

Analysis of Difficulties and Countermeasures in Inventory Supervision and Counting of Fresh Produce Industry

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Abstract

With the rapid development of the fresh food industry, the characteristics of its inventory, such as perishability, short shelf life, and dynamic value decay, pose severe challenges to the traditional inventory count supervision procedures. This paper systematically analyzes the core difficulties in the inventory count supervision of the fresh food industry regarding quantity accuracy, quality assessment, timeliness, and weak internal controls within enterprises, pointing out that the contradiction between static supervision and dynamic inventory is the root cause of the problem. On this basis, it proposes constructing a trinity countermeasure system of , technology empowerment, strategy innovation, institutional guarantee, : achieving dynamic supervision and real-time valuation through Internet of Things (IoT), big data, and AI technologies; formulating differentiated supervision strategies, such as prioritizing the counting of perishable items and weighing frozen products after de-icing; and promoting the industry to issue the , Guidelines for Inventory Management and Supervision in the Fresh Food Industry, to standardize the entire chain's internal control processes. This research aims to provide theoretical support and practical references for improving the effectiveness of inventory count supervision in the fresh food industry and reducing audit risks.

Keywords

fresh food industry, inventory count supervision, dynamic supervision, internet of things (IoT) technology, internal control standardization

1. Introduction

With the continuous upgrading of consumption patterns, market demand for fresh food has kept growing, and business forms such as fresh food retail, chain supermarkets, and fresh e-commerce have developed rapidly. Against this background, inventory management has become increasingly important in the operation of fresh food enterprises. Inventory is related not only to daily operating efficiency, but also directly to the authenticity of assets, costs, and profits reported in financial statements [1]. Therefore, inventory observation, as an important audit procedure for obtaining evidence, has strong practical significance in the fresh food industry. However, fresh inventory differs significantly from ordinary industrial inventory. It is characterized by

perishability, short shelf life, rapid quality changes, and high loss rates, and its condition often changes quickly with time and environmental factors [2]. This means that traditional observation procedures based on stocktaking at a specific point in time cannot fully reflect the true quantity and value of fresh inventory. Even if auditors complete the required procedures on site, they may still find it difficult to obtain sufficient and appropriate audit evidence because of rapid changes in product condition, incomplete loss records, or unstable storage conditions. At the same time, fresh food enterprises usually face considerable management pressure in procurement inspection, cold-chain warehousing, loss reporting, and synchronization of inventory information. If the internal control system is incomplete, or if it exists but is not effectively implemented, the difficulty of inventory observation will be further magnified [3]. In this situation, the issues faced in observation are no longer confined to whether stock can be counted accurately, but also involve whether book records can correspond to physical goods, whether losses are genuine, and whether inventory value is reasonable.

2. Literature Review

2.1 Characteristics of Fresh Inventory and the Management of Perishable Goods

Existing studies on perishable goods and fresh inventory mainly focus on inventory control, loss management, and circulation efficiency. These studies generally point out that perishability, short shelf life, and declining value over time are the main features that distinguish fresh products from ordinary goods. These characteristics determine that fresh inventory management cannot simply adopt general inventory management methods, but must pay greater attention to time factors, environmental conditions, and turnover efficiency [4]. Such studies provide a basis for understanding the problem of inventory observation in the fresh food industry. The reason why inventory observation is more difficult in this industry lies fundamentally in the fact that the observation object is not stable ordinary inventory, but special inventory that continuously changes and depreciates. However, most existing research has been conducted from the perspective of enterprise operation and supply chain management [5], and discussion remains insufficient as to how these features affect audit procedure design and audit evidence collection.

2.2 Inventory Observation Procedures and Practical Problems

Research on inventory observation in general mainly revolves around audit objectives, implementation procedures, and common practical problems. Relevant literature points out that, although inventory observation is a routine audit procedure, in practice it often suffers from irregular organization of stocktaking, difficulty in reconciling books with physical goods, insufficient reliance on internal control, and limited probative force of observation evidence. Particularly when enterprise management is weak, the effect of observation procedures is often significantly affected [6]. These studies provide procedural references for the analysis of inventory observation difficulties in the fresh food industry. However, it must be noted that general research on inventory observation is mainly based on manufacturing or trading enterprises and does not sufficiently consider the features of the fresh food industry, such as high loss rates, strong timeliness, and dependence on cold-chain logistics. Therefore, without incorporating the specific situation of the fresh food industry, general studies cannot directly answer why inventory is difficult to observe in fresh food enterprises, where the difficulty lies, and how it can be improved.

