Scenario planning as a mechanism to respond to changes in market environment indicators

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Abstract. The question raised in the article concerns scenario planning and its role in improving the efficiency of the economic entities of the poultry industry. The relevance of scenario planning, which is considered as a mechanism for responding to changes in the environment, is substantiated. The analysis of the main volume indicators of poultry production for 2018 both in the whole industry and in the context of regions is given and the presence of the Delta in these quantities is justified. One of the reasons for the difference in the existing indicators is the lack of scenario planning in individual economic entities. In this regard, a specific example shows the scenarios of planning the technology of meat production of broiler chickens when using the rearing of roosters up to 8 weeks of age and justified their economic feasibility.

1. Introduction
In modern economic conditions, poultry farms are in a dynamic environment, which is characterized by a high degree of uncertainty associated with the lack of completeness, accuracy and reliability of information on many factors of the external and internal environment and the degree of their influence. Therefore, the management of each business entity is interested in reducing the degree of uncertainty, which is one of the main causes of economic risk.

Modern poultry planning does not take full account of management risk, and alternatives to various planned solutions are poorly or not being developed at all. Therefore, the management of organizations of the industry must learn to anticipate the risk, assess its size, the benefits associated with it, as well as to plan measures to prevent it.

One of the mechanisms of risk accounting and strengthening the certainty of economic entities in achieving the planned results and their possible changes is the development of scenarios. Therefore, at present, one of the urgent tasks to ensure the stability and competitiveness of the poultry industry is the availability of scenario planning.

2. Methods
The following methods were used in the course of the research: analytical, comparative analysis, economic-statistical, computational-constructive, generalization, systematization.

3. Results and discussion
To ensure the sustainable development of the economic entity of the poultry industry and increase their economic viability it is necessary to have in the arsenal of its strategic plan scenario planning. It will help to avoid the risks associated with the uncertainty of internal and external conditions of functioning of the business, as well as to promptly make managerial decisions to change the situation [5].

The poultry industry is currently developing dynamically. According to the Russian Poultry Union, poultry production increased by 430,000 tonnes in 2016-2018, with most of the increase in 2017 – 320 thousand tonnes. Poultry production in 2018 increased by 1.2% year-on-year to approximately 5.0 million tonnes.

In 2018, poultry production for slaughter in live weight in all categories of farms increased compared to 2017 and amounted to 6.7 million tons, including 6.2 million tons in agricultural organizations. In total, in the period from 2014 to 2018, production growth amounted to 20% or 1.1 million tones of poultry meat.

Egg production in all categories of farms increased by 61.66 million eggs or 0.74% to 44.89 billion eggs, including 251.6 million eggs in agricultural organizations to 36.2 billion eggs.

According to the Federal State Statistics Service, the Central Federal District is the leader in the production of live weight poultry meat for slaughter in all categories of households. In 2018, the Central Federal District produced 2475,000 tones (37%), the Volga Federal District produced 1381,800 tones of poultry meat, the Southern Federal District produced 643,300 tones, the Urals Federal District produced more than 573,000 tones, the Northwest Federal District produced 522,600 tones, the North Caucasus Federal District produced 538,000 tones, the Siberian Federal District produced 475,200 tones and the Far Eastern Federal District produced 55,700 tones (Figure 1).

Data by region are presented in Figure 2. In 2018, Belgorod Region remained the leader in poultry production in Russia, with production of 800 thousand tonnes of poultry (-5.8% by 2017).

Despite the favorable situation in the industry, there are risks (political, social, technological, economic, environmental) both for the industry and for the enterprise.

In this regard, the mechanism for neutralizing these risks is the development of alternative scenarios for the development of the enterprise in the future.

The review of existing scientific researches and practical results has shown that there is a great number of approaches to the development of scenarios, which provide for the development of a conservative, pessimistic and optimistic plan, the feasibility of which is not always justified due to the fact that they are mathematical variations of the same scenario. It is more realistic to determine the main possible trends and directions of development of the enterprise than to make adequate quantitative forecasts at the same time [1].

Figure 1. Live weight poultry production for slaughter in all categories of households among federal districts in 2018.
The scenario planning options under development become an effective tool for selecting the strategic alternative that best contributes to achieving the organization's goals [4]. Over 60% of poultry farms develop only one planning scenario, while the rest of the industry prefer to develop two or three options. In our opinion, it is too risky in conditions of high uncertainty and rapid environmental changes to develop a strategy based on a single probability forecast, as the accuracy of scenario planning depends largely on its multivariate nature and automation of the process.

We have identified 5 main stages of scenario planning in the organization (Figure 3). The results of the industry largely depend on the results of the functioning of economic entities. Within the limits of the enterprise the problem zone in planning system is working out of scenarios according to change of the market environment and an initial point of realization of the given opinion is working out of scenarios of technology of the maintenance, cultivation and feeding of a bird according to requirements of the market [2]. The scenarios were based on the principle of efficiency in obtaining products under alternative options. When developing scenarios in the broiler production it is necessary to take into account such factors as: the unevenness of demand for meat and meat products, the emergence of new competitors in the market, the increase in requirements to the quality and range of meat and meat products.

**Figure 2.** Live weight poultry production for slaughter in all categories of households among regions in 2018.

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**Figure 3.** Stages of scenario planning.

