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**SYSTEM ANALYSIS OF QUALITY CONTROL PROCESSES IN THE PRODUCTION OF CEREALS AND OILSEEDS**

Quality management is an integral part of modern production of food and feed products based on cereals and oilseeds. It is the quality assurance at all stages of the production system that is the key to sustainable safety and quality of the final product, which is the basis of market competitiveness.

Given the complexity and interconnectedness of all stages of the production process, which at least includes the selection, storage and processing of raw materials, only the implementation of a systematic approach allows optimizing each stage of the cycle. In order to take into account modern challenges that form specific internal and external risks and opportunities, the initial stage of establishing systematic production management is the development of a basic model. Such a model should include the minimum necessary elements of the quality management system and take into account the minimum necessary relationships between these elements.

In order to develop a basic model, we implemented a systematic analysis of the elements and relationships that form the quality control technology, taking into account the characteristics of the food and feed grain industry. In the process, ten key elements of such a model were identified, which included: environment and occupational safety, personnel, equipment, consumables, objects of influence, methods and technologies, measurement uncertainty, risks and opportunities, information flows and management. In accordance with the identified elements of the system, six types of relationships were established, including functional, informational, material, managerial, feedback and coordination. In the process of analysis, a model network was developed, which included a combination of 113 direct and feedback relationships, the analysis of the frequency distribution of which demonstrated the highest prevalence of informational (49.56%) and functional (21.24%) relationships. The frequencies of other types did not exceed 11%. Taking into account these features of the graph, weight coefficients were assigned for each type of connection, ranging from 9 to 5 points of significance.

To analyze the model graph, the approaches of calculating the degree of nodes, determining the density and analyzing the centralities were used, including closeness centrality [1, 2] and betweenness centrality, which were calculated using the Floyd-Warshall algorithm [3].

To obtain an assessment of the reliability and effectiveness of the formed model system, a stability analysis was performed through the initial basic impact of the system, defined as the sum of all matrix values. The failure of each element was modeled by stepwise zeroing of its ties (row and column in the matrix), followed by calculating the total impact after each failure [4, 5].

The results obtained were processed using SWOT analysis [6]. This approach allowed to identify a wide range of external and internal aspects of the network functioning, from the point of view of the peculiarities of the technological process.

The results of the analysis indicate a high integration of the elements "Personnel", "Equipment" and "Consumables", which have the greatest degree of interaction and play a central role in ensuring the stability of the system. In particular, the element "Personnel" demonstrated the highest criticality in the stability of the system (33.67%), which confirms its key role in supporting production processes. At the same time, weaknesses of this element were identified, in particular, low closeness centrality (0.0783) and limited participation in strategic planning, which requires an increased coordination role.

The element "Environment and Occupational Safety" turned out to be important for supporting functional processes, but has a limited coordination role (2.65%) and weak management ties (8.85%), which reduces its ability to synchronize actions between departments. Improving interactions with critical nodes, such as "Risks and Opportunities" and "Measurement Uncertainty", will allow to increase the efficiency of management of this element.

The element "Equipment" plays a key role in ensuring the functionality of the system due to a significant number of functional ties, but its limited interaction with innovative elements and low coordination role may become an obstacle to increasing the flexibility of the system. Optimization of connections with the nodes "Methods and Technologies" and "Risks and Opportunities" will allow to improve the ability to adapt to changing conditions.

The elements "Risks and Opportunities" and "Management" showed high significance for the strategic management of the system. However, the low level of coordination links (2.65%) limits their ability to effectively synchronize actions between other components of the system. The development of the coordination function and integration with control nodes ("Measurement Uncertainty") will improve the effectiveness of strategic decision-making and increase the stability of the system.

In general, the analysis results indicate the need to increase the level of coordination between system elements by developing new links and optimizing existing ones. Particular attention should be paid to elements with a low level of coordination links, such as "Environment and Occupational Safety", "Equipment", "Methods and Technologies", which will reduce the risks of quality loss and increase the flexibility of the system in conditions of change. Strengthening interactions with strategic management nodes ("Risks and Opportunities", "Management") will ensure improved adaptability of the system to external challenges and increase its overall effectiveness.

In general, the analysis results open up opportunities for further improvement of the system by developing new links and optimizing existing ones. Elements with a low level of coordination relationships, such as "Environment and Occupational Safety", "Equipment", "Methods and Technologies", have a special potential for improvement. Improving their interaction will minimize the risks of quality losses and increase the flexibility of the system in the face of change.

The developed basic model takes into account all the main elements and relationships that are necessary to ensure effective quality management. The identified and described opportunities and weaknesses of the system represent important areas for deeper research and further development. Due to its flexible structure, the model can be adapted to the conditions of specific food and feed production, while providing a reliable basis for meeting both national and international requirements for the quality of grain products.

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