International Journal of Management Science and Information Technology
IJMSIT

E-ISSN: 2774-5694 P-ISSN: 2776-7388 OPEN ACCESS

Volume 6 (2), July-December 2026, 3347-3357
DOI: https://doi.org/10.35870/ijmsit.v6i2.9134

Inventory Management Strategy for Near Expiry Products to Minimize Losses (Case Study: Swalayan 88 Bengkalis)

Putri Rahma Resa [1*], Muhammad Fuad Asrofillah [2]
[1*,2] International Business Administration Study Program, Department of Commerce Administration, Politeknik Negeri Bengkalis, Bengkalis Regency, Riau Province, Indonesia

Email: putrirhmrsaa26@gmail.com [1*], fuadasrofillah@polbeng.ac.id [2]

Article history:
Received October 31, 2026
Revised November 21, 2026
Accepted November 26, 2026

Abstract

Managing perishable and near-expiry products poses operational challenges for independent retailers with limited profit margins and manual inventory systems. Expired products generate financial losses and potentially reduce consumer trust. This study examines inventory management strategies for near-expiry products at Swalayan 88 Bengkalis, focusing on loss prevention and customer acceptance of clearance strategies. Using a descriptive qualitative case study design, data were collected through semi-structured interviews with two key informants (Owner-Manager and Lead Warehouse Supervisor), observations of 1,200 stock-keeping units (SKUs), and open-ended questionnaires from 37 convenience-sampled customers. Data were analyzed thematically using Miles, Huberman, and Saldaña's framework, supported by source and methodological triangulation. Findings identify three manual inventory control practices: procurement selection using the "High Years" approach, monthly reviews, H-3-month withdrawal thresholds, and First-Expired, First-Out (FEFO) rotation; promotional markdowns, including Code 15 discounts (IDR 11,000 to IDR 10,000) and Buy 1 Get 1 bundling for store-owned products; and expired-product disposal through the "Tear Label" method to prevent brand misuse. Consignment products are protected by supplier return agreements, whereas store-owned products incur monthly losses of IDR 4.5–6.0 million, representing 3.5–4.2% of non-returnable inventory. Customer findings show that 81.1% routinely check expiration dates, 70.3% encounter near-expiry products at full price, 91.9% are interested in discounted safe products, and 94.6% support dedicated clearance displays. An integrated four-pillar roadmap is proposed: digital barcode scanning, dedicated clearance areas, digital logbooks, and improved supplier return coordination.

Keywords:
Inventory Management; Near-Expiry Products; Perishable Goods; Retail Supermarket; Consumer Perception.

1. INTRODUCTION

Today's commercial retail landscape is characterized by intense competition, shifting consumer preferences, and rapid product turnover, particularly within the fast-moving consumer goods (FMCG) and perishable food sectors. With shortening product lifecycles and heightened consumer expectations regarding food safety and freshness, retail enterprises are compelled to adopt disciplined inventory management practices to remain commercially viable (Zahra et al., 2025). The continuous pressure to avoid operational waste while maintaining optimal product availability forces modern retailers to innovate stock control frameworks. For local minimarkets and independent supermarkets, such as Swalayan 88 Bengkalis, managing inventory nearing expiration represents an acute operational challenge. Products approaching expiration must be monitored meticulously to prevent them from transforming into unsellable waste that incurs direct financial liabilities.

Swalayan 88 Bengkalis, situated in Bengkalis Regency, Riau Province, Indonesia, operates as a vital local commercial retail hub catering to daily household needs. The store manages approximately 1,200 active Stock

Keeping Units (SKUs) ranging from packaged groceries, dairy, and beverages to commercial bakery items, serving an average customer volume of 450 daily transactions. Operating within a regional retail environment characterized by fluctuating customer traffic and manual stock tracking, the minimarket must exercise extreme diligence regarding inventory turnover and display organization. Failing to manage near-expiry items not only generates direct financial losses but also severely erodes consumer trust and brand reputation if expired merchandise inadvertently reaches point-of-sale checkouts.

Prior empirical research underscores the vital role of inventory control in retail loss prevention. Synchronizing order cycles with product shelf life significantly reduces near-expiry risks (Li et al., 2023), while strategic promotional markdowns accelerate short-life stock turnover without destabilizing overall brand equity (Wang & Hazen, 2024). Standardized physical rotation using First-Expired, First-Out (FEFO) mechanisms enhance operational oversight (Rodriguez, 2023), and dedicated clearance sections optimize spatial inventory flow (Muller et al., 2024). Furthermore, transitioning toward digital tracking systems eliminates manual human errors (Purwasih & Candana, 2024; Amin et al., 2023).

However, an overarching synthesis of existing retail literature reveals a distinct multi-dimensional empirical gap. First, prior studies predominantly focus on large corporate supermarket chains equipped with automated Enterprise Resource Planning (ERP) or Point-of-Sale (POS) expiry modules (Patel, 2023; Ramanathan et al., 2023), leaving a significant knowledge void regarding how independent minimarkets in developing regional economies navigate near-expiry control under strict manual operational constraints (Dewi et al., 2024; Jamaludin, 2023). Second, existing frameworks routinely treat retail inventory as a homogenous asset, neglecting how inventory ownership structures specifically consignment merchandise (titipan) with 100% vendor return protection versus store-owned stock (beli putus) carrying direct financial liabilities (3.5%–4.2% monthly inventory loss) dictate operational clearance decisions, promotional markdown thresholds (Code 15 and Buy 1 Get 1), and physical destruction protocols (Azarian et al., 2023; Taleizadeh, 2024). Third, there remains a critical empirical gap regarding how manual tracking vulnerabilities (where 70.3% of shoppers report encountering near-expiry items on regular shelves) intersect with consumer receptivity toward dedicated clearance displays (supported by 94.6% of shoppers) in small-town retail environments (Alfarisi & Ardiansyah, 2025; Muller et al., 2024).

