BINDURA UNIVERSITY OF SCIENCE EDUCATION



INVENTORY MANAGEMENT AND COST CONTROL IN A PERISHABLE GOODS ENVIRONMENT: A CASE STUDY OF BAKERS INN SALES AND DISTRIBUTION

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RELEASE FORM

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"INVENTORY MANAGEMENT AND COST CONTROL IN A PERISHABLE GOODS ENVIRONMENT: A CASE STUDY OF BAKERS INN SALES AND DISTRIBUTION."

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In a bid to partially fulfil the requirements of Bachelor of Accountancy Degree

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DEDICATION

For Alexia, Alexanne and Mike Ndlovu.

ABSTRACT

The study investigated the effectiveness of inventory management systems and their effect on cost control in a perishable goods company and took Bakers Inn Sales and Distribution (Zimbabwe) as a case study. The issue was the absence of empirical findings supporting the use of particular inventory techniques on cost control because of the short shelf life of bread. The aim was to list the existing methods used for stock control, evaluate any difficulties, and make recommendations. Case study design was adopted, which is quantitative descriptive. Primary data was gathered from employees in five depots in the Southern Region by using a Google Forms questionnaire. The questionnaire proved to be reliable. Results indicated that manual FEFO and day-to-day stock rotation were common and technological batch tracking of expiration dates was not common. The main challenges faced were return logistics costs, load shedding, generator fuel costs, poor roads and poor mobile connectivity. The hypothesis tests showed that there is a significant positive relationship between inventory management techniques and cost control, while there is a significant negative correlation between challenges faced in the inventory of perishables and cost control. The study finds that, although waste is partly reduced by manual practices, it is caused by infrastructure shortcomings to hinder cost control. It suggests that batch tracking be enabled through a bar code system, introduce a 'nearing expiry' bread pricing mechanism, develop formal partnerships with secondary markets and introduce sales incentives based on net sales.

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LIST OF ACRONYMS

ABC: Activity Based Costing

BISD: Bakers Inn Sales and Distribution

BUSE: Bindura University of Science Education

EOQ: Economic Order Quantity

ERP: Enterprise Resource Planning

FAO: Food and Agriculture Organization of the United Nations

FEFO: First Expired, First Out

FIFO: First In, First Out

FMCG: Fast-Moving Consumer Goods

IoT: Internet of Things

IPCC: Intergovernmental Panel on Climate

JIT: Just In Time

KPIs: Key Performance Indicators

LIFO: Last In, First Out

RFID: Radio Frequency Identification

SPSS: Statistical Package for the Social Sciences

TDABC: Time-Driven Activity Based Costing

TOC: Theory of Constraints

VMI: Vendor Managed Inventory

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CHAPTER I

INTRODUCTION

1.1 Background to the Study

Inventories are a tricky area to manage for organisations around the world, especially when they're perishables. The shelf life of products like bread, milk, meat, fresh vegetables and medicines is much shorter than that of non-perishable products. Such products become worthless upon expiration as well as causing environmental pollution and famine (Nahmias & Cheng, 2019). The perishability characteristic of perishable products makes it necessary for businesses to have efficient inventory management systems and at the same time, manage their costs effectively to make the products sell (Hasiloglu-Ciftciler & Kaya, 2020).

Over the last decade, the world food industry has made tremendous strides in the management perishable inventories. In high-income countries, investments have been made in advanced logistics and cold chain infrastructure, and in digital visibility tools, such as barcodes, Radio Frequency Identification (RFID), and Internet of Things (IoT) sensors, which allow age-based issues and automatic replenishment (Aydinliyim et al., 2021). These technological interventions have been found to offer benefits of extended product shelf lives, lower write-offs and enable precision-markdowns over blanket discounts (Gupta & Chaturvedi, 2018; Tsang et al., 2021). Current studies have also shown that dynamic pricing strategies that can adapt the pricing of products according to their age, demand trends, and leftover shelf life can help to drastically lower losses due to spoilage without compromising profits. A field study by Aydinliyim et al. (2021) in Chinese bakery chains showed that the freshness pricing model reduced the amount of freshness spoilage by 22% and enhanced the revenue by 8% compared to the fixed pricing model. Likewise, Kavoosi et al. (2025) showed that deep reinforcement learning (DRL) models of dynamic pricing and inventory control

of perishable products can be used to optimize stock levels and reduce waste in real-time. Activities of the operational nature aimed at measuring, monitoring and coordinating action on food loss and waste have been actively promoted by international organizations. Around one-third of the world's total food production is lost or wasted, with serious economic, social and environmental impacts (Food and Agriculture Organization 2020). The Intergovernmental Panel on Climate Change (IPCC, 2021) has also stated that the reduction of food waste is one of the most cost-effective climate mitigation actions, returning economic and environmental benefits of $14 for every dollar spent on the reduction. These global initiatives connect food loss and waste reduction strategies to the sustainability goals and encourage investments in the public and private sector in logistics capacity and cold chain infrastructure (FAO, 2020).

However, while the world has made significant strides, some regions still have a poor track record with the use of advanced perishable inventory management methods. The developing economies like Sub-Saharan Africa countries have its own set of challenges that interfere with the adoption of best practices (Kumar & Suresh, 2019; Sodhi & Tang, 2017). Some of the challenges are unreliable electricity supply, inadequate road infrastructure, inadequate cold chain facilities, economic volatility and limited access to technology and digital systems (Mvumi & Stathers, 2018). Kumar and Suresh (2019) surveyed 200 food distributors in India, Kenya and Vietnam, and concluded that 55% of the perishable food supply chains were failing due to infrastructure deficits. The study also found that those organizations that do not have inventory training programs may lose 30% of the inventory from their program due to spoilage. The study, however, highlighted that the developing economy businesses should first of all concentrate on more cost-effective, impactful interventions like FIFO training and inventory tracking before investing in costly technology solutions (Kumar & Suresh, 2019). There are extra challenges in the African context. In emerging markets, electricity supply reliability is a major challenge as it leads to disturbance in production scheduling and requires expensive backup electricity generation systems, a factor that costs companies a lot of money (Gardas et al., 2025). Moreover, Afif and Doyon (2025) also observed that, in developing economies, the distribution of perishable products is a very expensive business due to poor infrastructure, frequent changes in the routes and also due to

wear and tear of the vehicles. The lack of digital connectivity with informal traders, as pointed out by Tyagi, Tiwari, and Sharma (2024), aggravates these challenges, making accurate demand forecasting and inventory visibility difficult.

Zimbabwe is one of the difficult markets for the distribution of perishable products. The country has faced continuous economic insecurity with high inflation rates, currency volatility and infrastructure decay (Chari & Ngcamu, 2022). The periodic or scheduled electricity service shutdowns (also referred to locally as "load-shedding") have a significant negative impact on production plans, and the use of backup generator systems (Mbizi & Gwangwava, 2023; Pandadyira & Hwinayi, 2022) is costly. Poor road networks, particularly in peri-urban and rural areas, raise the cost of vehicle maintenance, and also cause delays in deliveries, thereby shortening the shelf life of products in the retail outlets (Pandadyira & Hwinayi, 2022). Network connectivity for mobile services is fairly common in cities and towns but is inconsistent in rural and remote areas, thus information gaps between mobile network distributors and informal retailers (Tyagi et al., 2024). These infrastructure limitations are responsible for high food losses. Between production and consumption, Zimbabwe loses 15-20% of bakery products, valued at about USD 50 million annually, according to the FAO (2020). The main reasons found were the lack of storage (35% of losses), inefficiency in distribution (30%) and insufficient demand forecasting (20%).

The bakery industry is one of the few sectors in this difficult scenario. Foods produced in a bakery, especially bread, are extremely popular in Zimbabwe and form part of the daily diet of the country's households irrespective of their socioeconomic status. One of the most perishable consumer products on the market, bread has an exceptionally short shelf life of just 72 hours or less (Rigzin & Navee, 2024). Unlike other non-perishables, bread has a very short shelf life after production, its value decreasing gradually as it leaves the production line (Mbizi & Gwangwava, 2023). In Zimbabwe, the bakery industry is dominated by a few large-scale bakeries such as Bakers Inn, Proton and Lobels which produce thousands of loaves each day and have widespread distribution networks of depots, retailers and informal bakers. These enterprises have slim profit margins, and effective management of their inventories and cost control is essential to their profitability and sustainability (Mukucha & Chari, 2023). Understocking causes loss of sales and dissatisfaction of customers while

overstocking causes high level of losses and customer financial writeoffs which pose unique challenges in the sector (Murairwa 2025). Cost control is not just about saving money; it's about managing and reducing expenses for bakeries. It includes the issues of maintaining customer confidence, sustainability and protecting profitability (Heizer, Render & Munson, 2020). Various strategies like First-In-First-Out (FIFO) rotation, shrinkage monitoring, and adoption of technology have been proved to be effective in minimizing losses and competing with the operational efficiency (Gupta & Chaturvedi, 2018). However, the strategies above need to be tailored to the resource scarcity and infrastructure situation that exists in Zimbabwe.

Bakers Inn is one of the biggest and leading producers of bread in Zimbabwe selling an average of several hundred thousand loaves daily through depots, retailers and dealers throughout the country. The company has a high volume distribution system that has to deliver fresh products to its urban supermarkets, peri-urban distributors, tuckshops and rural outlets within a period of 72 hours before they go bad (Mbizi & Gwangwava, 2023). This distribution channel is subjected to all the challenges common to perishable goods logistics in Zimbabwe including unreliable electricity for production and storage, poor road infrastructure for delivery, high cost of fuel, and lack of digital connectivity with informal retail outlets (Chari & Ngcamu, 2022; Pandadyira & Hwinayi, 2022). Bakers Inn, although one of the largest players in the market of producing bakery products in Zimbabwe, experiences inventory management problems at all times. These are product expiration, retail returns rate, stock unbalance between depot, and increased distribution expenses (Mukucha & Chari, 2023). The sales and distribution segment of the company, which is the subject of this study, is a highly competitive and cost-sensitive industry where inefficiency in inventory management can result in increased product cost, return from retailers, and operating expenses, ultimately affecting profitability and customer satisfaction (Nomura, Liu & Nishi, 2025).

Many studies have been undertaken on perishable inventory management around the world but there is a significant gap in empirical studies in Zimbabwe. Theoretical models like Economic Order Quantity (EOQ), Just in Time (JIT), First in First Out (FIFO) and Theory of Constraints (TOC) have been heavily researched in developed economies with stable infrastructure and advanced technology (Nahmias & Cheng,

2019; Janssen, Claus & van der Heijden, 2020; Chhonker & Rai, 2021). The models, however, have been rarely used in the bakeries in Zimbabwe due to some unique problems experienced in the sector such as unreliable transport, low availability of cold stores, high returns from the retailers and a long-standing challenge of power shortages that are not really captured by these models (Mbizi & Gwangwava, 2023). In addition, although recent studies have investigated the use of IoT real-time monitoring for waste reduction (Maheshwari et al., 2025), and machine learning for demand forecasting (Tsang et al., 2021), few studies have tried to practically model the integration of these tools into resource-limited contexts such as Zimbabwe. The empirical evidence is very limited and indicates that there may be a lack of understanding of best practices, as well as lack of infrastructure and resources for implementing them (Kumar & Suresh, 2019; Sodhi & Tang, 2017). In particular, there are some limited empirical findings on: the effectiveness of existing Bakers Inn Sales and Distribution inventory management practices in this perishable goods environment; the specific challenges associated with inventory management practices that most significantly affect the effectiveness of cost control; and the relationship between the inventory management practices used in a bakery distribution network with the effectiveness of cost control in the presence of infrastructure constraints.

The discrepancy between theory and practice in Zimbabwe's bakery industry indicates a need for context-specific research to find ways to implement effective interventions in the current setting of resources and infrastructure. The present study seeks to fill the above gap by studying Bakers Inn Sales and Distribution as a case example of a perishable inventory in a difficult developing economy context.

1.2 Statement of the Problem

Bakers Inn Sales and Distribution is sitting in a particularly difficult perishable goods market and the need to manage inventory isn’t just a business option, but a business must. The company's main product is bread which has a shelf life of about 72 hours after which it is no longer saleable and should be classified as total write-off (Rigzin & Navee, 2024; Mbizi & Gwangwava, 2023). As the country's biggest bakery chain, it is operating over 256 distribution trucks and making up to 450,000 loaves daily, and

has plans to double its output to 1 million loaves per day (Bakers Inn, 2022; FUSO Trucks, 2022), the company is still plagued by constant and worsening inventory management issues, which have adversely affected its financial health.

The size of the problem is reflected by the company's recent financial performance. Bakers Inn (a subsidiary of Simbisa Brands Limited) posted an audited after-tax loss of US$1.14 million in the year ended 30 June 2023 and US$1.08 million in the nine months period ended 31 March 2024. The losses have been mainly due to "high operating costs in a challenging macroeconomic environment", and the company has been loss-making for the past two years. This cost burden was so heavy that it forced a major restructuring exercise which included major staff retrenchments and rationalisation of sales, distribution and logistics. Part of the restructuring documents cited “escalating operational costs that had severely affected the company's viability” as the impetus behind the workforce cuts.

These challenges are made more complex by Bakers Inn's scale of operation. The Bulawayo facility is alone responsible for a fleet of 91 trucks covering more than 14 000 kilometres each day to service almost 5,500 retailers and vendors. The company's current truck fleet of more than 256 trucks serve an average of about 950,000 loaves per day nationwide. Fuel price volatility has a particular impact on this wide logistics network: bakers have spoken about the impact of "escalating transport and input costs related to recent fuel price increases" many times as a reason for margin erosion. The Bakers Association of Zimbabwe has declared that bakers, "who are using the daily logistics to deliver fresh products are most vulnerable to fluctuations in the price of fuel which directly impacts on transport and operational costs". Frequent changes to bread prices have driven up costs, on a few occasions reaching 60% and further reducing sales volume; the company has seen a 30% fall in sales volumes after price changes driven by the company's rising cost structure.

Another dimension of the issue is the amount of waste generated. A study of the Bakers Inn in Simbisa Brands revealed that "significant trends in the waste generation patterns" exists and that "the current waste management systems were inadequate to cope with the increasing threat of waste in Bakers Inn". The study found that the core of these problems is "inefficient waste disposal procedures, inadequate forecasting and

lack of awareness of waste generation pattern trends" and that "extensive amount of waste generated makes a significant contribution to inefficiencies of operations causing the accumulation of wastage, which both adds to the cost of waste disposal and poses the threat of causing damage to the environment". The study also revealed that about 65% of the waste was organic waste, made up of food waste, food waste products, packaging waste, etc. with a significant amount of packaging waste being old and unsold bread.

The situation is further complicated by Zimbabwe's fragile infrastructure situation. Bakeries depend on costly generator back-up systems because of the frequent power outages or load shedding which results in electricity being available for around 6 hours in many areas. Only the transition of the baking industry from zero rated to VAT exempt has urged Bakers Inn to lose US$110,000 during the first quarter of 2024. Poor road infrastructure, especially in peri-urban and rural areas, add to the vehicle maintenance costs and contribute to delays that shorten the time the products spend at the point of sale. The cost pressures are all compounded by the aforementioned infrastructure problems, economic volatilities, exchange rate depreciation against ZWLs (denominated receivables) and the debt load associated with fleet replacement.

There is little empirical evidence available on inventory management methods applied by Bakers Inn Sales and Distribution and its effectiveness in controlling inventory cost in such perishable goods environment despite the challenges. Although there is a vast amount of research on global best practices such as First-Expired-First-Out (FEFO) rotation, dynamic pricing, real-time monitoring and vendor-managed inventory that has been carried out in developed economies with stable infrastructure and advanced technology (Nahmias & Cheng 2019; Aydinliyim et al., 2021; Hasiloglu-Ciftciler & Kaya 2020), there is a clear lack of context-specific research that investigates how such practices can be effectively adapted to Zimbabwe's unique operational realities. The existing empirical evidence is quite limited and indicates that recognition of best practices is possible, but the ability to put these practices into practice is constrained by infrastructure gaps, limited resources, and the lack of a systematic approach to technology adoption (Kumar & Suresh, 2019; Sodhi & Tang, 2017; Mbizi & Gwangwava, 2023).

The study's problem, therefore, concerns the lack of empirical evidence on the impact of specific inventory management techniques on the cost control of Bakers Inn Sales and Distribution in the context of perishable goods and the lack of documentation on the effect of the various interconnected factors that include product spoilage, return logistics costs, distribution inefficiencies and infrastructure constraints that have all contributed to the financial woes of the company.

