CHALLENGES OF INVENTORY CONTROL FOR MINIMIZING PERISHABLE PRODUCT LOSS IN FOOD SECTOR AT MELAKA

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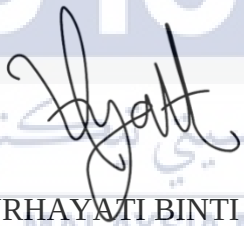
SIGNATURE : 

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DECLARATION OF ORIGINAL WORK

I hereby declare that all the work of this thesis entitled "CHALLENGES OF INVENTORY CONTROL FOR MINIMIZING PERISHABLE PRODUCT LOSS IN FOOD SECTOR AT MELAKA" is original done by myself and no portion of the work encompassed in this research project proposal has been submitted in support of any application for any other degree or qualification of this or any other institute or university of learning.

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DEDICATION

I would like to appreciate the dedication of my beloved family members who educated me and motive me to learn until degree level. And also, I express a deep sense of gratitude to my lecturer whom also my supervisor for my final year project, Datin Dr. Suraya Binti Ahmad and my fellow friends. They have provided me fully support and advice throughout this research. Without their blessing and encouragement, this research is impossible to complete within short period of time.

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Last but not least, I would like to express my appreciation to all respondents who had contributed their time and efforts in filling the questionnaires. They had provided valuable feedbacks that assist me in finishing this research. With the assistance and supports from the respondents, I have successfully fulfilled all the components of a questionnaire. Once again, I am grateful and honestly thankful to all.

ABSTRACT

This research paper aims to explore and describe the difficulties in perishable product inventory control strategy in food supply chain management. The research, which is done throughout Malaysia's supermarket chains, focuses on perishable goods. A perishable product is one that has a short shelf life or one that quickly degrades. These products include dairy products, medicines, and freshly prepared meals. Since they must be processed and transferred through the supply chain before perishing and losing either all or part of their value, this limited lifespan has an impact on inventory management. The suggested tactics are then contrasted with models described in the literature. The study will next determine the best method for minimising the loss of perishable goods that are not marketable by using the appropriate inventory control model. The study's conclusion includes the main conclusions.

Researchers and practitioners have been paying close attention to the food supply chain management since it addresses food waste issue especially for perishable product. The researcher focuses on the challenges of inventory control in order to solve increasing perishable product loss rate in food sector. Moreover, researcher is determined to investigate the relationship between firs-in-first-out strategy (FIFO), automated storage and retrieval system (AS/RS) and monitoring strategy in minimizing the perishable product loss in food sector which that led to this study.

This study employs a quantitative method. Primary data will be collected by a survey that will be distributed to all grocery store in Malacca state. In addition, 160 respondents will be chosen using probability sampling. To verify data consistency, a pilot test and reliability analysis will be conducted. Statistical Package for Social Sciences will also be used to analyse the results gathered from respondents (SPSS). To evaluate the researcher's hypothesis, descriptive statistics, Pearson's correlation coefficient, and multiple regression analysis are utilised. From the result, AS/RS and monitoring strategy have significant relationship in influencing the food sector in minimizing the perishable product loss and food waste. Researchers might use the proposed new conceptual framework to conduct future research or add other variables to the study.

Keyword: inventory control, perishable product, supply chain

ABSTRAK

Kertas penyelidikan ini bertujuan untuk meneroka dan menerangkan kesukaran dalam strategi kawalan inventori produk mudah rosak dalam pengurusan rantaian bekalan makanan. Penyelidikan, yang dilakukan di seluruh rangkaian pasar raya Malaysia, memfokuskan kepada barangan mudah rosak. Produk mudah rosak ialah produk yang mempunyai jangka hayat yang pendek atau produk yang cepat rosak. Produk ini termasuk produk tenusu, ubat-ubatan dan makanan yang baru disediakan. Memandangkan ia mesti diproses dan dipindahkan melalui rantaian bekalan sebelum musnah dan kehilangan sama ada semua atau sebahagian daripada nilainya, jangka hayat yang terhad ini mempunyai kesan ke atas pengurusan inventori. Taktik yang dicadangkan kemudiannya dibezakan dengan model yang diterangkan dalam literatur. Kajian seterusnya akan menentukan kaedah terbaik untuk meminimumkan kehilangan barang mudah rosak yang tidak boleh dipasarkan dengan menggunakan model kawalan inventori yang sesuai. Kesimpulan kajian merangkumi kesimpulan utama.

Penyelidik telah memberi perhatian kepada pengurusan rantaian bekalan makanan sejak ia menangani isu sisa makanan terutamanya untuk produk mudah rosak. Pengkaji memberi tumpuan kepada cabaran kawalan inventori untuk menyelesaikan peningkatan kadar kehilangan produk mudah rosak dalam sektor makanan. Selain itu, penyelidik berazam untuk menyiasat hubungan antara strategi pertama masuk dahulu (FIFO), sistem penyimpanan dan pengambilan automatik (AS/RS) dan strategi pemantauan dalam meminimumkan kehilangan produk mudah rosak dalam sektor makanan yang membawa kepada kajian ini. .