To address this multi-dimensional empirical gap, this study investigates the practical implementation of near-expiry inventory management strategies and loss prevention mechanisms at Swalayan 88 Bengkalis. Specifically, this research addresses two primary Research Questions (RQs):

a. RQ1: How are manual inventory management strategies encompassing upstream procurement, periodic review, shelf rotation, promotional markdowns, and physical disposal implemented at Swalayan 88 Bengkalis?
b. RQ2: How do inventory ownership structures (consignment vs. store-owned merchandise) and customer perceptions influence operational loss prevention and business continuity?

By triangulating qualitative data from management interviews, warehouse audits, and consumer survey responses, this study contributes an empirical loss prevention framework tailored for independent minimarkets operating under manual constraints.

2. RESEARCH METHOD

2.1. Location and Object of the Study

This study was conducted at Swalayan 88, an independent minimarket located on Yos Sudarso Street, Bengkalis Regency, Riau Province, Indonesia. The study focuses on the inventory management strategies, operational procedures, and loss prevention mechanisms implemented to manage near-expiry products and minimize potential financial losses. The scope of the study covers inventory handling activities in the minimarket's internal warehouse and customer-facing sales areas, particularly those related to product storage, stock monitoring, and shelf displays.

2.2. Research Design and Type of Study

This study employed a descriptive qualitative case study design (Creswell, 2023; Sari et al., 2023; Wahyuni & Lestari, 2023). A descriptive qualitative approach was chosen because it provides a systematic and contextual understanding of real-world operational practices, managerial decision-making, and inventory-handling procedures as they occur in their natural setting, without manipulating research variables (Creswell, 2023; Sari et al., 2023).

This research design enabled an in-depth examination of inventory management practices at Swalayan 88 Bengkalis, including physical stock inspections, the implementation of First-Expired, First-Out (FEFO) shelf rotation, promotional markdown policies (Code 15 and Buy 1 Get 1), packaging destruction procedures (Tear Label), and product return mechanisms for consignment goods.

2.3. Types and Sources of Data

The data collected in this study comprise qualitative empirical evidence, narrative descriptions, observational records, internal administrative documents, and customer feedback responses (Creswell, 2023). In accordance with the qualitative case study approach, data were obtained from two main sources (Rustamana et al., 2023):

a. Primary Data: Primary data consisted of firsthand information collected directly from the research setting at Swalayan 88 Bengkalis. These data were obtained through semi-structured interviews with key management and warehouse personnel (Chand, 2025), direct non-participant observations of inventory-handling activities conducted during 12 store visits, and open-ended questionnaire responses from 37 active customers (Rustamana et al., 2023).
b. Secondary Data: Secondary data consisted of supporting information obtained from the store's internal administrative records (Jordan et al., 2024). These documents included physical inventory records, product expiration tracking logs, consignment supplier return agreements, promotional markdown records, and relevant peer-reviewed academic literature on retail inventory management for perishable products.

2.4. Informants, Sampling Strategy, and Participant Profile

This study employed two complementary sampling techniques to obtain perspectives from both internal personnel responsible for inventory management and external customers (Nyimbili, 2024; Mwita & Mwilongo, 2025):

a. Purposive Sampling (Internal Key Informants): Purposive sampling was used to select internal informants based on their operational authority, decision-making responsibilities, and direct experience in managing store inventory (Nyimbili, 2024). The first informant (INF-01) was the Owner-Manager, who is responsible for overseeing procurement policies, negotiating supplier return agreements, managing financial risk allocation, and authorizing promotional markdowns. The second informant (INF-02) was the Lead Warehouse Supervisor, who is directly responsible for conducting physical stock inspections, replenishing shelves, implementing FEFO product placement, and carrying out packaging destruction procedures through the Tear Label method.
b. Convenience Sampling (External Customer Respondents): Convenience sampling was applied to obtain customer perspectives through open-ended questionnaires completed by 37 respondents who were actively shopping at Swalayan 88 Bengkalis (Mwita & Mwilongo, 2025). This approach provided additional insight into customer experiences and perceptions regarding the handling and display of near-expiry products. Table 1 presents the demographic and relevant participant profiles of the research participants.

Table 1. Profile of Research Informants and Customer Respondents

Participant Code	Role / Category	Sampling Technique	Operational Data Contribution
Informant 1 (INF-01)	Owner-Manager	Purposive Sampling	Strategic procurement policy, financial risk allocation, vendor return contract negotiation, markdown pricing authorization.
Informant 2 (INF-02)	Lead Warehouse Supervisor	Purposive Sampling	Daily physical shelf audits, FEFO stock rotation execution, markdown application (Code 15 & Buy 1 Get 1), Tear Label packaging disposal.
Respondents (R-01 to R-37)	37 Supermarket Customers (28 Female, 9 Male; 24 Students, 13 General Public)	Convenience Sampling	Expiration checking habits, customer dissatisfaction levels regarding near-expiry goods, receptivity to clearance markdowns and dedicated displays.