1.3 Purpose of the Study

1.3.1 Main objective

The purpose of this study is to examine the effectiveness of inventory management systems and their impact on cost control within Bakers Inn Sales and Distribution.

1.3.2 Specific objectives

The specific objectives of this study are to:

1. Identify inventory management techniques currently used by Bakers Inn Sales and Distribution in the management of perishable goods.
2. Evaluate the cost control mechanisms currently employed by Bakers Inn Sales and Distribution, including their effectiveness in managing spoilage costs, return logistics costs, distribution costs, and infrastructure-related expenses.
3. Assess the challenges associated with perishable inventory management and their impact on cost control effectiveness at Bakers Inn Sales and Distribution.
4. Propose improvements in inventory management strategies and cost control mechanisms to enhance operational efficiency and financial performance in the perishable goods environment.

1.4 Research Questions

The study sets to answer the following research questions:

1. What inventory management techniques are currently used by Bakers Inn Sales and Distribution?

2. What cost control mechanisms are currently employed by Bakers Inn Sales and Distribution, and how effective are these mechanisms in managing spoilage costs, return logistics costs, distribution costs, and infrastructure-related expenses?
3. What challenges are associated with managing perishable inventory, and how do these challenges impact cost control effectiveness at Bakers Inn Sales and Distribution?
4. What strategies can be adopted to improve inventory management and enhance cost control in a perishable goods environment, specific to Bakers Inn Sales and Distribution?

1.5 Statement of Hypotheses

Based on research objectives and research questions, the following null hypotheses (H_0) and alternative hypotheses (H_1) were formulated for statistical testing. The hypotheses are stated in null form as recommended for inferential statistical analysis (Creswell & Creswell, 2018; Pallant, 2020).

H_{01}: There is no significant relationship between inventory management techniques currently used by Bakers Inn Sales and Distribution and cost control effectiveness in the perishable goods environment.
H_{11}: There is a significant positive relationship between inventory management techniques currently used by Bakers Inn Sales and Distribution and cost control effectiveness in the perishable goods environment.

H_{02}: There is no significant relationship between the cost control mechanisms employed by Bakers Inn Sales and Distribution and the reduction of spoilage costs, return logistics costs, distribution costs, and infrastructure-related expenses.
H_{12}: There is a significant positive relationship between the cost control mechanisms employed by Bakers Inn Sales and Distribution and the reduction of spoilage costs, return logistics costs, distribution costs, and infrastructure-related expenses.

H_{03}: There is no significant relationship between the challenges of perishable inventory management and the cost control effectiveness of Bakers Inn Sales and Distribution.

H_{13}: There is a significant negative relationship between the challenges of perishable inventory management and the cost control effectiveness of Bakers Inn Sales and Distribution.

1.6 Significance of the Study

This study is of great significance because it highlights the interdependency of inventory management and cost control in the volatile environment for perishable items. Efficient control of perishable inventory plays an important role in minimizing waste and cost of the organization and maximizing organizational performance. The results of this research are valuable to these stakeholders:

1.6.1 Bakers Inn Management and Stakeholders

This study will offer a comprehensive evaluation of inventory management inefficiencies in Bakers Inn Sales and Distribution chain. The study will provide practical and attainable ways to lower operating expenses by identifying major issues such as product spoilage, stale returns, and distribution inefficiencies. Profitability, liquidity and overall financial performance can all be directly improved by better inventory control and cost effectiveness, which supports well-informed managerial decision making and the generation of shareholder value.

1.6.2 Employees in Sales and distribution

By identifying areas where better inventory management procedures and control systems can boost operational efficiency, the findings will help workers in sales, distribution and inventory handling. This may result in less handling losses, greater workflow coordination and more efficient use of the organization’s resources.

1.6.3 The Accounting Profession

By offering empirical data on cost control strategies in a specialized perishable commodities context, the study contributes to the discipline of management accounting. It bridges the gaps between theoretical models of inventory management and real-world accounting challenges of handling goods with very short shelf lives. The results could help accountants create more efficient cost monitoring and control systems for fast moving consumer goods (FMCG) businesses.

1.6.4 Future Scholars and Researchers

Students and scholars at Bindura University of Science Education (BUSE) and other institutions who are interested in exploring inventory management, cost control, supply chain finance or FMCG logistics might employ this study as a reference. Additionally, the study lays the groundwork for future investigations into real time inventory tracking in perishable commodities environments and automated accounting systems.

1.6.5 Customers and the economy

More reliable availability and pricing of goods for consumers can be achieved through efficient inventory management and cost control at the distribution level. Additionally, the study will support Zimbabwe's larger economic goals of resource efficiency, sustainability and food security by lowering food waste through better inventory method (Christopher, 2016; Heizer, Render and Munson, 2020).

1.7 Assumptions of the Study

This study is based on the following assumptions:

- Consistency of operations: Operations of Bakers Inn Sales and Distribution are assumed to be consistent and typical of normal operation for the study period; that is, there are no significant changes to the organizational structure or operations that make the results unrepresentative of normal operations.

- Operational conditions assumed to be relatively stable: It is assumed that the external operational conditions, such as economic policies, regulatory conditions and market structures, will not change significantly during the study period, so that the conclusions would not be influenced by temporary changes in the operational conditions.

- Representativeness of the case study: Assumption that any findings and recommendations may be applicable to other large scale perishable goods distributors in similar conditions in Zimbabwe and Bakers Inn Sales and Distribution are representative of such distributors.

- Validity of inventory management theories: The theories used as the basis for this study were Economic Order Quantity (EOQ), Just In Time (JIT), First Expired First Out (FEFO) and Theory of Constraints (TOC) which were assumed as valid for application in the context of distribution of perishable goods in Zimbabwe and as a basis for analysing inventory management and cost control practices.

- The measurability of constructs: It is assumed that the constructs under investigation such as inventory management techniques, cost control mechanisms and challenges of inventory management of perishables are measurable using the research instrument established for this study.

- Generalizability of findings: It is assumed that the issues related to inventory management and cost control that have been identified in the Southern Region depots are representative of the issues that may be found throughout the Bakers Inn distribution system, thus recommendations may be applicable elsewhere and need only be adapted to those areas.

1.8 Delimitations

This study is delimited by the following boundaries:

- Geographical Delimitation: The study is restricted to Bakers Inn Sales and Distribution depots in the Southern Region of Zimbabwe namely Bulawayo, Gweru, Masvingo, Kwekwe and Zvishavane. The study does not cover the Northern, Eastern and Western regions of the country or other places beyond Zimbabwe.

- Conceptual Delimitation: The study is concerned only with the practices of inventory management and cost control in perishable goods setting. The scope of the investigation is solely to delve into the inventory management systems (inventory rotation, segregation, batch tracking, etc.), the cost control systems (spoilage cost management, return logistics cost management, distribution cost management, infrastructure related cost management, etc.), and the challenges for these systems. Other operational aspects of the business, apart from cost control, like production processes, human resource management, marketing and financial management are not covered in the study.

- Organisational Limitation: The study is just an organisational study within Bakers Inn Sales and Distribution, particularly the sales and distribution function of the organisation. This study is not comprehensive of the production division, the retail outlets or any other business units of Inscor ltd. The study is based on sales, distribution logistics, employees in the fleet management, dispatch and finance departments, who are directly involved in inventory management and cost control activities.

- Product Delimitation: This study examines only bread and other bakery goods sold by and distributed via Bakers Inn's sales and distribution chain. Other product categories, like beverages, confectionery, or non-perishable goods, that may be dealt with by the organisation are not included in the study.

- Temporal Delimitation: The study is limited to the time period the data is collected over (current operating period). The results do not compare the level of inventory management and cost control that existed at the time of the study

but do not necessarily offer explanations for past trends or predictions for future conditions that lie outside the period of the study.

- Delimitation of the study: It is restricted to the employees with at least one year of experience in their present job and who are directly involved in the decision making, inventory-related, stock rotation, return logistics, route planning and/or cost monitoring operations. Based on operational knowledge, those employees who were less than 1 year of service and may not have operational knowledge in other departments are not included in the study.

1.9 Limitations

Access to Confidential Records

Respondents' perceptions could not be confirmed with actual cost data, as access to Bakers Inn's confidential inventory and financial records was limited. This restriction was countered by triangulating the data in the questionnaires with the secondary or published data from the financial reports, industry publications and documented operational challenges reported in the media.

Respondent reluctance and potential response bias

The sensitivity of some respondents may have been to incomplete or inaccurate information, leading to response bias. This limitation was addressed by giving explicit assurances of anonymity, setting up Google Forms to not gather identifying data, and communicating the academic purpose and voluntary nature of participation.

Sample Size Constraints

The number of the respondents (n=30) in five depots was relatively small, which reduced the generalisability of the findings. This limitation was partly addressed by the use of purposive sampling in order to involve respondents who have at least one year of experience and direct involvement in the inventory management, by having a rate of 75% of respondents and by triangulation of the findings with secondary data sources.

Time Constraints

Limited time for data collection and analysis prevented follow-up interviews or additional document verification. This constraint was addressed by a focused research, a thorough questionnaire capturing all the variables and the use of Google Forms for a convenient and automatic data collection and the compilation of the questionnaires.

Self-Reported Data Limitations

Self-reported perceptions created the potential for inaccuracies in recall or subjectivity in interpretation. This was reduced by using clear, specific questions which were expressed as Likert scales, pilot-testing the questionnaire with five staff members outside the main sample, and triangulating perceptual data with the available secondary data.

1.10 Definition of Terms

Inventory Management: The variables used to measure inventory management in this study were the specific inventory management techniques reported by Bakers Inn depot staff (using questionnaires), including FEFO rotation, manual stock rotation and monitoring of stale returns. The effectiveness was evaluated by the correlation with the cost control indicators.

Perishable Goods: Operationally defined as bread and bakery products that have a shelf life of less than 72 hours. The measurements were conducted based on the responses of staff on how they handle, rotate, and return the expired or near-expiry bread.

Cost Control: Based on reported practices that lowered costs, such as fuel cost management, return logistical and waste reduction. The criterion for the effectiveness was measured using hypothesis testing between inventory techniques and the profitability results.

FIFO (first in, first out): Implementing the rotation practice as the older batches of bread were sent first, as staff stated. The frequency in the questionnaires was used for the measurement.

First Expired, First Out (FEFO): Measuring number of breads to be distributed according to the first date of expiration. Staff responses showed that they were not using technological batch tracking but manual checks.

Shrinkage: These are defined as losses that are reported by staff when food isn't used, it goes out of date, or when it doesn't match the recorded stock. Frequency and perceived impact were used as measures in the survey responses.

Dynamic Pricing: As the proposed (but not yet implemented) policy of bread price adjustment close to the expiration date. In this study, it was observed using staff perceptions of feasibility and cost reduction benefits.

Shelf Life: It was implemented as the length of time (in hours) during which bread would stay marketable. Measurements were carried out based on staff consciousness and handling to reduce wasted within the set time frame.

Stale Returns: As a percentage of bread returned from retailers because it was out of date. Frequency of returns and related logistics costs were recorded by staff.

Operational Efficiency: Based on the staff's perception of coordination in the work, the reduction in handling losses and the use of resources in the depots. It was indirectly evaluated with respect to reported difficulties and cost results.

Cross Docking: Implementing a "no storage" approach for loading bread into outbound trucks directly from inbound trucks. Whether depots reported to reduce holding costs was used as the measure.

Vendor Managed Inventory (VMI): Measured in terms of supplier involvement in managing stock levels (or not). In this study, staff indicated that VMI was not commonly practiced at Bakers Inn.

Stochastic Demand: They are considered as unpredictable variations in the demand for bread reported by depot operators. The measure was staff experiences with overstocking, understocking and forecasting.

1.11 Summary

This chapter established the foundational framework for the study by examining the crucial influence of inventory management and cost control within a perishable goods environment of Bakers Inn Sales and Distribution. The background emphasized the unique challenges presented by a 72-hour shelf life, where poor forecasting results in substantial financial loss due to spoiling or lost sales. The study aims to discover the existing methods and propose enhanced strategies for operational efficiency by identifying the problem statement, research objectives and specific research questions. The research is essential for increasing the organization's profitability and contributes to the broader accounting discourse on fast moving consumer products, even though it is delimited to the Southern Region and recognizes possible data access constraints. After outlining the study's theoretical and practical motivations, Chapter Two will offer a thorough analysis of relevant literature to place these issues in the context of existing academic and empirical frameworks.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature extensively on inventory management and cost control in perishable goods environment. This review is divided into thematic sections to discuss theoretical background, inventory management techniques, cost control mechanisms, problems associated with the management of perishable inventory, and empirical evidence from previous studies. The chapter starts with a theoretical grounding that guides the study, based on three theories: Economic Order Quantity (EOQ), Just-in-Time (JIT) and Theory of Constraints (TOC). These theories are combined to offer a lens for examining the practices at Bakers Inn Sales and Distribution, as well as its challenges.

Specific inventory management techniques are then discussed for perishable products and then cost control techniques are discussed. The results of the previous research on each research objective are synthesized and the findings and methodology are critically compared. The chapter ends by stating the research gap this study aims to address and shows how existing empirical research as a whole warrants further context-specific research in the bakery sector in Zimbabwe.

2.2 Theoretical Framework

This study is based on three key theories on which the theoretical framework of this study is constructed. These three key theories explain the dynamics of inventory management and cost control in perishable goods environments. The theories are combined into a coherent framework to offer an overview of how the practices and problems at Bakers Inn Sales and Distribution can be analysed.

2.2.1 Economic Order Quantity (EOQ) Theory and its Weaknesses

Originally formulated by Harris in 1913 and improved later by Wilson, the Economic Order Quantity (EOQ) model is one of the oldest and best-known inventory management theories. As such, EOQ model determines the optimal quantity that minimizes the sum of ordering and holding costs assuming deterministic demand and constant lead times (Hillier & Lieberman, 2020).

In regard of perishable goods, it is well-documented by researchers that traditional EOQ model has some drawbacks. Typical EOQ model has inadequacy to manage perishable goods because the basic hypothesis of infinite shelf life is inadequate to cover deterioration. Neglecting the deterioration effect while calculating EOQ will always cause over estimation of optimal order quantity and subsequent inventory accumulation (Nahmias, 2019).

In their review on various EOQ based perishable inventory models, Janssen, Claus & van der Heijden (2020) concluded that even though the theories are well-established, a lot of changes are to be done in order to meet practical application requirements. They indicated that a term to present percentage of inventory lost per unit of time (θ) has to be added in the traditional EOQ formula. Consequently, the modified EOQ for perishable inventory is given by:

$$Q^* = \sqrt{[2DCo/(Ch + D\theta Cp)]}$$

where D, Co, Ch, and Cp are annual demand, ordering cost per order, holding cost per unit per year and purchase cost per unit, respectively, and θ is the deterioration rate.

Another study by Diaz et al. (2020) introduced the purchase probability instead of using demand. Disposal costs for unsold products are also introduced along with ordering costs and holding costs. The EOQ theory is used for the purpose of this study as a foundation to understand that there are several types of costs involved in

inventory decisions with the added complexity of perishability necessitating variations of the EOQ models. The theory is used to guide the analysis of the Bakers Inn distribution system in terms of ordering, holding and spoilage costs.

2.2.2 Just In Time Philosophy and Perishable Inventory.

First pioneered by Toyota in the 1970's and thereafter adopted by manufacturing businesses. The Just In Time (JIT) philosophy consists in a set of ideas and procedures that rely heavily on having minimal stock levels in order to optimize the production and transportation plans. The concept as described by Chhonker and Rai (2021), is that 'the Just In Time theory essentially minimizes inventory held by ensuring that the goods arrive at the appropriate place at the appropriate time.' It is basically a theory of the elimination of waste. Goods arrive just in time so they are only produced and consumed when and where they are needed and thereby minimize the storage and also thereby the use of capital efficiency (Liker, 2020).

The theoretical principle behind the JIT systems is the elimination of waste. In the context of perishable inventory, it translates into the reduction of losses due to perishability. In theory, if items are consumed/used exactly when they are required for immediate consumption or selling there will be no wastage. So, implementing just in time strategies will considerably reduce loss in the production of perishable goods since there will be less stock, so there will be a tangible reduction of spoiled items which also means profit margin is increased and costs for discarding expired items are cut down (Chhonker and Rai, 2021). Garcia-Diaz and Hwarng (2021) pointed out that just in time is completely adapted to the perishable products nature because they get less value over time they are stored.

