Development of meat poultry farming in Russia within the framework of State programs

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Abstract. Current meat poultry farming, along with pig breeding, is one of the livestock sub-sectors that provides adequate nutrition for the population and food security of the country. The development of the sub-sector is provided by the goals, objectives and main areas for the development of state programs, as well as by the support that is provided within their framework. The experience of implementing programs and state support has shown high efficiency. Broiler meat is mainly obtained in industrial conditions. Achievements of science make it possible to obtain high production results. To solve the strategic objectives of meat poultry farming, a subprogram is being implemented, the purpose of which is to reduce the import dependence of meat poultry farming on imported breeding products and processes. The state of meat poultry farming in Russia, the dynamics of poultry meat production, the results of construction, reconstruction and upgrading of poultry farms within the framework of the state program and the results of the implementation of the subprogram are analyzed. Proposals have been formulated to clarify the productivity of domestic cross-country meat chickens and increase production through further upgrading and reconstruction of poultry farms that have been using outdated technologies and equipment so far.

1 Introduction

Poultry farming, as the most knowledge-intensive and sustainable livestock sector, makes a significant contribution to ensuring the country's food security and import substitution [1]. Currently, stable production of poultry meat has become an important condition for providing the population with a complete diet due to its high biological value and a short production cycle [2, 5].

Support within the framework of state programs plays an important role in the development of meat poultry farming. The experience of state support has shown high efficiency. During the implementation of the industry program titled “Development of poultry farming in Russia for 2013–2015”, the increase in poultry meat production has exceeded more than two times the amount planned [6].

Currently, the main tool for supporting the agribusiness is the State Program for the Development of Agriculture and the Regulation of Agricultural Products, Raw Materials

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and Food Markets (further referred to as the State Program), which determines the goals, objectives and main areas for the development of agriculture and the regulation of the agricultural and food market, as well as the financial support and mechanisms for the implementation of the activities planned. The State Program provides for the integrated development of all industries and sub-sectors, as well as areas of activity, including meat poultry farming [7].

At the federal level, there is a set of measures to support agricultural organizations (e.g. subsidies for the purchase of breeding young animals, support for breeding livestock, keeping the breeding stock, reimbursement of part of the costs for the construction, upgrading and technical equipment of poultry farms, for the provision of grants for state support for research and development and reimbursement of part of the costs for the implementation of research work in the field of poultry farming, etc.) that can be applied by breeding and genetic centers, reproducers and poultry farms as well [8]. Support measures have changed significantly in recent years, so the analysis of their effectiveness is relevant now and in the future from the standpoint of applying successful experience in other sectors of agriculture.

2 Methodology

The object of study is the economic effects of the development of meat poultry farming in the Russian Federation arising in the framework of the implementation of the State Program. The purpose of the study is to investigate the state and dynamics of the development of meat (broiler) poultry farming in Russia and develop proposals for enhancing the development of the industry. The study used data obtained from Russian statistical services, scientific organizations of the Russian Academy of Sciences and the Ministry of Agriculture of Russia, publications of scientists, etc. In the course of the study, methods of integrated and structural-dynamic analysis, expert assessments, extrapolation, and others methods were used.

3 Results and Discussion

Poultry meat plays an important role in the nutrition of the population of Russia, since it occupies a leading position in the total production of livestock and poultry for slaughter in live weight that amounts to 42.9% [2, 9].

In 2021, the output of poultry for slaughter in live weight in farms of all categories amounted to 6.7 million metric tons as of the level of 2020. Over the past 5 years, the output of poultry meat for slaughter (in live weight) in farms of all categories has increased by 10.8%. The main producers of poultry meat are agricultural organizations, which ensured the growth of poultry output for slaughter by 524,900 metric tons or by 9.2%. Peasant (farm) households, including individual entrepreneurs, have increased output by 11.2% over the same period, and the output has decreased by 1.4% in the households of the population (Table 1) [9].