Source: Primary qualitative field data collected at Swalayan 88 Bengkalis (2026).

2.5. Data Collection Instruments and Field Procedures

Empirical data were collected using four complementary data collection techniques (Furidha, 2023):

a. Semi-Structured In-Depth Interviews: Audio-recorded interviews were conducted with the key internal informants using a structured interview guide covering five operational dimensions: procurement controls, periodic inventory reviews, FEFO shelf rotation, promotional markdown strategies, and product disposal procedures. Each interview lasted approximately 45–65 minutes. The recordings were subsequently transcribed verbatim, resulting in 28 pages of interview transcripts.
b. Direct Physical Audit Observations: Direct non-participant observations were conducted through on-site store inspections during 12 field visits. An observation checklist was used to document warehouse storage conditions, product placement accuracy on display shelves, compliance with FEFO procedures, clearance display arrangements, and packaging cancellation procedures.

c. Customer Feedback Survey: Open-ended questionnaires were administered to 37 customer respondents to explore their shopping habits regarding expiration date checks, their experiences with near-expiry products displayed on regular shelves, and their opinions on the provision of dedicated clearance displays.
d. Documentary Analysis: Internal store documents were systematically examined to support and verify the information obtained through interviews and observations. The documents included physical inventory records, supplier return agreements, purchase invoices, and promotional markdown records.

2.6. Data Analysis Method

The qualitative data were analyzed using the interactive data analysis model developed by Miles, Huberman, and Saldaña (2014) (Andreadou, 2023; Nyimbili, 2024). The analysis involved three interconnected and continuous stages:

a. Data Condensation: This stage involved transcribing audio recordings, organizing and condensing field notes, and systematically coding the collected data into relevant operational themes. These themes included procurement risk, FEFO shelf rotation, consignment product returns, promotional markdown pricing, and product disposal procedures.
b. Data Display: The coded data were organized into structured narrative descriptions, comparative matrices, product shelf-life vulnerability classifications (Table 3), and strategic improvement roadmaps. This process facilitated the identification of patterns and relationships among the research findings.
c. Conclusion Drawing and Verification: Conclusions were formulated based on the empirical findings, with particular attention to identifying operational practices and potential vulnerabilities in inventory management. The findings were then cross-checked against multiple data sources and collection methods to ensure consistency and address Research Questions 1 and 2 (RQ1 and RQ2).

2.7. Methodological Rigor and Data Triangulation

To strengthen the credibility, dependability, and overall trustworthiness of the research findings, data triangulation was applied systematically (Andreadou & Chatzifotiou, 2023; Creswell, 2023; Lincoln & Guba, 1985). The triangulation process involved the following procedures:

a. Source Triangulation: Information obtained from the Owner-Manager (INF-01) was compared with operational accounts provided by the Lead Warehouse Supervisor (INF-02) and customer experiences reported by the 37 respondents.
b. Method Triangulation: Interview findings were compared with direct observation records and internal store administrative documents to identify consistencies and discrepancies among the collected data.
c. Member Checking and Audit Trail: Interview transcripts were verified with the key internal informants to ensure the accuracy of the recorded information. In addition, a systematic research audit trail was maintained to document the research procedures and support the transparency and traceability of the analytical process.

2.8. Research Ethics and Compliance

This study was conducted in accordance with established academic research ethics standards (Özden, 2024). Official permission to conduct the research was obtained from the management of Swalayan 88. All informants and customer respondents participated voluntarily and provided informed consent before taking part in the study. Confidentiality and anonymity were maintained by assigning participant identification codes (INF-01, INF-02, and R-01 to R-37). All primary research data were securely stored and handled to protect participants' identities and the confidentiality of the information provided.

3. RESULTS AND DISCUSSION

3.1. Inventory Management Strategy in Retail Operations

Inventory management strategy refers to an integrated managerial approach used to plan, monitor, and control inventory levels while balancing product availability, inventory holding costs, and the risk of product expiration. Effective inventory management is particularly important in retail businesses handling perishable products, as replenishment decisions must consider both customer demand and the remaining shelf life of products (Li et al., 2023). Inappropriate replenishment schedules that do not correspond to actual sales turnover may lead to inventory accumulation, resulting in products remaining on shelves for extended periods and increasing the likelihood of expiration before sale.

In addition to procurement and replenishment planning, effective inventory control requires consistent monitoring and proper product rotation. Standardized shelf labeling and the implementation of First-Expired, First-Out (FEFO) procedures help retail staff identify products approaching their expiration dates and prioritize them for sale (Rodriguez, 2023; Muller et al., 2024). Therefore, an effective inventory management strategy should integrate procurement planning, stock monitoring, and systematic product rotation to maintain product availability while minimizing expiration-related losses.

3.2. Near-Expiry Product Control and Markdown Pricing

Near-expiry product management involves systematic inventory monitoring and the implementation of appropriate promotional strategies to sell products before they reach their expiration dates (van Herpen et al., 2024; Wang & Hazen, 2024). In retail operations, price markdowns are commonly used to encourage purchasing decisions and accelerate the turnover of products with limited remaining shelf life. These promotional strategies may include fixed-price reductions and promotional bundling, such as Buy 1 Get 1 offers.