The limitation of JIT systems towards supply chain interruptions is of particular concern for perishables items since if demand is higher than the available stock level, then it is impossible to cater for this need from a buffer reserve of stock. The Covid-19 pandemic illustrated clearly that lack of inventory buffers and highly coordinated supply chain systems lead to increased vulnerability for organizations given global distribution chains (Khalil, Zaman and Iqbal, 2025).

Wang and Chen (2021) performed research in JIT implementation on fresh food supply chains in seven countries in Asia. Their findings show that to succeed, firms should look at specific factors: reliable suppliers, which means formal service level agreements with penalty for underperformance; accurate demand forecasting, which is aided by historical data and analytical forecasting tools; and transportation flexible systems, which may include backup carriers and optimal routing plans. According to their results, in many cases a pure Just In Time may not be applied to perishable items business because demand is not stable, but hybrid techniques that include the combination of Just In Time principles with the use of safety stocks seem to be the ones working the best.

In this study, the principle of minimising the holding time of the inventory plays a part in JIT philosophy, while the reduction of the waste is closely related to the reduction of the inventory. Bakers Inn, however, is unique in its requirements for reliable forecasting, and flexibility in logistics.

2.2.4 TOC for Perishable Supply Chains

The Theory of Constraints (TOC) which was developed by Goldratt and Cox is based on the principle that there are typically a few limitations or constraints that restrict system performance. Focusing improvement on non-constraint system components will yield no benefit. When applied to perishable supply chains, TOC guides management decisions regarding improvement variables that most severely limit the movement of inventory through the system.

Simpson and Tan (2019) observed that typical constraints in perishable supply chains include cold storage capacity, transportation refrigeration reliability and order cycle time, while discussing TOC for fresh food distribution in Southeast Asia. Their study also indicated that targeted improvements focused on the constraints yield greater waste reduction than improvement of other elements in the supply chain distributed evenly.

With regard to distribution of bakery products, Watson and Johnson (2020) argue that lead time stability is the binding constraint in most urban environments. From their investigation of 15 urban bakery distributors in large cities, they concluded that when lead time variability is reduced from four to one hour, stale returns decrease by 41%. They also noted that no changes were required in production levels or order cycles.

In this study, TOC has delivered the key insight that the inventory management improvements need to be targeted on the most restrictive constraint in the system. In Bakers Inn, factors that can pose constraints include unreliable electricity supply which impacts production and storage, poor road conditions which impacts delivery times, and limited digital connectivity which impacts accuracy of demand forecasting. These constraints can be identified and addressed to make targeted improvements for the study.

2.3 Inventory Management Techniques

2.3.1 Demand Forecasting and Replenishment Planning

Correct forecasting will reduce the cost associated with under and over stocking situations. Excessive stocks lead to write-offs and lack of stocks lead to loss of sales. This can result in unhappy customers and affect a company's reputation. Several forecast techniques can be used to assist in good management of bread distribution. Time series analysis, moving averages, exponential smoothing and casual forecasting, which allows for the use of outside information such as weather, holidays or promotions. Aydinliyim et al (2021) states that bakeries which implement demand-based systems are able to maintain a service rate of over 95% while reducing waste by 28% and maintaining a service rate of 95%. They have found that the classic order quantity models are inapplicable for perishable products because of the variability of their demand and time sensitivity. Some of the practical measures for Bakers Inn are to have a daily order cut-off time that is coordinated with the production time and a buffer for the product shelf life (for bread, a maximum of 12 hours).

2.3.2 Age Based stock Segregation

Age based stock segregation is an inventory that allows management to manage the older stock items and to differentiate inventory prices by the product manufacturing date or near date of stock on the shelves. According to Lu et al. (2020), consumers' willingness to pay influences the quality of the items and this impacts customer demands. Thus, it is important to differentiate inventory by age in order to incorporate inventory control systems in customer demand for fresh products. With the perishable products of bakeries and pharmacies, as well as fresh produce this technique results in fewer waste products, greater sustainability and more profitability.

2.3.3 Cross Docking for Perishable Distribution

Cross Docking is a distribution strategy in which goods are generally received from suppliers and then immediately sent to customers without being placed in long term storage (Aydinliyim et al (2021). This approach reduces stocking cost with the aim of minimizing the refrigeration cost and also the risk of spoilage, especially in perishable supply chains. Acevedo-Chedit et al.(2023) conducted a study and found that cross docking helps to improve the efficiency of the logistics process, reduce waiting times and prevent unnecessary storage and handling.

2.3.4 Dynamic Pricing Strategies

Dynamic pricing, as defined by Nowak and Pawlowska-Nowak (2024), is an operating model in which a company can adapt the price of its products or services over a period of time in response to evolving consumer preferences, market dynamics and business goals. This strategy is used by retailers to ensure supply meets demand, considering factors such as shelf life, demand elasticity, and customer behavior (Chen, Liu & Lu, 2018). Dynamic pricing in contrast with static pricing, considers market competitiveness and perishability, making it especially well-suited for cases where the value of the product fades quickly.

2.3.5 Vendor Managed Inventory

Vendor Managed Inventory (VMI) is a partnership-based supply-chain management approach that involves the supplier in managing the inventory level at the retailer. In

perishable situations, this approach boosts responsiveness and prevents waste. The integration of discount strategies in VMI models can help improve the cost efficiency and reduce the amount of spoilage in perishable supply chains (Kaasgari et al., 2017). This way, the retailer is spared of certain risk of overstocking or stock shortages, and the coordination of the stock is better.

2.3.6 First Expired, First Out

The first expired, first out (FEFO) inventory management method helps reduce waste and preserve product quality by focusing on those items that have the shortest shelf life. The FEFO warehouse management concept developed by Hertog et al. (2014) is based on the idea of issuing stock based on "expiration dates" instead of "arrival dates". Important in the context of perishable foods such as bakeries, dairy and pharmaceuticals, where implementing this method ties inventory rotation with product safety requirements and cost control goals.

2.3.7 Real Time Monitoring and Visibility Systems

Real time monitoring and visibility systems (typically using Internet of Things (IoT) technologies) are digital platforms that track the condition of products (e.g. temperature, humidity, movement) throughout the supply chain. According to a research done by Maheshwari (2025), “IoT enabled visibility system gives managers with continuous data streams, which improves forecasting accuracy, optimal replenishment and strengthens responsiveness to demand fluctuations.” In perishable goods settings, these types of systems are especially crucial as they minimize the risk of food spoilage and improve cost management to allow management to have real-time access to accurate and current inventory data.

2.4 Cost Control in Perishable Goods Environments

2.4.1 Algorithmic Inventory and Replenishment Policies

Traditional approaches to inventories are not appropriate for perishable situations because inventories are believed to be infinite, and in many such situations, batches go out at the same time, losing a substantial amount of money. In this regard, operational research is directed towards age-based frameworks of control and stochastic dynamic programing where the shelf life is regarded as variables (Doung, Wood, and Wang, 2018; Pavlova, 2026). With the best models, managers can use analysis to conduct the same financial calculations as they do when purchasing items for their inventories, but when they also face stockout penalties (Wu, 2026). Research also suggests that allowing multiple open orders as opposed to waiting for the one order cycle to clear results in a definite cost saving as steady fresh orders flow in which correspond to erratic consumer orders. (Poormoaid, Gurler and Berk, 2020)

2.4.2 Effective Inventory Management

In case of perishables, rational and efficient policy of inventory of these goods involves maintaining the perishability stock at a minimum cost and this includes investments into deterioration and replenishment policies (Filina-Dawidowicz 2016). This theory has been further confirmed by recent studies; Hasiloglu-Ciftciler and Kaya (2020) argue that the implementation of pricing and inventory management will provide profit and reduce waste, whereas under deterioration conditions, balancing restocking time and carrying cost and shortages is crucial to managing the inventories effectively. Likewise, Frontiers in Sustainability (2024) highlights that the cost side must be coupled with the environmental side by factoring in the carbon emissions and freshness dependent demand in the models of sustainable inventories. Overall, these views show that inventory control for perishables is not just about efficiency, it's also about minimizing spoilage, minimizing losses and ensuring sustainability.

2.4.3 Waste Reduction Strategies

Waste reduction is not only about cost savings for perishable businesses, but also an environmental sustainability objective. Food waste occurs at various points in the food supply chain including consumer waste, retail food waste, and food waste in the food production and distribution process (FAO, 2020). De Keizer, Akkerman, Granow and

Bloemhof (2019) identified two types of waste: unavoidable waste (waste because of losses in the production, distribution or consumption system) and avoidable waste (waste because of management decisions or inefficiencies in the production, distribution or consumption system). They also discovered that 40-60% of the perishable waste in developed economies is preventable with proper and efficient inventory management methods.

After analysing the waste reduction initiatives undertaken by food distributors in India (63 food distributors), Sharma, Patwardhan and Kumar (2021) identified 6 waste reduction practices that are consistently associated with the reduction of waste:

1. Daily freshness inspections;
2. Automated expiry alerts;
3. Targeted Waste monitoring indicators;
4. Study of the causes of spoilage incidents;
5. Training and deployment of employees on rotation procedures,
6. Programs to lower the amount of money that suppliers are returned.

The 68% reduction in the rates of spoilage for distributors who used all six strategies as compared to those who used less than three strategies indicates the significant impact of the strategies.

2.4.4 Activity Based Costing for Perishables

Activity based costing (ABC) seeks to assign indirect costs of activities to the products and services that consume these activities in their production and distribution process. By defining cost drivers specific to the perishable nature of items like a short shelf life, number of hands that have handled the product and its energy needs and controls, ABC can offer improvements over traditional costing for perishables environments (Cooper and Kaplan, 2019, as updated by Maas, van de Wiel and Schins, 2021). Maas, van de Wiel and Schins (2021) used ABC within a European fresh and frozen bread distribution network to discover previously unnoticed disparities between product lines. In their model fresh items proved significantly more expensive than frozen items, primarily with regard to handling, marking down and waste, though frozen products were much more energy intensive. Their findings were then used to develop pricing and product mix. Williams and Green (2020) developed a

time driven ABC model for costing perishable inventory with receiving, temp controlled storage, age based pricing, and wasted disposal included in their framework. Through this method, a fresh produce distributor identified unprofitable customer sectors and adjusted service levels to maintain profitable profitability while reducing costs by 11 percent and maintaining customer satisfaction.

2.4.5 Structural Cost Drivers and Environmental Internalization

Today's operations management strategies have increasingly adopted the concepts of the circular economy and waste valorization as methods for internalizing environmental costs and creating value out of latent inventory. Traditionally, expired goods were considered either a complete loss (asset write-off), or simply a high disposal cost (Drury, 2018). New accounting research suggests, however, that when cold chain energy footprint and emissions waste values are considered in accounting models, the ideal inventory levels decrease, as does waste (Pavlova, 2026). Companies can find structural profit when they form upcycling partnerships that allow for use of items nearing expiration rather than disposal of those goods. Empirical models estimate that waste value becomes a stream of revenue instead of a cost when recovery rates reach around 35% converting items to animal feed or biogas (Krommuang et al., 2026; Pavlova, 2026). Structural supply chain risks are diminished with waste reuse (Govindan et al., 2019).

2.4.6 Technology and Automation

More accurate allocation of spoilage and handling costs in perishable environment using advanced technologies. RFID provides real time automation of tracking batch level and temperature exposures, directly into time-driven activity based costing (TDABC) models (Jedermann et al., 2019). AI-driven demand Forecasting reduces negative yield variations (Tsang et al., 2021). The traceability feature of blockchain can enhance the ease of loss segregation and determine the period cost cutoffs (Zhang and Lee, 2023). These solutions, in combination, make it possible to track the cost of spoiling as a product cost, and not as a pooled overhead.

2.4.7 Supply Chain Coordination and Redesign

Reducing costs means rethinking the whole supply chain to avoid systemic delays in which perishable products languish. The geometric characteristics of a distribution network affect the speed of a product from manufacture to the end customer, and are therefore important for its structural efficiency. By putting in place decentralized multi-echelon hub systems, businesses can efficiently redistribute commodities and consolidate product flows, taking use of economies of scale to drastically reduce handling and transportation costs (Gharakhani Dehsorkhi, 2026). Operational execution practices, such as disciplined FIFO stock rotation, clear information flow in the supply chain, and precise on-time purchasing, ensure such efficiency at point-of-sale (Aleruchi 2025). By combining the physical infrastructure with tight floor management, firms can effectively eliminate the structural fiction that leads to unnecessary product expiry and won't earn any revenue.

2.5 Challenges in Perishable Inventory Management

2.5.1 Short Shelf Life, Product Deterioration, and Spoilage Costs

The short shelf life of bakery products greatly impacts the efforts of Bakers Inn Sales and Distribution. Bakery items retain commercial viability for only 24 to 72 hours. Unlike other products, these items lose a lot of their appeal, both economically and structurally, in terms of texture and moisture, a short while after they are produced (Rigzin and Navee, 2024). This presents additional challenges as inventory loses its value upon leaving the production plant.

Returned unsold products in Bakers Inn’s distribution networks are often unsellable within full value the following day in various sales channels, including super markets, tuck shops and street vending. Per Drury (2018), inventory value in a traditional cost accounting system is assumed unchanging, and as a result earns the company revenue. However, in a bakery inventory, products continually lose their value. As a result, daily adjustment and reconciliation of the stock value is imperative. The absence of an inventory valuation write-down for products no longer suitable for sale may lead to

elevated asset value and earnings affected negatively due to the under reporting of profit.

Because of spoilage, there are enormous challenges in managing the production costs, as the company suffers expense burden of production, transportation, storing and packaging bread products that may never sell. Spoilage costs lead to a decline in earnings for the company and therefore necessitate the implementation of a robust inventory monitoring system (Horngren, Datar and Rajan, 2021). Unsold, spoiled bread at an outlet reflects a financial loss to the company. The bread cannot be processed into the final products. In such situations, the bread is often unsold at a very low value as animal feeds. A lot of unsold bread is also thrown away. Moreover, inaccurate forecasting can lead to overproduction and increased waste, while underproduction can lead to inventory shortages and customer dissatisfaction. Therefore, Bakers Inn must continuously balance the availability of products against the spoilage in order to manage their profitability and cost control efficiency.

2.5.2 Demand Forecasting, Overstocking and Return Logistics

Another big hurdle in inventory management for Bakers Inn Sales and Distribution is demand forecasting. Demand for baked goods can change several times throughout the day and can be influenced by customer preferences, the state of the economy, the weather, what promotions the store is running, and the buying patterns of those in the store's vicinity. Saghiri (2023) states that the balance of perishables puts an even greater challenge on inventory since a business must keep products stocked, fresh, and minimize waste.

In order to not fall out of stock and remain shelf dominant at supermarkets and tuckshops, Bakers Inn's distribution team oversupplies shops. Gunasekaran, Jie, and Nair (2019) state that to avoid a substitution of brands by customers, retail chains encourage the placement of excess stock. This oversupply results in a return logistics conundrum due to unsold loaves being sent back to distribution depots once the bread has gone out of date.

Chopra and Meindl (2021) refer to this scenario as the “bullwhip effect” where there are minor imbalances in the demand by customers resulting in major inventory imbalances in the supply chain. For Bakers Inn, returned breads is a total loss on materials, labor, and distribution due to the bread being inedible and unable to be sold again. Nomura, Liu and Nishi (2025) also provide that returned stocks and firesale products become a norm when employees of a business constantly order products to achieve their sales.

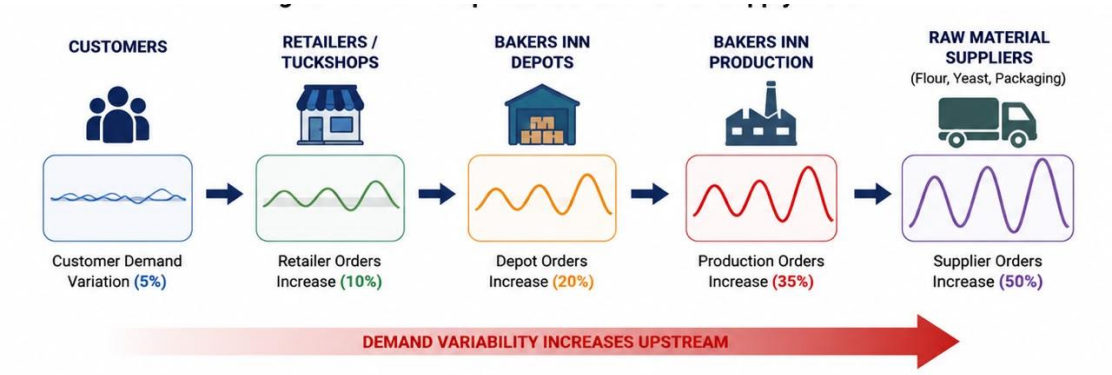


Figure 1. The bullwhip effect

Considering management accounting, growing returns lead to excess spoilage, wasted returns, and an increases in the cost of disposal. Also, poor demand forecasting always ends in inventory imbalances; there is either too much unsold inventory leading to increased spoilage, or there is too little stock leading to a loss of sales and customer dissatisfaction (Sasanuma, Hibiki and Sexton, 2021).Therefore, Bakers Inn faces continuous pressure to improve forecasting accuracy and align production levels with real time market demand.

