, technology, and marketing efforts. M. Alzhanova, R. Uteev claims that even though poultry farming in the country is developing dynamically, prices for poultry meat and eggs are not decreasing due to the high cost of not only feed, but also electricity tariffs (Alzhanova M., Uteev R.) [3].

T. Dzhumazhanov claims, the sharp jump in the dollar exchange rate due to the outbreak of hostilities in Ukraine and Western sanctions against Russia became a cold shower for poultry farmers in Kazakhstan in early spring. Enterprises in the industry are extremely dependent on imports. Breeding chickens, hatching eggs, feed additives, veterinary drugs - all this and much more is imported from abroad and purchased for foreign currency (Dzhumazhanov T.) [4].

At the same time, the development of poultry farming cannot be hindered either in diversified agricultural enterprises or in peasant (farm) farms, since these commodity producers also have certain advantages and potential, which helps to effectively complement large-scale poultry farming (Wright L.) [5].

The decrease in productivity can have a negative impact on the country's economy, and most importantly, lead to the loss of thousands of jobs and a new rise in food prices for the population ((Ajeigbe H. A., Angarawai I. I., Inuwa A. H.et al.) [6].

Laurens K. [7] argued that limited access to affordable credit and financial support can be a barrier for small and new poultry farmers. Difficulty obtaining credit, high interest rates and a lack of specialized financial services for the poultry sector can hinder farm growth and expansion. Lack of technical knowledge and training programs is a barrier for poultry farmers, especially in remote or rural areas. Access to expert advice, training in advanced poultry management, disease control and modern production methods can significantly improve farmers' skills and productivity.

Poultry farming is inherently a progressive part of the agricultural sector. Technological innovations are emerging every day, from sophisticated air purifiers that remove more than 90% of ammonia emissions to robotic assistants that clean litter (Relf-Eckstein J.E, Ballantyne Anna T., Phillips Peter W.B.)[8].

I.I. Davletov [9]. postulated that a 3D printer provides a unique opportunity to preserve rare, expensive breeds of birds and preserve the gene line, which can significantly improve the quality of meat and eggs.

The contribution of genetics and breeding to the development of industrial poultry farming far exceeds technology and nutrition. It is estimated that selection contributes 80% to broiler welfare and 30% to nutritional improvement (The United States has a highly developed…) [10].

**Materials and methods**

Innovation and Technological Advances: The poultry industry is constantly evolving due to advances in genetics, nutrition, biosecurity, and management practices. Innovations such as improved breeds, vaccines, automation, and precision farming techniques are improving productivity, animal welfare and biosecurity standards. Overall, the essence of poultry farming lies in its contribution to food production, economic development, resource efficiency, value addition, scalability, and improved livelihoods. It plays a vital role in the agricultural sector by providing a sustainable and affordable source of protein, contributing to socio-economic development and food security.

Identifying the key factors driving innovation in the poultry industry in the digital age and examining successful management strate-

gies relied on a comprehensive review of existing literature, research articles, industry reports and case studies related to industry innovation.

The method of scientific abstraction was a fundamental method of research for the purpose of this paper; the method of statistical analysis made it possible to identify the current state of the poultry industry over a period of 5 years and make suggestions and recommendations. Many works have been written by domestic and foreign authors since the innovative development of poultry farming; thus, through the method of deduction, conclusions were drawn, and proposals were developed to improve poultry farming in Kazakhstan.

**Results**

There are several types of poultry production methods, each with its own characteristics, management approaches and production systems. Here are some common types of poultry farming:

1. Broiler farming focuses on raising chickens specifically for meat production. Chickens, known as broilers, are typically raised in large-scale intensive systems, and bred to grow quickly and efficiently convert feed into meat.

2. Raising laying hens involves the production of eggs by hens. Laying farms can range from small backyard setups with a few hens to large commercial operations with thousands or even millions of hens.

3. A breeding farm is designed to produce parent stock, which are hens and roosters used to produce fertilized eggs to hatch into chicks. Breeding farms focus on maintaining the genetic traits and reproductive performance of birds. Special management techniques are used to maximize egg production, fertility, and hatchability. Breeding farms are often combined with hatcheries to provide a consistent supply of high-quality chicks for broiler or layer production.