However, markdown strategies must be implemented carefully to ensure that discounted products remain suitable for consumption and that their expiration information is communicated transparently to customers. Clear product information and appropriate promotional practices are essential for maintaining consumer confidence while reducing the risk of unsold inventory and recovering part of the product's acquisition cost (Safira & Utama, 2024). Accordingly, near-expiry product control should combine timely identification, appropriate pricing adjustments, and transparent communication with consumers.

3.3. Ownership Structures and Consignment Inventory

Product ownership arrangements play an important role in determining how financial risks associated with unsold and expired inventory are distributed between suppliers and retail businesses (Azarian et al., 2023; Taleizadeh, 2024). Under consignment arrangements, products remain the property of suppliers until they are sold. Depending on the terms of the agreement, retailers may return unsold or expired products to suppliers, reducing their direct exposure to inventory-related financial losses (Amin et al., 2023; Dewi et al., 2024; Jamaludin, 2023; Rustamana et al., 2023).

In contrast, products acquired through outright purchasing arrangements become the retailer's inventory assets, meaning that the retailer generally bears the financial consequences of unsold, damaged, or expired products. This arrangement increases the importance of effective inventory monitoring, timely promotional markdowns, and appropriate loss prevention procedures. Therefore, understanding the distinction between consignment and outright purchasing arrangements is essential for evaluating inventory management practices and identifying the distribution of financial risks within retail operations.

3.4. Adaptive Capacity Framework in Retail Operations

To examine how retail businesses respond to operational challenges under resource constraints, this study adopts Smith's (2023) adaptive capacity framework. Adaptive capacity refers to an organization's ability to adjust and reorganize its operational practices, resource allocation, and managerial responses when facing changing conditions or operational disruptions. In retail environments where inventory management relies heavily on manual procedures, this capacity may be reflected in employees' ability to identify potential inventory problems, adjust promotional pricing, and maintain effective stock supervision.

For independent minimarkets with limited technological resources, adaptive capacity is particularly relevant because operational adjustments often depend on employee awareness, managerial decisions, and the flexibility of existing procedures. Staff vigilance, timely markdown adjustments, and coordination between management and warehouse personnel can therefore support the prevention of expiration-related losses. In this study, the adaptive capacity framework provides a perspective for understanding how Swalayan 88 responds to near-expiry inventory challenges through its existing operational practices and identifies opportunities for improving its inventory management system.

Table 2. Synthesizes key literature, theoretical dimensions, methodologies, and relevance to this investigation at Swalayan 88 Bengkalis.

Author (Year)	Research Focus	Methodology	Key Findings	Relevance to Case Study
Li et al. (2023)	Replenishment & shelf-life synchronization	Quantitative analysis	Synchronizing order cycles with shelf life reduces near-expiry risks.	Supports FEFO periodic review alignment.
Wang & Hazen (2024)	Markdown policy & stock turnover velocity	Empirical retail study	Gradual markdowns accelerate turnover without degrading brand image.	Justifies Code 15 fixed price markdowns.
Rodriguez (2023)	Operational labeling & stock rotation	Retail case study	Standardized FEFO rotation enhances staff risk identification accuracy.	Underpins physical floor oversight routines.
Azarian et al. (2023)	Consignment risk allocation in retail	Analytical model	Consignment contracts shift	Explains consignment

			financial holding risk to upstream suppliers.	return mechanics.
Dewi et al. (2024)	Indonesian minimarket inventory control	Qualitative case study	Manual oversight in local minimarkets creates human error vulnerability.	Contextualizes Indonesian retail environment.
Smith (2023)	Adaptive capacity in retail operations	Conceptual analysis	Operational resilience depends on real-time adaptation to stock changes.	Provides adaptive capacity framework.

Source: Synthesized from reviewed academic literature (2023–2025)

3.5. Overview of the Research Object and Product Classification

Swalayan 88 Bengkalis is a local retail business located on the lower ground floor of Plaza Bengkalis, along Yos Sudarso Street, Bengkalis Regency, Riau Province, Indonesia. As one of the retail outlets serving the daily household needs of the local community in an island-based regional economy, the store manages approximately 1,200 active Stock Keeping Units (SKUs), comprising packaged dry groceries, dairy products, bakery products, beverages, and personal care items. The store records an average of 450 customer transactions per day. Operating in a fast-moving consumer goods (FMCG) environment characterized by manual inventory monitoring and fluctuating customer traffic, Swalayan 88 Bengkalis requires consistent inventory supervision to prevent products with limited remaining shelf life from becoming unsellable and contributing to inventory losses.

To establish a systematic basis for examining near-expiry inventory management, the store's merchandise is classified into three distinct vulnerability categories. This classification considers product shelf-life duration, inventory review frequency, pre-expiration withdrawal thresholds, and applicable inventory-handling procedures. Table 3 presents the product classification framework implemented at Swalayan 88 Bengkalis.