2.5.3 Transportation, Fuel Costs, and Distribution Inefficiencies

Inefficiencies in transportation and distribution systems pose significant challenges to businesses managing perishable inventories. Very often, products must reach customers in the least possible period to ensure the products do not lose their freshness. Bakers Inn operates a high volume, daily distribution of bread to urban supermarkets, peri-urban retailers, tuckshops, and rural outlets in all the provinces of Zimbabwe. As such, the management of Bakers Inn’s inventory system is highly reliant on efficient logistics systems and a dependable transport network.

The volatility of fuel prices is one of the major issues. Bakery products cannot afford to sit in a warehouse uncollected, and as a result, delivery trucks must hit the road every day, irrespective of the cost of transportation, and the level of utilization of the truck. The fulfillment of daily transportation irrespective of the cost has the effect of raising fuel prices which consequentially increases the cost of doing business and decreases profitability. Furthermore, fragmented delivery systems lead to higher transportation costs, as serving a network of small retail traders requires more costly delivery.

Afif and Doyon (2025) contend that poor infrastructure and the frequent need to alter a delivery route, coupled with the wear and tear of delivery vehicles is costly in the distribution of perishable products. Bakers Inn suffers from road traffic congestion, delivery delays leading to product perishability, and ad and fuel scarcity. Since bread is perishable, even delays in the delivery schedule of less than a day can cause product returns from the clients and loss of product.

Inefficient transportation systems increase unplanned delivery costs, higher fleet maintenance costs, and increased inventory losses. Kaplan and Atkinson (2015) argue that logistics costs must be strategically and perpetually evaluated as they have a direct impact on the cost control of operations. Bakers Inn suffers from inefficiencies in its delivery system as inadequate route planning leads to decreased delivery rates and increased fuel costs.
As a result, transportation management is not only a logistics concern but also a major cost accounting concern because poor distribution performance increases spoilage rates, operational costs, and overall inventory losses.

2.5.4 Infrastructure Instability, Technology Limitations, and Information Gaps

The problem that developing countries like Zimbabwe face in relation to managing stocks of perishable items such as baked goods, rests in missing elements of the supply chain. These elements range from the continuous supply of electricity to adequate transport systems, communications, advanced tracking systems, and good

quality up to date information systems. Unfortunately, such supply chain systems and infrastructure development is intermittent in most of the emerging markets.

The baking schedule at Bakers Inn is usually thrown off balance by load shedding, resulting in an inefficient proofing system and a waste of resources. The authors cite a deliberate reference to the effect of an unstable, irregular supply of electricity, on the perishable goods supply chain. (Gardas et al, 2025). Intermittent power supply can cause delays in production and can result in baked goods reaching the retailer past their useful life, thus affecting the supply schedule and increasing losses. Bakers Inn may be forced to rely on a combination of backup diesel generators and other energy systems during a supply chain disruption to help maintain a greater level of continuing operations. These combined systems increase the cost of operations (due to diesel supply, maintenance and capital costs) and, the increased overheads are beyond the company's ability to control, are a significant burden.

Again, a troublesome situation for the company is the lack of visibility of inventory in near real-time. Most of the informal retailers and remote distribution points lack integrated digital systems that can interconnect real-time sales and stock data. As noted by Tyagi, Tiwari, and Sharma (2024), poor visibility of inventory leads to inaccurate forecasts and greater levels of spoilage because managers have difficulty monitoring the flow of stock and expiry dates. A lack of information between the depots and retailers at Bakers Inn, for example, can lead to some retailers having too much inventory while other retailers have too little. Additionally, according to Afif and Doyon (2025), lack of connectivity digitally makes it harder for coordination throughout the supply chain as well as increases the number of returns. Poor inventory records ultimately lead to inaccurate stock values, greater levels of spoilage, and less effective decision-making. Thus, there are two main obstacles for the proper management of inventories and cost controls in the distribution of perishable baked goods; namely limitations in technology and unstable infrastructures.

2.5.5 Regulatory Compliance, Food Safety, and Environmental Waste Costs

Food distribution companies like Bakers Inn have a lot of regulations to comply with depending on the nature of the food. For example, bakery products that Bakers Inn

sells are susceptible to eating by microorganisms, growth of mold, etc. Laws and regulations regarding food safety and product hygiene compel distribution companies to ensure hygiene throughout the supply chain from transport and storage to distribution. Bakers Inn has to maintain high levels of hygiene during the transportation and distribution of its products. Otherwise, it risks incurring product recalls, legal risks, a negative public outlook, and the loss of customer trust. Therefore, an extra cost to transport companies is the management of compliance to food safety standards. This includes regular training of employees, cleansing of the transport and storage systems, establishment of protective packaging systems, and development of quality assurance frameworks. These costs ultimately affect the pricing of the products Bakers Inn sells.

Furthermore, food waste also contributes to pollution and gives a poor image to companies. Thus, to maintain a good image, companies have to limit spoilage. Waste Disposal Costs are an additional financial burden to businesses from a Management Accounting perspective, in addition to the usual production losses.To efficiently manage perishable inventories at the bakery, Bakers Inn must find a way to be profitable, comply with regulatory requirements, protect the environment, and ensure customer safety.

2.6 Empirical Evidence

2.6.1 Objective 1: Inventory Management Techniques Currently Used in Perishable Goods Distribution

There are several empirical studies that have explored the inventory management techniques in perishable goods distribution. While conducting extensive literature review on more than 200 studies, Nahmias (2019) found that age-based issuing policies (FIFO/FEFO) outperform LIFO in reducing spoilage in general, the average reduction in spoilage of 3-day shelf-life products was 40% under FIFO. According to Zhang, Li and Liu (2022), automated FIFO systems in the food distribution warehouses in China reduced the rates of food spoilage by 62% in comparison to

manual systems, while the tracking with blockchain systems ensures an irrefutable record of the manufacturing date.

They explored the adoption of technology by 150 food distribution companies in India, and found that RFID-based tracking had an 94% accuracy rate for inventory as opposed to 78% for barcodes and 65% for manual.They studied the technology adoption by 150 food distribution companies from India and found that RFID-based technology had 94% accuracy rate for inventory while barcodes had 78% accuracy and manual had 65% accuracy. But two major challenges were perceived complexity (67% of non-adopters) and implementation cost (89% of non-adopters). Resource constraints appear to be significant limitations: large companies were four times more likely to be using RFID than small companies. In their field experiment, Aydinliyim et al. (2021) found that sales of bakery products decreased by 22% due to spoilage and sales of bakery products increased by 8% due to freshness-based pricing in bakery chains in China. Rationalization was well received by the customer if it was explained well.

Although these studies give clear evidence of the effectiveness of FEFO, technology adoption and the effectiveness of dynamic pricing in the developed and emerging economies, there is scarce empirical evidence on their use in Zimbabwean bakeries where infrastructure problems, economic volatility, and resource challenges are different. In this study, the researcher aims to fill this gap by exploring the inventory management practices that are being implemented at Bakers Inn Sales & Distribution.

2.6.2 Objective 2: Cost Control Mechanisms and Their Effectiveness in Managing Spoilage Costs, Return Logistics Costs, Distribution Costs, and Infrastructure-Related Expenses

There are several empirical studies that have explored the inventory management techniques in perishable goods distribution. While conducting extensive literature review on more than 200 studies, Nahmias (2019) found that age-based issuing policies (FIFO/FEFO) outperform LIFO in reducing spoilage in general, the average reduction in spoilage of 3-day shelf-life products was 40% under FIFO. According to Zhang, Li and Liu (2022), automated FIFO systems in the food distribution warehouses in China reduced the rates of food spoilage by 62% in comparison to

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2.6.3 Objective 3: Challenges Associated with Perishable Inventory Management and Their Impact on Cost Control Effectiveness

There have been some studies that have identified problems with perishable inventory management. Kumar and Suresh (2019) surveyed 200 food distributors in India, Kenya and Vietnam and concluded that 55% of the food was lost due to the lack of infrastructure (unreliable electricity, poor roads, no cold storage). The second problem was economic volatility, with 68% reporting exchange rate fluctuations and inflation as problems. Organisational factors can partly address infrastructure challenges as evidenced by the 30% reduction in spoilage that was achieved with the formal inventory training programme.

Mbizi and Gwangwava (2023) employed a mixed methods approach to evaluate 25 bakeries in Zimbabwe, showing that 68% of the bakeries experienced a rate of spoilage of more than 15%. Poor electricity supply reliability (72% of responses), poor road conditions (58%) and poor demand forecasting (45%) were the most common causes. Cost control was cited as the top priority (82% "critical" or "very important"). Only 34% had formal inventory management systems though.

According to the FAO, (2020) Zimbabwe is estimated to be losing 15-20% of bakery products between production and consumption, contributing to a loss of about $50 million annually, mainly due to inadequate storage (35%), inefficient distribution (30%) and poor demand forecasting (20%). According to Gardas et al. (2025), intermittent power supply leads to delays in production and requires expensive backup power systems, which have a direct impact on operational expenses. Tyagi, Tiwari and Sharma (2024) identified that lack of transparency puts inventory visibility under question, resulting in wrong estimates and higher spillage. According to IPCC (2021) reducing food waste is a cost-effective climate mitigation strategy, having a return of $14 for every single dollar invested.

Although these studies have pinpointed some of the challenges, there is little empirical evidence on the specific challenges that affect cost control effectiveness in Zimbabwean bakeries. The macro level estimates are presented by the FAO which do not include a discussion of specific mechanisms, whilst challenges are presented by Mbizi and Gwangwava, but these are not quantified in terms of the cost impact. This study attempt to bridge this gap by evaluating certain challenges at Bakers Inn Sales and Distribution and relating them to the relationship with cost control effectiveness using hypothesis testing.

2.6.4 Objective 4: Proposed Improvements in Inventory Management Strategies and Cost Control Mechanisms

Various research has suggested a number of remedies to improve perishable inventory management. Hasiloglu-Ciftciler and Kaya (2020) suggested that small size and large frequency orders should be used due to the remaining shelf life instead of the conventional EOQ models for bakery operations. Heizer, Render and Munson (2020)

showed that waste is consistently decreased with the adoption of lean, such as small batches, visual management, and pull-based replenishment, with one bakery cutting down their number of stale returns from 18% to 9% in 6 months. The study also emphasized the significance of the role of employees in lean project and suggested that employees should be organized into cross-functional teams and supported by management.

Aydinliyim et al. (2021) suggested tiered pricing depending on the remaining shelf life with effective communication to the customers to ensure customer satisfaction. Sharma, Patwardhan and Kumar (2021) suggested 6 practices for waste reduction, which are daily freshness checking, automated expiry alerts, targeted waste monitoring, spoilage incident analysis, employee training and supplier return waste reduction. To be able to allocate costs correctly and pinpoint unprofitable products and customer segments, Maas, van de Wiel and Schins (2021) suggested activity-based costing.

The use of AI-based forecasting (Tsang et al., 2021), RFID-based batch level tracking (Jedermann et al., 2019), and blockchain-based traceability (Zhang & Lee, 2023) are examples of technology-driven improvements. Christopher (2016) suggested real-time inventory visibility, flexible delivery routes, collaborative partnerships and performance metrics that include spoilage. To reduce oversupply and returns, Nomura, Liu and Nishi (2025) suggested that sales incentives should be tied to net, instead of gross, sales.

Such research suggests promising approaches, but most of the research was carried out in developed countries (Europe, Turkey, China and India) where infrastructure and technology availability is relatively stable. The applicability of these strategies in Zimbabwe is limited with limited evidence, as resource constraints and infrastructure deficits pose unique challenges. This study will rectify these deficiencies by suggesting appropriate enhancements for Bakers Inn Sales and Distribution, taking into account the constraints of resources and infrastructure.

2.7 Research Gap

Although there has been a lot of literature on the management of perishable inventories, past empirical research has not been able to come up with quantified statistically significant relationships between specific inventory practices and cost control results. While some studies, including those of Nahmias (2019), Gupta and Chaturvedi (2018) and Sharma, Patwardhan and Kumar (2021), have documented the effectiveness of FEFO policies, technology adoption and waste reduction practices, many have been descriptive and reported in percentage, without testing the statistical significance of the relationships between the measures and/or isolating the contribution of individual practices to cost control. Moreover, the models constructed by Hasiloglu-Ciftciler and Kaya (2020), Maheshwari et al. (2025), and Kavoosi et al. (2025) are based on the premise of fixed infrastructure conditions (be it reliable electricity supply, paved roads, or digital connectivity), which may not be the reality of developing economies. The situation in Zimbabwe with its frequent load shedding, inadequate road infrastructure, and restrictions on digital access with informal retailers has been poorly empirically studied, with macro-level estimates based on FAO (2020) not accounting for how inventory practices influence spoilage rates and sectoral studies by Mbizi and Gwangwava (2023) and Murairwa (2025) limited to descriptive findings without testing the relationship between inventory techniques, infrastructure challenges and cost control effectiveness.

2.8 Chapter Summary

this chapter contains a review of theories and practices for inventory management and cost control in environments with perishable goods. It illustrated the shortfalls of traditional models like EOQ applied to products with limited shelf lives, and potential solutions like Just-in-Time, FIFO / FEFO rotation, and Theory of Constraints for minimizing spoilage and maximizing throughput. Other topics discussed included demand forecasting, age–based stock segregation, cross–docking, dynamic pricing and vendor-managed inventory as a means to increase agility while reducing waste. These Include modern technologies highlighted for Increased visibility, forecasting accuracy and operational control (real-time monitoring; IoT systems).

In general, while classical models serve as a basic framework for addressing inventory management in an e-commerce context, they must be tailored to the specific challenges inherent in perishable goods. However, these strategies have substantial contextual gaps when applied to Zimbabwean bakeries, where infrastructural constraints and fickle demand patterns necessitate service models tailored to specific contexts. This lays the framework for Chapter Three whereby methodology is outlined on examining how Bakers Inn has managed its stock and controlled its costs.

CHAPTER III

RESEARCH METHODOLOGY

3.0 Introduction

The research methodology applied in the investigation of the effectiveness of inventory management systems and their effect on cost control in Bakers Inn Sales and Distribution is highlighted in this chapter. The chapter describes in detail the research methodology, research design, population, sample, sampling technique, data collection method, type of data collected, process of collecting the data, validity and reliability of the data collected, data analysis and presentation methods, ethical issues considered, and chapter summary.

3.1 Research Approach

This study used a quantitative descriptive case study method to study the inventory management procedure and the effectiveness of controlling costs in Bakers Inn Sales and Distribution. The quantitative descriptive method is suitable for gathering data that is measurable and standardised and analysing the data with statistical methods to understand patterns, distributions and relationships between variables from a sample (Creswell & Creswell, 2018; Saunders, Lewis & Thornhill, 2019). Quantitative research methods generally involve the use of a structured instrument, such as a Likert scale questionnaire, to collect quantitative data which can then be systematically analysed to detect trends and associations (Hair et al., 2019).

The quantitative descriptive case study design was used for three reasons: First the study set out to describe and quantify the current situation in terms of how well inventory management practices at Bakers Inn are adhered to, including the level of

adoption of FEFO rotation, stock sorting and employee training, as well as the frequency and severity of inventory management challenges like reverse logistics costs, load shedding and infrastructure constraints. The use of descriptive statistics (frequencies, percentages, means and standard deviations) is appropriate for the purpose of giving a profile of these operational realities, based on data (Pallant, 2020). Secondly, the study aimed to examine statistically the association that is considered to exist between the variables of interest which are the relationship between the techniques of inventory management and the effectiveness of cost control and the relationship between the problems of the perishable inventory and its cost. Correlation analysis is an important tool in quantitative descriptive research that will enable the researcher to study the strength and direction of these relationships without implying causality (Field 2018). Third, a quantitative approach also gave the researcher the opportunity to test his hypotheses formulated in Chapter One through the application of inferential statistics (Pearson correlation) to provide empirical evidence beyond the narratives of anecdotal observation (Creswell & Creswell, 2018).