4. Free-Range Farming: Free-range poultry farming allows birds to have access to open areas where they can roam, feed, and exhibit natural behaviors. Birds have more space than conventional systems and can access pasture, sunlight, and fresh air. Free-range systems require appropriate fencing and predator control measures to protect the birds. This rearing method is popular among consumers who value animal welfare and prefer products from birds with more natural living conditions.

5. Organic poultry production adheres to strict organic standards that prohibit the use of synthetic chemicals, antibiotics, hormones, and genetically modified organisms (GMOs) in feed and production methods. Organic poultry farms focus on providing birds with organic feed, access to outdoor space, and natural living conditions. The emphasis is on sustainability, environmental stewardship, and compliance with organic certification.

6. Duck farming involves raising ducks to produce meat, eggs or down (feathers). Ducks are known for their adaptability to aquatic environments and their ability to forage on land. Duck farms can be established in either extensive or intensive systems, depending on production goals and available resources.

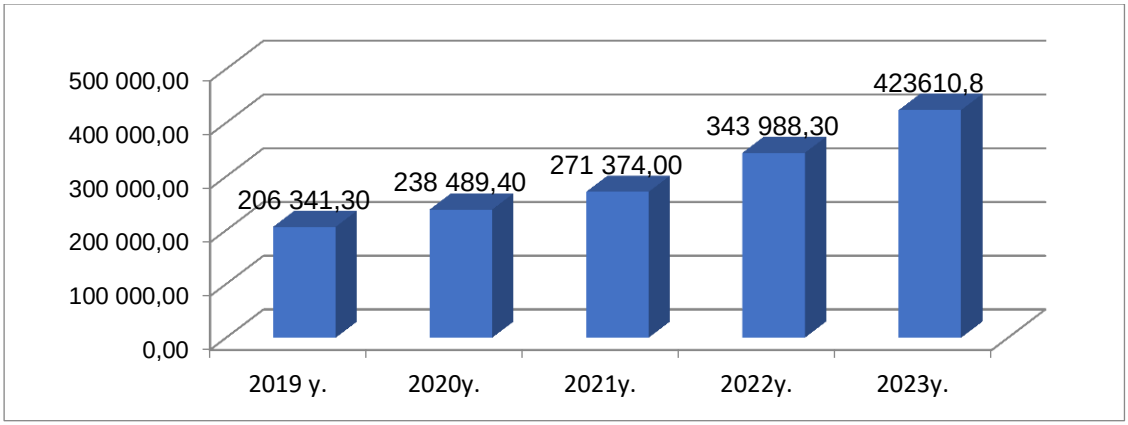
7. Turkey farming focuses on raising turkeys for meat. Indian farms can range from small operations to large commercial operations. Turkeys require special management techniques to meet their specific nutritional needs and ensure proper growth. Turkeys have a longer production cycle than broilers as they take longer to reach marketable weight.

Overall, poultry farming plays a critical role in food production, economic development, nutrition, and poverty alleviation. In addition, advances in technology and practice can help minimize environmental impacts by optimizing feed efficiency, reducing water use and effectively managing waste.

The importance of poultry farming lies in its contribution to global food security, providing a significant portion of the world's meat and egg production. Poultry is a rich source of high-quality protein, and poultry products such as eggs and lean meats are highly nutritious. They are rich in essential amino acids, vitamins (vitamin B complex, especially vitamin B12) and minerals (iron, zinc, and selenium).

Including poultry in the diet helps meet people's nutritional needs, especially in areas where access to a variety of food sources is limited. It also provides employment opportunities for farmers, farm workers and those involved in the poultry supply chain, such as feed manufacturers, veterinarians, and hatcheries. It also contributes to the local and national economy through the sale of poultry products, and poultry farming can be carried out on a small scale by individuals or households, providing them with a source of income and livelihood.

Let's look at the current state of the poultry industry in Kazakhstan for the last 2019-2023 at the beginning of the period in figure 1.