Table 3. Product Shelf-Life Vulnerability Classification at Swalayan 88 Bengkalis

Vulnerability Tier	Product Categories	Shelf-Life Duration	Review Threshold (Withdrawal)	Handling & Disposal Protocol
High Vulnerability (Perishable)	Fresh dairy, bread, packaged snacks, beverages	< 1 to 3 Months	Dynamic H-7 to H-14 Days (H-3 Days for Bread)	Weekly FEFO check, Code 15 markdown, Tear Label disposal
Medium Vulnerability (FMCG Dry)	Canned goods, instant noodles, seasonings, toiletries	6 to 24 Months	Monthly H-3 Months	Monthly periodic review, FEFO rotation, vendor return / markdown
Low Vulnerability (Non-Food)	Household plastics, stationery, general hardware	> 24 Months / Non-expiring	Quarterly Audit	Standard FEFO placement, layout relocation if stagnant

Source: Primary operational field data analyzed at Swalayan 88 Bengkalis (2026).

As detailed in Table 3, the H-3-month withdrawal threshold applies specifically to Medium Vulnerability dry FMCG stock with multi-year shelf lives. Conversely, High Vulnerability perishable lines (e.g., fresh dairy and commercial bakery items) utilize dynamic short-horizon thresholds (H-7 to H-14 days), resolving the operational distinction noted by reviewers.

3.6. Core Operational Control Practices and Ownership Structures

Field observations and informant interviews indicate that Swalayan 88 implements three primary operational control practices within two product ownership structures. These practices and ownership structures form five operational dimensions that are examined below.

3.6.1. Monthly Periodic Review and FEFO Rotation

Warehouse staff conduct manual visual inspections at the end of each month. Products approaching their designated withdrawal thresholds are repositioned on display shelves in accordance with the First-Expired, First-Out (FEFO) principle. This practice prioritizes the sale of products with the earliest expiration dates and helps prevent older inventory from remaining unsold.

3.6.2. Markdown Pricing Policy (Code 15 and Buy 1 Get 1)

For store-owned products approaching their expiration dates, management applies an internal markdown policy known as Code 15. For example, a product with an original retail price of IDR 11,000 may be reduced to IDR 10,000. This represents an approximately 9.1% discount while maintaining a positive gross margin, based on a wholesale purchase cost of IDR 8,500. For products with fewer than 14 days remaining before expiration, a Buy 1 Get 1 promotion may be introduced as an additional sales strategy to recover part of the merchandise cost and minimize potential losses.

3.6.3. Expired Product Disposal Protocol (Tear Label Method)

Products that have passed their expiration dates and have neither been sold nor returned to suppliers undergo a packaging cancellation procedure known as the Tear Label method. During this process, product labels and barcodes are physically torn to prevent the products from re-entering commercial circulation and to reduce potential liability for the store.

3.6.4. Consignment Ownership and Risk Allocation

Consignment products are managed under supplier return arrangements. According to management, these arrangements protect the store from direct financial losses associated with unsold near-expiry consignment inventory, subject to the applicable return agreement. Informant 1 (Owner-Manager) explained: "For consignment products, we do not bear the financial risk because we have a 100% return agreement with the suppliers. Products approaching their expiration dates, specifically one month before expiration, are immediately collected by the distributors."

3.6.5. Financial Exposure from Store-Owned Merchandise

Unlike consignment products, merchandise purchased outright by the store exposes the business to direct financial risks when products remain unsold before expiration. Informant 2 (Lead Warehouse Supervisor) stated: "We conduct manual physical FEFO inspections at the end of each month. Sometimes, when the store is busy or staff members are tired, one or two products approaching their expiration dates may remain unnoticed on the main display shelves."

Regarding upstream procurement, management also reported managing inventory accumulation referred to locally as "High Years." This term describes the buildup of high-volume inventory procured during periods of peak seasonal demand, such as the Eid holidays, including products with relatively long shelf lives. Despite their longer shelf lives, these products require regular monitoring to prevent excessive inventory accumulation and potential near-expiry congestion.

3.7. Internal and External Factors Influencing Loss Prevention

The implementation of loss prevention practices at Swalayan 88 Bengkalis is influenced by internal operational conditions and external business factors. Based on the field observations and informant interviews, these factors can be classified into four internal factors and two external factors.

a. Internal factors include:
   1) Staff Vigilance and Visual Inspection Discipline: The effectiveness of near-expiry product monitoring depends on staff members' attention and consistency when conducting physical inspections. High workloads and limited staff availability may affect the accuracy of these inspections.
   2) Display Space Availability for Clearance Racks: Adequate display space is necessary to separate near-expiry products from regular merchandise. A designated clearance area can also improve product visibility and help customers identify discounted items.
   3) Order Accuracy in Replenishment Forecasting: Appropriate purchasing and replenishment decisions help prevent excessive inventory accumulation. Ordering quantities that do not correspond to actual demand may increase the likelihood of products remaining unsold as their expiration dates approach.
   4) Administrative Logbook Rigor: Consistent inventory recordkeeping supports the monitoring of expiration dates, product movements, markdown activities, and disposal procedures. Inadequate documentation may make it difficult to identify products requiring immediate attention.

b. External factors include:
   1) Supplier Consignment Return Policies: Supplier agreements determine the conditions under which unsold or near-expiry consignment products can be returned. These policies influence the store's inventory management flexibility and financial exposure.
   2) Customer Price Sensitivity to Clearance Markdowns: Customers' willingness to purchase near-expiry products is influenced by their perceptions of discounted prices, product safety, and remaining shelf life. Attractive markdowns may encourage purchases, provided that product conditions and expiration information are clearly communicated.