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Table 1. Output of poultry meat for slaughter in live weight by category of farms, thousand metric tons.
The accelerated development of poultry and pig breeding has changed the structure of livestock and poultry production for slaughter (in live weight) by species. Over the past five years, the share of pork has increased from 31.2% to 35.1%, the share of cattle has decreased from 20% to 18.3%, that of poultry has decreased from 44.5% to 42.9%. The development of these livestock sub-sectors contributed to an increase in the production output of poultry and pork meat and their import substitution.

Since broilers currently occupy a leading position in the structure of poultry production for slaughter in farms of all categories (88.3%), it is advisable to consider the development of meat poultry farming using the example of broiler production. However, other types of poultry meat are the culling of egg crosschickens (3.3% in 2021), turkey (7.5%), duck (0.8%) and geese (0.1%) meat [8] are promising for increasing the poultry meat output.

The implementation of the State Program had a significant impact on the development of poultry meat. For the period 2016-2021, 62 new poultry farms were commissioned, 77 farms were reconstructed and upgraded, and the additional output of poultry for slaughter in them was brought to 1,308,200 metric tons, while the share of additional production in the poultry production output for slaughter averaged 3.3% (Table 2) [9].

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<tr>
<td>Farms of all categories</td>
<td>6,190.7</td>
<td>6,618.3</td>
<td>6,670.5</td>
<td>6,708.7</td>
<td>6,715.2</td>
<td>6,717.2</td>
<td>108.5</td>
<td>100</td>
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<td>Agricultural organizations</td>
<td>5,674.3</td>
<td>6,104.7</td>
<td>6,162.2</td>
<td>6,196.7</td>
<td>6,196.8</td>
<td>6,199.2</td>
<td>109.2</td>
<td>100</td>
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<td>Households of population</td>
<td>447.2</td>
<td>445.8</td>
<td>440.4</td>
<td>437.7</td>
<td>439.8</td>
<td>441.1</td>
<td>98.6</td>
<td>100.3</td>
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<td>Peasant (farm) households, including</td>
<td>69.2</td>
<td>67.9</td>
<td>67.9</td>
<td>74.3</td>
<td>78.5</td>
<td>77</td>
<td>111.2</td>
<td>103</td>
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Within the framework of the departmental target project titled “Scientific and technical support for the development of agribusiness branches”, the “Creation of a domestic competitive cross-country of meat chickens in order to obtain broilers” subprogram of the
Federal Scientific and Technical Program for the Development of Agriculture for 2017 - 2030 (hereinafter referred to as the FSTP subprogram) is being implemented that provides conditions for a stable growth in production through the use of breeding products obtained as part of the implementation of the subprogram. The FSTP subprogram should help reduce dependence on breeding products of grandparent forms in meat poultry farming.

The subprogram's purpose is to create a domestic competitive meat cross of broiler-type chickens that feature high productivity and viability based on the use of new high-tech domestic projects, including elements of a complete integrated scientific and technical cycle.

Currently, 95% of the breeding stock market is occupied by imported meat crosses from such transnational companies as Aviagen Brands (Arbor Acres and Ross crosses) and Cobb-Vantress (Cobb-500 cross) [3]. Work on the creation of a new broiler cross (Smena-9) is performed based on the Smenabreeding and genetic center, a branch of the All-Russian Research and Technological Institute of Poultry of the Russian Academy of Sciences. By 2025, the birds of this cross should provide 15% of the domestic market demand for breeding material.

The high performance of the final hybrid is due to the significant genetic potential of the poultry of the original paternal and maternal lines, which is stably transmitted from generation to generation. The work was performed on 70 economically useful traits using bioinformatics and genomic selection methods, which made it possible to obtain a cross that featured the following: the number of eggs laid per initial laying hen was 177 pieces, the average live weight of broilers for 42 days was 2,749 g, the broiler productivity index was 366, livability was 95%, and feed conversion was 1.6-1.85. Among the pluses were also the adaptability of the poultry to local feed, stable reproduction at a stable growth rate, 1,600-2,450-gram carcass weight after cutting (1,800-1,900 g on average.) However, to compare commercial indicators with the Cobb 500 and Ross 308 crosses (the main foreign Russian cross competitors), a larger analysis of daily weight gain, feed conversion, egg production and many other parameters is required [6, 10].