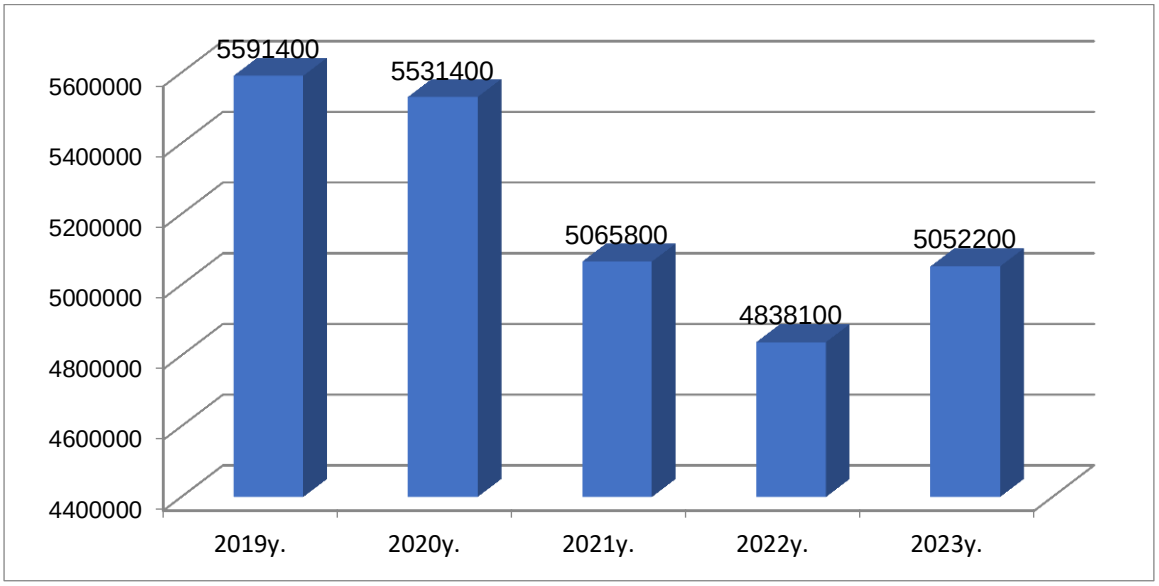



Note: compiled by the authors based on the source (6 Latest Tech…) [11].

Figure 1 - Indicators of poultry farming in Kazakhstan for 2019-2023, units

This figure depicts the income of poultry farming in Kazakhstan from 2019 to 2023 in million tenge. Over the past five years, revenue from poultry farming in Kazakhstan has had a steady upward trend. Starting from 206.341.3 million tenge in 2019, revenue increased by 15.5% to 238.489.4 million tenge in 2020, by 13.8% to 271.374.0 million tenge in 2021, by 26.7 % to 343,988.3 million tenge in 2022 and, finally, by 23.1% reached 423.610.8 million tenge in 2023. The poultry revenue growth rate in Kazakhstan shows positive and sustained growth during the period under review, with a sustained double-digit growth rate year-on-year. Which indicates a thriving poultry industry in Kazakhstan. The upward trend in revenue suggests growing demand for poultry products in Kazakhstan, driven by factors such as population growth, changing food preferences and urbanization.

Let's look at egg production in Kazakhstan over the past 5 years (figure 2).




Note: compiled by the authors based on the source (6 Latest Tech…) [11].

Figure 2 - Egg production in Kazakhstan for 2019-2023, million pieces.

Based on the data provided, we can observe the following trends in egg production. In 2019, egg production was 5.591.4 million, and in 2020, egg production decreased slightly to 5.531.4 million, down about 1.1% from the previous year. In 2021, egg production fell further to 5.065.8 million, reflecting a decline of approximately 8.4% compared to the previous year. In 2022, egg production continued to decline, reaching 4.838.1 million, indicating a further decline of approximately 4.5% compared to the previous year. In 2023, egg production increased slightly to 5.052.2 million, up about 4.4% from the previous year.

In conclusion, the data shows a variable trend in egg production over the years considered. Although there was a slight decline in production between 2019 and 2020, larger

declines were observed in 2021 and 2022 because of the COVID-19 pandemic and factors such as changes in demand, market conditions, disease outbreaks and production challenges faced by the poultry industry. industry in crisis years.

Even though in 2023 there was a slight recovery with a slight increase in egg production, however, pre-pandemic growth as in 2020 was not observed, which is primarily due to subsidies for egg producers. Let's consider the list of areas and standards of subsidies in table 1.