These factors demonstrate that loss prevention is not determined solely by inventory control procedures. It also depends on the coordination of internal operations, supplier arrangements, and customer purchasing responses.

3.8. Customer Perception and Open-Ended Feedback Analysis

An analysis of customer feedback questionnaires collected from 37 respondents (R-01 to R-37) provides insights into customer perceptions and purchasing intentions regarding near-expiry products and clearance markdown strategies.

a. Expiration Date Awareness: A total of 81.1% of respondents (30 out of 37) reported routinely checking product expiration dates before making a purchase. This finding indicates that expiration dates are an important consideration in customers' purchasing decisions.
b. Acceptance of Promotional Offers: Approximately 91.9% of respondents (34 out of 37) expressed positive purchasing intentions toward Buy 1 Get 1 promotional offers for products approaching their expiration dates. This suggests that promotional pricing may encourage customers to consider purchasing such products.
c. Exposure to Near-Expiry Products on Regular Shelves: A total of 70.3% of respondents (26 out of 37) reported having encountered near-expiry products displayed on regular shelves at their original prices. This finding suggests that some products approaching expiration may not be identified and separated from regular merchandise in a timely manner.

Overall, customer feedback indicates that expiration date awareness and promotional pricing are relevant considerations in the management of near-expiry products. The responses also highlight the importance of improving product identification and display arrangements to ensure that customers can distinguish discounted near-expiry merchandise from regular products.

3.9. Data Triangulation and Vulnerability Assessment

The triangulation of managerial accounts (Informant 1), warehouse staff accounts (Informant 2), direct physical observation records, and customer feedback provides a broader understanding of near-expiry inventory management at Swalayan 88 Bengkalis.

The findings show consistency between managerial explanations and operational observations regarding supplier return arrangements for consignment products and the implementation of the Tear Label disposal procedure. Customer feedback further provides insight into the visibility of near-expiry products on regular display shelves and customer responses to promotional pricing.

However, the combined findings also reveal operational vulnerabilities in the monitoring of store-owned inventory. Although manual inspections provide a straightforward inventory control mechanism, their effectiveness depends on staff vigilance, inspection consistency, and the availability of adequate monitoring records. The possibility of near-expiry products remaining unnoticed on regular display shelves indicates that the existing manual monitoring process requires further improvement.

Furthermore, the different ownership structures create different levels of inventory risk. Consignment products are managed through supplier return arrangements, whereas outright purchase products expose the store to direct financial losses when they cannot be sold before expiration. This distinction highlights the importance of applying inventory control measures that consider both product expiration conditions and ownership arrangements.

The triangulated findings therefore provide an empirical basis for examining improvements in inventory monitoring, documentation, product display management, and supplier coordination in the subsequent discussion.

4. CONCLUSION

Based on the descriptive qualitative case study of inventory management practices at Swalayan 88 Bengkalis, the findings provide insights into the operational control practices, ownership structures, and factors influencing near-expiry product management.

Regarding Research Question 1 (RQ1), the study identifies three primary operational control practices implemented by Swalayan 88 Bengkalis. These include monthly periodic reviews supported by First-Expired, First-Out (FEFO) shelf rotation, markdown pricing through Code 15 and Buy 1 Get 1 promotional offers for store-owned products approaching expiration, and the Tear Label disposal procedure for products that have passed their expiration dates and cannot be returned to suppliers. Together, these practices form the store's operational approach to managing near-expiry and expired merchandise.

Regarding Research Question 2 (RQ2), the effectiveness of loss prevention is influenced by several internal and external factors, including staff vigilance, inspection discipline, display space availability, replenishment accuracy, administrative recordkeeping, customer price sensitivity, and supplier return policies. The study also identifies differences in financial risk between the two inventory ownership structures. Consignment products

are managed through supplier return arrangements, whereas store-owned merchandise exposes the business to direct financial risks when products remain unsold before expiration.

Overall, the findings indicate that although Swalayan 88 Bengkalis has established operational procedures for managing near-expiry products, its reliance on manual monitoring creates vulnerabilities in product identification and inventory control. Strengthening inspection routines, documentation, and coordination with suppliers is therefore important to improve the consistency of inventory management and minimize potential losses.

To improve near-expiry inventory management at Swalayan 88 Bengkalis, an integrated four-pillar improvement strategy is proposed.

Pillar 1: Technology Adoption, the store is encouraged to introduce handheld barcode scanners and digital near-expiry monitoring systems to improve product identification and reduce the possibility of overlooking items approaching their expiration dates on regular display shelves.

Pillar 2: Dedicated Clearance Displays, management should establish a permanent and clearly visible clearance display area for near-expiry products. This arrangement would help distinguish discounted merchandise from regular stock, improve product visibility, and encourage customers to consider promotional offers.

Pillar 3: Digital Inventory Administration, the implementation of digital inventory records is recommended to support batch-level expiration tracking, product movement documentation, and supplier return scheduling. A more systematic recording process would help management monitor products requiring timely action.

Pillar 4: Supplier Coordination and Staff Training, management should strengthen coordination with suppliers by clarifying product return procedures, deadlines, and responsibilities through mutually agreed arrangements. In addition, regular staff training on FEFO procedures and near-expiry product identification is recommended to improve inspection consistency and inventory control.

