Production quality and safety management in the corporate-type integrated structures in the agro-industrial complex

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Abstract. The article (paper) presents questions connected with the abilities of corporate-type integrated structures in the imports phase-out problems solving applied to the agro-industrial production. The paper deals with the advantages of the corporate-type integrated systems functioning, describes the profits from its functioning for the national economy in general. There offered management tools for the quality of production in the corporate-type integrated systems, and the indicative-planning elements use among other factors. There presented the implementation scheme of cycle process of production quality management and the algorithm of the analysis and control of production quality and safety control of the corporate-type integrated structures, functioning in the agro-industrial complex.

1 Introduction

Nowadays the national economy of the Russian Federation continues to be influenced by the economic sanctions, and the problem of food safety provision is acquiring special interest. Imports phase-out has a key meaning in the solving this problem, the success of imports phase-out is determined first of all by the quality of Russian production. The experience of Russian and several foreign companies, operating in the agro-industrial complex, demonstrates that the process of creating the corporate-type integrated structures is one of the most effective directions to implement the imports phase-out policy.

The study purpose is to develop the scheme of the quality management process in corporate-type integrated structures, operating in the agro-industrial complex.

In terms of this paper there was designed the scheme of the quality management process in corporate-type integrated structures, operating in the agro-industrial complex, there found out the abilities of these structures in the imports phase-out problem solving and production quality and safety provision, there was offered the range of tools to manage the production quality and safety in the corporate-type integrated structures of agro-cultural complex.

The analysis for operations results of huge integrated structures in the agro-cultural complex of Russia was held during the designing process; statistics and research data from rating agencies are amongst other things (in particular RA Expert).

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2 Results

Due to the concentration of significant resources the corporate-type integrated structures make it possible to ensure traceability of production quality and safety parameters along the entire chain of processes in its life and technological cycles, and thereby to ensure the competitiveness of Russian products and to replace gradually the imported goods.

Nowadays the corporate-type integrated structures are actively developing and successfully operating in the Russian agro-cultural complex. According to a study by the rating agency Expert 2018, the agro-cultural complex is characterized by an increase in integration and consolidation processes: it is with them that in most cases were associated with an increase in revenue of many holdings [1]. An essential factor contributing to the development and successful functioning of the corporate-type integrated structures in the agro-cultural complex is the implementation of the large-scale integration project “PARK: Industrial-Agricultural Regional Clusters”

The formation processes of the corporate-type integrated structures, their types, ways and advantages of creation and operation are described in sufficient detail in the research papers of I. Bogdanova, K. Barmuta and others [2-9]

Under this type of structure formation, the system-forming element that determines the effectiveness of the entire integrated structure is the goal of its creation, which differs from the private goals of autonomous business units that are part of it.

Despite the “individuality and uniqueness” of each separate corporate-type integrated structure, the goals of their creation can be summarized as follows: the creation of conditions for the sustainable development of an integrated structure based on the coordination of the interests of autonomous business units that are part of it.

The results study of the functioning of the corporate-type integrated structures and integration processes occurring in these structures operating in the field of agribusiness allows establishing the advantages of such structures inherent in agro-cultural industry:

- ensuring the growth of products competitiveness;
- expansion of potential opportunities to ensure the growth of labor productivity and the implementation of innovations through effective access to resources;
- significant opportunities for technological improvement of production, and as a result, resource conservation;
- ensuring the improvement of the production quality and safety;
- increasing the sustainability of development of both the corporate-type integrated structure as a whole, and individual autonomous business units that are part of it;
- ensuring a “through process” of product development within the framework of one system of the corporate-type integrated structure, which in its turn creates the opportunity to ensure traceability of production processes;
- creating conditions for both monitoring and effective risk management within the framework of the integrated structure as a whole and at the level of a separate autonomous business unit that is part of it.

The key advantage from the functioning of the corporate-type integrated structures in the agro-cultural sector is the ability to implement effectively the imports phase-out policy, ensuring sustainable development, increasing the competitiveness of agricultural products, and ensuring the quality of population life.

The issues of agricultural production quality management are widely described in the research papers of Russian scientists, such as, E. Susloparova [10], Gamova [11], N. Haryati [12], N. Shashlo [13]. However, their approaches are either oriented towards independent business entities and aren't connected by integration processes, or take into account certain aspects of the integrated quality management process. The specifics of the management processes implementation into the corporate-type integrated structures in the

case when the combination of direct and indirect methods of influence is required is not considered in these papers.

Managing the corporate-type integrated structure, as a complex system that allows implementing successfully the end-to-end process of creating products is a complex task, the implementation of which is indicative planning.

