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Organizational and Economic Mechanisms of Service Quality and Production in the Food Products Industry of Uzbekistan

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Abstract: The article examines organizational and economic mechanisms for improving the quality of services and the efficiency of production in the food products industry. Theoretical approaches to quality management, including the SERVQUAL model, the cost of quality concept, HACCP principles and the ISO 22000 standard, are systematized. Based on official statistics for 2025, the regional structure of food production in Uzbekistan is analyzed, its concentration is assessed, and state targets for processing and cold storage capacity are compared. The analysis shows that 45.1% of output from large enterprises is concentrated in three territories, while processing and storage capacity remains a key constraint on quality. A four-block mechanism (regulatory, organizational, economic, and information-digital) and an integral indicator for assessing quality and efficiency are proposed. Practical recommendations for food enterprises and regional authorities are developed.

Keywords: Food Industry, Service Quality, Production Efficiency, Organizational and Economic Mechanism, Quality Management, HACCP, Cost of Quality, Integral Indicator.

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1. Introduction

The food products industry is one of the strategic sectors of the national economy, as it ensures food security, processes agricultural raw materials and creates added value. In recent years the sector in Uzbekistan has grown rapidly. According to official statistics, in 2025 large enterprises in the country produced food products worth 152.1 trillion soums, which is 9.7% more than in 2024 [1]. The Development Strategy of New Uzbekistan for 2022–2026 sets the tasks of saturating the domestic market with quality food products and ensuring price stability [2].

Despite this growth, the sector faces structural problems that directly affect the quality of products and services. Only about 15% of the fruits and vegetables grown in the country are processed, while around 30% is lost due to insufficient storage and processing capacity; only 16% of meat and milk is processed [3]. In response, Presidential Resolution PP-136 of April 2025 set targets to expand fruit and vegetable processing capacity and refrigerated warehousing by 2027 [4], [5].

In a competitive market, the quality of food products is no longer determined solely by their technical parameters. Order fulfilment on time and in full, reliability of deliveries, safety guarantees, speed of response to complaints and transparency of information have become decisive factors of competitiveness. However, at many domestic enterprises, service processes are not treated as a separate object of management, and the link between quality indicators and economic results is not measured.

The **aim of this study** is to substantiate organizational and economic mechanisms for improving service quality and production efficiency in the food products industry and to develop recommendations for their implementation.

The scientific basis of quality management was formed in the works of W. E. Deming, who viewed quality as the result of continuous improvement of processes across the whole organization rather than of final inspection, and introduced the Plan–Do–Check–Act (PDCA) cycle into management practice [6]. J. Juran defined quality as “fitness for use” and proposed the quality trilogy of planning, control and improvement [7]. P. Crosby substantiated the economic side of quality, arguing that the costs of preventing defects are lower than the costs of correcting them, which laid the foundation for the cost of quality concept [8].

The study of service quality as a separate category is associated with C. Grönroos, who distinguished technical quality (what the customer receives) and functional quality (how the service is delivered) [9]. A. Parasuraman, V. Zeithaml and L. Berry developed the SERVQUAL model, which measures service quality as the gap between customer expectations and perceptions along five dimensions: tangibles, reliability, responsiveness, assurance and empathy [10]. J. Cronin and S. Taylor proposed the SERVPERF model, which relies only on perceived performance and is simpler to apply in practice [11].

In the food industry, quality is inseparable from safety. The HACCP principles adopted by the Codex Alimentarius Commission [12] and the ISO 22000:2018 standard [13] require hazards to be identified and controlled at every stage of the food chain, from raw material supply to delivery to the consumer. M. Porter’s value chain concept shows that competitive advantage is created both in primary activities (production, logistics, sales, service) and in support activities [14]. The lean production concept of J. Womack and D. Jones demonstrates that eliminating activities that do not create value for the customer improves quality and efficiency at the same time [15]. R. Kaplan and D. Norton’s balanced scorecard links financial results with customer, internal process and learning indicators [16].

The review shows that quality management, efficiency management and incentive systems are usually considered separately. Few studies combine them into a single organizational and economic mechanism at the level of food enterprises, taking into account the specifics of developing markets such as Uzbekistan. This gap defines the scientific novelty of the present research.

