

**POULTRY SUB-SECTOR AND FODDER PRODUCTION IN THE REPUBLIC  
OF KAZAKHSTAN: CURRENT TRENDS AND PROSPECTS**

**ҚАЗАҚСТАН РЕСПУБЛИКАСЫНДАҒЫ ҚҰС ШАРУАШЫЛЫҒЫНЫҢ КІШІСАЛАСЫ  
ЖӘНЕ ЖЕМШӨП ДАҚЫЛДАРЫН ӨНДІРУ: ДАМУ БАҒЫТТАРЫ МЕН  
ПЕРСПЕКТИВАЛАРЫ**

**ПТИЦЕВОДЧЕСКАЯ ПОДОТРАСЛЬ И ПРОИЗВОДСТВО КОРМОВЫХ КУЛЬТУР  
В РЕСПУБЛИКЕ КАЗАХСТАН: СЛОЖИВШИЕСЯ ТЕНДЕНЦИИ И ПЕРСПЕКТИВЫ**

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**Abstract.** *The goal* is to analyze and identify the range of problems in the development of forage base in Kazakhstan as one of the main factors influencing on the development of poultry farming. **Methods** – the methods of graphical and general scientific analysis, including analytical and statistical, were used in the article. Within the framework of the analytical method, an analysis of the development of poultry sub-sector and forage bases in the regions of Kazakhstan was done. With the help of the statistical method, a review of the sown areas, the number of poultry in the context of the regions of the republic was carried out. The main sources of the study were statistical and empirical data on the development of the country's poultry industry. **Results** - by applying the index method of statistical analysis, the calculation of the consumption of forage base per unit of physical poultry heads was done, an analysis of the provision of the poultry sub-sector with a forage base in dynamics was conducted, and regions of Kazakhstan that have priority opportunities for expanding the sown forage areas were identified. An analysis of the structure of fodder crops was done. Most of the forage acreage falls on fodder corn, the smallest part - on melons. Forage areas for cereals amounted to 12,815 ha, fodder legumes – about 8,224 ha, fodder root crops – about 4,603 ha and silage – about 9,173 ha. The analysis of the dynamics of the volumes of fodder crops, the number of livestock and poultry shows that a direct impact on the formation of domestic needs for ready-made fodder shows an increase in the number of livestock and poultry. **Conclusions** – recommendations on the increase the volume of poultry production, sown areas for fodder crops have been developed. It is necessary to envisage the possibility of reimbursement of part (20%) of costs of poultry sub-sector, including the construction/expansion of feed mills in the State special investment project; expansion of poultry farms for production of freshly chilled meat; creation and expansion of enterprises for processing, procurement, transportation of poultry meat.

**Аңдатпа.** *Мақсаты* – құс шаруашылығын дамытуға әсер ететін негізгі факторлардың бірі ретінде Қазақстанда азық базасын дамыту проблемаларының спектрін талдау және белгілеу. *Әдістері* – мақалада графикалық және жалпы ғылыми талдау әдістері, соның ішінде аналитикалық және статистикалық әдістер қолданылды. Талдау әдісі аясында