Kajian ini menggunakan kaedah kuantitatif. Data utama akan dikumpul melalui tinjauan yang akan diedarkan ke semua kedai runcit di negeri Melaka. Selain itu, 160 responden akan dipilih menggunakan pensampelan kebarangkalian. Untuk mengesahkan ketekalan data, ujian rintis dan analisis kebolehpercayaan akan dijalankan. Pakej Statistik untuk Sains Sosial juga akan digunakan untuk menganalisis keputusan yang dikumpul daripada responden (SPSS). Untuk menilai hipotesis penyelidik, statistik deskriptif, pekali korelasi Pearson, dan analisis regresi berganda digunakan. Hasilnya, AS/RS dan strategi pemantauan mempunyai hubungan yang signifikan dalam mempengaruhi sektor makanan dalam meminimumkan kehilangan

produk mudah rosak dan sisa makanan. Penyelidik mungkin menggunakan rangka kerja konsep baru yang dicadangkan untuk menjalankan penyelidikan masa hadapan atau menambah pembolehubah lain kepada kajian.

Kata kunci: kawalan inventori, produk mudah rosak, rantaian bekalan

TABLE OF CONTENT

CHAPTER 5 CONCLUSION AND RECOMMENDATION

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1. Introduction

1.1. Introduction

The purpose of this research paper is to be discussing and describing the challenges of inventory control strategy of perishable product in food supply chain management. After that, the recommended strategies are compared to models presented in the literature. Then this study will figure out the effective approach of how to minimize wastage of unmarketable perishables products with the proper inventory control model. The key findings are at the end of the study.

1.2. Background of Study

The management of the flow of goods and services is referred to as supply chain management, and it encompasses all procedures that turn raw materials into finished items. It entails a company's supply-side activities being actively streamlined to optimize customer value and obtain a competitive edge in the marketplace. On the other hand, the operations that illustrate how food generated on a farm gets at the dinner table are referred to as the food supply chain. This involves the production, administration, use, and disposal of food products. A food item is transferred from maker to consumer throughout this project, and the money used by customers to pay for the item is distributed to people who work at various levels of the chain.

The study focuses on perishable products and is conducted across Malaysia's grocery chains. Perishable product is a product with a limited shelf life or one that deteriorates shortly. Fresh meals, dairy products, and medications are among these goods. This short lifespan affects inventory management since they must be processed and moved through the supply chain before perishing and losing either a portion or all their value. The items have a set shelf life and are disposed once that time has elapsed. The primary logistic features for each item class will be defined. Furthermore, we detail the

present inventory control rules for perishable products and propose the intended inventory management approach for these items.

When perishable goods transit through a logistical system, they deteriorate at different rates. Fresh fruits, fresh vegetables, and fresh meat are examples of agri-fresh products, which are perishable. Excessive spoilage-related waste results from uncontrolled degradation. Therefore, the effective inventory control is important to reduce the waste rate.

1.3. Problem Statement

This paper would lead to identifying the effective inventory control that would maintain and preserve the quality of perishable products. This is because, the waste of perishable products that does not reach the required level of quality are not suitable to be market is keep increasing. As a consequence of after harvest or processing, perishable goods such as fruits and vegetables, dairy, fish, and meat products have a limited shelf life. The time it takes for them to become unmarketable or inedible is determined by the food product and other environmental conditions. According to (Donselaar, 2016), it is indeed crucial to emphasis on how to take account of perishable inventory. The objectives of inventory control will be to minimize the key cost element for perishables like waste. Excessive inventories result in waste, which must either be marked down immediately before the sell-by date or discarded after the sell-by date. If the supplier does not have a return policy, the financial implications for the store are significant in both circumstances.

1.4. Research Questions

1. What is influence of FIFO on minimizing perishable product loss?
2. What is the influence of automated retrieval system on minimizing perishable product loss?
3. What is the influence of monitoring strategy on minimizing perishable product loss?

1.5. Research Objectives

1. To investigate the influence of First-In-First-Out (FIFO) strategy on minimizing perishable product loss.
2. To identify the influence of automated retrieval system on minimizing perishable product loss.
3. To determine the influence of monitoring system on minimizing perishable product loss.

1.6. Scope and Limitation of the Study

The scope of this study is to outline the proper inventory strategy for minimizing the perishables product loss. Therefore, several independent variables are involved which is First-In-First-Out (FIFO) strategy, automated retrieval system and monitoring strategy. On the other hand, this study will only focus on groceries store in Melaka which approximately have 200 stores in rural area. Besides, there are approximately 25 big groceries store and 10 supermarkets in the urban area.

1.7. Significant of Study

From research perspective, this study expected to be valuable to supply chain management and retail grocery leaders to create the strategic solutions in order to mitigate the loss of perishables food. Furthermore, this study is crucial in maintaining the good quality of supplied food to satisfy the consumer needs and demands. Thus, this study will be the proof that an effective supply chain management is the vital decision managers or leaders need to conduct which will affect the feedback of consumers, company's revenue and minimizing the products loss.

