The prospect of the development of the poultry industry

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Abstract. Over the past five years, great changes have been made in the development of poultry farming in the Republic of Mari El in primarily meat direction. In many district municipalities of the North-Eastern part of the Republic, modern complexes for broiler poultry cultivation with the use of modern, intensive technology have been built, which greatly facilitates the work of workers. All this contributes to the increase in the gross production of poultry meat. This industry is characterized by a rapid rate of reproduction of livestock, high productivity, lowest cost of production compared to other livestock industries. However, there was a question of the production of hatching eggs at the local level, because it is expensive to buy them on the side, the period of their storage is short, and most importantly, from the development of the economy, it is not profitable. There is a question, what methods and means it is possible to solve the arisen problem in our conditions. The scientific article reflects new approaches to attract investment resources for the development of poultry industry using innovative technologies. The proposed scientific recommendations will contribute to the production and significant reduction in the cost of hatching eggs at the first stage and ultimately to the overall reduction in the cost of finished products – poultry meat. The investments made by the calculations shall be repaid within three years. Thus, they will create a new production base that is not inferior to the existing Western analogues in the production and sale of hatching eggs, both in the Republic of Mari El and abroad, which will contribute to cheaper final products and significantly improve the financial condition of the poultry farm.

1. Introduction

One of the most important branches of an agricultural complex of the Republic Mari El is poultry farming. It is characterized by a rapid rate of reproduction of livestock, high productivity, the lowest cost of production compared to other sectors of livestock.

Institute of agricultural market studies (ICAR) in 2015 conducted a study of the volume of production of hatching eggs in Russia. The analysis showed that in the previous year the volume of egg production amounted to 2.9 billion units, while a year earlier to 2.7 billion pieces. Despite the annual growth of production of hatching eggs (since 2009, the sector had been adding 200-300 million eggs/year), there is a high volume of imports in the industry. A large proportion of hatching eggs in Russia is imported products. The poultry industry is developing rapidly in Russia, which does not yet fully cover the increasing demand for breeding material and even increases the volume of imports of hatching eggs into the country. Over the past five years, the volume of importation of hatching eggs into the country increased from 300-330 million units to 700 million units per year.

98% of total imports of hatching eggs in the country — broiler egg, 2% — Turkey egg and other poultry. More than 90% are imported from the European Union, including more than 38% from the
Netherlands (250 million units in 2015). Germany, Czech Republic, France and others also remain major importers.

Currently, poultry farms of the Republic of Mari El also do not fully cover their need for incubation eggs. Only 25% of eggs used in poultry breeding are locally produced [1]. The main reasons for the refusal to import hatching eggs in the Republic of Mari El:

- High production costs, which determines the high cost of poultry.
- Long-term transportation, which worsens the quality of breeding eggs.
- Western countries can impose sanctions on these products at any time.

It is expected that the implementation of the project will significantly reduce the high number of unemployed in the country.

The comparative analysis of prices of hatching eggs of agricultural producers of Russia and foreign countries is reflected in table 1.

| Bird breed                  | Producing country |
|-----------------------------|-------------------|
|                             | Russia | France | Czech Republic | Belarus |
| The hen hajseks brown, Lohmann brown Hen | 14     | 25     | 20              | 16      |
| COBB 500, ROSS 308        | 16     | 55     | 24              | 19      |

The analysis of the table proves the necessity of full provision of poultry breeding material of own production.

In the Republic, as in the whole country, there is a need for the development of environmentally friendly production. The market of organic food in the world is increasing annually by 20 %. Okotowari is just starting to gain momentum in sales in Russia. Entry to this market is quite free. There are neither strict legal restrictions nor restrictions on the scale of production. A relatively stable customer base can be established without much effort [2].

2. Experimental

For the development of agricultural production in the Republic began to introduce the project on ecological production of the incubation egg capable of covering completely overtime requirements of the enterprises of regions in a breeding egg.

The opening of the breeding hatchery also involves the organisation of an innovative veterinary and breeding centre in the region, which will create a closed cycle of cultivation of the parent herd within the first and second order breeding reproducers [3].

The innovation of the project is that it is designed for environmental production, which is not yet distributed throughout our country. The environmental orientation of the project involves the introduction of new methods of cultivation of poultry, refusal to vaccinate chickens and the use of antibiotics, as the birds will be grown regarding strengthening the natural immunity. It will be achieved due to the outdoor content, walking, using as a feed of its production [4].

| Table 2. Consolidated project schedule for 2017-2018. |
|---------------------------------------------------|
| Months                        | The names of the events                          |
| Jan 2017                       | Organization of financing, registration of the company, purchase of land |
| January-June 2017             | The construction of the enterprise               |
| May 2017                      | The purchase and delivery of equipment, hiring  |
| Jun 2017                      | The purchase and delivery of equipment, hiring  |
Thus, an innovation project requires its hatching egg production in the Republic of Mari El from December 2017. The formation of a complete parent herd is planned for 2018.