2.3 Fresh Food Supply Chain and Internal Control

In recent years, with the development of fresh retail and e-commerce, fresh food supply chain management has gradually become a major research focus. Existing studies show that the whole process from procurement, transportation, and warehousing to sales is significantly affected by time and temperature conditions, so inventory status is essentially closely related to supply chain process control [7]. At the same time, some studies point out that fresh food enterprises commonly suffer from weak supplier management, unclear inspection standards, inaccurate warehouse records, extensive loss management, and unsynchronized information systems. These problems are eventually reflected in the authenticity and valuation of inventory. This indicates that inventory observation in the fresh food industry is not an isolated counting issue, but is closely related to the enterprise's overall management level, supply chain coordination, and effectiveness of internal control.

The difficulty of observation is often the result of the combined effect of business process problems and audit procedure problems.

2.4 Technology Application and Observation Optimization

With the development of the Internet of Things, artificial intelligence, big data analysis, and intelligent terminals, some studies have begun to pay attention to the application of these technologies in fresh inventory management. For example, sensors can be used to continuously monitor storage and transportation conditions, RFID and image recognition can improve inventory identification efficiency, and time-temperature indicators can assist in judging product quality [8]. These studies show that technology can make up, to a certain extent, for the shortcomings of traditional manual counting and manual judgment. However, current studies are still more concentrated on technology application itself, and there remains insufficient discussion on how these technologies can truly be transformed into audit evidence, how they can be embedded in audit procedures, and how they can serve inventory valuation judgment. There is still room for further integration between technology research and audit research.

2.5 Review of Existing Research

Overall, existing studies have revealed some of the problems in inventory management and inventory observation practice in the fresh food industry from multiple perspectives, but they still show three limitations. First, different studies are relatively scattered and have not yet formed a complete logic of inventory characteristics—observation difficulties—cause analysis—improvement path. Second, the depth of research on the special characteristics of inventory observation in the fresh food industry is still insufficient, especially in terms of valuation risk, timeliness control, and procedural differentiation. Third, technology application, internal control, and institutional development have not yet been systematically integrated. Based on this, the present paper attempts to provide a more complete review and analysis of inventory observation in the fresh food industry.

3. Analytical Basis of Inventory Observation in the Fresh Food Industry

3.1 Audit Objectives of Inventory Observation

As an important audit procedure, inventory observation aims to obtain audit evidence concerning the existence, completeness, and valuation of inventory. In general industries, auditors often pay more attention to verifying whether the book inventory actually exists through stocktaking. In the fresh food industry, however, the objective of observation obviously cannot remain at the level of simply determining whether inventory exists [9]. Because fresh products experience rapid quality changes and obvious value decay, auditors must also pay attention to product condition, remaining shelf life, and signs of impairment during observation. In other words, inventory observation in the fresh food industry bears the dual tasks of quantity verification and value judgment. Whether the procedure is effective depends not only on whether the stocktaking results are consistent with book records, but also on whether auditors can reasonably judge whether the inventory still has corresponding value.

3.2 Fresh Inventory Observation under a Risk-Oriented Approach

From the perspective of risk-oriented auditing, inventory is often one of the items most likely to contain misstatements in the financial statements of fresh food enterprises. Compared with ordinary inventory, fresh inventory is more prone to material misstatement because of untimely loss reporting, unidentified spoilage, unadjusted quality decline, and insufficient provision for inventory write-downs. Therefore, the risk focus of inventory observation in the fresh food industry lies not only in discrepancies between books and physical goods, but also in whether valuation is reasonable. This means that, in designing observation procedures, auditors should pay more attention to highly perishable goods, rapidly circulating segments, abnormal loss records, and areas with weak cold-chain management, rather than merely being satisfied with completing formal stocktaking observation.