2. Methodology

The research is based on systemic and process approaches. The enterprise is considered as a set of interrelated processes, each of which affects the quality of products and services and the efficiency of production.

The following methods were used: analysis and synthesis, induction and deduction for generalizing scientific literature and regulatory documents; structural analysis of official statistics on food production by region for 2025; comparative analysis of state targets for processing and cold storage capacity ;systemic modeling to develop the structure of the mechanism; and the index method with expert weighting to construct the integral indicator.

The level of territorial concentration of production was assessed using the Herfindahl–Hirschman Index (HHI), calculated as the sum of squared regional shares (in percent):

$$HHI = \sum_{r=1}^N s_r^2 \quad (1)$$

where s_r is the share of region r in total output and N is the number of regions. According to the 2010 Horizontal Merger Guidelines, a value below 1,500 indicates an unconcentrated structure .

To assess quality and efficiency jointly, each indicator is first normalized: for indicators where growth is desirable, the actual value is divided by the target value, and for indicators where a decrease is desirable, the target value is divided by the actual value. The quality index (I_Q) and efficiency index (I_E) are calculated as weighted sums:

$$I_Q = \sum_{i=1}^n w_i \cdot k_i, \quad I_E = \sum_{j=1}^m v_j \cdot k_j \quad (2)$$

where k is a normalized indicator and w and v are expert weights ($\sum w = \sum v = 1$). The integral indicator is the geometric mean of the two indices:

$$I_{QE} = \sqrt{I_Q \cdot I_E} \quad (3)$$

The geometric mean prevents a high score in one dimension from fully compensating for a low score in the other: an enterprise that raises quality at excessive cost cannot obtain a high rating.

3. Results

3.1. Regional structure of food production

The distribution of food production by large enterprises across the regions of Uzbekistan in 2025 is presented in Table 1.

Table 1. Food production by large enterprises by region of Uzbekistan, 2025

Region	Volume, trillion soums	Share, %
Tashkent city	27.6	18.1
Tashkent region	21.5	14.1
Samarkand region	19.5	12.8
Fergana region	11.6	7.6
Bukhara region	11.3	7.4
Kashkadarya region	10.2	6.7
Andijan region	9.6	6.3
Namangan region	8.5	5.6
Navoi region	7.9	5.2
Republic of Karakalpakstan	6.6	4.3
Khorezm region	6.0	3.9
Syrdarya region	5.4	3.6
Jizzakh region	3.3	2.2
Surkhandarya region	3.2	2.1
Uzbekistan, total	152.1	100.0

Source: compiled by the author based on data of the National Statistics Committee [1]; shares calculated by the author.

Three territories — Tashkent city, Tashkent region and Samarkand region — account for 68.6 trillion soums, or 45.1% of total output. The ratio between the largest (Tashkent city) and smallest (Surkhandarya region) producers is 8.6 times. At the same time, the HHI value calculated from the data in Table 1 is about 1,006, which indicates an unconcentrated structure at the national level.

These results show that production is spread across all regions, but its volume is strongly linked to proximity to large consumer markets and logistics hubs. For regions with small output, such as Jizzakh and Surkhandarya, the main task is not only to increase production but also to organize services that give their products access to distant markets: storage, packaging, transportation and certification.

3.2. Processing and storage capacity as a constraint on quality

Food quality depends heavily on the condition of raw materials at the time of processing and on the cold chain after production. The state targets set for 2024–2027 are shown in Table 2.

Table 2. Targets for processing and cold storage capacity in Uzbekistan

Indicator	2024, thousand t	2027 target, thousand t	Growth, %
Fruit and vegetable processing capacity	3,488	4,480	+28.4
Refrigerated warehousing capacity	1,306	1,930	+47.8

Source: compiled by the author based on Resolution PP-136; growth rates calculated by the author.

The planned expansion of cold storage capacity is almost 1.7 times faster than that of processing capacity [17]. This reflects the fact that losses at the storage stage are one of the main reasons why raw materials reach enterprises in poor condition. For food enterprises, this means that quality management must extend beyond the production floor to supply, storage and distribution, which requires the joint participation of producers, logistics operators and the state.