The high genetic potential and advantages of the Smena 9 cross give grounds for its widespread use in poultry farms in various regions of Russia. The poultry complies with all process conditions and can be easily used on any equipment of imported and domestic production [1, 10].

As part of the implementation of the FSTP subprogram, the following indicators were achieved in 2020:

- The number of initial lines in the biological collection of chickens used to create new competitive crosses of meat chickens of domestic selection in order to obtain broilers (per year) was 4 lines (4 lines planned);
- The number of registered results of intellectual activity (RIA) created as part of the implementation of the subprogram, for the use of which license agreements were concluded, amounted to 7 RIA (4 RIA planned);
- The number of new domestic competitive crosses of meat chickens for the purpose of obtaining broilers created as part of the implementation of programs for the use of which license agreements had been concluded amounted to 1 cross (a single cross planned);
- The share of poultry farms using new crosses of meat chickens created under the program in order to obtain broilers in the total number of poultry farms producing crosses of meat chickens in order to obtain broilers was 6.6% (1% planned) [10].

According to the Russian Ministry of Agriculture, to produce 4.55 million metric tons of broiler meat annually, about 4 billion broiler hatching eggs or 3.2 billion day-old chicks are needed with 80% hatching and 94% viability. Such a number of day-old chicks can be obtained from 25 million heads of hens of parental forms (with 135 chicks for the initial laying hen of parental forms and 95% viability of hens of parental forms.) The need for the
grandparent flock of chickens is about 610,000 heads with 55 chickens per initial laying hen on the maternal line [11].

The breeding base of domestic poultry meat for the acquisition of parent flocks is represented by two first-order reproducers, which does not meet the needs of poultry farms that provide commercial enterprises with the final hybrid and causes a high level of annual imports of hatching eggs of the final hybrid [12]. Therefore, first of all, it is necessary to create reproducers of the first order, a sufficient supply of products of which will contribute to the formation of reproducers for parental forms. The solution of this problem, as well as the reduction of dependence on the breeding products of grandparental forms, will be facilitated by the implementation of the FSTP Subprogram.

4 Conclusion

The meat poultry industry in Russia has come a long way in recent years as part of the formation of an up-to-date and a competitive sector of the meat subsector. Thanks to the state support provided and measures to develop competitive production, many poultry farms managed to perform a comprehensive technical and technological upgrading and reach a qualitatively new production level. This, in turn, made it possible to completely get away from dependence on imported supplies of poultry meat and ensure food security for this category of products.

The indicators of individual poultry farms in the country, which use up-to-date processes, make it possible to maximize the genetic potential of poultry productivity, for example, average daily gains are more than 70 g with a feed conversion of less than 1.5 kg. Over the past five years, 62 new poultry farms have been commissioned and 77 have been reconstructed and upgraded. These enterprises output only 3.3% products on average, and this is an insignificant share of products from the total production output. This small share indicates insufficient grade of the production upgrading. Poultry farms, which have not been included in the number of reconstructed and upgraded facilities, are a significant resource for increasing poultry meat production, which can be achieved as a result of their upgrading. At the same time, the competitiveness of enterprises is largely determined by the efficiency of the processes used and the genetic potential of the breeding material. The productivity of the Smena 9 cross, according to some indicators, has not yet reach the productivity demonstrated by the best poultry farms in the country. Therefore, comparing the commercial performance of the Smena 9 with the Cobb 500 and Ross 308 requires a larger analysis of daily weight gain, feed conversion, egg production and many other parameters in these top poultry farms.

References

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