Table 1 - List of areas and standards of subsidies for 2023

| № | Subsidy area | Unit | Subsidy standards for 1 unit, tenge |
|---|---|---|---|
| Poultry farming | | | |
| 1. | Purchase of breeding day-old young animals of the parent/grandparent form | acquired head | 600 |
| 2. | Reducing the cost of poultry meat production | | |
| 2.1 | actual production from 15,000 tons | kilogram sold | 80 |
| 2.2 | actual production from 10,000 tons | | 70 |
| 2.3 | actual production from 5,000 tons | | 60 |
| 2.4 | actual production from 500 tons | | 50 |
| 3. | Reducing the cost of turkey meat production* | | |
| 4. | Reducing the cost of waterfowl meat production | | 40 |
| Egg farming | | | |
| 1. | Purchase of day-old young animals of the final form of the egg direction obtained from breeding birds | acquired head | 60 |
| 2. | Reducing the cost of producing food eggs for actual production of 5 million pieces (valid until January 1, 2023) | realized item | 3 |
| Note: compiled by the authors based on the source (6 Latest Tech…) [11]. | | | |

Subsidizing for the meat sector has remained virtually unchanged, however, the subsidy for poultry farmers has been changed not in the amount of 3 tenge per egg, but depending on the size of the enterprise's production, that is, subsidies are paid from 5 million pieces. The abolition of subsidies for eggs of small entrepreneurs will have a nega-tive impact on the industry, as many poultry farms are now on the verge of bankruptcy.

In Kazakhstan, the poultry industry faces several challenges and problems that may affect the productivity and profitability of the industry. Here are some common problems faced by poultry farmers in Kazakhstan:

Outbreaks of diseases such as avian influenza or Newcastle disease pose a significant threat to poultry farms. These diseases can spread quickly and cause high mortality rates, resulting in significant financial losses. Appropriate biosecurity measures, vaccination programs and monitoring systems are essential to prevent and control disease outbreaks. Availability and quality of poultry feed is a problem in some regions of Kazakhstan. Access to high quality feed ingredients such as grains, protein sources and additives at affordable prices can impact the growth, health, and productivity of poultry. Farmers may have to rely on imported feed ingredients, which can be expensive and subject to fluctuations in international markets.

The lack of infrastructure in some areas is inadequate and may hamper poultry farming. These include issues such as limited access to electricity, water supplies, transport networks and adequate waste management systems. Inadequate infrastructure increases production costs, limits market access, and hinders the growth of the poultry industry. Vari-

able supply and cost of inputs: Poultry farmers in Kazakhstan face challenges related to the availability and cost of inputs such as chicks, hatching eggs, vaccines, and medicines. Inconsistencies in supply chains and fluctuations in input prices can disrupt production and profitability.

Market challenges: Poultry farmers may face challenges related to market access, pricing, and competition. Limited distribution channels, low bargaining power and price fluctuations can affect the profitability of poultry products. Developing strong market linkages, improving distribution networks, and exploring export opportunities can help overcome these challenges. Climate change and extreme weather conditions.

Kazakhstan's varied climate and extreme weather events such as cold winters or hot summers can affect poultry production. Extreme temperatures, humidity, and natural disasters can affect bird health, housing conditions, and food availability. Adaptation strategies, improved housing design, and climate-resilient management practices can help mitigate these challenges.

Addressing these challenges requires collaboration between government agencies, industry stakeholders, research institutions and farmers themselves. Supporting the poultry sector through infrastructure investment, research and development, access to credit, technical assistance and market development can contribute to the growth and sustainability of the poultry industry in Kazakhstan. It is necessary to develop the economy of the poultry industry in Kazakhstan primarily based on a narrow specialization of industrial-type enterprises, concentrating production in areas close to large markets.

In the source of literature, Brazil will remain the world leader in the production of poultry meat notes that in modern conditions of high competition in poultry farming, those who invest in new technologies succeed (Stadnicka K., Aleksandra D., Bartosz T.) [12]. Since, in parallel with the increase in the level of automation of production, the total income also increases. If in a small poultry house, it is still possible to do without innovative developments, then to reach a more global level they are simply necessary. One of the innovative solutions to the problems of poultry farming in Kazakhstan is the introduction of smart farming and precision farming technologies. This approach uses advanced technology and data-driven systems to optimize various aspects of poultry production. Here are some key components of this innovative solution:

Internet of Things (IoT) sensors. Deploying IoT sensors in poultry houses allows you to monitor and collect real-time data on factors such as temperature, humidity, air quality and bird behavior. This information can help farmers quickly identify and correct potential problems, ensuring optimal living conditions for birds. Automated Environmental Control Systems: The introduction of automated environmental control systems can regulate temperature, ventilation, lighting and other parameters in poultry houses. These systems can be integrated with sensor data and programmed algorithms to maintain optimal conditions, reduce stress on birds and improve their health and productivity.

