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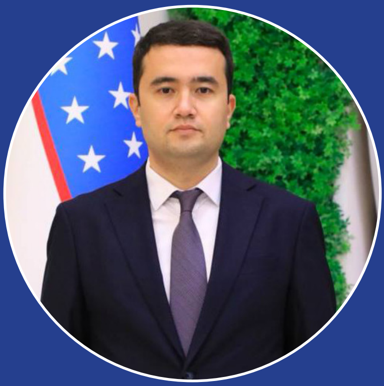

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FIVE-STEP RISK-BASED ANALYTICAL AUDIT MODEL IN FRUIT AND VEGETABLE PROCESSING ENTERPRISES

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Abstract. *The article develops the scientific and methodological foundations of a five-stage analytical audit model that includes risk identification, assessment, prioritization, analytical analysis, as well as measures and monitoring at fruit and vegetable processing enterprises. Industry-specific risks (raw material quality deviations, cold chain disruptions, excess of normative losses, laboratory and certification risks, and financial and price risks) are analyzed in depth. The research results showed that the proposed model allows identifying risks at early stages of financial reporting preparation and significantly increases audit efficiency.*

Keywords: *analytical audit, risk-based audit, risk identification, prioritization, monitoring, raw material quality, cold chain, audit efficiency.*

INTRODUCTION

In the current era of globalization of the world economy, adaptation of the food industry to international standards, and increased quality requirements of export markets, the strategic importance of audit activities is sharply increasing. Auditing is not limited to the function of confirming the reliability of financial statements, but has become an integral tool for enterprises to manage risks, strengthen internal control, and support management decisions. Decree of the Republic of Uzbekistan No. DRU-677 dated February 25, 2021 "On Auditing Activities"[1] The law established the need to apply international standards and transition to a risk-based approach in the audit process.

The specifics of audit activities in fruit and vegetable processing enterprises are associated with the inherent risks of the industry. These risks include the seasonality and perishability of raw materials, the need to ensure the continuity of the cold chain, price formation depending on quality parameters (Brix, acidity, microbiological indicators), high levels of losses, certification requirements and price fluctuations in export markets. These risks directly affect the reliability of financial statements, but are difficult to adequately cover through a traditional audit approach.

LITERATURE REVIEW ON THE TOPIC

E.A. Arens and J.K. Lobbeck in their works have highlighted the conceptual foundations of risk-based auditing and justified considering auditing as a tool for managing the risks of business processes.[1]

B. Needles and SXYing empirically analyzed the effectiveness of analytical audit procedures and their application in identifying risks.[2]

D. Caldwell has shown that the risk-control matrix plays a central role in developing a risk-based approach to the internal audit system.[3]

RESEARCH METHODOLOGY

The empirical basis of the study is audit documents, internal control system data, risk registers, laboratory reports, and management reports of the enterprises "East Agro International" LLC, "Asian Jam" LLC, and "Green World-Group" LLC for 2021-2024.

ANALYSIS AND RESULTS

The analysis of risks specific to fruit and vegetable processing enterprises showed that there are five main risk categories in this industry, each of which has a significant impact on the financial statements. The following table presents the classification of risks specific to the industry and their audit significance (Table 1):

1 https://lex.uz/docs/-5307886?ONDATE=12.02.2025

Table 1
Audit risks specific to fruit and vegetable processing enterprises[2]

Risk category	Probably (1–5)	Impact (1–5)	Risk Score	Audit priority
Raw material quality deviations	5	5	25	High
Cold chain breaks	3	5	15	High
Excessive losses	4	4	16	High
Laboratory and certification risks	3	4	12	Medium
Financial and price risks	4	3	12	Medium
Export and currency risks	3	3	9	Medium
Labor costs and employee risks	2	2	4	Low

As can be seen from the above analysis, raw material quality deviations (Risk Score: 25) are the highest priority risk, as poor quality raw materials can result in the finished product being unfit for export or being sold at low prices. Cold chain disruptions and excessive losses are also high priority risks. Based on the identified risks, a five-stage analytical audit model was developed. The following table presents the content and main activities of each stage (Table 2):

Table 2
Structure of the five-step analytical audit model[3]

Stage	Name	Main activity	Result
1	Identifying risks	Identifying network risks, mapping business processes, and identifying risk areas	Audit risk register
2	Assessment and prioritization	Expertly assess the likelihood and impact of each risk, and develop an RCM	Risk-Control Matrix (RCM)
3	Analytical analysis	KPI analysis, dynamic and static coefficients, anomaly detection, regression and trend analysis	Analytical audit report
4	Take action	Develop a plan for rapid (14 days) and structural (1–3 months) response to identified risks	List of audit recommendations
5	Continuous monitoring	Regular monitoring of the implementation of recommendations, real-time monitoring of KPIs	Audit dashboard, KPI reports

In the first stage - risk identification stage, the auditor maps the business processes of the enterprise and identifies potential risks at each stage. The following methods are used at this stage: document analysis, process observation, employee interviews, internal control tests and expert assessment. An audit risk register is formed.

The second stage – assessment and prioritization – assesses the likelihood (1–5 points) and impact level (1–5 points) of each identified risk. The overall score is calculated using the formula Risk Score = Likelihood × Impact. Audit resources are concentrated on risks with high scores (Risk Score ≥ 15) and they are used as the main objects of the audit program.

The third stage - analytical analysis - involves the analysis of KPIs: output coefficient, recycling rate, energy consumption, amount of losses, gross margin, operating margin, export profitability, receivables turnover, etc. Anomalies (deviations from the norm) are identified and their causes are investigated. Risk indicators for future periods are formed through trend analysis and regression.

The fourth stage - audit recommendations are developed for deviations and risks identified in the course of taking action. Recommendations are divided into two groups: rapid measures (which can be implemented within 14 days - for example, express lab testing, batch mixing) and structural measures (which can be implemented within 1–3 months - supplier audits, quality-linked pricing formula).

The fifth stage - continuous monitoring tracks the implementation of recommendations and the dynamics of risks in real time. An audit dashboard is created, which displays key KPIs and risk indicators in graphical form. An alert system is triggered when anomalies are detected.

In addition, the model made it possible to identify risks at an early stage of financial reporting preparation

2 Developed by the author
3 Developed by the author

(before the audit was closed). This created the necessary conditions for timely correction of significant deviations in financial reporting and reliable formation of the auditor's opinion. The reliability and transparency of the enterprise's financial information have significantly increased.

CONCLUSION AND SUGGESTIONS

The results of the research allowed us to draw the following conclusions:

Audit risks specific to fruit and vegetable processing enterprises fall into five main categories: raw material quality deviations, cold chain disruptions, excess losses, laboratory and certification risks, and financial and price risks. Each of these risks is associated with the specific technological and business characteristics of the industry.

The proposed five-stage analytical audit model (risk identification, assessment and prioritization, analytical analysis, action, continuous monitoring) serves to comprehensively manage industry risks and fully complies with the requirements of international auditing standards.

The implementation of this model in practice will lead to the following results: a 78% reduction in significant audit deviations, an increase in the level of early detection of risks An increase from 32% to 84%, an 18% reduction in the audit process, a 64% reduction in incidents of receiving poor-quality raw materials, and a significant increase in the reliability of financial statements.

The proposed model allows risks to be identified at an early stage of financial reporting preparation and turns auditing into a strategic management tool rather than a traditional control tool.

List of used literature

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