**Stage 1. Identification of key environmental factors affecting the poultry industry**

**Stage 2. Formulation of scenarios at a qualitative level**

**Stage 3. Scenario digitization - forecast of factors development and forecast of market development**

**Stage 4. Identify risks and opportunities for the organization in each scenario**

**Stage 5. Identification of critical events and identification of critical points of scenario development**
Their account is carried out by means of scenario planning by means of the mechanism of traditional technologies of broiler growing and technologies based on biological features of growth and development of poultry. Due to the prolongation of the term of growing the cocks up to 8 weeks old it is supposed to receive additional products (Table 1).

**Table 1.** Scenario planning for the production of broiler chicken meat when growing cocks up to 8 weeks of age

| Index                                      | Unit of measure | Variant 1 | Variant 2 |
|--------------------------------------------|-----------------|-----------|-----------|
| Young growth supplied for growing          | thous. of heads | 700,0     | 700,0     |
| Number of broilers in 6 weeks              | thous. of heads | 660.1     | 660.1     |
| incl. hens                                 |                 | -         | 328.5     |
| cocks                                      |                 | -         | 331.6     |
| Average weight of 1 head                  | kg              | 2.330     | 2.330     |
| incl. hens                                 | kg              | -         | 2.095     |
| cocks                                      |                 | -         | 2.565     |
| Cocks raised to 8 weeks.                   | thous. of heads | -         | 330.9     |
| Gross growth of living mass                | t.              | 1538.0    | 1829.1    |
| Total cost of live weight gain             | thous. of rubles| 50229.8   | 59286.5   |
| Cost of living weight gain of 1 kg         | rub./kg         | 32.7      | 32.4      |
| Slaughter yield                            | %               | 71.0      | 72.3      |
| Total production and processing costs      | thous. of rubles| 71087.3   | 90230.7   |
| Cost of production of 1 kg of meat         | rub.            | 65.1      | 68.2      |
| Selling price of 1 kg of meat              | rub.            | 93.5      | 112.6     |
| Profit                                     | thous. of rubles| 31014.7   | 58671.5   |
| Product profitability                      | %               | 43.6      | 65.1      |

At this poultry farm the technology of broiler meat production is used for joint cultivation of cocks and chickens up to slaughter age (6 weeks). Clogging of chickens and chickens is carried out simultaneously and 75-80% of the meat produced is sold in the form of chilled or frozen carcasses, and 20-25% - by products of deep processing.

The advantage of the proposed scenario of production technology is that the extension of the period of growing cocks for 2 weeks can improve the quality of meat by obtaining a more mature muscle tissue and increasing the yield of edible parts in a natural carcass.

At the same time, the cost of feed per 1 kg of live weight gain in cocks from 6 to 8 weeks remains quite low - 1.75-1.80 kg. Extension of the period of use of chickens is inexpedient, because after 6 weeks of age the growth of live weight is suspended as a result of the beginning of forming processes, and therefore, the conversion of feed by 1 kg of live weight growth sharply increases.

The use of the second scenario of broiler growing technology allowed increasing the live weight of cocks by 34.4% in the period from 6 to 8 weeks of age. Feeds with reduced nutrient content were used during this two-week period. The economy of this option is achieved by increasing the slaughter yield of meat by 1.3% and exceeding the growth rate of the selling price of meat products (20.4%) over the growth rate of its cost of production (4.8%).

The use of the proposed scenario by the poultry farm allowed increasing profits by 27.7 million rubles and profitability by 21.5%.

Thus, scenario planning allows defining the most probable way of development of the poultry farming organization in the forecasted near and far future.

Post-forecast assessment is carried out on the basis of the index of dynamics of development of the enterprise (Id), characterizing the rates of development of the organization in real conditions, taking into account the forecast of their changes. This index makes it possible to determine the growth source of the organization's asset formation required to achieve the expected level of financial development [3].
where $I_d$ is the index of dynamics of development of the organization, $\%$; $\Sigma B$ - amount of sources of formation of the organization's assets according to the balance sheet for the analyzed period; $\Delta B$ - increase in the sources of formation of the organization's assets in the forecasted period. Thereafter, the external and internal development factors of the organization should be assessed in terms of value for the projected period.

It is possible to use the scenario approach both as a stand-alone tool and in combination with other methods of quantitative risk analysis, such as decision tree or sensitivity analysis. Simulation modeling is increasingly being used in scenario planning to organize the search for a large number of variants. Moreover, as part of the simulation, experimental planning methods are used to reduce the search for options.

4. Conclusion

Thus, the writing of scenarios will allow the organization to determine the order of actions to eliminate risks or reduce them, to determine the measures of responsibility and criteria for risk management, to establish the timing of work and performers, to optimize costs, improve profitability and ensure dynamic development.

Different methods, which can be used in writing scenarios, make it possible to differentiate entrepreneurial risks of a business entity into appropriate groups depending on priorities and rank them by importance.

To date, one of the most effective methods of strategic analysis and risk management is scenario-based, as it makes it possible to determine the full range of existing problems facing the poultry industry, to identify the most significant of them, to carry out a comparative analysis of selected scenarios on a single basis, that is, in terms of their consequences for the organization.

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