Data analytics and decision support systems. Analyzing the collected data using advanced analytics and machine learning algorithms can provide valuable insights and predictive capabilities. Farmers can make informed decisions about feed formulation, disease management and herd health based on data patterns and predictive models, increasing efficiency, and reducing risk. Precision Feeding and Nutrition Management: Using precision feeding techniques, farmers can optimize feed composition and delivery based on the specific nutritional needs of poultry at different growth stages. Accurate feeders, combined with bird performance and health data, can ensure accurate and efficient feed distribution, minimizing waste and increasing productivity.

Remote Monitoring and Management: Using mobile apps and remote monitoring systems, farmers can access real-time data and manage their poultry farms remotely. This allows them to monitor critical parameters, receive alerts and manage systems even if they are not physically present on the farm. Remote access enables quick response and efficient management, increasing operational efficiency. Disease Detection and Prevention: The introduction of advanced disease detection technologies such as computer vision systems or thermal imaging cameras can help in the early detection of diseases or abnormalities in birds. When combined with data analytics and machine learning, these systems can identify patterns associated with disease outbreaks and alert farmers, enabling timely intervention and disease prevention.

Robotics and automation. Integrating robotics and automation technologies can simplify labor-intensive tasks such as cleaning, feeding and egg collection. Robotic systems can operate with high precision, reduce human errors and optimize operational efficiency.

This automation frees up labor resources for other important operations on the farm. Platforms for collaboration and knowledge sharing. Creating collaboration platforms, online forums or mobile apps that facilitate knowledge sharing, best practice sharing and networking among poultry farmers can encourage innovation and create a supportive community. Farmers can learn from each other's experiences, receive expert advice, and stay abreast of industry trends and advances.

Using smart farming and precision farming technologies, poultry farmers in Kazakhstan can increase productivity, optimize resource use, improve animal welfare, reduce risks, and make data-driven decisions. This innovative solution has the potential to revolutionize poultry farming practices and contribute to the sustainability and competitiveness of the industry. Lack of funds is a limitation for current activities and investments for technical re-equipment and expansion of production. There may be several approaches in this regard, and among them is the search for external investors. But this is associated with a certain loss of economic independence of commodity producers. It is undesirable to cross a certain line to preserve agriculture as a sector of the country's economy.

Several countries have successfully developed their poultry industries to become major producers and exporters of poultry products, to mention a few notable examples: The United States of America has a highly developed and technologically advanced poultry industry. It is one of the world's largest producers and exporters of poultry meat and eggs. Petracci M., Estévez M. [13] claims the industry is characterized by large-scale production, advanced breeding programs, efficient feed conversion and strict biosecurity measures.

Brazil has become a world leader in the production and export of poultry meat. It has a strong integrated poultry industry with modern production systems, favorable climatic conditions, abundant feed resources and competitive cost structure. Busse M., Schwerdtner W., Siebert R. et al. [14]. emphasized, Brazil is known for its efficient production methods and high-quality poultry products.

**Discussions**

Effective poultry management involves implementing good management practices to ensure the welfare, health, and productivity of the poultry flock. Providing suitable housing that will protect birds from adverse weather conditions, predators, and disease. Adequate ventilation, lighting, temperature control, and adequate space for comfortable movement and minimizing stress are important. Maintain cleanliness and hygiene in the home, a balanced and suitable diet that meets the nutritional needs of the bird.

Provide a constant supply of clean and fresh water to prevent dehydration and maintain proper digestion, implement effective biosecurity measures to prevent the entry and spread of diseases on the farm. This includes controlling visitor access, disinfecting shoes and equipment, and following proper quarantine procedures for new birds. Regular monitoring of bird health, behavior, and performance, as well as important parameters such as feed intake, egg production, weight gain, vaccination history and any observed health problems, is required to prevent infestations of insects, rodents and other pests that could harm the flock poultry.