However, it is important to note that this study does not attempt to make a causal inference between inventory management practices and cost control. Because of the descriptive case study design, along with the use of correlation analysis, the study only offers associations and patterns, but not proof that a cause and effect relationship exists. Correlation coefficients provide information on how closely the two variables are related, but are not evidence that one variable is causing changes in the other as indicated by pallant (2020). Thus, the results of the study should be viewed as statistical associations, rather than causes of action. This reading is consistent with the descriptive research design, and recognizes the constraints of survey research within one organization.

The quantitative descriptive case study approach also enabled the gathering of data from the geographically diverse sample (employees from 5 depots in the Southern Region of Bulawayo, Gweru, Masvingo, Kwekwe, and Zvishavane) based on a standardised questionnaire by Google Forms. This ensured consistency of data collected, and enabled a systematic comparison of responses between departments and depots (Bell, Bryman & Harley, 2022). The questionnaire was structured in a manner that each research objective had Likert scale questions to ensure the researcher

collected accurate data for the constructs being studied (FEFO implementation, reverse logistics costs, route optimisation and infrastructure constraints) and that the instrument was reliable (using Cronbach's Alpha (Taber, 2018)). The use of this method results in a well-established, empirically supported assessment of inventory management and cost control practices at Bakers Inn as well as statistically significant correlations in order to make recommendations in Chapter Five..

3.2 Research Design

The study used descriptive case study design because it was considered to be the most suitable design for the achievement of the four research objectives and the test of the related hypotheses. Descriptive case study design is especially appropriate for research aimed at describing and illustrating in detail what is happening with a particular set of variables in a specific organisational context, as well as the interrelationships and issues that emerge in that context (Yin, 2018; Stake, 2018). This decision to use this design was driven by the nature of each of these research goals as detailed below.

Objective 1: To identify inventory management techniques currently used by Bakers Inn Sales and Distribution. This objective was best achieved by a Descriptive case study design, which allows the researcher to describe and classify current practices in the context in which they are used. The descriptive case study approach enables a detailed account of existing practices (like FEFO rotation, stock sorting, training practices of employees, and technology and technology adoption) as they are practiced in several depots without manipulation of variables. This design enabled the gathering of standardised information from the employees themselves who are directly involved in the inventory operation, yet still allows for the flexibility of gathering the specific details that vary in functional departments and depot locations. The descriptive quality of the design was critical to developing an understanding of "what is currently happening" as a basis for any recommendations to improve it.

Objective 2: To evaluate the cost control mechanisms currently employed by Bakers Inn Sales and Distribution, including their effectiveness in managing spoilage costs, return logistics costs, distribution costs, and infrastructure-related expenses. The objective lends itself to a descriptive case study design, as it enabled the systematic assessment of multiple cost control mechanisms at once, within a structured instrument which measured each mechanism with several items. The case study design allowed the researcher to break down cost control into its component parts – spoilage management, return logistics, distribution fuel and infrastructure costs – and discuss each as a separate element for the particular operational issues that the organisation encountered. In addition, the case study approach enabled the gathering of perceptual data from the respondents in the various functional areas (finance, distribution logistics, fleet management and dispatch) thus allowing for multiple perspectives on the effectiveness of the existing cost control mechanisms. Case study research is multi-perspective, which is important to enrich the findings and increase the validity of the research (Stake, 2018).

Objective 3: To assess the challenges associated with perishable inventory management and their impact on cost control effectiveness at Bakers Inn Sales and Distribution. The descriptive case study design was well suited to this objective as it enabled the researcher to explore issues related to challenges as they might be experienced within the specific context of the distribution network of Bakers Inn and mapped out the issues related to the challenges across the context. Case study designs are particularly useful when the research questions are of "how" and "what" in the context of their actual environments (Yin, 2018). The case study design allowed the researcher to see the interrelationship between the variables, such as how load shedding affects production schedule, which affects delivery schedule, which affects freshness of the product and return rates, unlike an experimental design where variables are kept independent from their environment or cross-sectional surveys that only take a snapshot of the situation. This holistic perspective was critical to the ability to evaluate the real effect on the effectiveness of cost control. Furthermore, the design allowed for testing of Hypothesis Three (H_{03} and H_{13}) which stated that there will be a negative relationship between perishable inventory challenges and cost control perceptions of these challenges, since quantifiable data were collected for both challenges and cost control perceptions from the same respondents.

Objective 4: To propose improvements in inventory management strategies and cost control mechanisms to enhance operational efficiency and financial performance. The descriptive case study design was suitable for the aims of this study, since it focused on a contextual understanding of the situation, which is required to make practical and context-sensitive recommendations. Case study research provides findings that are more likely to be realistic and feasible because they are based on what the organisation actually does on the ground, recommendations are more likely to be actionable, and the findings are more likely to be relevant to the organisation on the ground because they are based on what really happened (Hammond & Wellington, 2021). The case study design allowed the researcher to identify specific disconnects between the existing situation and the desired situation, such as the fact that technological batch tracking was not widely used, or that return logistics were expensive, and then recommend specific actions to bridge those gaps and improve Bakers Inn's situation. Moreover, the design's focus on the Southern Region depots ensured that the recommendations were relevant to the infrastructure conditions, economics and operational challenges of these depots and not generic that may not be relevant to the Zimbabwean context.

Justification for the Case Study Approach to Hypothesis Testing.
Alternative Designs Considered and Rejected.

Bakers Inn Sales and Distribution was used as the case study in the study. As stated by Yin (2018), a case study examines a unit that offers an illustration of a particular area of study. It works well for small-scale research where the researcher has easy access to a high degree of contextual information and highly relevant data (Hammond & Wellington, 2021). A case study provided a more thorough grasp of the subject being studied since it considers a range of factors specific to the organization. The descriptive case study design was chosen because it enabled the researcher to provide a detailed account of existing inventory management practices: specifically FEFO stock rotation, reverse logistics processes, route planning systems, and infrastructure adaptation strategies; while documenting associated challenges and identifying areas for improvement (Stake, 2018).

3.3 Population

According to Obilor (2023), a population is the total group or assembly of people, things or events that can be distinguished by certain specific characteristics and are of interest to an investigator. Taherdoost (2021) defines a population as a group of entities the researcher is studying and making inferences about. It is defined as all the observations of a random variable, according to Wegner (2016). In this sense the population can be considered as the whole group of people, events or topics that the researcher wants to study. In many cases, because of several constraints including limited budget, time and urgency, there are very few research projects that are able to study every member of a community, as populations may be large (Casteel & Bridier, 2021).

Bakers Inn Sales and Distribution was the research unit. The target population of the study was the management and staff of the company. Asiamah et al. (2017) describe the target audience as a group of people "the investigator is willing to learn more about." The target population of the study was employees from sales, distribution logistics, fleet management, dispatch and finance departments. The researcher focused on the following functional domains as these are more familiar to her and are relevant to this particular line of research as to inventory management and cost control in the context of a perishable goods environment.

3.4 Sample and Sampling Techniques

If the sample size is to be determined, it is often used as a representation of the entire population because it is difficult to handle the entire population due to its large size. Sample size is the subset of a target population that is selected to represent the target population (Lakens, 2022). The number of employees that are used in a study is known as the sample size. This sample provides information about a target population as a whole. Hence, for this purpose, questionnaires were sent to the respondents at the selected depots. As proposed by Kothari (2019), a sample of at least 10% of the intended population acts as a good representative sample of the population.

Sampling for conducting research is selecting some members of the population to be targeted, says Taherdoost (2021). There are two types of sampling: probability sampling and non probability sampling. According to Cooper and Schindler (2014), probability sampling is a sampling technique that guarantees that each individual in the population at large has an equal probability of getting selected. Among other things, probability sampling involves stratified, systematic, and random sampling. In non-probability sampling the chances that any individual member of the population that will be sampled are not known. Etikan, Musa and Alkassim (2016) cite convenience sampling and judgmental sampling as two instances of non-probability techniques.

3.5 Judgmental Sampling

The researcher employed judgmental sampling approach (also known as purposive sampling), to select a sample of respondents. Non-probability sampling approach is one of which is judgmental sampling. The researcher was able to choose respondents who understood the goal of the study and possessed the necessary expertise thanks to purposive sampling (Campbell et al., 2020). The employees that were chosen for the survey questionnaire in this study have a responsibility and know of the inventory management practices and costs that Bakers Inn encounters in its fields of work which include sales, distribution logistics, fleet management, dispatch and finance.

The participants were selected by purposive sampling and the criteria were as follows (Patton, 2015):

(a) with at least one year of experience in their current job,
(b) be directly involved in inventory related decision making, stock rotation operations, return logistics, route planning or cost monitoring, and
(c) voluntary participation in the study.

These criteria ensured that there was sufficient knowledge and experience among the participants to provide accurate information on FEFO implementation, challenges of

reverse logistics, fuel cost management, and the drivers of fuel infrastructure costs (Guest, Namey & Mitchell, 2017).

3.6 Data Collection Methods / Research Instruments

Information for these important questions can be collected through data collection. Research instruments are defined as a collection of techniques on how the researchers need to collect information from research subjects (Sukmawati, 2023). Research instruments, in turn, are defined by Jain (2021), as the data collection techniques that will be merged with other information for analysis. The details about the research instruments can refer to anything that the investigator uses to gather information from field (Mligo, 2016), or a second study site. Data was obtained through a self-administered Google Forms questionnaire which was disseminated to the research respondents concerning the research problem.

3.6.1 Questionnaire

According to Taherdoost (2021), a questionnaire is "a research instrument that contains a series of questions to obtain information from the respondents." A part of a questionnaire is set up as a way human beings will not have a 'wrong' answer as they can choose their answer (Cohen, Manion & Morrison, 2018). It was decided to use an online questionnaire of Google forms type for collecting the data. The same questions and response alternatives are administered to each respondent via a self-administered questionnaire.

The multivariate randomized control trials used were self-administered questionnaires, which are less costly and take less time to complete than face-to-face interviews and provide a large amount of qualitative data in written format, eliminating the worry of respondents with confidentiality concerns (Bryman, 2016). Another advantage of allowing the respondent to determine the pace at which they completed the questionnaire was to further strengthen the anonymity of the respondents (Bell, Bryman & Harley, 2022). Google Forms was selected as the form-collection tool because of its easy access and the auto-collection of data into a spreadsheet as well as the ability to send it out via email or messaging service.

The questionnaire was divided into six sections, corresponding to the research objectives:

Section A: Demographic Information collected information pertaining to gender, highest education, present department and length of service at Bakers Inn. The variables facilitated the cross-tabulation analysis and the researcher could compare the responses based on the various categories of jobs and operation contexts.

The second research objective, Managing Fresh Stock and Expiration Dates (FEFO), was assessed in Section B. The five Likert scale items that were assessed were: whether bread with the shortest remaining shelf life is prioritised for loading onto distribution trucks; whether dispatch and delivery workers are trained to check the freshness dates of products; whether Bakers Inn has reliable systems (such as ERP software or digital tracking logs) in place to track batch expiration timelines; whether stock is sorted daily to ensure that older batches are separated from fresh production runs; and whether the current methods of stock rotation are considered effective in reducing daily bread waste and financial write-offs.

The second research objective was examined in Section C: Reverse Logistics and Accounting for Return Product Costs, which explored the impact of product returns from the retail network on the profit margins of a company. The four Likert-scale items evaluated were: (1) the degree of accuracy with which Bakers Inn's accounting system identifies the financial cost for unsold bread returned from shops, (2) how much pressure sales representatives feel to put the excess bread on shelves to meet the company's sales goals despite the risk of high returns, (3) the effectiveness of selling returned or stale bread to secondary markets, e.g., animal feed manufacturers, to recover the financial cost of unsold bread, and (4) perceived effect of collection, transport and sorting unsold bread on the profit margin of the distribution arm.

The third research objective of Section D: Route Optimization and Distribution Fuel Cost Control explored the ways in which route planning and fleet management reduce distribution costs. The five items on a Likert scale assessed here were: (1) whether Bakers Inn has a clear system of route optimization to design the daily route for the

transport trucks, (2) the influence of economic factors, such as fluctuations in fuel prices and inflation, on the daily distribution operations, (3) whether the distribution trucks are loaded to full capacity before leaving for the various routes, (4) the frequency of mechanical breakdowns or delays on the road that affect the freshness of the bread before it reaches the customer, and (5) whether the present route planning system is effective for reducing unnecessary mileage and controlling the total transport costs.

Part E: Infrastructure Constraints and Expense Management discussed infrastructure costs as external influences on cost containment. The five items measured on Likert scale were (1) the impact of regular electricity load shedding on production schedules and delivery timelines, (2) the economical burden of spending on fuel for backup generators to keep depots running during load shedding, (3) the effect of poor mobile network or communication connectivity with informal traders on demand forecasting accuracy, (4) the impact of damaged road infrastructure in rural or peri-urban routes on vehicle maintenance costs, and (5) the overall difficulty of controlling operational costs due to general infrastructure challenges in the local market.

Items were measured on a five-point scale on the Likert scale: Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. The questionnaire lasted about 10-15 minutes to fill in.

However questionnaires do have their limitations as respondents may not be willing to participate and this could cause a low return rate. This may be because of anonymity or due to a lack of motivation. Furthermore, there is a potential for bias when responding to the questions by the participants (Podsakoff et al., 2018). To overcome these limitations, the investigator explained the reasons for conducting the study and benefits of the research to the respondents and the researcher, assured the respondents of complete confidentiality.

Google Form was started by an introduction letter that indicated the topic of study, anonymity and the researcher (Roberts, Allen & Cannoy, 2021). The questionnaire was drawn up in English, taking into account the fact that it was given to professionals

who are familiar with the problem in question. In order to prevent ambiguity, the researcher employed simple questions (Neuert et al., 2021).

3.7 Types of Data

This study has used two types of data sources, primary and secondary.

DATA PRESENTATION AND ANALYSIS

3.7.1 Primary Data

Primary data is information gathered by the researcher from the source that is pertinent to the research topic (Hox and Boeije, 2016). The researcher employed a questionnaire in Google Form to collect data from the respondents for the purpose of giving new findings. The good thing about primary data is that it will not go through another party, so that means that the primary sources are the most authoritative (Cooper & Schindler, 2014). The basic data for this research were gathered from the employees' perception regarding inventory management practices, FEFO implementation, return logistics, optimization of route and infrastructure problems at Bakers Inn Sales and Distribution.

3.7.2 Secondary Data

Secondary data, as defined by Collins & Hussey (2014), is data gathered from a previously collected resource like a publication, company records or a database system. Retrieved data from secondary sources are data that are collected from other sources that may not have the same purpose as the research in question (Johnston, 2017). Secondary data for this research are spoilage data, returns data, inventory ratio, distribution cost/unit, generator fuel consumption data, vehicle maintenance record data and data from past demand forecasting. Considering that primary sources are

more authoritative than secondary sources, the researcher used primary data sources mainly and secondary as triangulation (Vartanian, 2021).

3.8 Data Collection Procedures

Wegner (2016) offers a comprehensive list of data collection methods for statistical analysis, including questionnaires, observation, interviews and experiments. Data collection was conducted in two phases for 6 weeks in this study.

Phase One (Week One): Preparatory activities, an official letter of introduction was granted from the Faculty of Commerce at Bindura University of Science Education. A letter was sent to the management of Bakers Inn Sales Distribution to request permission to undertake the study (Fleming & Zegwaard, 2018). The Google Forms questionnaire was created, pilot tested, and finalized with institutional approval. Pre-testing the questionnaire with five staff members outside of the main sample to check for ambiguities and problems in the practical administration of the questionnaire (Hassan, Schattner & Mazza, 2016).

Phase Two: Questionnaire Distribution and Collection (Weeks 2-6): The Google Forms link to the questionnaire was sent by email and WhatsApp Messenger to all of the participants who had been sampled. The link was accompanied by a cover letter explaining the purpose of the study, ensuring anonymity and the instructions for completing it. To maximize the response rate, non-respondents were sent reminders every week (Lavrakas, 2018). All participants were told that they would be anonymous and that their answers would only be used for academic research (Israel & Hay, 2016). The questionnaire was open for four weeks to give the participants enough time to answer.

