Analysis of methodological approaches to assessing the effectiveness of the quality management system (QMS)

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Abstract. The article substantiates the relevance of the issue of assessing the effectiveness of QMS processes. The systematization of the main methodological approaches to the assessment of the effectiveness of the relevant processes is carried out. The characteristic of their essence is given, the main advantages and shortcomings with justification of prospects of each of them are defined. A method of assessing the effectiveness of QMS processes in poultry farming is proposed, the stages of its implementation are given and its main provisions are illustrated in the form of an integrated process model with comments on the construction of its assessment and adaptation at a particular enterprise, the results of which justify the validity of the proposed method.

1. Introduction

The importance of development and implementation of QMS at the enterprise today lies in the fact that it allows to achieve production and release of high quality products entering the market, provides success in the fight against competitors in view of improvement of all business processes in the poultry industry.

The industry is gaining momentum in poultry production today. According to the Russian Poultry Union, poultry production in Russia increased by 1.2% year-on-year to 5.0 million tonnes in 2018, and egg production increased by 0.74% to 44.9 billion eggs, respectively.

Achievements in the industry should be maintained and sustained, both in quantitative and qualitative terms. A core issue in the implementation of this task is the assessment of the effectiveness of QMS processes, as well as a clear description of the main terminological definitions.

At the same time, a review of the literature sources on the issue under consideration shows that the problem of evaluating the QMS processes is insufficiently covered.

In this regard, the study and analysis of methodological approaches to evaluating the effectiveness of QMS processes is an important issue. Today, the modern enterprise works as a circulatory system which provides interaction of all processes in their interrelation and interdependence. It should be noted that disruption of the life cycle of at least one production business unit leads to neutralization of the positive effect of the entire process model. Factors that create the risk of failure of any process are quite large and depend on the efficiency of the used potential (technical and technological, human, biological and financial). In this regard, the issue of managing the effectiveness and quality of each
business process, identifying the causes and violations in their activities is extremely acute. For this purpose, it is necessary to have a methodological toolkit to assess the effectiveness of the JMC.

Therefore, the aim of the study is to systematize and analyze the existing methodological approaches to evaluating the effectiveness of QMS processes with the identification of the most progressive elements in each of them and the development of appropriate theoretical basis taking into account the specifics of the industry.

"Efficiency - the degree of implementation of planned activities and achievement of planned results in accordance with ISO-9001 standard.

"Process is a set of interrelated or interacting activities, transforming "inputs" into "outputs" Process approach - definition of methods and criteria ensuring efficiency in process management. The advantages of this approach are the continuous management of interacting processes.

We have developed an integrated process model for the production of eggs and poultry meat.

It is important not only today to adapt the JMC together with the standards, but also to have a toolkit (algorithm) for evaluating the functioning of the JMC.

In the literature under study, the effectiveness of the QMS is structurally subdivided into a functional and process approach.

At the same time, the QMS has a process approach as part of its overall performance.

A review of the existing approaches has made it possible to systematize them and to identify promising elements of each of them and shortcomings.

2. Materials and methods
The following methods were used in the study, such as structural, comparative and systemic analysis.

3. Results of the research
The analytical study was carried out by means of systematizing approaches to the assessment of the effectiveness of the QMS processes and substantiating the advantages and disadvantages of each of them.

| Authors                        | The essence of the approaches                                                                                                                                 |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N V Tereshchenko               | Development of a system of efficiency criteria and their indicators taking into account the current state of socio-economic life; building a tree of the company's quality objectives reflecting performance criteria; taking into account the criteria for a national quality award. |
| N I Satalkina                  | Analytical review of the financial ratios based on the value of the synergy effect, taking into account the four blocks of balanced indicators; based on a key indicator - the consumer satisfaction index. |
| V I Dolgii                     | Development of a system for monitoring compliance and evaluation of the effectiveness of all business processes related to the production of finished products and other actions of the organization; Compliance with standards and requirements related to the maintenance, development and improvement of the QMS; with the help of audit programs that allow systematizing, consistently and timely qualify the assessment of compliance and overall performance on the basis of the developed policy in the field of the quality system of the enterprise, which reflects the conditions necessary to achieve it. |
| L A Redko                      | Assessment of the QMS performance by the main objectives of the organization's management based on the principle of fact-based decision-making. |
When considering and analyzing these sources, we can say that the assessment of QMS performance today plays a huge role in shaping the image of the company and its activities in general. It should be noted that the QMS has been implemented everywhere, but not everywhere effectively, as at the moment there are a great many methods and techniques of performance evaluation, many of which are becoming obsolete. At the same time, innovations dictate new directions for the successful development of enterprises, and the methods of the abovementioned authors testify to the insufficient evaluation of the QMS performance.