China's poultry industry is experiencing rapid growth, driven by rising domestic consumption and urbanization (Hu Zafar F., Khan A., Manzoor S. A.et al.) [15]. It has a diverse poultry sector, including both large-scale commercial operations and small backyard farms ( Kukk M., Põder A., Viira A.-H et al.) [16]. Studies of Abraliev O.A., Sugirova G.S., Velesko S. [17] postulated, China has introduced modern production methods, advanced breeding programs and improved biosecurity measures to meet the growing demand for poultry products.

European Union: The European Union (EU) has a well-established poultry industry, with countries such as France, Germany and the Netherlands being the main producers Ryskeldi O., Shelomenceva V.P., Narynbaeva A.S. informed the EU has strict regulations on animal welfare, food safety and environmental sustainability, which have contributed to the development of high-quality and sustainable poultry farming systems (Ryskeldi O., SHelomenceva V.P., Narynbaeva A.S.) [18].

Thailand has made significant progress in poultry farming and is a major exporter of poultry products, especially chicken meat. The country has adopted modern production technologies, efficient processing plants and strict quality control measures. Thailand's poultry industry is successfully expanding into international markets and meeting the needs of global consumers.

The Netherlands is known for its advanced and innovative poultry industry. The company has developed sustainable and high-tech poultry production systems with a focus on animal welfare, food safety and environmental sustainability. The country has ex-

pertise in poultry genetics, precision farming technologies and efficient supply chains. These countries have successfully developed their poultry sectors through investment in research and development, adoption of advanced technologies, efficient production methods, wide access to markets and adherence to high quality standards. However, it is important to note that each country's success in poultry production depends on specific geographic, economic, and cultural factors.

**Conclusion**

1. Thus, the poultry industry in Kazakhstan is trending upward, however, to maintain this positive trend and become innovative, stakeholders must focus on solving potential problems and promoting further development of the poultry sector. For innovative development, we have proposed development paths that are directly related to digitalization and the introduction of innovative technologies and can be in use for state bodies managing agriculture, enterprises.

2. The use of innovative technologies is a pattern for developed countries and the adoption of progressive experience from countries such as the United States of America, Brazil, China, Thailand, the European Union, in particular: France, Germany, and the Netherlands, will allow Kazakhstan to increase not only poultry production, but also increase economic country growth. For future research it is needed to deepen the analysis of innovations implemented successfully by farmers.

3. Research and development programs in poultry needs to develop.

4. Expand to international market by providing export privileges to the strong poultry farmers

5. Promote and support production-research-market collaborating by state funding.

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***References***

[1] Кулашева, А. Птицеводство – отрасль сельского хозяйства [Электронный ресурс].- 2022.- URL: https://www.world-nan.kz/blogs/ptitsevodstvo-otrasl-selskogo-khozyayistva (дата обращения 25.12.2023).

[2] О результатах работы за 2022 год отрасли птицеводства Республики Казахстан [Электронный ресурс].- 2022.- URL: https:// www.palata.ptica.kz/ news/o-rezultatah-raboty-za--2022--god--otrasli--pticevodstva-respubliki-kazahstan (дата обращения 20.12.2023).

[3] Альжанова, М., Утеев, Р. Казахстан обеспечивает себя яйцом на 100% [Электронный ресурс].- 2022.- URL: https://www.almaty.tv/ news/ obschestvo/2007-kazakhstan-obespechivaet-sebya-yaytsom-na-100percent (дата обращения 20.12.2023).

[4] Джумажанов, Т. Отечественные птицеводы оказались под давлением [Электронный ресурс].-2022.- URL: https://www./kapital.kz/economic/105602/otechestvennyye-ptitsevody-okazalis-pod-davleniyem.html (дата обращения 25.12.2023).

[5] Wright, L. The illustrated book of poultry. Wright BoD–Books on Demand / L.Wright.- London, 2023.- 550 p.

[6] Ajeigbe, H. A. Handbook on Improved Pearl Millet Production Practices in Northeastern Nigeria. International Crops Research Institute for Semi-Arid Tropics/ H.A. Ajeigbe, I.I. Angarawai, A.H Inuwa, F.M Akinseye, T. Abdulazeez //The U.S. Government's Global Henger & Food Security Initiative, Nigeria, 2020.- 125 p.