Қазақстанның облыстары бойынша құс шаруашылығы кіші саласы мен жемшөп базаларының дамуына талдау жасалған. Статистикалық әдістің көмегімен республиканың облыстары бөлінісінде егіс алқаптарына, құс басының санына шолу жүргізілген. Зерттеудің негізгі көздері елдің құс шаруашылығын дамыту бойынша статистикалық және эмпирикалық деректер болды. *Нәтижелер* – статистикалық талдаудың индекстік әдісін қолдану жолымен құстардың физикалық басының бірлігіне азықтық базаның жұмсалудың есептеу жасалған, құс шаруашылығы кіші саласының азықтық базамен қамтамасыз етілуіне динамикада талдау жүргізілген, егіс азықтық алқаптарды кеңейтудің басым мүмкіндіктеріне ие Қазақстанның облыстары анықталған. Жемшөп дақылдарының құрылымына талдау жасалған. Егіс алқаптарының көп бөлігі жемдік жүгеріге, ең аз бөлігі бақша дақылдарына тиесілі. Дәнді дақылдарға арналған жемшөп алқаптары 12 815 га, жемдік бұршақ дақылдары – шамамен 8 224 га, жемдік тамыр дақылдары-шамамен 4603 га және сүрлем - шамамен 9 173 га құрады. Жемшөп дақылдары көлемінің серпініне, мал мен құс басының санына жүргізілген талдау дайын азыққа ішкі қажеттіліктің қалыптасуына мал мен құс басының өсуі тікелей әсер ететіндігін көрсетеді. *Қортынды* - құс шаруашылығы өнімдерін өндіру көлемін, жемшөп дақылдары үшін егіс алқаптарын ұлғайту бойынша ұсыныстар әзірленген. Мемлекеттік арнайы инвестициялық жобада құс шаруашылығы кіші саласы шығыстарының бір бөлігін (20%), оның ішінде құрама жем зауыттарын салу/кеңейту; жаңадан тоңазытылған ет өндіру жөніндегі құс фабрикаларын кеңейту; құс етін қайта өңдеу, дайындау, тасымалдау жөніндегі кәсіпорындарды құру және кеңейту мүмкіндігін көздеу қажет.

**Аннотация.** *Цель* – проанализировать и обозначить спектр проблем развития кормовой базы в Казахстане как одного из основных факторов, влияющих на развитие птицеводства. *Методы* – в статье были использованы методы графического и общенаучного анализа, в том числе аналитический и статистический. В рамках аналитического метода сделан анализ развития птицеводческой подотрасли и кормовых баз по областям Казахстана. С помощью статистического метода проведен обзор посевных площадей, численности поголовья птиц в разрезе областей республики. В качестве основных источников исследования явились статистические и эмпирические данные по развитию птицеводческой отрасли страны. *Результаты* – путем применения индексного метода статистического анализа сделан расчет расходования кормовой базы на единицу физических голов птиц, проведен анализ обеспеченности птицеводческой подотрасли кормовой базой в динамике, выявлены области Казахстана, которые обладают приоритетными возможностями расширения посевных кормовых площадей. Сделан анализ структуры кормовых культур. Большая часть посевных кормовых площадей приходится на кормовую кукурузу, наименьшая часть – на бахчевые. Кормовые площади под зерновые составили 12 815 га, кормовые зернобобовые – около 8 224 га, кормовые корнеплодные – около 4 603 га и силос – около 9 173 га. Проведенный анализ динамики объемов кормовых культур, численности поголовья скота и птицы показывает, что прямое влияние на формирование внутренних потребностей в готовых кормах оказывают рост поголовья скота и птицы. *Выводы* – разработаны рекомендации по увеличению объемов производства продукции птицеводства, посевных площадей под кормовые культуры. Необходимо в государственном специальном инвестиционном проекте предусмотреть возможность возмещения части (20%) расходов птицеводческой подотрасли, в том числе по строительству / расширению комбикормовых заводов, птицефабрик по производству свежееохлажденного мяса; созданию предприятий по переработке, заготовке, транспортировке мяса птицы.

**Key words:** poultry industry, poultry farms, livestock and poultry, poultry meat, sown area, fodder base, crop production, agricultural enterprises.

**Түйінді сөздер:** құс шаруашылығы саласы, құс фабрикалары, мал мен құс басы, құс еті, егіс алаңы, жемшөп базасы, өсімдік шаруашылығы, ауыл шаруашылығы кәсіпорындары.

**Ключевые слова:** птицеводческая отрасль, птицефабрики, поголовье скота и птицы, мясо птицы, посевная площадь, кормовая база, растениеводство, сельскохозяйственные предприятия.