Let us formulate the main competitive advantages of the product innovation project:

- high taste quality products due to the achievement of environmental production;
- low cost of production.

The demand of the enterprises of the Republic for breeding egg now makes 158.7 million pieces of incubation egg a year. The total prize pool is about 15 million heads of the single contents.

According to data of the Russian agroindustrial sites of Russia the standard complex of such capacity-incubators on 10 million eggs (170 million a year), 160 poultry houses, slaughter shop (4 thousand head/ hour), Elevator capacity of 150 thousand tons, the production of feed (300 thousand tons/ year), meat processing, logistics, meat and bone meal shops, treatment plants is estimated at 18 billion rubles [5].

Social orientation of the project is in reducing unemployment in the country. The project is designed to create 1,000 new jobs.

Estimation of the investment costs should cover the totality of used resources associated with the project. The evaluation process should take into account all direct and indirect costs of cash (own and borrowed), tangible and intangible assets, labour and other types of resources.

**Table 3.** The recurrent costs for implementation of the project, mln. RUB.

| Cost name                                           | Amount     |
|----------------------------------------------------|------------|
| Capital investments to launch the production complex | 18000      |
| The purchase of imported eggs for the formation of the first parent stock in the amount of 100 thousand pieces | 3.6        |
| Total initial costs                                 | 18003.6    |

The sum of one-time costs for the project implementation will amount to 18003.6 million rubles.

It will be necessary to keep the parent herd in the amount of 0.47 million heads to meet the full demand for breeding eggs. As a result, we will get 169.2 million pieces of hatching eggs per year.

**3. Results and considerations**

In 2018, a complete parent flock of birds will be formed; it is planned to slaughter industrial poultry of its production in the amount of 141.67 thousand tons annually. Feed costs are growing in proportion to the number of live birds, and by 2019 the amount of 362.64 million rubles will be reached.

The determining factor in assessing the effectiveness of the investment project is the cost of production, which is calculated in table 4.

**Table 4.** Planned cost of hatching eggs.

| Indicator                      | 2017     | 2018     | 2019     | 2020     | 2021     |
|--------------------------------|----------|----------|----------|----------|----------|
| 1. Feed costs, mln. RUB.       | 2        | 228.44   | 362.64   | 362.64   | 362.64   |
| 2. The cost of labor, mln. RUB.| 171.2    | 282.48   | 310.73   | 341.8    | 375.98   |
| 3. The premiums from remuneration RUR million | 51.36    | 84.74    | 93.22    | 102.54   | 112.79   |
| 4. Utility costs, mln. RUB.    | 0.8      | 1.5      | 1.5      | 1.5      | 1.5      |
The development of its production of hatching eggs will significantly reduce the cost of breeding material used to expand the number of chickens in the country, which in turn will contribute to increasing the profitability of the industry in the country and reduce the retail sales prices of eggs and chicken meat.

### Table 5. Planning the revenue from the project.

| Indicator                                                      | 2017  | 2018  | 2019  | 2020  | 2021  |
|---------------------------------------------------------------|-------|-------|-------|-------|-------|
| 1. The volume of production, thousand tonnes                  | -     | 48.01 | 141.67| 141.67| 141.67|
| 2. Sale price, RUB / kg                                       | -     | 50    | 55    | 60.5  | 66.5  |
| 3. Revenue, mln. RUB                                          | -     | 2400.57791.858571.049421.06 | |

The annual increase in poultry meat production in the Republic will increase the cash flow from the project to 9421.06 million RUB after five years of operation, activities with an annual output of meat in live weight of 141.67 thousand tons [6].

The economic effect of the project is due to the profit from the sale of commodity products. The financial result of regional investment projects is the main source of the formation of the revenue side of the budget of the region.

The effectiveness of the investment project implies compliance of the project with the goals and interests of its participants. Effective implementation of the project increases the gross domestic product of the region. The success of the enterprise will largely depend on how accurately the economic effect of the investment project is calculated.

We calculate the discount rate according to the method based on alternative yield when the discount rate is equal to the refinancing rate of the Central Bank of the Russian Federation, but the inflation rate is still taken into account. Discounted rates are informative more capacious since their calculation are casting to multi-temporal economic performance to the current point in time.

According to the Central Bank of the Russian Federation, the average annual inflation in 2017 amounted to 8.6%. The refinancing rate is taken at the level of 11%.

Determine the rate of discount Equation:

$$i = \left(1 + r \right) / \left(1 + d \right) - 1,$$

where $r$ is the refinancing rate, and $i$ is the inflation rate, given the Data of the Central Bank of the Russian Federation.

The discount rate for 2017 is set at 2.21%.

Determine the average risk associated with the implementation of the project in the range from 13% to 15% by the table 6.

### Table 6. Risk Assessment of investment projects.

| Degree of risk | Project objective | The risk-adjusted, % |
|----------------|------------------|---------------------|
| Low            | Development of production by development of equipment | 3 – 5 |
| Average        | The increase in sales of products                  | 8 – 10 |
High Production and market promotion of a new product 13 – 15
Very high Research and innovation 18 – 20

One of the key objectives of cash flow estimates is to calculate the discount rate used to convert future cash flows into a single present value. For this project, the discount rate of 15.21%.