The issues of indicative planning application in the corporate-type integrated structures are considered in detail in the works of I. Bogdanova, other russian and foreign researchers [6, 7]. In the framework of this paper, we consider the specifics of the use of indicative planning in the agricultural sector as applied to the product quality management subsystem.

There can be applied the Deming cycle for reflection of the process of product quality management in the corporate-type integrated structure of agro-cultural complex, which is a combination of various types of activities and processes integrated in stages (see Figure 1).

Fig. 1. The process of product quality management within the overall management system of the corporate-type integrated structure of agro-cultural complex.

3 Discussion

We will consider the mechanism for the elements implementing for indicative planning in the four stages of the cyclical process of quality and safety management.

At the first stage of the quality management process, the unified policy for the quality and safety of products is developed for the entire integrated structure of a corporate type.

This stage involves the development of a number of specific programs, plans and measures aimed at implementing a corporate policy in the field of quality and safety of agricultural products based on the results of diagnostics and taking into account forecasts of the development of the corporation as whole and individual autonomous business units that are part of it.

At the second stage of this process, the autonomous business units of the corporate-type integrated structure are developing and implementing their programs to ensure the quality and safety of agro-cultural products within a single corporate policy.

It should be noted that during this stage the autonomous business units of an integrated structure, acting independently, get a certain level of product quality at the output. The difficulty lies in the fact that, in spite of independence, autonomous business units are interconnected by production, technological, logistic and other chains. As a result, the quality level achieved by one autonomous business unit is an element of the overall quality management system of the corporate-type integrated structure, determines the level of product quality of another autonomous business unit, or depends on the level of a similar indicator of another autonomous business unit. Since within the framework of the corporate-type integrated structure the possibilities of direct directive management of autonomous business units are limited, and the product quality management system has a complex hierarchical nature, it is advisable to use the block modeling method to describe this system, in which the object of modeling (results of product quality management at the integrated level corporate structure as a whole) is divided into separate blocks (quality management results at the level of separate autonomous business units). Each block is subjected to analysis both as an independent object and in conjunction with other blocks (other autonomous business units that are part of an integrated structure).

At the same time the functional side of the model is represented by the behavior of the corporate-type integrated structure when implementing control actions or its reaction to external influences, and the structural side is the interaction of its autonomous business units.

At the third stage the effectiveness of the corporate quality management system is assessed based on the actually achieved values of the control and target indicators for individual autonomous business units.

It should be noted that if there is a need to assess the effectiveness of the quality and safety management system for products of the corporate-type integrated structure of the agro-cultural complex as a whole at this stage, the values of the control and target indicators without preliminary processing are not very informative for such an assessment. This is due to the limited and incomplete initial data on the activities of individual autonomous business units. It is proposed to use the mathematical apparatus of the theory of fuzzy sets to conduct an integrated assessment of the effectiveness and efficiency of the quality and safety management system for products of the integrated structure of the agro-cultural sector. At the same time, it is proposed to use the actual values of the target and control indicators of individual autonomous business units as input. The tools of the theory of fuzzy sets will allow obtaining generalized data at set intervals. Such data may include the integrated values of the control indicators of the effectiveness and efficiency of the product quality and safety management system and the values of the control and target indicators in certain areas and separate autonomous business units, necessary for making effective management decisions.

At the fourth stage the adoption of effective management decisions and the implementation of corrective and preventive actions require a systematic holistic analysis of the values of target and control indicators for individual autonomous business units.

To implement such analysis and control, it is proposed to apply the algorithm shown in Figure 2.

Thus, all stages of the cyclic process of product quality management are implemented within the framework of the general management system in the corporate type integrated structure of agro-cultural complex.

4 Conclusion

The given approach for production quality management of corporate-type integrated structure in the agro-cultural sector allows working out and realizing the effective management solutions for correction of the current situation and possible problems preventing. The decision-making tool on the basis of control and possible targets is an effective mechanism for autonomic business units to cooperate within the integrated structure concerning directions and priorities of the quality provision operations. Creation of the system for the production quality and safety management in the corporate-type integrated structures, and also its continual improvement are the essential condition to provide the efficiency of these structures operations and the efficiency of agro-cultural complex in general, also the essential condition to raise quality and, as follows consequently, increase of competitiveness of agro-cultural production, providing of sustainable development of some regions and national economy in general. Among other things the formalized model of production quality management in the corporate-type integrated structures in agro-cultural complex is flexible for the structures of different types.

Fig. 2. Algorithm for analysis and control of processes of quality and safety management of products of the corporate-type integrated structure of agro-cultural complex. NP- nonconforming products.

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