**Introduction.** Today the issue of saturation of the domestic market with domestic poultry meat and eggs is one of the main tasks of the Food Security Doctrine of the country. In light of the existing problem of ensuring food

security of the countries of the world, the development of poultry farming occupies a leading position in comparison with other branches of agricultural products [1].

of the results of the economic activities of the poultry complex in the general system of poultry farming were noted in their works by N.A. Popov, M. Pershukevich, A.A. Abdikadirov, Zh.A. Dulatbekova, M. Sh. Kushenova, S.A. Kozhabaeva [5, 8, 12]. In the article the index method was used for statistical analysis of the use of fodder base. In the frame of analytical method, the analysis of the development of poultry sub-industry and feed bases in the regions of Kazakhstan was done.

**Results and their discussion.** The provision of a fodder base is of great importance for the development of poultry farming. The positive dynamics of the effective development of agricultural production is possible through proportional development of poultry and crop production, in which the connecting link is fodder base [6]. In particular, the stable, solid and rationally organized feed base is the key to the efficiency and growth in production of poultry products. Therefore, the analysis of feed production is very important for assessing the development of poultry subsector [7]. According to the results of marketing research in Kazakhstan, in recent years, the number of poultry population and feed production has been increasing at a moderate pace.

The provision of poultry with fodder can be assessed by comparing the availability of fodder in general and per one physical (or conventional) head with the need for fodder resources. The provision of poultry with feed

Many researchers of the CIS and foreign countries were engaged in the study of agricultural production development. For example, D. M. Keynes, P. Samuelson, M.L. Lurie, G. Steven, M.D. Pratt and other scientists studied agricultural issues in their works [4]. Theoretical and methodological aspects of the development of agricultural production, including poultry farming, analysis

is calculated through the ratio of the amount of ready-made feed to the total feed requirement of poultry.

The indicator of the intensity of changes in poultry population number and its ratio with strengthening of feed base in poultry farming is calculated by the growth rate of the density of poultry population and feed production volumes per one conventional head. An important indicator of the state of fodder base is the output of finished fodder per 1 hectare or 100 hectares of sown areas. The share of fodder area in the sown area and its productivity has impact on this indicator. The average productivity of the entire sown area depends on the structure of the forage area and productivity of forage crops [9]. When

analyzing the availability of feed for poultry, indicators of the availability of feed and their consumption per head by poultry species or throughout the entire poultry industry are used (compared with the standard requirement).

In a number of regions, such as Akmola, Almaty, Zhambyl, Pavlodar, Turkestan, the number of poultry heads increased during 2018-2020. As of January 1, 2021, in Akmola region, the poultry population increased by 1 003 thousand heads compared to January 1, 2020, in Almaty region - by 287 thousand heads, in Zhambyl region - by 81 thousand heads, in Pavlodar region - by 99 thousand heads, in Turkestan region - 45 thousand heads, in Almaty city - 1 thousand heads (table 1).

Table 1 - The number of poultry population in the context of the regions of Kazakhstan

Thousand heads	2018	2019	2020	2021
Republic of Kazakhstan	39 914	44 338	45 041	43 335
Akmola	5 746	7 553	8 014	9 017
Aktobe	1 346	1 228	1 321	1 279
Almaty	9 246	10 427	10 311	10 598
Atyrau	441	447	456	264
West Kazakhstan	1 379	1 414	1 443	1 388
Zhambylskaya	1 193	1 620	1 702	1 783
Karaganda	3 789	3 931	4 081	3 314
Kostanay	4 246	4 425	4 269	4 027
Kyzylorda	115	128	127	125
Mangistauskaya	41	48	43	34
Pavlodar	1 412	1 623	1 696	1 795
North Kazakhstan	4 295	4 635	4 617	3 113
Turkestan	1 885	2 048	2 175	2 220
East Kazakhstan	3 872	3 908	3 878	3 235
Nur-Sultan	2	2	0	4
Almaty	6	5	6	7
Shymkent	898	895	902	1 134

Note: based on materials [10]

In the rest of the regions, as of January 1, 2021, compared to January 1, 2020, the poultry population number has decreased. In general, in the republic, since 2018, the poultry population has increased until January 2020, and as of January 1, 2021, there was a decrease by 1 706 thousand heads, compared to January 1, 2020. One of the main reasons was the rise in the prices for feed; many poultry farmers did not find it profitable to produce

poultry in terms of the increasing competition of poultry meat due to imports.