3.3. The proposed organizational and economic mechanism

Based on the literature review and analysis, a mechanism consisting of four interrelated blocks, connected through monitoring and a PDCA feedback loop, is proposed (Figure 1).



Figure 1. Organizational and economic mechanism for improving service quality and production efficiency in the food industry

Source: developed by the author.

Table 3. Blocks and instruments of the organizational and economic mechanism

Block	Main function	Instruments
Regulatory	Setting quality and safety requirements	Technical regulations, ISO 9001 [18], ISO 22000, HACCP, company standards
Organizational	Aligning processes with quality goals	Process owners, quality department, staff training, lean tools
Economic	Linking quality with material interest	Cost of quality accounting, KPI-based bonuses, investment and tax incentives
Information and digital	Data-driven decision-making	ERP and CRM systems, product traceability and labeling, online customer feedback

Source: developed by the author.

The regulatory block ensures that enterprise activity complies with national technical regulations and international standards. The organizational block defines owners of service processes, distributes responsibility and provides staff training. The economic block accounts for the structure of quality costs (prevention, appraisal, internal and external failure) and links staff remuneration to quality results [18]. The information and digital block supplies the other blocks with real-time data.

3.4. Indicators and interpretation scale

The SERVQUAL dimensions were adapted to the food industry and supplemented with a product safety dimension (Table 4). Efficiency is assessed through service costs per unit of output, the share of quality costs in revenue, the level of defects and waste, revenue per employee and return on sales.

Table 4. Service quality dimensions adapted for food enterprises

Dimension	Content	Sample indicator
Product safety	Compliance with sanitary and technical requirements	Share of batches failing laboratory control, %
Reliability	Complete and timely order fulfilment	On-time in-full (OTIF) deliveries, %
Responsiveness	Speed of response to customer requests	Average complaint resolution time, hours
Assurance	Staff competence and trust	Share of certified staff, %
Empathy	Individual approach to customer needs	Customer satisfaction index (CSI), points
Tangibles	Condition of packaging, transport and warehouses	Share of returns due to packaging defects, %

Source: developed by the author based on [10].

Table 5. Interpretation scale of the integral indicator

Value of I_{QE}	Level	Management decision
0.85 and above	High	Maintain the level, disseminate best practice
0.70–0.84	Medium	Targeted measures for weak indicators
0.50–0.69	Low	Reorganize processes, strengthen the quality function

Value of I_{QE}	Level	Management decision
Below 0.50	Unsatisfactory	Develop a full implementation program for the mechanism

Source: developed by the author.

As a conditional example, consider an enterprise with a quality index of 0.82 and an efficiency index of 0.74. Its integral indicator is $\sqrt{(0.82 \times 0.74)} \approx 0.78$, which corresponds to the medium level. In this case, management attention should focus mainly on efficiency: reducing service costs and waste.

4. Conclusion

The study shows that the food products industry of Uzbekistan is growing steadily, but the quality of products and services is constrained by limited processing and cold storage capacity and by the lack of systematic management of service processes at enterprises. Production is present in all regions without excessive concentration, yet its volume depends strongly on access to markets and logistics.

The main conclusions are as follows: first, service quality and production efficiency should be managed within a single mechanism rather than separately; second, quality management must cover the whole chain from raw materials to the consumer; third, the proposed integral indicator allows management to measure the balance between quality and costs; and fourth, regions with low output need service infrastructure as much as production capacity.

Based on the research, the following practical recommendations were developed:

Implement ISO 22000 and HACCP systems in stages and expand state co-financing of certification costs for small and medium-sized enterprises;

Introduce separate accounting of quality costs in management reporting;

Link staff bonuses to quality indicators such as OTIF, complaint numbers and the customer satisfaction index;

Ensure product traceability through ERP and CRM systems and digital labeling, and collect customer feedback regularly;

Prioritize cold storage and logistics centers in regions with low output, such as Jizzakh and Surkhandarya, through public-private partnerships;

Monitor quality and efficiency quarterly using the integral indicator and base management decisions on the results.

Future research should test the integral indicator on data from specific enterprises and refine the weights by sub-sector.

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