[7] Laurens, K. A review of social science on digital agriculture, smart farming, and agriculture 4.0: New contributions and a future research agenda / K. Laurens// NJAS Wageningen Journal of Life Sciences. -2019.- № 90-91.- P. 1-16.

[8] Relf-Eckstein, J.E. Farming Reimagined: A case study of autonomous farm equipment and creating an innovation opportunity space for broadacre smart farming/ J.E. Relf-Eckstein, Anna T. Ballantyne, Peter W.B. Phillips // NJAS: Wageningen Journal of Life Sciences. - 2019.- N 1.–P1-23.

[9] Давлетов, И.И. Инновационный вектор развития птицеводства пермского края [Электронный ресурс].- 2022.- URL: https:// www.fundamental-research.ru/ru/article/ view?id=41405 (дата обращения 20.12.2023).

[10] Соединенные Штаты имеют высокоразвитую и технологически продвинутую птицеводческую промышленность [Электронный ресурс]. -2022.- URL: https:// www.svoya-ptica.com/ssha-ptitsevodstvo-obespechivaet-1-6-milliona-rabochikh-mest (дата обращения 05.12.2023).

[11] 6 новейших технических инноваций для птицеводов [Электронный ресурс].-2022.- URL: https://www.agrovent.ru/blog/novosti-kompanii/6-noveyshikh-tekhnicheskikh-innovatsiy-dlya-ptitsevodov (дата обращения 25.12.2023).

[12] Stadnicka, K. Poultry Science: The Many Faces of Chemistry in Poultry Production

and Processing / K. Stadnicka, D. Aleksandra, T. Bartosz. – Berlin. Boston: Walter de Gruyter GmbH, 2023.- 22p.

[13] Petracci, M. Improving poultry meat quality / M. Petracci, M. Estévez. -London: Burleigh Dodds Science Publishing, 2023.- 156 p.

[14] Busse, M. Analysis of animal monitoring technologies in Germany from an innovation system perspective/ M. Busse, W. Schwerdtner, R. Siebert .et al. /Agricultural Systems.- 2020.- Vol. 138.- Issue C.- P. 55-65.

[15] Hu Zafar, F. Modeling pesticide use intention in Pakistani farmers using expanded versions of the theory of planned behavior / F. Hu Zafar, A. Khan, S. A Manzoor, M. Akmal, M. Usama Imran, M. Taqi, S. Manzoor, M. Lukac, Gul, H. Tahira, S.V. Joseph// Man and Ecological Risk Assessment: An International Journal. -2021.-Vol 27. – P.687-707.

[16] Kukk M., Põder A., Viira A.-H. /The role of public policies in the digitalization of the agrifood sector. A systematic review / M. Kukk, A. Põder A.-H. Viira // NJAS: Impact in Agricultural and Life Sciences. -2022.- Vol 94, issue 1.- P.217–248.

[17] Абралиев, О.А. Аграрный сектор Казахстана: ориентация на инновационное развитие / О.А. Абралиев, Г. С. Сугирова, С.Велеско// Проблемы агрорынка. - 2023.- N1.-С.23-31.

[18] Рыскелді, О. Развитие АПК на основе цифровизации: зарубежный опыт / О. Рыскелді, В.П. Шеломенцева, А.С. Нарынбаева//Проблемы агрорынка.-2023.-N1.-С.32-40.

### *References*

[1] Kulasheva, A. (2022). Pticevodstvo – otrasl' sel'skogo hozyajstva [Poultry farming is a branch of agriculture]. Available at: https://worldnan.kz/ blogs/ ptitsevodstvo-otrasl-selskogo-khozyayistva (date of access 25.12.2023) [in Russian].

[2] O rezul'tatah raboty za 2022 god otrasli pticevodstva Respubliki Kazahstan [Results of work for 2022 of the poultry industry of the Republic of Kazakhstan]. Available at: https:// palata.ptica.kz/news/o-rezultatah-raboty-za-20 22-god-otrasli-pticevodstva-respubliki-kazahstan (date of access: 20.12.2023) [in Russian].

[3] Alzhanova, M., Uteev, R. (2022). Kazakhstan obespechivaet sebya yajcom na 100% [Kazakhstan provides itself with eggs by 100%]. Available at: https://almaty.tv/news/obschestvo/2007-kazakhstan-obespechivaet-sebya-yaytsom-na-100percent (date of access: 20.12.2023) [in Russian].