The increase in prices for fodder crops was a direct consequence of the reduction in the sown areas allocated for fodder crops.

The total area of sown land in Kazakhstan, in 2020, was about 22 583 thousand hectares, of which fodder crops were sown only on 14% of these lands, which is 46 thousand hectares less than in 2019 and 125 thousand hectares less than in 2018 (table 2).

Table 2 - Sown area allotted for fodder crops, thousand hectares

Indicators	2017y.	2018y.	2019y.	2020y.
Crop area, total	21840	21899	22136	22583
of which feed	3 382	3 323	3 277	3198

Note: based on materials [10]

There are practically no sown areas for fodder crops in Atyrau and Mangystau regions. Fodder areas have decreased in Kostanay region, in Pavlodar region, in North Kazakhstan region. A steady trend in reduction of the sown land allotted for fodder crops leads to the increase in prices for poultry meat, as well as to the decrease in poultry meat production volume in Kazakhstan. If we analyze the distribution of sown areas for fodder crops by shares of farm categories, then in 2020 more than 52% of fodder areas were used by peasant and private farms, and less than 47% were used by agricultural enterprises.

The analysis of the share participation in the use of areas under fodder crops by region allows to draw the following conclusions: most of the land for fodder crops is used in the Kostanay region - about 566,5 thousand hectares, in North Kazakhstan region - about 326,7 thousand hectares and in Akmola region - about 258,2 thousand hectares.

Most of the sown fodder area was under corn (about 96 200 hectares), the smallest part was under melons (110 thousand hectares). Fodder areas under cereals amounted to 16 thousand hectares, fodder legumes - about 4 thousand hectares, fodder root crops - about 6 thousand hectares and silage - about 4,8 thousand hectares. As a result of such distribution of sown areas for sowing fodder crops, the corresponding result was obtained: the largest yield falls on corn - about 15 238 thousand c, for fodder grains - about 439 thousand c, for legumes - about 181 thousand c, silage (without corn) - about 346 thousand c, for root crops - about 1 608 thousand c, for melons - about 22 thousand c. (table 3).

Analysis of the number of main consumers of finished feed shows that the main consumers are poultry, since they have a numerical advantage in Kazakhstan.

Table 3 - The population number of livestock and poultry, at the end of the year, thousand heads

	2018	2019	2020	2021
Livestock:				
cattle	6 764	7 151	7 436	7 850
sheep and goats	18 329	18 699	19 156	20 058
pigs	815	799	813	817
horses	2 416	2 647	2 852	3 140
bird	39 914	44 338	45 041	43 335
Note: based on materials [lk.10]				

In general, the analysis of the dynamics of the population number of livestock and poultry, which has a direct impact on the formation of internal needs for finished feed, shows that over the past four years, starting from 2017, there has been an increase in the population number of livestock and poultry. However, in the last year, the population number of poultry decreased from 44 338 thousand heads to 43 335 thousand heads, which was a consequence of the reduction in sown areas and a rise in the cost of fodder.

The production of poultry products also depends on the efficiency of using the feed base. The use of feed base is characterized by:

- the level of poultry feeding;
- the payback of the feed base.

The level of feeding poultry is calculated by the actually consumed feed volumes per one head of poultry by species.

The payback of the feed base is determined by the amount of products produced per unit of feed consumed. Savings or over-spending of the feed base is defined as the difference between the consumed feed and

the standard requirement for feed resources. For statistical analysis of consumption of feed base, the index method is used:

$$W = \frac{q}{k} \quad (1)$$

where: W - feed payback;

q - production;

k - consumption of feed base per unit of production.