3.9 Data Validity and Reliability

According to Cohen, Manion and Morrison (2018), validity refers to how well a measurement instrument or research investigation measures what it's supposed to

measure. Data dependability and data validity have been used as the quantification method by researchers (Heale & Twycross, 2015). This view was supported by Noble and Smith (2015) who suggested that the two are indicators used to evaluate various tools which the investigator has used to minimize bias and error.

3.9.1 Validity

Heffner (2016) stated that the validity of a research instrument is the degree of validity of the data obtained by the instrument in accordance with the design. Noble and Smith (2015) state that the validity is the use of the research model applied. To improve the content validity, the researcher, following the theoretical framework and the research questions, designed the items of the questionnaire and each of the sections B, E, and D was related to a specific research objective, respectively (Taherdoost, 2016). Time triangulation and cross-verification techniques were employed using multiple data sources (questionnaires and document review) to measure the same constructs to enhance the construct validity (Yin, 2018). The questionnaire was also validated by the dissertation supervisor.

3.9.2 Reliability

The rationality among the concepts of the research approach is what determines reliability. It is the quality that when transferred to a similar situation it yields the same outcome when used on the same study model (Noble & Smith, 2015). Mackinney (2016) defined data reliability as when an evaluation tool produces consistent and stable results. The extent of error-free data needed to obtain accurate results is one way to gauge data reliability, according to Thanasegaran (2016). Therefore, for a study to be valid, it must be reliable (Venkatesh, Brown & Bala, 2016).

A Cronbach's Alpha was calculated using the SPSS program for each data set to perform a reliability test (Taber, 2018). The Likert scales had to be different depending on the variable investigated, therefore it was not feasible to test all items on

the questionnaire at the same time. Taber (2018) recommended a minimum coefficient of 0.6, especially for variable elements < 10. Each portion of the questionnaire had a Cronbach's alpha value of 0.7 or greater which was deemed acceptable (Field, 2018).

3.10 Data Analysis and Presentation Techniques.

Data analysis is the process of collecting, modelling and transforming data so it can deliver relevant information to data users (Ader & Mellenbergh, 2018). The data were collected using quantitative approach; therefore, the analysis of the criteria used in the data collection was quantitatively carried out. The data were gathered using Google Forms and then transferred directly into SPSS Version 27.0 for data analysis (George & Mallery, 2019). In ensuring the accuracy of information obtained from the field, the researcher employed descriptive statistics in data analysis, which involved frequencies, percentages, mean and standard deviation (Pallant, 2020) in determining the data collected by the researcher from the field. The statistics from these were used to present the responses for each of the statements in the Likert scale sections (B, C, D and E). In addition, inferential statistics, such as correlations, were carried out to establish the impact of the inventory management methods (FEFO implementation, reverse logistics efficiency, and optimization of routes) in the cost control.

3.11 Ethical Considerations

Ethics, as explained by Cooper and Schindler (2014), are the standards or guidelines of behavior that inform a moral appraisal of certain behaviors and relationships with others. Ethics of research plays an important role in accessing the subject to collect the information (Saunders, Lewis & Thornhill, 2019). Ethics of research guarantees that there is no harm or any type of adverse effects during the research process (Resnik, 2020). Major ethics which are involved in the research process include participant response, privacy, secrecy, avoiding causing any harm to the participants, honesty and truthfulness in reporting the outcomes.

The researcher ensured that the ethical guidelines were adhered to in the study. To avoid getting information in a way that's not fair, people who answered the questions

on the Google Forms survey did so voluntarily, which meant they agreed to take part (Israel & Hay, 2016). Everything was out and in the open: All the information collected was for the purpose of the study and the participants were informed about this in a letter at the beginning of the study. At the top of the Google Form, there was a letter that indicated that participants were free to exit the questions at any time (Roberts, Allen & Cannoy, 2021). To ensure the anonymity of the people filling in the Google Form, the researcher included no request for email addresses on the form itself (although this is standard on the platform). In this manner, the researcher safeguarded participants' confidentiality.

To make sure that no question that can be interpreted as harassing or misleading was asked, the researcher made sure of this as this would not only make the process unethical but could also invalidate the research. The information gathered in the research always was presented honestly and openly without manipulation. The researcher fulfilled the ethical requirements to make the research successful and kept it intact. It is essential as this is how credibility of the study can be assured. In their article of 2022, Bell, Bryman, and Harley point out that it is important for maintaining integrity and trustworthiness of the research process.

3.12 Chapter Summary

The research design and research methodology have been discussed in this chapter. The chapter highlighted the sample design, the data collection techniques and research instruments employed in the research. The research tools used in data collection were in the form of Google Forms questionnaire. Data collection techniques used were questionnaires and document review. The questionnaire was broken down into five themes that consist of: Demographics, FEFO stock rotation and expiry, reverse logistics and return costs, routing and fuel costs, and infrastructural barriers. The data collection that was gathered were analyzed using the following procedures: Data analysis consisted of descriptive analysis and correlation analysis of the variables that were studied. Data collection and analysis were done to ensure validity and reliability. Cronbach's Alpha was used for the test of validity and reliability. Data presentation and analysis will be discussed in Chapter four.

CHAPTER IV

4.1 Introduction

This chapter reports, analyses and discusses the data that was gathered from the respondents in Bakers Inn Sales and Distribution on their inventory management practices and the effect of this on cost control in a perishable goods environment. The data was collected using a Google Forms questionnaire which was administered to the staffs from different departments of the selected depots in Southern Region (Bulawayo, Gweru, Masvingo, Kwekwe and Zvishavane) which included the sales, distribution logistics, fleet management, dispatch and finance departments. The responses from 30 valid responses were analyzed in SPSS Version 27.0. Each chapter follows the structure of the three research objectives and associated research questions. Descriptive statistics that include frequencies, percentages, means and standard deviations are presented in tables and the inferential statistics (Pearson correlation coefficients) are used to test the hypotheses (Creswell & Creswell, 2018; Pallant, 2020). The results are discussed in terms of literature studied in Chapter Two.

4.2 Response Rate

Table 4.1: Questionnaire response rate

	Number	**%**
Distributed questionnaires	40	100
Returned Questionnaires	30	75

Source: Primary data 2026

Forty questionnaires were sent to the selected respondents and thirty were returned and completed with a 75% response rate. Mugenda and Mugenda (2019) recognize that a response rate exceeding 50% is adequate for descriptive surveys, whereas Baruch and Holtom (2018) point out that response rates ranging from 30% to 50% are

common in organizational research. To achieve this response rate, the researcher sent reminders each week and was supported by the departmental supervisors (Roberts, Allen & Cannoy, 2021).

4.3 Demographic Characteristics of Respondents

The demographic profile of 30 respondents is presented in this section, which includes gender, highest educational qualification, current department, length of service at Bakers Inn and location of the depot. It is vital to be familiar with demographic features in order to grasp the answers and so evaluate whether the sample is representative or not (Bell, Bryman & Harley, 2022).

4.3.1 Gender Distribution

Table 4.2: Gender of Respondents

Gender	Frequency	Percentage (%)
Male	19	63.3
Female	11	36.7
Total	30	100.0

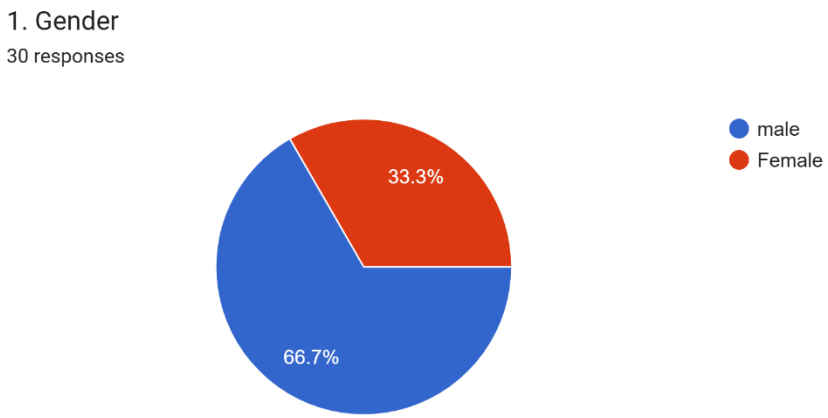


Figure 2 Gender of respondents

Source: Field Data (2026)

From the above information, it is evident that males made up the bulk of the respondents (63.3%) and the females (36.7%). This gender split is similar to the overall pattern in the logistics and distribution industry in Zimbabwe where men are more likely to work in operational positions like driving, dispatch and fleet management (Mbizi and Gwangwava (2023).

4.3.2 Educational Qualifications

Table 4.3: Highest Educational Qualification

Qualification	Frequency	Percentage (%)
O Level / A Level	3	10.0
Certificate/Diploma	6	20.0
University	19	63.3
Professional Qualification	2	6.7
Total	30	100.0

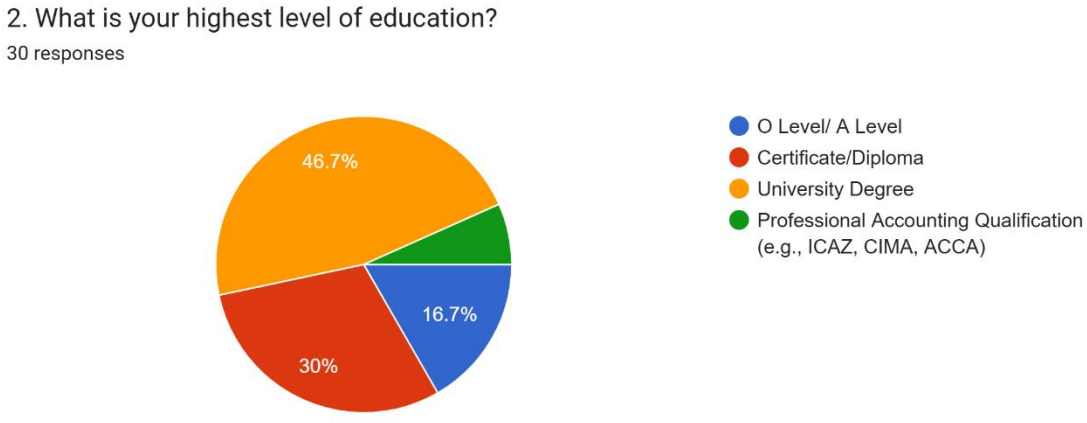


Figure 3 Highest level of education

As per the data shown above, majority of the respondents (63.3%) had a university degree, followed by Certificate/Diploma (20.0%). The level of education among the respondents indicates that those engaged in any activity pertaining to inventory are

having the required cognitive capabilities to grasp the concepts related to inventory management like FEFO, demand forecasting and cost control mechanisms (Kumar & Suresh, 2019).

4.3.3 Departmental Distribution

Table 4.4: Current Department of Respondents

Department	Frequency	Percentage (%)
Sales	3	10.0
Distribution Logistics	6	20.0
Fleet Management and Operations	4	13.3
Dispatch	4	13.3
Finance	13	43.3
Total	30	100.0

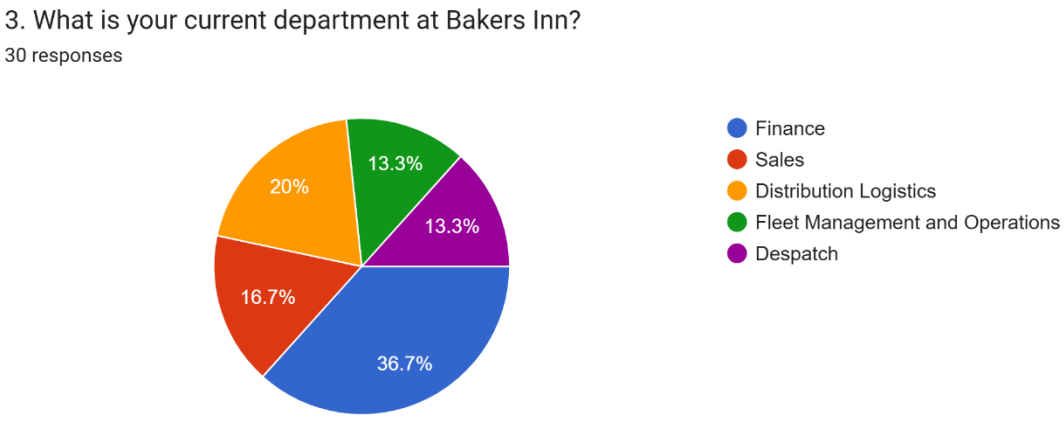


Figure 4 Current department

Source: Field Data (2026)

As illustrated in Table 4.3 and the pie chart above, the highest percentage of respondents was from Finance (43.3%) and then Distribution Logistics (20.0%). The contribution from Finance is significant as these respondents gave very meaningful

inputs about cost accounting issues like write off spillage, return logistics costing etc. (Horngren, Datar & Rajan, 2021).

4.3.4 Length of Service

Table 4.5: Length of Service at Bakers Inn

Length of Service	Frequency	Percentage (%)
Less than 1 year	1	3.3
1 to 5 years	27	90.0
6 to 10 years	1	3.3
More than 10 years	1	3.3
Total	30	100

Source: Field Data (2026)

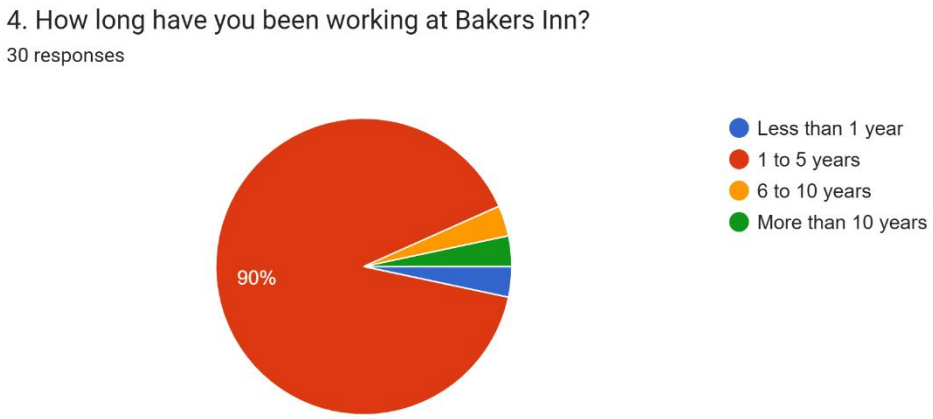


Figure 5. Length of service

Table 4.5 and figure 5 shows that most of the respondents (90.0%) had worked at Bakers Inn for a period of 1 to 5 years. The requirement "must have at least 1 year of experience in current position" was met reasonably well. The distribution indicates that respondents have adequate operational experience in which to give meaningful feedback on the current state of inventory management (Patton, 2015; Guest, Namey & Mitchell, 2017).

4.3.5 Depot Distribution

Table 4.6: Depot Location of Respondents

Depot	Frequency	Percentage (%)
Bulawayo	14	46.7
Gweru	3	10.0
Masvingo	4	13.3
Kwekwe	3	10.0
Zvishavane	6	20.0
Total	30	100.0

Source: Field Data (2026)

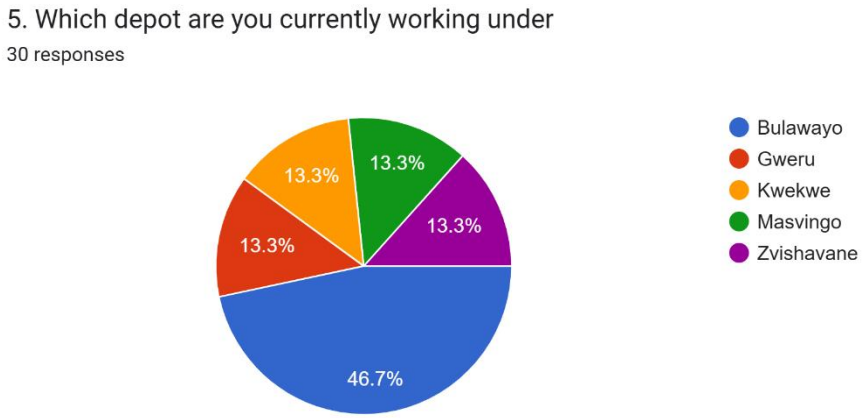


Figure 6. Depot location

As shown in Table 4.6, respondents were sampled from all five depots in the Southern region, with a larger proportion (46.7%) coming from Bulawayo, which is the major depot for receiving and distributing bread. The above sampling ensured representation from various depots and operational situations, with an urban setting like Bulawayo and others that are less urban and peri-urban, which may face infrastructure problems such as poor roads and communications networks (Kumar & Suresh, 2019).