In this case, the authors believe that in determining the effective performance of the JMC it is necessary to use several methods at once, adding their point of view to the different approaches.

Based on the survey data currently used in the national economy [1;2], various methods of evaluating the effectiveness of QMS processes have been established that there are progressive elements to be taken into account in the development of appropriate methods. Moreover, the implementation of this task requires a comprehensive approach, which begins with the development of quality management policy, definition of processes, their regulation, process map and methodological basis for process evaluation. Based on this, an integrated process model has been developed in the poultry industry, including 3 blocks, Figure 1.
Each of these processes is regulated and the main input and output parameters of the process are defined.

Thus, during the incubation process, the input parameters of the process are the flow of the incubation egg, its laying into the incubator with the fixation of the batch number, date, number of the incubator and control over the sanitization and disinfection of the incubator.

Problems in QMS can arise at the junction of processes that can occur even irrespective of performance of the purposes of process, and be connected with quality of inputs and outputs of processes.

The analytical review of the issue under study showed that there is no clear structure,[3-5].

We believe that it is now more effective and efficient to evaluate the QMS according to the process model.

Based on all the methods (taking into account the perspectives) we have studied the state of the issue in the industry and developed the appropriate methodology, including a certain stage of its implementation.

We will focus only on the main stages:

- the development of an integrated model;
- the results’ analysis;
- the model itself;

![Figure 1. Schematic diagram of the process model of the poultry farm QMS](image)

Having the basic model of QMS processes of the poultry breeding enterprise the method of evaluation of efficiency of each process by means of the method of expert scoring of efficiency is developed.

Its essence consists in the establishment by experts of the significance of the indicators in each of the 3 blocks of the integrated process model and the scoring based on the algorithmization of the
methodological base. The integrated assessment of the QMS business process set is illustrated in Table 2.

Table 2. Assessment of the level of efficiency of business processes in quality management systems

| No. | Business process                                | performance level,% | total stock level |
|-----|-------------------------------------------------|---------------------|------------------|
| 1   | Management processes                           | 92.67               | 0.56             |
| 2   | Processes of the life cycle                    | 89.95               | 2.43             |
| 3   | Supporting processes                           | 78.33               | 3.45             |
| 4   | The whole set of business processes of the quality management system | 88.03               | 3.58             |

According to the above mentioned business processes, we will classify the entire set of processes as highly efficient (more than 88.03%). When viewed in terms of business processes, the supporting processes do not correspond to this level (78.33%). The point score for the majority of this business process is not more than 2 points, which can be seen from the table above.

Having considered these positions, it is necessary to monitor each criterion and develop management decisions to adjust each of them. The assessment of opportunities to improve the efficiency and effectiveness of each business process is calculated on the basis of the stock level, namely, the higher this indicator, the more efficient the business process is. In this case, management processes are the most effective.

Due to the fact that the effectiveness of QMS processes is being integrated into the competitiveness of products, it can be stated that the industry has entered foreign markets in a number of positions. According to the Russian Poultry Union, exports of eggs for food in 2018 increased 3.4-fold compared to 2001, while poultry meat was not exported at all in 2001, and poultry meat exports of 200 thousand tons of slaughter weight were typical for 2018. At the same time, if we compare 2018 with 2017, the export of meat increased by 22.2%, and the export of eggs by 30.2%, which means that our products are competitive. This competitiveness is ensured by the implementation of the QMS, which will allow monitoring of each business process with subsequent traceability and development of appropriate management solutions for their improvement through corrective actions and preventive actions.

4. Conclusion

The methods used to assess the effectiveness of QMS processes cannot be adapted to the poultry industry. Therefore, we have developed a comprehensive methodology for assessing the performance of each process and the QMS system as a whole.

Its adaptation at each enterprise in the industry allowed to improve the quality of not only the products, but also to ensure the effective functioning of the processes of the economic entity of the industry.

Today, no enterprise efficiently and effectively does not function without proper assessment of QMS, does not provide the release of quality products and monitoring of business processes, as it is the basis for the image and competitiveness of the enterprise.

It is important today to focus on the process approach, which allows you to monitor all the parameters of business processes at the input and output during the implementation and manufacture of poultry products.

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