3.3 Internal Control and the Reliability of Observation Evidence

The effectiveness of inventory observation depends to a large extent on whether internal control is sound. For fresh food enterprises, procurement inspection, storage custody, environmental monitoring, loss approval, inventory recording, and sales dispatch are closely linked. Once any of these links has significant defects, the authenticity of quantity records, product condition, and loss allocation may all be affected. Therefore, what auditors see during observation is not formed in isolation, but is based on the whole inventory management system. If basic management is chaotic, then even if the observation procedure is carried out relatively completely, the final evidence obtained may still have limited probative force because the underlying source is unreliable.

4. Special Characteristics of Inventory Observation in the Fresh Food Industry

4.1 Dynamic and Fragile Nature of the Inventory Object

The first feature that distinguishes inventory observation in the fresh food industry from that in general industries is that the observation object itself is unstable. Fruits, vegetables, meat, and aquatic products continue to undergo physiological or chemical changes during storage, and their quantity, quality, and value may all change over time. This dynamic and fragile nature means that the inventory status observed by auditors at a given point in time can only reflect the local condition at that moment, and cannot represent year-end inventory as stably as ordinary industrial inventory. Therefore, inventory observation in the fresh food industry is naturally more dependent on time control and supplementary process information.

4.2 Change in the Risk Focus of Observation

In general industries, inventory observation is more often conducted to verify whether inventory actually exists. In the fresh food industry, however, the more common and more substantive problem is not fictitious inventory, but rather that goods are still physically present while their quality has declined and their saleable value has been significantly weakened, yet the enterprise has not made timely provisions for write-downs or adjusted book values accordingly. Thus, the focus of risk in inventory observation in the fresh food industry actually extends from pure existence testing to valuation and allocation judgment. This is also why observation in the fresh food industry usually places greater emphasis than in general industries on the identification of product condition and the analysis of value reasonableness.

4.3 Timeliness and Differentiation Requirements of Observation Procedures

Because different fresh products vary greatly in perishability, preservation methods, and loss patterns, inventory observation procedures can hardly adopt a uniform standard. Fresh aquatic products, leafy vegetables, and some high-end fruits, for instance, are more likely to undergo obvious changes within a short time, while frozen products involve special issues such as ice coating, moisture, and net weight judgment. Therefore, inventory observation in the fresh food industry requires auditors not only to act faster and in a more compact manner in terms of timing, but also to design procedures more specifically. Which goods should be counted first, which goods require special weighing methods, and which areas need focused observation cannot simply follow the practices of general industries.

5. Core Difficulties and Causes of Inventory Observation in the Fresh Food Industry

5.1 Quantity Verification and Its Causes

Difficulty in quantity verification is one of the most fundamental and common problems in inventory observation in the fresh food industry. Fresh products often circulate at a high frequency within enterprises. A batch of goods may go through receipt, sorting, processing, replenishment, sale, and loss reporting all within one day. What auditors see on site is only a cross-section of inventory at a certain point in time, making it difficult to achieve a completely static correspondence with book data. Meanwhile, fresh products generally involve evaporation, spoilage, damage, weight loss, and processing loss. These losses are often continuous and

difficult to record promptly and accurately in accounting books. As a result, discrepancies between book records and physical counts are difficult to explain solely on the basis of stocktaking results. Their causes may include normal loss, internal control defects, or improper accounting treatment.

5.2 Quality Assessment and Its Causes

Compared with quantity verification, quality assessment involves even greater professional difficulty. The value of fresh products highly depends on their quality condition, while quality deterioration is not always directly visible from appearance. For example, some fruits may look intact on the outside while beginning to rot inside, and some frozen meat products may have suffered quality decline due to temperature fluctuations without obvious visual signs. Traditional observation mainly relies on auditors' on-site observation and experience-based judgment. For fresh goods with complex categories and rapid changes, however, this method clearly has limitations. Auditors usually do not possess systematic expertise in product quality identification, and thus it is difficult for them to make sufficient and persuasive judgments as to whether goods have obviously depreciated. This is also one of the important reasons why overstatement risks of inventory in the fresh food industry are difficult to identify.

5.3 Cut-off Testing and Time Control

The rapid change in fresh goods means that inventory observation procedures are highly sensitive to time. In general industries, when there is a certain time gap between stocktaking and the reporting date, auditors can usually make adjustments by checking receipt and dispatch records and carrying out cut-off testing. In the fresh food industry, however, the condition of goods may change substantially in a very short period of time, making observation results quickly lose relevance. If stocktaking is not organized efficiently or the counting sequence is not arranged properly, auditors may complete the checking of one batch of goods only to find that subsequent spoilage, sales, or losses have already undermined the meaning of the earlier results. Therefore, the difficulty in time control is not only a matter of procedural arrangement, but also directly affects the appropriateness of audit evidence.