1.8. Summary

The research study's overview is presented in this chapter. The study's background, issue statement, aims, and research questions have all been succinctly explained by the researcher. The problem statement serves as the basis for the development of the study objectives and questions. Additionally, the researcher has described the study's coverage and constraints, as well as

its breadth. Finally, the importance of the study is discussed by outlining its objectives and benefits.

CHAPTER 2

LITERATURE REVIEW

2. Literature Review

2.1. Introduction

This chapter will look at the current supply chain management that related to food industry especially in perishable products. It is also included the issues in the degradation rate of perishable product which would affect the supply chain management of it. Therefore, this chapter would discuss deeply into inventory control also comparing the inventory management for perishable product that will bring effectiveness in lowering the wastage of unmarketable products. Then, it will outline the issue of deterioration rate of perishable product that need the effective strategy. Apart from that, transportations for perishable product also the main issue that is important to be discuss.

2.2. Supply Chain Management

Supply chain management is the management of different interactions along the supply chain. The supply chain is a network of many businesses and relationships, rather than a chain of businesses with one-to-one, business-to-business interactions (Lambert, 2000). They add more, supply chain management allows for the capturing of intra- and inter-company integration and management synergies. In this sense, SCM is concerned with whole business process excellence and represents a new approach to company management and connections with other supply chain participants. According to (Ding, 2022) in reality, Supply Chain Management (SCM) is critical in manufacturing organizations for resource allocation and cost reduction. (Lejarza, 2020) address that controlling product quality throughout the different tiers of the supply chain is crucial for companies handling extremely perishable inventory (e.g., fresh fruit, vaccinations, biologics) to avoid inventory waste and fulfil customer quality standards.

2.3. Food Supply Chain Management

Population increase and worldwide commerce have a significant influence on supply chain sustainability, particularly in the food business. The way food is created, processed, and consumed determines the food supply chain's sustainability. Due to persistent conflicts between elements of the food sector, food shortages have been slowly increasing over the last few years (Sharma, 2022). Food is a critical item for consumers in the modern period, since it has a direct influence on their health (Caplan, 2013). Due to the perishable nature of food goods, the food supply chain is more difficult than manufacturing and other traditional supply chains (La Scalia, 2017). (Singh, 2018) mention that food retailers hope to make their supply chains more consumer-centric (a supply chain designed to meet the needs of end consumers by addressing organizational, strategic, technology, process, and metrics factors) by using a variety of methods, such as market surveys, market research, interviews, and allowing customers to provide feedback in-store.

Moreover, food supply chain management encompasses several disciplines, including production economics, operations, and food science, as well as food business management, notably in terms of logistics. Indeed, understanding food systems from raw materials to consumption necessitates a comprehensive range of information on a variety of distinct but connected phenomena, including macro-economic and micro-economic elements that are intertwined throughout the global supply chain (Eastham, 2017). (Bendeković, 2014) determine that agricultural production, postharvest handling, processing, distribution/retail/service, and consumption are the five steps of the food supply chain. In terms of food quality and safety, the food supply chain employs two systems. The first is based on laws and regulations that employ mandated standards that are inspected by state authorities.

The second option is to depend on voluntary standards set by market legislation or international organizations. Moreover, the food industry's supply chains are complicated, ever-changing systems with a large number of actors. Food procurement and manufacturing firms, wholesale/distribution firms, brokers, food service and restaurant firms, and retail grocery firms make up the food supply chain. It stands out for its efficiency, diversity of business sizes and types, and consumer response (King, 1996).

2.4. Perishable Product

The rate of degradation of perishable goods has implications. Insofar as the pace of degradation of a perishable product is proportional to its quality, it has an impact on customer demand. Freshness, for example, is a significant attribute of agri-fresh product quality. The look of an agri-fresh product as a proxy for its freshness is typically judged by its customers (Lodree Jr, 2008). When choosing between two comparable agri-fresh goods at the same price, people are more likely to prefer the one that looks to be fresher. In contrast to other types of perishable items, there is a clear link between perceived agri-fresh product freshness and its rate of degradation (Yang, 2020). Therefore, (Tiwari, 2017) explain the reason is because the deterioration rate has a direct impact on an agri-fresh product's freshness, the lower the rate, the greater the freshness and the longer the agri-fresh product will stay fresh.

Meanwhile, shelf stock levels have an impact on consumers' propensity to acquire agri-fresh items. The price that may be acquired while addressing consumer needs is influenced by the age of the items. A single supplier is in charge of producing and distributing perishable items to a group of clients in this scenario. When manufacturing takes place at the supplier's site, fixed setup and variable production costs are charged, while routing charges are charged for distribution operations. Additionally, both the manufacturing plant and the consumer locations incur inventory holding expenses (Alvarez, 2022). Thus, perishability, an often-overlooked aspect of consumer products, has been demonstrated to play a significant effect in multistore purchasing behavior (Krider, 2000). Because their output and quality are inherently unreliable and unexpected, most perishable items, such as fish and vegetables, are traded primarily on the spot market.

The variable production costs of the items are often sunk costs in spot markets, which occur after production, and these costs are irrecoverable for perishable goods when the goods stay unsold, and the value of the perishable goods evaporates. As a result, if the market collapses, suppliers of perishable items may incur significant losses (Miyashita, 2014).