We will determine the effectiveness of the project using the discount rate in Table 7.

The value of net discounted income is positive. Therefore, investments are effective at this discount rate. From a financial point of view, the draft should be adopted. The value of the accumulated discounted cash income of RUB 3692.78 million indicates that there is a margin of safety designed to compensate for a possible error in forecasting cash flows.

For accurate project payback results, you need to calculate the discounted payback period of the project, the profitability index, the internal rate of return:

\[
Current = t + \frac{(NPV \cdot (n - 1))}{PV(n)},
\]

where Current-discounted payback period of the project; \( t \) is term of the project; \( NPV \) is accumulated discounted cash flow; DDP is discounted cash flow.

Table 7. Schedule of cash flows for the years 2017-2021, mln. RUB.

| Indicator                          | 2017    | 2018    | 2019    | 2020    | 2021    |
|-----------------------------------|---------|---------|---------|---------|---------|
| 1. Cash inflow                    | -       | 2400.50 | 7791.85 | 8571.04 | 9421.06 |
| 2. Cash outflow                   | 18231.46| 599.66  | 770.59  | 810.98  | 855.41  |
| 3. Profit before tax              | -18231.46| -16430.62| -9409.36| -1649.30| 6916.35 |
| 4. Profit tax                     | -       | -       | -       | -       | 414.98  |
| 5. Net cash flow                  | -18231.50| 1800.84 | 7021.26 | 7760.06 | 8150.67 |
| 6. Net cash flow accumulated      | -18231.50| -16430.60| -9409.36| -1649.30| 6501.37 |
| 7. Discount rate, %               | 15.21   | 0.868   | 0.753   | 0.654   | 0.568   |
| 8. The ratio of the discount      | 1       | 0.868   | 0.753   | 0.654   | 0.568   |
| 9. Net discounted cash flow       | -18231.50| 1563.13 | 5287.01 | 5075.08 | 4629.58 |
| 10. Net present cash flow         | -18231.50| -14261.80| -7085.25| -1078.64| 3692.78 |

The profitability index is the ratio of the net present effect of the project to the discounted cost of investment costs and is calculated by the Equation:

\[
PI = \frac{VP}{NVP}.
\]

The internal rate of return is the rate of interest at which the entire amount of the investment is returned in full for the period of their operation. It can be interpreted as a limit of return on investment, which can be a criterion for the expediency of additional investment in the project. The calculation of this indicator is based on the Equation:

\[
\sum (k = 1)^n \cdot (P(n)) / ((1 + IRR)) \cdot n = IC,
\]

where \( P(n) \) – net cash flow in the n-th year; \( IRR \) – internal rate of return on the investment project; \( IC \) – investment costs.

Thus, using the investment project, it was succeeded to adjust a full cycle of the release of import-substituting production in the region.

It is important to assess the budget effects of the project – the impact of the results of the planned project on the revenues and expenditures of the national budget to assess the effectiveness of the
proposed project for the economy of the Republic. The efficiency of the project is also calculated by the ability to influence the GDP of the region’s economy and ensure the dynamics of economic growth [8].

Under the macroeconomic effects accompanying the implementation of the investment project, the revenues generated in the economy as a result of the direct and indirect impact of the investment project on the formation of income in the region are assumed.

Implementation of the proposed project of innovative development of agriculture of the Republic will effectively affect the socio-economic development of the region. It is planned to increase revenues to the budget of the Republic every year. For five forecast years, it is planned to increase the consolidated budget of the region due to the development of the project by 1052.31 million rubles, including through tax deductions on profits of organizations for 414.98 million rubles, social insurance contributions-444.65 million rubles, income taxes on wages of workers-192.68 million rubles. The increase in the budget of the Republic will have a positive impact on the development of the entire region.

Successful implementation of the project for the Mari El Republic characterizes the level of the gross regional project, increasing the level projected for 5 years is planned for 47509.61 million rubles, including in agriculture 47502.81 million rubles, in the field of public utilities 6.8 million RUB during the first year of operation of the project is expected to increase gross regional product per 18002.8 million RUB, due to the large investments in innovative production.

4. Summary
Thus, the implementation of the project will ensure positive effects for the socio-economic development of the Mari El Republic:

- creation of competitive, highly effective, high-tech production, capable of increasing competitiveness of the enterprises of the Republic of Mari El;
- creation of favourable conditions for the development of entrepreneurship in the region;
- full provision of the Republic in hatching eggs that will allow refusing import of breeding eggs;
- the annual increase in the gross output of the region, in particular, agricultural products;
- increase in the average monthly wage;
- the increase of tax deductions to the consolidated budget of the Republic of Mari El;
- the increase of employment of the population of the Republic;
- development of the regional innovation system, providing effective, innovative development of the organizations of the Republic.

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