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GOSPODARKA I INNOWACJE

LABORATORIUM WIEDZY Artur Borcuch

Volume: 71 | 2026

Economy and Innovation

ISSN: 2545-0573

For more information contact : editor@gospodarkainnowacje.pl

ASSESSMENT OF THE CURRENT STATE OF QUALITY OF FRUIT AND VEGETABLE PRODUCTS IN THE AGRARIAN SECTOR AND QUALITY MANAGEMENT MECHANISMS

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A R T I C L E I N F O.

Keywords: *fruit and vegetable products, quality management, agricultural sector, competitiveness, quality standards, export, ISO 9001, HACCP, Uzbekistan.*

Abstract*:*

This article analyzes the current state of fruit and vegetable product quality in the agricultural sector of Uzbekistan. The study evaluated existing mechanisms in the quality management system for fruit and vegetable products and examined their compliance with national and international standards. To increase competitiveness, proposals and recommendations for improving quality management have been developed. The research results are of great importance in increasing the export potential of fruit and vegetable products and ensuring competitiveness in the agricultural sector.

Introduction.

The agricultural sector is of strategic importance in Uzbekistan's economy, and the country occupies a worthy place in the global market for the production and export of fruit and vegetable products. The agricultural sector accounts for approximately 27–30 percent of the country's GDP. At the same time, amid intensifying competition in global markets, the issue of product quality is becoming increasingly relevant.

The issue of improving the quality management system for fruit and vegetable products is a priority task for several important reasons. First, to enter international markets, products must comply with EU, SCO, and other regional standards. Secondly, ensuring product quality in conditions of increasing consumer demand in the domestic market determines the competitiveness of manufacturers. Thirdly, economic losses resulting from low-quality products (losses, returned batches, fines) negatively affect the financial

stability of agricultural enterprises. The objective of this study is to develop practical recommendations based on the analysis of quality assessment and management mechanisms for fruit and vegetable products in the agricultural sector of Uzbekistan.

Literature review.

The issue of quality management of fruit and vegetable products has been widely studied in the world economic literature. The theoretical foundations of quality management were developed in the works of Juran J.M. and Gryna F.M., who defined quality as "compliance with consumer requirements." Feigenbaum A.V. justified the implementation of total quality control (Total Quality Control - TQC) into production processes.

The works of economists such as Toshmatov N.Yu., Khasanov B.A., and Karimov O.R. are of particular importance in the study of agricultural product quality in CIS countries, particularly in Uzbekistan. Their research highlights shortcomings in the national certification system and ways to eliminate them. In international practice, HACCP (Hazard Analysis and Critical Control Points) and ISO 22000 standards are recognized as the primary mechanism for ensuring food safety. Global Food Security Initiative (GFSI) certificates are a de facto requirement for market entry in international trade.

Research methodology.

The following methods were used in the study:

• Analytical-synthetic method - for analyzing statistical data on the quality of fruit and vegetable products;

• Comparative analysis - to compare national and international standards;

• Expert assessment - when evaluating quality management mechanisms;

• Monographic method - in studying the experience of individual enterprises and regions

• Economic-statistical methods - when analyzing the dynamics of product quality indicators.

The State Committee of the Republic of Uzbekistan on Statistics, documents of the Cabinet of Ministers of the Republic of Uzbekistan, FAO data and the results of sectoral research were used as sources of information.

Key findings and discussion. In terms of gross fruit and vegetable production, Uzbekistan ranks second among the CIS countries after Russia. The following table presents the main indicators of fruit and vegetable production in recent years.