[4] Dzhumazhanov, T. (2022). Otechestvennye pticevody okazalis' pod davleniem [Domestic poultry farmers are under pressure]. Available at: https://kapital.kz/economic/1056 02/otechestvennyye-ptitsevody-okazalis-pod-davleniyem.html (date of access: 25.12.2023) [in Russian].

[5] Wright, L. (2023). The illustrated book of poultry. *Wright BoD–Books on Demand*, 550.

[6] Ajeigbe, H.A., Angarawai, I.I., Inuwa, A.H., Akinseye, F.M. & Abdulazeez (2020). Handbook on Improved Pearl Millet Production Practices in Northeastern Nigeria. *International Crops Research Institute for Semi-Arid Tropics. The U.S. Government's Global Henger & Food Security Initiative, Nigeria,* 125.

[7] Laurens, K. (2019). A review of social science on digital agriculture, smart farming, and agriculture 4.0: New contributions and a future research agenda. *NJAS Wageningen Journal of Life Sciences*, 90-91, 100307.

[8] Relf-Eckstein, J.E. (2019). Farming reimagined: A case study of autonomous farm equipment and creating an innovation opportunity space for broadacre smart farming. *NJAS: Wageningen Journal of Life Sciences,* 1, 1-23.

[9] Davletov, I.I. (2022). Innovacionnyj vektor razvitiya pticevodstva permskogo kraya [Innovative vector of poultry farming development in Perm Krai]. Available at: https:// fundamental-research.ru/ru/article/view? id= 414 05 (date of access: 20.12.2023) [in Russian].

[10] Soedinennye S Htaty imeyut vysokorazvituyu i tekhnologicheski prodvinutuyu pticevodcheskuyu promyshlennost' [The United States has a highly developed and technologically advanced poultry industry]. Available at: https://svoya-ptica.com/ssha-ptitsevodstvo-obespechivaet-1-6-milliona-rabochikh-mest (date of access: 05.12.2023) [in Russian].

[11] 6 novejshih tekhnicheskih innovacij dlya pticevodov [6 latest technical innovations for poultry farmers]. Available at: https:// agrovent.ru/blog/novosti-kompanii/6-noveyshikh-tekhnicheskikh-innovatsiy-dlya-ptitsevodov/ (date of access: 25.12.2023) [in Russian].

[12] Stadnicka, K., Aleksandra, D., Bartosz, T. (2023). Poultry Science: The Many Faces of Chemistry in Poultry Production and Processing. *Berlin/ Boston: Walter de Gruyter GmbH.*

[13] Petracci, M., Estévez, M. (2023). Improving poultry meat quality. *London: Burleigh Dodds Science Publishing*.

[14] Busse, M., Schwerdtner, W., Siebert, R., Doernberg, A., Kuntosch, A., König, B. Bokelmann, W. (2015). Analysis of animal monitoring technologies in Germany from an innovation system perspective. *Agricultural Systems,* 138, 55-65.

[15] Hu, Zafar, F., Khan, A., Manzoor, S.A., Akmal, M., Usama Imran, M., Taqi, M., Manzoor, S., Lukac, M., Tahira Gul,H., & Joseph, S.V. (2021). Modeling pesticide use intention in Pakistani farmers using expanded versions of the theory of planned behavior. *Man and Ecological Risk Assessment: An International Journal,* 27, 687-707.

[16] Kukk, M., Põder, A., Viira, A.-H. (2022). The role of public policies in the digitalization of the agri-food sector. A systematic review. *NJAS: Impact in Agricultural and Life Sciences,* 94(1), 217–248.

[17] Abraliev, O.A., Sugirova, G.S., Velesko, S. (2023). Agrarnyj sektor Kazahstana: orientaciya na innovacionnoe razvitie [Agricultural sector of Kazakhstan: focus on innovative development]. *Problemy agrorynka – Problems of AgriMarket,* (1), 23-31.

[18] Ryskeldi, O., SHelomenceva, V.P., Narynbaeva, A.S. (2023). Razvitie APK na osnove cifrovizacii: zarubezhnyj opyt [Development of agro-industrial complex based on digitization: foreign experience]. *Problemy agrorynka - Problems of AgriMarket,* (1), 32-40.

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