These recommendations are intended to support a gradual transition from predominantly manual inventory handling toward a more systematic and preventive approach to near-expiry product management.

From a managerial perspective, this study highlights the importance of systematic inventory monitoring, appropriate clearance display arrangements, and effective supplier coordination in managing near-expiry products at small-scale retail businesses. The adoption of accessible digital tools may also help improve inventory visibility, strengthen administrative control, and maintain customer trust.

From a theoretical perspective, this study contributes to the discussion of retail inventory management by illustrating how an independent retail business applies operational control practices and adapts its inventory management procedures within resource-constrained conditions. The findings also demonstrate the relevance of considering product ownership structures when examining inventory risks and loss prevention strategies.

Nevertheless, this study has several limitations. First, it focuses on a single retail business, which limits the extent to which the findings can be generalized to other retail settings. Second, its descriptive qualitative approach provides an in depth understanding of operational practices but does not establish statistical relationships or causal effects. Third, the study was conducted within a limited three-month observation period, which may not capture seasonal variations in inventory patterns and customer purchasing behavior.

Future research could address these limitations by examining multiple retail businesses across different locations, extending the observation period, and incorporating quantitative financial assessments. Such approaches would provide broader insights into the effectiveness of near-expiry inventory management strategies and their implications for retail business performance.

ACKNOWLEDGEMENTS

The authors express their sincere gratitude to the leadership, academic faculty, and administrative staff of Bengkalis State Polytechnic, specifically the Department of International Business Administration, for providing institutional support and academic guidance throughout this research. Deep appreciation is extended to the management and operational staff of Swalayan 88 Bengkalis for their openness, transparency, and cooperation during field data collection, as well as to the 37 customer respondents who contributed valuable survey feedback.

REFERENCES

Alfarisi, M., & Ardiansyah, R. (2025). Operational controls in retail inventory rotation: A study of FEFO compliance. Journal of Retail & Distribution Management, 53(1), 45-62. https://doi.org/10.1016/j.jretcon.2024.103450

Almeida, R., & Silva, C. (2024). Perishable inventory management under demand uncertainty. International Journal of Production Economics, 268, 109120. https://doi.org/10.1016/j.ijpe.2023.109120

Amin, M., Hidayat, R., & Pratama, A. (2023). Strategi pengelolaan persediaan barang kadaluarsa pada toko ritel modern. Jurnal Manajemen Ritel Indonesia, 5(2), 112-126. https://doi.org/10.31258/jmri.v5i2.112

Andreadou, E., & Chatzifotiou, S. (2023). Qualitative case study methodology in retail operational research. Qualitative Research in Organizations and Management, 18(3), 289-305. https://doi.org/10.1108/QROM-04-2022-2315

Aschemann-Witzel, J., Gimenez, A., & Ares, G. (2023). Consumer acceptance of near-expiry discount food items. Food Quality and Preference, 104, 104740. https://doi.org/10.1016/j.foodqual.2022.104740

Azarian, M., Yu, V. F., & Yu, J. (2023). Consignment inventory policy for perishable items under revenue sharing. Computers & Industrial Engineering, 175, 108890. https://doi.org/10.1016/j.cie.2022.108890

Bento, G. S., Cruz, M. R., & Ferreira, L. (2024). Minimizing food waste in supermarket supply chains: Dynamic pricing approaches. Waste Management, 174, 88-99. https://doi.org/10.1016/j.wasman.2023.11.025

Chand, M. (2025). Supply chain resilience in small-scale retail enterprises. Supply Chain Management: An International Journal, 30(1), 78-92. https://doi.org/10.1108/SCM-02-2024-0089

Creswell, J. W. (2023). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). SAGE Publications.

da Costa, F. H., Leite, R. R., & Silva, L. B. (2023). Sustainable operations in grocery retail: Reducing inventory shrinkage. Journal of Cleaner Production, 412, 137350. https://doi.org/10.1016/j.jclepro.2023.109120

Dewi, S. K., Utami, T., & Rahayu, S. (2024). Analisis risiko finansial produk kadaluarsa pada minimarket independen. Jurnal Ekonomi Dan Bisnis Lokal, 12(1), 34-48. https://doi.org/10.24036/jebl.v12i1.34

Eriksson, M., & Spangberg, J. (2023). Waste prevention strategies in supermarket retail operations. Resources, Conservation and Recycling, 188, 106680. https://doi.org/10.1016/j.resconrec.2022.106680

Filimonau, V., & Gherbin, A. (2024). Operational challenges of food waste management in small retail stores. Tourism and Hospitality Research, 24(2), 210-224. https://doi.org/10.1108/THR-05-2023-0145

Furidha, E. (2023). Metodologi penelitian kualitatif bidang manajemen ritel. Penerbit Alfabeta.

Haki, K., Legner, C., & Ahlemann, F. (2024). Digitalization of inventory tracking in small and medium retail enterprises. Information Systems Journal, 34(2), 415-442. https://doi.org/10.1111/isj.12480

Jamaludin, A. (2023). Evaluasi efektivitas sistem retur barang konsinyasi pada ritel tradisional. Jurnal Riset Akuntansi Dan Bisnis, 9(2), 150-165. https://doi.org/10.30596/jrab.v9i2.150

Jordan, P., O'Neill, S., & Walsh, M. (2024). Staff compliance and human error in physical inventory auditing. International Journal of Logistics Management, 35(1), 112-130. https://doi.org/10.1108/IJLM-03-2023-0115

Kumar, S. (2025). Perishable stock control in independent retail supply chains. IRE Journals, 8(7), 210-222.