5.4 The Impact of Weak Internal Control on Observation

Fresh food enterprises often face complex procedures, unclear responsibility boundaries, and inconsistent standards in procurement, inspection, storage, transportation, and sales. If supplier management is weak, unqualified products may enter inventory at the source; if warehouse records are not updated in time and temperature control is inadequate, the inventory system may easily deviate from the real situation; if sales information and logistics information are not synchronized, differences will arise between book records and actual inventory flow [10]. Under such circumstances, the quantities and conditions seen by auditors during observation are often merely the final manifestation of a disordered management process, rather than results that can be easily traced and explained further. Precisely for this reason, weak internal control systematically undermines the reliability of inventory observation evidence.

6. Countermeasures for Inventory Observation in the Fresh Food Industry

6.1 Strengthening Technology Application to Improve Dynamic Observation Capability

To improve the effectiveness of inventory observation in the fresh food industry, it is first necessary to break through the limitations of traditional point-in-time stocktaking and gradually enhance dynamic observation capability. Technologies such as the Internet of Things, RFID, image recognition, weight sensing, and intelligent terminals can help enterprises continuously monitor inventory conditions and environmental parameters. For example, by continuously recording changes in temperature and humidity during storage and transportation through sensors, auditors need not rely entirely on instantaneous on-site observations, but can instead judge whether goods have experienced adverse environments based on historical data. Through intelligent identification and real-time uploading technologies, the timeliness and accuracy of inventory records can also be improved, thereby reducing discrepancies between books and physical goods. Furthermore,

by combining big data and artificial intelligence analysis, it becomes possible to estimate remaining shelf life, abnormal losses, and net realizable value more precisely.

6.2 Optimizing Observation Procedures and Implementing Differentiated Strategies

Fresh goods involve numerous categories and highly diverse risks. Therefore, observation procedures should not pursue superficial uniformity, but instead emphasize differentiation. Auditors should distinguish observation priorities based on the perishability, value level, preservation method, and loss pattern of different goods [11]. In practical operation, highly perishable goods should be counted first to reduce the impact of time differences; frozen goods should be weighed after removing ice so as to obtain a figure closer to their true net weight; and for products whose quality changes are not easy to identify, time-temperature indicators or other auxiliary tools may be used for judgment. Only in this way can observation procedures truly fit the actual characteristics of fresh products.

6.3 Improving Internal Control and Strengthening Full-Process Management

Observation procedures themselves cannot replace enterprise management. Therefore, improving their effectiveness also requires strengthening internal control. Fresh food enterprises should establish more refined management systems covering procurement, inspection, storage, transportation, sales, and loss reporting. Specifically, supplier admission and evaluation should be strengthened in procurement, quality standards should be clarified and traceable records maintained in inspection, inventory records should be updated promptly and environmental control strengthened in warehousing, and information synchronization and loss classification should be emphasized in sales and logistics [12]. Only when basic management becomes more standardized can the evidence obtained by auditors through observation become more reliable.

7. Conclusion

By reviewing relevant research, this paper finds that the difficulties of inventory observation in the fresh food industry are not merely an amplification of general observation problems in a special industry. Rather, they are systemic problems formed through the joint action of the perishability, dynamic nature, and value decay of fresh inventory, together with weak internal control, complex supply chain management, insufficient technical support, and incomplete institutional norms. Compared with general industries, inventory observation in the fresh food industry depends more heavily on time control, process information, and differentiated procedures, and its focus extends more clearly from pure existence verification to valuation reasonableness. If one continues to rely entirely on traditional point-in-time stocktaking models, it is often difficult to fully reflect the true condition of fresh inventory. In response to these problems, this paper suggests four directions for improvement: first, strengthening the application of technologies such as the Internet of Things, intelligent identification, and data analysis to improve dynamic observation capability; second, optimizing observation procedures according to the risk characteristics of different goods; third, improving internal control in procurement, storage, and sales; and fourth, gradually promoting industry norm construction to provide institutional support for special observation procedures and new forms of audit evidence.

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Conflicts of Interest

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