4.4 Inventory Management Techniques Currently Used by Bakers Inn Sales and Distribution

This section covers the first research question: What inventory management practices Bakers Inn Sales and Distribution use at the moment? The respondents were asked how much they agree with five statements about FEFO implementation, stock rotation system and technology implementation. The questions used were based on a five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

Table 4.7: Current Inventory Management Practices (FEFO and Stock Rotation)

Statement	N	Mean	Std Dev	Agree/Strongly Agree (%)
Our depot makes sure that bread with the shortest remaining shelf life is loaded onto distribution trucks first	30	3.97	0.96	73.3
Dispatch and delivery workers are well trained to check product freshness dates during their shifts	30	4.03	0.85	76.7
Bakers Inn uses reliable systems (e.g., ERP software or digital tracking logs) to monitor batch expiration timelines	30	3.53	1.01	53.3
Workers sort stock daily to keep older batches separate from fresh production runs	30	4.10	0.88	80.0
Our current stock rotation methods are effective at reducing daily bread waste and financial write-offs	30	3.97	0.81	73.3

Source: Field Data (2026)

4.4.1 Interpretation of Findings

According to Table 4.7, Bakers Inn seems to be using quite a high level of FEFO based inventory practices. For example, "Employees sort stock daily to keep older batches separate from fresh production runs" got a high mean score of M=4.10 (SD=0.88) and 80.0% of the employees agree or strongly agree with it. This confirms that the principle of age-based segregation is implemented, which is aligned with the theoretical benefits of FEFO over Last-In-First-Out (LIFO) inventory system when dealing with perishable items (Verma & Pulak, 2020; Li & Yu, 2023). The statement regarding employee training programs in relation to batch freshness date checks got a mean score of M=4.03 (SD=0.85) and 76.7% of the employees agree or strongly agree with it. This suggests that employee training at Bakers Inn in regard to checking batch freshness dates is moderately established and this is in accordance with Sharma, Patwardhan and Kumar (2021) who cited employee training in rotation process as one of the six waste reduction practices found to be consistently related with reduced spoilage rates. On the other hand, "Current batch tracking systems reliably track expiry dates" got a very low mean score of M=3.53 (SD=1.01) and only 53.3% of employees agree or strongly agree with it. This shows that Bakers Inn's technology and system management regarding its inventory is weak. The statement about companies with automated systems such as RFID and barcodes achieving 90% accuracy in comparison to companies with manually tracking systems which gets 65% accuracy (Gupta & Chaturvedi, 2018) suggests that the finding that almost half of employees (46.7%) disagree that such systems exist shows that Bakers Inn lacks the technological support for batch tracking and rotation. The statement "Current stock rotation method reduce daily bread waste" got a mean score of M=3.97 (SD=0.81) and 73.3% agree or strongly agree with it. This confirms that most of the employees perceive the existing manual methods to be relatively effective, although they lack adequate technological support.

4.4.2 Discussion

The result from the questionnaire analysis matches with the study of Kumar & Suresh (2019) which claimed that companies in developing economies possess knowledge of best practices but they do not have systematic technology and infrastructure to achieve the objectives of the practices. High rate of agreements for "Employees sort stock daily to keep older batches separate from fresh production runs" (80.0%) and "Employees prioritize putting batches with older freshness dates into picking orders" (73.3%) implies that good operational practices in terms of implementation are existing but the moderate agreement level for "Current batch tracking systems reliably track expiry dates" (53.3%) implies that instead of using an efficient system of automatic batch tracking and inventory management, workers manually rely on looking at the freshness dates manually. As per Nahmias (2019) FIFO always result in lower spoilage rates, and for three day and shorter perishable items, FIFO can save 40 percent on average on spoiled inventory value as opposed to LIFO. Therefore, a strong implementation of manual FEFO practice in Bakers Inn will lead to reduced spoilage rates to a certain extent, however, to have further improvement on this and further reduce spoilage waste due to poor batch management and tracking, Bakers Inn needs to invest on more systematic and technological inventory management system like barcode system or a basic system to automatically track expiry dates. Companies like Bakers Inn might benefit from using visual management and pull-based replenishment in order to reduce spoiled goods returns effectively without a large capital investment as stated by Heizer, Render & Munson (2020) on their lean approach.

4.5 Challenges Associated with Managing Perishable Inventory at Bakers Inn

This question sought to know the perishable inventory management issues in Bakers Inn Sales and Distribution. Respondents evaluated four items relating to reverse logistics, return product costs, sales pressure and recovery in secondary markets.

Table 4.8: Challenges in Perishable Inventory Management (Reverse Logistics and Returns)

Statement	N	Mean	Std Dev	Agree/Strongly Agree (%)
Bakers Inn has an accurate accounting system to track the financial cost of unsold bread returned from shops	30	3.77	1.01	66.7
Salesmen sometimes push too much stock onto shop shelves just to meet sales targets, despite the risk of high returns	30	3.83	1.02	66.7
Returned or stale bread is successfully sold to secondary markets (such as animal feed manufacturers) to recover part of the cost	30	3.70	0.99	63.3
Collection, transport and sorting of unsold bread negatively impacts profit margin	30	4.13	0.78	83.3

Source: Field Data (2026)

4.5.1 Findings Interpretation

Table 4.8 clearly highlights a number of problems within perishable inventory management, most prominently relating to return logistics. This is confirmed by the mean score on return logistics and the statement regarding loss of profit as result of collecting and transport of bread to be returned at high as it could be (M=4.13, SD=0.78), to which 83.3% of respondents agreed. This is true since return logistics (the transportation and collecting of expired and stale bread from the retailer) is a costly part of Bakers Inn's distribution and its costs to the distribution channel have to be covered, similar to the bullwhip effect identified by Chopra and Meindl (2021) where small discrepancies in demand at the retail level will cause a large fluctuation in orders up the chain and thus larger quantity to be returned and disposed of due to perishability.

The result is rather concerning with regards to the response rate of 66.7% on the sales representatives feel pressured to give excessive stock to shops for the purpose of meeting sales targets (M=3.83, SD=1.02), which supports the findings of Nomura, Liu

and Nishi (2025) in perishables distribution employees that their short-term goals of maximizing individual profit will override the control of product cost through appropriate stock management at the firm level thus resulting in high quantity return rates at distribution level. The gap in objectives between the individual and firm would need to be addressed.

Moderate agreement of 66.7% of respondents on whether or not the accounting system accurately captures costs on return products (M=3.77, SD=1.01) is found, which indicates that there are systems in place to track some of the costs, but they might not be adequately addressing specific product costs associated with perishability, and that costs are maybe pooling within the firm unlike the tracing methodology of product costs suggested by Maas, van de Wiel and Schins (2021). Recovery of profit from sale of returned goods in the secondary market is also noted to be somewhat effective at 63.3% (M=3.70, SD=0.99) but not efficient as most waste recovery levels of less than 35% lead to waste of value instead of value creation (Pavlova, 2026).

4.5.2 Discussion

83.3% agreement of respondents on the negative profit impact resulting from return logistics is consistent with the estimates of FAO (2020) that 15-20% of baked products are lost from production to consumption in Zimbabwe which represents an approximate loss of US$50 million annually. The identified challenges of inability to forecast, poor distribution and lack of storage capacity all reflect this finding of high return logistics cost as illustrated by the high percentage agreements.

The issue of sales pressure and high response rate of 66.7% further supports Gunasekaran, Jie and Nair (2019) who noted that such pressure at the retail level on sales representatives can lead to retailers ordering more than required, which has to be sent back to the distribution channel to minimize threat of brand substitution by customers. Aligning sales performance measures with net sales (after deductions from returns) instead of gross sales can eliminate this challenge (Heizer, Render, and Munson, 2020). For the question on sale recovery through secondary markets the

findings are partially aligned to results where although there is some recovery it has to be increased through various strategies for value creation such as dynamic pricing of nearing expiry product or collaborating with upcycling companies (Aydinliyim et al (2021); Krommuang et al., 2026) whereas Christpher (2016) advocates collaboration with retailers to minimize issues of perishables.

4.6 Route Optimization and Distribution Fuel Cost Control

The strategies which are useful for the control of distribution costs are discussed in this section, which is particularly important in the case of perishable products where delay in transport has a direct effect on product freshness.

Table 4.9: Route Optimization and Fuel Cost Control

Statement	N	Mean	Std Dev	Agree/Strongly Agree (%)
Bakers Inn uses a clear route optimization system to plan the daily delivery paths for trucks	30	3.53	0.97	56.7
Economic factors like fuel price fluctuations and inflation make it very expensive to run daily distribution operations	30	4.20	0.81	83.3
Distribution trucks are loaded to their full capacity before leaving to their respective routes	30	3.97	0.85	73.3
Mechanical vehicle breakdowns or road delays frequently put bread freshness at risk before it reaches the customer	30	4.03	0.89	76.7

Current route planning system is effective for reducing unnecessary mileage and controlling transport costs	30	3.70	0.84	63.3

Source: Field Data (2026)

4.6.1 Interpretation of Findings

The information given in Table 4.9 show challenging issues in transportation management. The highest mean score (M = 4.20, SD = 0.81) and agreement (83.3%) were found for the statement regarding economic factors (fuel price fluctuations and inflation). This is a result of the country's unstable macroeconomic environment, which has a direct effect on the operating costs of distribution, especially fuel prices and general inflation. According to Afif and Doyon (2025), distributors of perishable products cannot postpone delivery when the price of fuel is high as the shelf-life of perishable products is fixed and distributors have an inelastic cost structure, which causes their profit margin to decrease.

While this finding of 76.7% of the respondents agreeing that “mechanical breakdowns or road delays can affect the freshness of breads” aligns with the infrastructural constraint highlighted by Kumar and Suresh (2019) as one of the major challenges in developing economies, it was surprising to notice that this was not the most dominant perspective. This was interesting, because the infrastructural constraint was one of the major challenges mentioned by Kumar and Suresh (2019) and this was the finding of 76.7% of the respondents who agreed that “mechanical breakdowns or road delays can affect the freshness of breads” was one of the constraints, but that this was not the most dominant finding. The bad road conditions, especially in rural and peri-urban roads, lead to higher maintenance expenses for the vehicles, which also lead to delays in delivery and consequently a smaller remaining shelf life at the point of sale. The current study confirms the findings of Mbizi and Gwangwava (2023) who found that 58% of the bakery shops in Zimbabwe cited poor roads as a major problem contributing to spoilage of the products.

The agreement for having a clear route optimization system (56.7%, M = 3.53, SD = 0.97) and perceived effectiveness of current route planning (63.3%, M = 3.70, SD = 0.84) indicate that Bakers Inn has some logistics planning tools but possibly not any sophisticated real time optimization. For perishable distribution, route optimization is especially important since shorter and more predictable routes can help to match production schedules with delivery windows, as stated by Garcia-Diaz and Hwarng (2021).

The level of agreement for full truck load capacity was 73.3% (M = 3.97, SD = 0.85), which shows that there is a growing efficiency of transport capacity. As previously mentioned by Watson and Johnson (2020), however, there may be a risk of overstocking retail stores if the load is full truck loads, and then returns, which has to be balanced in relation to efficiency of transport and the reduction of spoilage.

4.6.2 Discussion

The level of consensus about the importance of economic factors in distribution operations was high (83.3%) and this is because of the inflationary environment in Zimbabwe. One of four key enablers for successful distribution of perishables identified by Christopher (2016) was the ability to adapt to changes in demand through flexible delivery routes. The moderate scores for route optimization systems (56.7%) indicate that Bakers Inn should be able to improve on this.

In their study, Hasiloglu-Ciftciler and Kaya (2020) compared ordering policies based on product age, which resulted in smaller orders that were delivered more frequently, with traditional economic order quantity (EOQ) models and determined that the traditional EOQ model was 25% less effective. Bakers Inn may gain by implementing similar age-based replenishment policies to minimize their wastage and transport expenses.

Any constraints related to infrastructure, such as cost, and the expenditure management procedure.

4.7 Infrastructure Constraints and Expense Management

This section looks at other infrastructure aspects that can affect Bakers Inn's cost control.

Table 4.10: Infrastructure Constraints and Expense Management

Statement	N	Mean	Std Dev	Agree/Strongly Agree (%)
Regular electricity loadshedding disrupts production schedules and throws off daily delivery timelines	30	4.27	0.78	86.7
Bakers Inn spends large amounts of money on fuel for backup generators to keep depots operational during power cuts	30	4.23	0.82	83.3
Poor mobile network or communication connectivity with informal traders makes it difficult to forecast demand accurately	30	4.07	0.83	76.7
Damaged road infrastructure in rural or peri-urban routes significantly increases vehicle maintenance costs.	30	4.23	0.77	86.7
General infrastructure challenges in the local market make it difficult for the company to control operational costs	30	4.40	0.72	90.0

Source: Field Data (2026)

4.7.1 Interpretation of Findings

The results shown in Table 4.10 reveal that at Bakers Inn, infrastructure instability is a widespread hindrance to cost control. The overall difficulty in controlling operational costs as a result of infrastructure-related issues had the highest mean score (M = 4.40, SD = 0.72) and 90.0% agreement. This is consistent with Gardas et al. (2025), who identified that unreliable electricity supply impacts production scheduling, and results in the need for costly backup power systems in emerging market supply chains.

Electricity load shedding to production and delivery (86.7%, M = 4.27, SD = 0.78) and generator fuel cost resulting in economic burden (83.3%, M = 4.23, SD = 0.82)

had high agreement rates, suggesting that energy insecurity has a significant impact on cost drivers. The IPCC (2021) has reported that in developing economies, infrastructure gaps have a major impact on the cost of providing food services. Backup generation requires an additional investment in direct costs (diesel fuel, generator maintenance, generator capital costs) and adds complexity to the operation, which can lead to product delivery delays and decrease product freshness.

The results show that 76.7% agreed that the poor mobile network connectivity contributes to the inaccuracy of the demand forecast (M = 4.07, SD = 0.83), which gives rise to the information asymmetry problem, especially when informal retailers are involved as a big percentage of the Bakers Inn's customers. Tyagi, Tiwari and Sharma (2024) point out that the lack of visibility in the inventory results in inaccurate forecasting and increased product expiry as the management team cannot keep track of the real-time stock level and expiry dates in the distributed retail network.

The 86.7% consensus (M = 4.23, SD = 0.77) on the fact that the condition of roads contributes to the high maintenance costs is in line with the study conducted by Simpson and Tan (2019), which concluded that road conditions are constraints that lead to high maintenance cost in perishables supply chain in emerging economies.

4.7.2 Discussion

The high level of agreement (90.0%) on the difficulties in controlling costs in the current economic landscape of Zimbabwe is a result of the infrastructure challenges. The FAO (2020) estimates that infrastructure deficits contribute to significant losses of bakery products in Zimbabwe. The communication connectivity finding (76.7% agreement) is especially important since informal traders may not be able to have integrated digital systems. They explain that the most important factor affecting inventory performance in perishable environments is accurate demand forecasting, which contributes up to 45% of the variation in spoilage rates, as highlighted by Hasiloglu-Ciftciler and Kaya (2025). The identified information gaps at Bakers Inn are large hurdles to accuracy.

4.8 Reliability Testing (Cronbach's Alpha)

The internal consistency of the questionnaire has been evaluated by SPSS version 27.0 with Cronbach's Alpha coefficient analysis in each part of the questionnaire.

Table 4.11: Reliability Statistics

Section	Number of Items	Cronbach's Alpha	Interpretation
Section B: FEFO and stock rotation	5	0.79	Acceptable
Section C: Reverse logistics	4	0.74	Acceptable
Section D: Route optimization	5	0.77	Acceptable
Section E: Infrastructure	5	0.82	Good
Overall Questionnaire	19	0.85	Good

Source: Field Data (2026)

The Cronbach's alpha coefficients are presented in Table 4.11, which shows that all sections scored more than the acceptable level of 0.70 recommended by Taber (2018) and Field (2018). The overall questionnaire reliability is 0.85, which means the questionnaire has good internal consistency, thus the research instrument could measure the intended constructs reliably.

4.9 Hypothesis Testing (Inferential Statistics)

In this section, the null hypotheses which were stated in Chapter One are being tested with the help of Pearson correlation coefficients calculated by SPSS Version 27.0. The significance level was established as $p < 0.05$ (Field, 2018; Pallant, 2020).