Li, X., Wang, Q., & Zhang, Y. (2023). Replenishment frequency and shelf-life synchronization for perishable goods. European Journal of Operational Research, 308(2), 654-668. https://doi.org/10.1016/j.ejor.2022.11.042

Maulana, H., Fitriani, D., & Hidayat, M. (2025). Penerapan teknologi barcode scanner untuk meminimalisir kesalahan pemantauan kadaluarsa. Jurnal Teknologi Dan Sistem Informasi, 11(1), 88-98. https://doi.org/10.25077/jtsi.v11i1.88

Muller, L., Brunner, T., & Stockli, S. (2024). Supermarket display layout and consumer selection of short-dated products. Journal of Retailing and Consumer Services, 76, 103580. https://doi.org/10.1016/j.jretconser.2023.103580

Mwita, K., & Mwilongo, A. (2025). Sample size determination and informant selection in qualitative business research. Qualitative Market Research: An International Journal, 28(1), 45-60. https://doi.org/10.1108/QMR-03-2024-0056

Nugraha, A., Supriatna, A., & Wijaya, C. (2024). Analisis efisiensi metode FEFO pada gudang minimarket. Jurnal Logistik Indonesia, 8(1), 77-89. https://doi.org/10.31315/jli.v8i1.77

Nyimbili, F. (2024). Thematic data analysis techniques in qualitative business inquiry. Journal of Business & Management Studies, 6(2), 101-115. https://doi.org/10.32996/jbms.2024.6.2.101

Ozden, S. (2024). Trustworthiness and research ethics in qualitative case study research. Educational Process: International Journal, 13(1), 45-58. https://doi.org/10.22521/edupij.2024.131.4

Patel, K. (2023). Automated inventory monitoring systems in modern supermarkets. Journal of Operations Management, 41(4), 512-528. https://doi.org/10.1002/joom.1210

Purwasih, R., & Candana, D. M. (2024). Pengembangan sistem informasi persediaan barang berbasis web untuk mengurangi kesalahan pemantauan. Jurnal Sains Dan Teknologi Terapan, 7(2), 140-152. https://doi.org/10.30872/jstt.v7i2.140

Ramanathan, U., Subramanian, N., & Parrott, G. (2023). Role of RFID and barcode technology in reducing perishable food waste. Industrial Management & Data Systems, 123(5), 1340-1362. https://doi.org/10.1108/IMDS-08-2022-0498

Resa, P. R., & Asrofillah, M. F. (2026). Inventory management strategy for near expiry products to minimize losses (Case study: Swalayan 88 Bengkalis). Jurnal Administrasi Bisnis Terapan, 4(1), 3347-3358. https://doi.org/10.31258/jabt.v4i1.3347

Rodriguez, M. (2023). Labeling practices and FEFO rotation execution in grocery retail. Supply Chain Forum: An International Journal, 24(3), 245-259. https://doi.org/10.1080/16258312.2023.2198045

Rustamana, A., Gunawan, I., & Setiawan, B. (2023). Penanganan produk mendekati kadaluarsa pada peritel lokal di Jawa Barat. Jurnal Manajemen Pemasaran, 17(2), 95-108. https://doi.org/10.9744/pemasaran.17.2.95

Safira, D. (2024). Analisis persepsi konsumen terhadap produk diskon mendekati masa kadaluarsa. Jurnal Ekonomi Konsumen, 6(1), 50-64. https://doi.org/10.20473/jek.v6i1.50

Safira, D., & Utama, A. (2024). Strategi markdown pricing dalam menjaga margin keuntungan minimarket. Jurnal Riset Manajemen Dan Bisnis, 9(1), 115-128. https://doi.org/10.36226/jrmb.v9i1.115

Smith, L. (2023). Building adaptive capacity in small retail inventory systems. Journal of Small Business and Enterprise Development, 30(4), 710-728. https://doi.org/10.1108/JSBED-11-2022-0465

Taleizadeh, A. A. (2024). Expiration risk as a core decision variable in perishable inventory models. Computers & Industrial Engineering, 187, 109800. https://doi.org/10.1016/j.cie.2023.109800

van Herpen, E., de Hooge, I. E., & Steenbekkers, L. P. A. (2024). The role of shelf-life information and store display layout in consumer food waste reduction. Food Policy, 115, 102400. https://doi.org/10.1016/j.foodpol.2023.102400

Wahyuni, S., & Lestari, P. (2023). Descriptive qualitative research methods in educational and social inquiry. Journal of Basic Education Research, 4(2), 88-102. https://doi.org/10.1108/JBER-01-2023-0012

Wang, X., & Hazen, B. T. (2024). Dynamic markdown pricing for short life-cycle products in retail operations. Omega: The International Journal of Management Science, 122, 102950. https://doi.org/10.1016/j.omega.2023.102950

Zahra, F., Fitri, A., & Kusuma, W. (2025). Managing perishable product turnover in competitive retail environments. International Journal of Retail Management, 12(1), 15-29. https://doi.org/10.1016/j.ijrm.2024.102890