Table 1

Dynamics of fruit and vegetable production in Uzbekistan (2019-2023)

Year	Vegetables (mln t)	Fruits and berries (mln t)	Export (mln USD)
2019	10,8	3,2	890

2020	11,2	3,5	950
2021	11,9	3,7	1 120
2022	12,4	4,0	1 380
2023	13,1	4,3	1 650

Source: State Committee of the Republic of Uzbekistan on Statistics, 2023

Table data shows that between 2019 and 2023, vegetable production increased by 21.3%, and fruit and berry production by 34.4%. Export volumes increased by 85.4 percent, indicating the presence of significant economic potential in the export sector. Research shows that the main problems of fruit and vegetable product quality are:

1. Problems of compliance with standard requirements. According to Uzstandard, 18-22 percent of fruit and vegetable products that have passed inspections do not fully meet the established requirements. Main disadvantages: excessive pesticide residues, mechanical damage, and uneven sizes and colors.

2. Storage and logistics problems. Thirty-five to thirty-five percent of fruit and vegetable products lose their quality from the harvesting stage until they reach the consumer. One of the main reasons for this is the underdevelopment of the cold chain system.

3. Low level of certification. Only 12–15% of fruit and vegetable exporters are certified for international quality management systems (ISO 22000, GlobalG.A.P.).

4. Assessment of quality management mechanisms

During the study, the main quality management mechanisms for fruit and vegetable products and their current effectiveness were evaluated. The table below presents the effectiveness of quality management mechanisms.

Table 2.

Efficiency of quality management mechanisms

№	**Mechanism**	**Current state**	**Efficiency**	**Need for improvement**
1	State Standards (GOST/UzSt)	Partial	Medium	High
2	Laboratory control	Insufficient	Low	Very high
3	ISO 22000 / HACCP	Low current	High	High
4	Global G.A.P. certification	Very low	High	Very high

5	Digital monitoring	Primary	Potential	High
6	Training of manufacturers	Unsystematic	Medium	High

Source: compiled by the author, based on data from Uzstandard and industry experts

The analysis results indicate that although the state standards system officially exists, the effectiveness of its practical implementation and oversight remains at a low level. In particular, serious reforms are required in the field of organizing laboratory tests in desert conditions, building cold chain infrastructure, and improving the qualifications of manufacturers.

The study confirms that competitiveness in export markets depends directly on product quality. Prices for fruits and vegetables on world markets can vary by 2–4 times depending on the quality class. Therefore, while investing in quality management increases costs in the short term, it allows for a significant increase in export revenues in the long term.

Particularly important markets for Uzbekistan - Russia, China, Kazakhstan, and EU countries - each set specific quality requirements. In particular, a GlobalG.A.P. or BRC Food certificate is mandatory for entering the EU market.

Suggestions and recommendations. Based on the research results, the following proposals and recommendations were developed:

1. Development of quality control infrastructure. It is necessary to organize modern laboratory centers at the regional level, establish mobile laboratory services, and expand the laboratory accreditation system.

2. Stimulating the implementation of international quality standards. It is advisable to establish a system for providing subsidies or preferential loans to manufacturers to obtain ISO 22000, HACCP, and GlobalG.A.P. certificates.

3. Development of cold chain logistics. It is necessary to expand investment in infrastructure to ensure the temperature regime throughout the entire chain, from harvesting to consumer delivery.

4. Application of digital technologies. The implementation of IoT sensors, blockchain technologies, and digital certification systems to monitor product quality will significantly improve quality management.

5. Personnel training and training. It is recommended to organize regular training programs on quality management for dehkan farms and farmers, including practical training in rural areas through mobile training groups.

6. Strengthening public-private partnerships. State support and the joint attraction of private investment in building quality infrastructure will yield effective results.

Conclusion.

The agricultural sector of Uzbekistan demonstrates significant growth rates in the production and export of fruit and vegetable products. However, shortcomings in the product quality management system hinder the full realization of the country's export potential. The study showed that: first, existing quality control mechanisms still rely mainly on state-mandated regulatory documents and lag behind competing international standards. Secondly, the low level of certification and insufficient development of the cold

chain infrastructure have a serious negative impact on product quality. Third, strengthening public-private partnerships and implementing digital technologies in improving quality management is a strategic necessity.

If the proposals and recommendations developed in this study are implemented in practice, the quality and competitiveness of fruit and vegetable products will significantly increase, export revenues will expand, and the economic efficiency of the agricultural sector will improve.

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