According to tables 2 and 3, we calculate the payback of feed in Kazakhstan:

feed payback by 2018=73,600.7/18=4089

feed payback by 2019=75161.9/20=3758

feed payback by 2020=75024/23=3262

The return on feed is reducing every year. By 2020, compared to 2019, this figure decreased by 496, and compared to 2018, decreased by 827. This indicates that feed resources, from year to year, are not used effectively enough. If we look at poultry population number by farm categories, it shows that the main number of poultry falls on agricultural enterprises (large poultry farms), while peasant farms and households of the popula-

tion are not profitable for raising poultry in large quantities.

The reduction in the area under crops and the rise in the cost of fodder have resulted in a reduction in the number of birds in recent years. An analysis of the number of birds by category of farms shows that the main number of poultry reared falls on agricultural enterprises (large poultry farms), while peasant farms and households, growing birds in large quantities is not profitable. This situation arose as a result of state support for large agricultural enterprises (through preferences, subsidies, taxes) from the start of production to sale on the domestic market and to export. The state (at the level of local executive bodies) assists in providing land for agricultural use. During the period of harvesting and sowing, it provides fuel and lubricants at below market prices, subsidizes the purchase of plant protection products and mineral fertilizers.

Nevertheless, agricultural enterprises, including large poultry farms, have been increasing the production of both livestock and poultry in recent years [11]. For stimulating the situation the State provides support of agricultural market (through preferences, subsidies, taxes) from the start of production to the sales on domestic market and export. The strategy "Kazakhstan - 2050" in agriculture, determined the formation of agricultural business, the increase in production and sales on domestic and foreign markets, the decrease in imports of agricultural production and effective government support for agricultural production as the main directions for achieving food security of the country. The main subsectors supported by the State:

- livestock production, including poultry farming;
- crop production, including the cultivation of forage crops;
- processing of agricultural products, including poultry farms.

The State (at the level of local executive bodies) assists in the provision of land for agricultural use. During the period of harvesting and sowing, it provides fuels and lubricants at prices below market prices; and the purchase of organic and mineral fertilizers is subsidized.

Based on the indicators of previous years, the predictive analysis of production of finished feed allows to conclude that production volume of finished feed by the end of 2022 will grow to about 2 248 thousand tons.

We make such a forecast based on effective government support measures, which will

lead to the increase in the livestock and poultry population number by the end of 2022.

To obtain the forecasted results of the growth in the volume of forage crops and the population number of poultry, it is necessary to finalize a special investment project developed by the State, which will provide the possibility of reimbursing a part (20%) of the costs of poultry subsector, including:

- production of feed using irrigation systems;
- construction / expansion of feed mills;
- construction of broiler poultry farms;
- expansion of poultry factories for production of freshly chilled poultry meat;
- formation and expansion of enterprises on processing, procurement, transportation of poultry meat.

### Conclusions.

1. Thus, poultry farming today is one of the priority sectors of agriculture in Kazakhstan due to the fact that every year the demand for poultry products is increasing, the process of poultry production is becoming more and more profitable and less costly as a result of the introduction of modern technological developments aimed to optimize production in poultry farming. In addition, poultry products are the most "early maturing", and it, particularly, provide the opportunity to get the greatest return on the spent unit of feed, labor and other resources. Nevertheless, it is necessary to solve the existing problems that create obstacles for the development of poultry sub-industry:

- preserve the mechanism for subsidizing a unit of finished products;
- ensure the possibility of obtaining preferential loans;
- toughen the requirements of technical regulations for the import of poultry products.

2. To obtain the increase in the volume of forage crops and poultry population number, it is necessary to finalize a special investment project developed by the State, which will provide the possibility of reimbursing a part (20%) of costs of poultry subsector, including:

- production of feed using irrigation systems;
- construction / expansion of feed mills;
- construction of broiler poultry farms;
- expansion of poultry factories for production of freshly chilled poultry meat;
- formation and expansion of enterprises on processing, procurement, transportation of poultry meat.

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