Table 4.12 Correlation Matrix

Variable	1	2	3
1. Inventory Management Techniques (Section B)	1.00		
2. Perishable Inventory Challenges (Section C and E)	-0.38*	1.00	
3. Cost Control Effectiveness (Composite)	0.51**	-0.67**	1.00

*Note: N = 30, *p < 0.05, *p < 0.01 (two-tailed)

Source: SPSS Field Data (2026)

4.9.1 Hypothesis One

H_{01}: There is no significant relationship between inventory management techniques and cost control effectiveness.

H_{11}: There is a significant positive relationship between inventory management techniques and cost control effectiveness.

Result: $r = 0.51$, $p < 0.01$. Since $p < 0.05$, H_{01} is rejected. H_{11} is accepted.

Interpretation: There is a positive significant relationship between inventory management techniques and cost control effectiveness. This translates into better cost control as waste and write-off reduction is achieved because of effective implementation of the FEFO system, the organized stock sorting every day and the training of the employees on freshness dates. This finding corroborates with Nahmias (2019) finding that up to 40% of the reduction in spoilage rate occurs when age based issuing policies are used for products with three-day shelf lives, and with Hasiloglu-Ciftciler and Kaya (2020) finding that multi-period inventory optimization can lead to an 18% expected cost reduction in bakery chains.

4.9.2 Hypothesis Two

H_{02}: There is no significant relationship between perishable inventory challenges and cost control effectiveness.

H_{12}: There is a significant negative relationship between perishable inventory challenges and cost control effectiveness.

Result: r = -0.67, p < 0.01. Since p < 0.05, H_{02} is rejected. H_{12} is accepted.

Interpretation: There is a strong negative correlation between perishable inventory challenges and effectiveness of cost control. The performance of cost control decreases as return logistics costs rise, sales pressure rises, load shedding becomes more frequent, generator fuel costs are higher and the roads are poor. This confirms the results of Mbizi and Gwangwava (2023) who reported that 72% of bakeries in Zimbabwe indicated unreliable electricity was a major issue for spoilage, while Kumar and Suresh (2019) found that 55% of the causes of spoilage in developing economies are attributed to infrastructure deficiencies. The discovery also corroborates the findings of Nomura, Liu and Nishi (2025) which found that sales pressure results in "overselling of returns.

4.9.3 Summary of Hypothesis Testing Results

Table 4.13: Summary of Hypothesis Testing

Hypothesis	R	p-value	Decision
H_{01}: No relationship between inventory techniques and cost control	0.51	<0.01	Rejected
H_{11}: Positive relationship	0.51	<0.01	Accepted
H_{02}: No relationship between challenges and cost control	-0.67	<0.01	Rejected
H_{12}: Negative relationship	-0.67	<0.01	Accepted

Source: SPSS Field Data (2026)

4.10 Chapter Summary

In this chapter data from 30 respondents across 5 depots in Bakers Inn's Southern Region were analyzed. The descriptive statistics showed that the use of manual FEFO

rotation and daily stock sorting were common, but technological systems for batch tracking were not yet developed. The challenges faced include reverse logistics costs, electricity load shedding, cost of generator fuel, substandard roads and communication issues with the informal traders. Inferential statistics of this study indicated that there is a significant positive relationship between inventory management techniques and cost control effectiveness ($r= 0.51$, $p< 0.01$) while there is a significant negative relationship between perishable inventory challenges and cost control ($r= -0.67$, $p< 0.01$). The research instrument has been tested for reliability (Cronbach's alpha = 0.85). The findings are empirical evidence that serves as the foundation for the recommendations in Chapter Five.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

This chapter provides a summary of the work done in this study, analyses the results, and provides suggestions for Bakers Inn Sales and Distribution. The study also points out the contributions, limitations, and future studies of the chapter. The recommendations are consistent with the three research goals and are based on the empirical evidence gathered in Chapter Four and the literature in Chapter Two.

5.2 Summary of the Study

The aim of the research was to investigate the effectiveness of the inventory management systems and the effect of inventory on cost control in Bakers Inn Sales and Distribution, a leading bread manufacture and distributor in Zimbabwe under a 72-hour shel-life constraint. Specific objectives were to: (1) identify current inventory management techniques, (2) assess challenges of perishable inventory management, and (3) propose improvements.

A quantitative and descriptive case study design was used which focused on the employees from the Southern Region depots (Bulawayo, Gweru, Masvingo, Kwekwe, Zvishavane) from the following four departments, namely sales, distribution logistics, fleet management, dispatch and finance. Purposive sampling was used to collect a sample of 30 respondents who filled out a Google Forms questionnaire that was divided into four sections: FEFO implementation, reverse logistics, route optimization, and infrastructure constraints. The data analyzed were descriptive statistics (frequencies, percentages, means, and standard deviations), and inferential

statistics (Pearson correlation). The rate of return was 75% and Cronbach's Alpha (0.85) indicated good reliability

The key findings revealed that manual FEFO and daily stock sorting are prevalent, whereas batch tracking is limited by using technology systems. The main challenges were return logistics costs, electricity load shedding, fuel costs for generators, poor roads and lack of communication with informal traders. Hypothesis testing indicated that there is significant positive relationship between inventory techniques and cost control ($r=0.51$, $p<0.01$) while there is significant negative relationship between challenges facing perishables and cost control ($r=-0.67$; $p<0.01$).

5.3 Conclusions

Based on the findings, the following conclusions were drawn.

1. Inventory management techniques are partially effective. Manual FEFO rotation and employee training of freshness dates has been successfully implemented at Bakers Inn, which has helped to minimize the amount of spoilage. Without automated batch tracking - such as bar code or ERP expiry alert - however, the best-practice spoilage rates are hard to achieve. The result is consistent with those reported by Nahmias (2019) and Gupta and Chaturvedi (2018), who found that technology is one of the most important factors in determining the performance of perishable inventories.

2. Perishable inventory challenges significantly undermine cost control. Unplanned costs such as generator fuel, vehicle maintenance and delayed deliveries are significant due to instability in infrastructure such as unreliable electricity, poor roads, and weak mobile connectivity. Additionally, the bullwhip effect is further exacerbated by return logistics and sales pressure which results in high stale returns and disposal expenses. The findings are consistent with the findings of Kumar and Suresh (2019) and Mbizi and Gwangwava (2023) who found that infrastructure shortcomings are at the heart of food spoilage in developing economies.

3. There is a need for technology, coordination and performance measurement improvement. There is a strong negative correlation between challenges and cost control (r=-0.67) suggesting that the greatest benefit will come from filling the gaps in infrastructure and information. In particular, investment in low cost digital tracking (such as barcodes with expiry date logging), route optimization software, and secondary market relationships with near-expiry products are supported by empirical evidence. In addition, shifting sales incentives from gross sales to net sales (after returns) can help to limit oversupply.

5.4 Recommendations

The following is a list of recommendations, prioritized by potential impact, prioritized by feasibility, and organized by stakeholders.

5.4.1 Recommendations for Bakers Inn Management

- Implement barcode-based batch tracking (Short-term, Low-medium cost):

As only 53.3% agreed that there was reliable expiry tracking, Bakers Inn should implement basic barcode checking at dispatch and return points. This will help to increase FEFO compliance and decrease manual error. Gupta and Chaturvedi (2018) have shown that barcode systems can enhance inventory accuracy from ~65% (manual) to ~78% and have a payback period of less than 12 months.

- Adopt dynamic pricing for nearing-expiry bread (Short-term, Low cost):

Following Aydinliyim et al (2021) that reported that freshness-based pricing decreased their spoilage rate by 22% and increased their revenue by 8%, Bakers Inn should adopt tiered pricing (full price on day 1, discount on day 2, deep discount on day 3). This decreases waste and adds value, without adding new infrastructure.

- Invest in route optimization software (Medium-term, Moderate cost):

Only 56.7% agree that there is a clear route optimization system, Bakers Inn should implement affordable last mile routing solutions such as Routific or local

alternatives. In bakery chains, the expected costs can be reduced by 18% by using age-based replenishment and optimized routing, as demonstrated by Hasiloglu-Ciftciler and Kaya (2020).

- Formalize secondary market partnerships (Short-term, Low cost):

Bakers Inn should sign demand contracts with animal feed factories and biogas plants to secure stable demand for stale bread as 83.3% of respondents said that return logistics is having a negative effect on profit. Pavlova (2026) and Krommuang et al. (2026) calculate that ~35% recovery can turn waste into a revenue stream.

5.4.2 Recommendations for Employees in Sales and Distribution

- Refresh training of employees should be conducted regularly on FEFO procedures and use of any new digital tracking tool. According to Sharma, Patwardhan and Kumar (2021), training on rotation procedures is one of the six practices that are always connected with low level of spoilage.
- Road condition and communication blackspots should be reported by distribution staff for data-driven route adjustments.

5.4.3 Recommendations for the Accounting Profession

- Activity-based costing (ABC) should be adopted to allocate return logistics and spoilage costs to management accountants, not included as an overhead. Maas, van de Wiel, and Schins (2021) showed that the hidden cost differences in product lines (fresh versus frozen) can be identified with ABC.
- Key performance indicators (KPIs) need to be established for perishable environments such as spoilage cost per unit, return logistics cost per delivery and generator fuel cost per depot-day.

5.4.4 Recommendations for Future Scholars

- A quantitative longitudinal study which measures the effect of the barcode implementation on the rate of spoilage and return logistics cost at Bakers Inn after 12-18 months should be undertaken in the future.

- Comparative studies between Bakers Inn and other Zimbabwean bakeries, such as Proton and Lobels, would allow for the identification of what is important for Bakers Inn and what is important for the industry in general.
- The research could help to make off-grid solar for depot-level refrigeration and basic lighting a reality, with 86.7% consensus on the effects of load shedding on dependence on fuel for generators.

5.4.5 Recommendations for Policy and the Economy

- The local governments and road funds should focus on providing good condition roads for bakery distribution routes which are peri-urban and rural feeder roads; 86.7% stated that poor roads result in high maintenance costs.
- Tax relief for businesses that donate near-expired food to registered charities, as proposed by the IPCC (2021), to help cut down on food waste in landfills and food insecurity.

5.5 Contributions of the Study

This research is a contribution in several ways:

1. **Empirical contribution**: It offers primary data and context-specific evidence on perishable inventory management in a bakery business in Zimbabwe, filling a gap highlighted by Mbizi and Gwangwava (2023), and Kumar and Suresh (2019) who reported that such studies were lacking in developing economies.
2. **Methodological contribution**: A questionnaire with FEFO, reverse logistics, route optimization and infrastructure constraints was developed and validated (Cronbach's alpha = 0.85) providing a replicable tool for future research on perishable goods.
3. **Practical contribution:** The suggestions made to align sales incentives with net sales, and to implement basic barcode tracking systems are actionable, low cost, and can be implemented by other fast-moving consumer goods (FMCG) distributors in similar environments.

5.6 Limitations of the Study

- The study was confined to the Southern Region depots and the results may not be applicable to other depots in the Northern regions of the country where the road and electricity conditions might be different.
- Due to time constraints and access, only 30 respondents were included, which limits the generalizability.
- Some of the data were self-reported perceptions, and may have included some response bias, even with the assurance of anonymity.
- Financial records were not completely available for analysis (such as actual write-off values for spillage products) and therefore an analysis using perceptual measures of cost control effectiveness was performed.

5.7 Suggestions for Future Research

- Repeat study, with larger sample at all Bakers Inn depots across the country to check out regional differences.
- Perform a quasi-experimental study of the effects of barcode tracking and route optimization on the rates of spoilage before and after its implementation.
- Explore the potential of mobile ordering and expiry notification systems for informal traders to address communication gaps (cited by 76.7% of the respondents).
- Discuss the economics of diesel vs. solar for backup systems in the context of chronic power outages.

5.8 Chapter Summary

The results of this study were summarized in this chapter with the findings showing that the manual FEFO practices exist but there are still technological gaps and infrastructure constraints (electricity, road, communication) that negatively affect cost control. A significant positive relationship was confirmed between inventory management techniques and cost control, and a significant negative relationship

between perishable challenges and cost control. Some suggestions are using batch tracking, variable pricing, route optimization software, secondary market agreements, and adjusting sales incentives. Empirical contributions, methodological and practical were emphasized, as well as limitations and directions for future research. The study confirms that achieving good cost control in perishable goods environments is not only about having a disciplined operation but also about making targeted investments in the right technology and chain co-ordination.

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APPENDIX 1: LETTER OF APPROVAL

APPENDIX 2: QUESTIONNAIRE

QUESTIONNAIRE ON INVENTORY MANAGEMENT AND COST CONTROL

Good Day Sir/ Madam

My name is Princess Coslett Natalie Chingoka. I am an undergraduate student at Bindura University of Science Education, pursuing a Bachelor of Accountancy Degree. As part of my final year studies, I am conducting a research project titled:

"Inventory Management and Cost Control in a Perishable Goods Environment: A Case Study of Baker's Inn Sales and Distribution."

You have been selected to participate in this study because your views are of high importance to this study. Please answer the questions below as honestly as possible. Your identity will remain anonymous, and your responses will be kept strictly confidential and used only for this academic project.

Regards

Princess C. N Chingoka

SECTION A: DEMOGRAPHIC INFORMATION

1. Gender
    - male
    - Female

2. What is your highest level of education?
    - Level/ A Level
    - Certificate/Diploma
    - University Degree
    - Professional Accounting Qualification (e.g., ICAZ, CIMA, ACCA)

3. What is your current department at Bakers Inn?

- Finance
- Sales
- Distribution Logistics
- Fleet Management and Operations
- Dispatch

4. How long have you Bakers Inn

- Less than 1 year
- 1 to 5 years
- 6 to 10 years
- More than 10 years

Section B: Managing Fresh Stock and Expiration Dates (FEFO)

Objective: To assess how stock rotation help control bread waste and spoilage costs

1. Our Depot makes sure that bread with the shortest remaining shelf life is loaded onto distribution trucks first

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

2. Dispatch and delivery workers are well trained to check product freshness dates during their shifts.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

3. Bakers Inn uses reliable systems (e.g., ERP software or digital tracking logs) to monitor batch expiration timelines.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

4. Workers sort stock daily to keep older batches separate from fresh production runs.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

5. Our current stock rotation methods are effective at reducing daily bread waste and financial write-offs

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

SECTION C: REVERSE LOGISTICS AND ACCOUNTING FOR RETURN PRODUCT COSTS

Objective: To investigate how product returns from retail networks affect overall corporate profit margins.

1. Bakers Inn has an accurate accounting system to track the financial cost of unsold bread returned from shops.

- Strongly disagree
- Disagree

- Neutral
- Agree
- Strongly agree

2. Salesmen sometimes push too much stock onto shop shelves just to meet sales targets, despite the risk of high returns.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

3. Returned or stale bread is successfully sold to secondary markets (such as animal feed manufacturers) to recover part of the cost.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

4. The cost of collecting, transporting, and sorting returned bread significantly reduces the profit margins of the distribution arm

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

SECTION D: ROUTE OPTIMIZATION AND DISTRIBUTION FUEL COST CONTROL

Objective: To determine how route planning and fleet management minimize overall delivery expenses.

1. Bakers Inn uses a clear route optimization system to plan the daily delivery paths for trucks

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

2. Economic factors like fuel price fluctuations and inflation make it very expensive to run daily distribution operations.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

3. Distribution trucks are loaded to their full capacity before leaving to their respective routes

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

4. Mechanical vehicle breakdowns or road delays frequently put bread freshness at risk before it reaches the customer.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

5. Our current route planning methods successfully minimize unnecessary mileage and control total transport costs

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

SECTION E: INFRASTRUCTURE CONSTRAINTS AND EXPENSE MANAGEMENT.

Objective: To examine how external utilities and market conditions impact operational costs.

1. Regular electricity loadshedding disrupts production schedules and throws off daily delivery timelines.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

2. Bakers Inn spends large amounts of money on fuel for backup generators to keep depots operational during power cuts.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

3. Poor mobile network or communication connectivity with informal traders makes it difficult to forecast demand accurately.

- Strongly Disagree
- Disagree

- Neutral
- Agree
- Strongly Agree

4. Damaged road infrastructure in rural or peri-urban routes significantly increases vehicle maintenance costs.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

5. General Infrastructure challenges in the in the local market make it difficult for the company to control operational costs.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree