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Raw Material Waste Control to Improve Operational Efficiency in a Food and Beverage Company: A Case Study of Cafe Hoffmann Lane, Bandar Lampung, Indonesia

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Abstract

The rapid growth of the food and beverage (F&B) industry has intensified competition among cafes, requiring businesses to improve operational efficiency to remain sustainable. One of the main challenges faced by cafes is raw material waste, which directly increases food costs and reduces profitability. This study aims to analyze the factors causing raw material waste, examine the implementation of waste control using the Plan–Do–Check–Act (PDCA) approach, and evaluate its impact on operational efficiency at Cafe Hoffmann Lane in Bandar Lampung, Indonesia. This research employs a qualitative descriptive method, with data collected through direct observation, in-depth interviews, and documentation analysis. The findings reveal that raw material waste is primarily caused by inaccurate demand planning, suboptimal storage systems, portioning inaccuracies, overproduction, and human resource factors. The implementation of PDCA-based waste control, including small-batch preparation, portion control, and improved monitoring, resulted in a significant reduction in food cost from approximately 45% to 33%. Additionally, improvements were observed in cost efficiency, time efficiency, workflow effectiveness, labor productivity, and quality control. This study concludes that effective raw material waste control plays a crucial role in enhancing operational efficiency in the cafe industry. The findings provide practical insights for food and beverage businesses in implementing sustainable waste management strategies to support long-term operational performance.

Keywords

Raw Material Waste, Operational Efficiency, PDCA, Food and Beverage Industry, Cafe

Introduction

The food and beverage (F&B) industry, particularly cafes and coffee shops, has experienced rapid growth in Indonesia, including in Bandar Lampung. This growth is driven by changing consumer lifestyles, especially among millennials, who increasingly view cafes not only as places to consume food and beverages but also as social spaces and experiential destinations. As a result, competition within the cafe industry has intensified, requiring businesses to continuously improve their operational performance to remain sustainable and profitable (Siregar et al., 2023).

Operational efficiency has become a critical factor in determining business success in the highly competitive F&B sector. Operational efficiency refers to a company's ability to optimize the use of resources—such as raw materials, labor, time, and energy—to achieve maximum output with

minimal input while maintaining product quality and service standards. Inefficient operational practices can lead to increased costs, reduced profitability, and declining competitiveness (Mulyani & Saputra, 2025). In cafes, inefficiencies are often closely linked to poor control of raw materials, which directly affects food cost and operational performance.

According to data from the Indonesian Ministry of Industry, the food and beverage industry recorded a year-on-year growth of 6.15% in the second quarter of 2025, exceeding the national economic growth rate of 5.12% (Indonesia, 2025). The F&B sector also contributed approximately 38.9% to Indonesia's manufacturing gross domestic product during the 2023–2025 period (Statistik, 2025). This positive trend was accompanied by a significant increase in investment, reaching IDR 22.63 trillion in the first quarter of 2025, reflecting strong investor confidence in the sector (Indonesia, 2025). Despite this growth, increasing numbers of cafes have intensified competition, making operational efficiency a strategic necessity rather than a managerial option.

One of the most critical operational challenges faced by cafes is raw material waste. Raw material waste refers to any loss of materials that does not add value to the final product, including spoilage, expiration, improper storage, inaccurate portioning, and overproduction (Smith & Jones, 2022). In the F&B industry, where many raw materials are perishable, ineffective waste control can significantly increase food costs and erode profit margins. Studies indicate that improper raw material management can result in substantial financial losses and negatively impact environmental sustainability (Lee et al., 2023).

At the regional level, the F&B industry in Bandar Lampung has also shown consistent growth. Data from the Central Bureau of Statistics indicate that the number of F&B business units increased from 1,243 in 2023 to 1,572 in 2025, with an average annual growth rate exceeding 12% (Statistik, 2025). This growth was accompanied by an increase in production value, reaching IDR 1,764.2 billion in 2025. While this trend reflects strong market potential, it also highlights increasing competitive pressure, requiring cafes to improve internal efficiency to maintain profitability.

Cafe Hoffmann Lane, one of the growing cafes in Bandar Lampung, experienced significant challenges related to raw material waste, as reflected in its food cost, which reached approximately 45%, far above the ideal industry standard. This condition indicated inefficiencies in raw material planning, storage, and production processes. To address this issue, Cafe Hoffmann Lane implemented operational improvements based on the Plan–Do–Check–Act (PDCA) cycle, a systematic quality management approach designed to identify problems, implement corrective actions, and ensure continuous improvement (Mulyani & Saputra, 2025).

The implementation of PDCA-based waste control at Cafe Hoffmann Lane included changes such as shifting from large-batch to small-batch preparation, tightening portion control, and improving monitoring procedures. These measures resulted in a reduction in food cost from approximately 45% to 33%, indicating a significant improvement in operational efficiency. Beyond cost efficiency, effective waste control is also believed to enhance time efficiency, workflow effectiveness, employee productivity, and quality consistency (Sibarani & Alhazami, 2022; NetSuite, 2024).

Based on these conditions, this study aims to analyze the factors causing raw material waste, examine the implementation of PDCA-based waste control, and evaluate its impact on operational efficiency at Cafe Hoffmann Lane in Bandar Lampung. This research is expected to contribute both

theoretically and practically by providing insights into raw material waste control strategies that can enhance operational efficiency in the cafe and broader F&B industry.

Methods

Research Design

This study employed a qualitative descriptive research design to obtain an in-depth understanding of raw material waste control and its impact on operational efficiency. A qualitative approach was chosen because it allows researchers to explore operational processes, managerial practices, and human behavior in their natural setting, which is essential for analyzing waste management practices in the food and beverage industry.

Research Location and Object

The research was conducted at Cafe Hoffmann Lane, a cafe operating in Bandar Lampung, Indonesia. The object of this study was the implementation of raw material waste control in daily operational activities, particularly in purchasing, storage, production, and service processes.

Research Focus

The focus of this study was divided into two main aspects:

1. Raw material waste control, including planning of raw material requirements, storage systems, portion control, production processes, and supervision.
2. Operational efficiency, which was analyzed through cost efficiency, time efficiency, workflow effectiveness, labor productivity, and quality control.

Data Sources

This study used two types of data sources:

Primary data, obtained through direct observation and in-depth interviews with cafe owners, managers, and employees involved in purchasing, inventory management, and food preparation.

Secondary data, collected from company documents, such as inventory records, food cost reports, standard operating procedures (SOPs), and other relevant documentation related to cafe operations.

Data Collection Techniques

Data collection was carried out using the following techniques:

1. Observation, conducted by directly observing daily operational activities to identify sources of raw material waste and inefficiencies.
2. In-depth interviews, conducted with key informants to gain insights into operational practices, waste control strategies, and challenges faced by the cafe.
3. Documentation, involving the review of internal records and reports to support findings from observations and interviews.

Data Analysis Technique

Data analysis was conducted using qualitative analysis techniques, including data reduction, data display, and conclusion drawing. The analysis was structured using the Plan–Do–Check–Act (PDCA) cycle to examine the implementation of raw material waste control.

1. Plan, identifying problems related to raw material waste and planning corrective actions.
2. Do, implementing planned improvements in raw material management and production processes.
3. Check, monitoring and evaluating the effectiveness of the implemented actions.
4. Act, taking corrective actions and standardizing successful practices to improve operational efficiency.

Data Validity

To ensure data validity and reliability, this study applied triangulation of data sources and data collection techniques. Findings from observations, interviews, and documentation were compared to ensure consistency and credibility.

Results and Discussion

Overview of Raw Material Waste at Cafe Hoffmann Lane

The findings indicate that Cafe Hoffmann Lane experienced a relatively high level of raw material waste prior to the implementation of structured waste control measures. This condition was reflected in the cafe's food cost, which reached approximately 45%, exceeding the ideal standard for cafe operations. High food cost indicated inefficiencies in raw material planning, storage, and production processes. Similar conditions have been identified in previous studies, which emphasize that poor raw material management is a major contributor to operational inefficiency in the food and beverage industry (Siregar et al., 2023).

Direct observations and interviews revealed that waste mainly occurred during purchasing, storage, and food preparation activities. Raw materials with limited shelf life were frequently overstocked, increasing the risk of spoilage and expiration. In addition, inconsistencies in portion sizes during food preparation contributed to excessive raw material usage.

Factors Causing Raw Material Waste

Several key factors were identified as the main causes of raw material waste at Cafe Hoffmann Lane.

First, inaccurate demand planning resulted in excess inventory. The cafe relied largely on rough estimations rather than systematic analysis of historical sales data, leading to over-purchasing of raw materials. This finding is consistent with Lee et al. (2023), who stated that inaccurate forecasting significantly increases waste and food cost in F&B businesses.

Second, suboptimal storage systems contributed to spoilage and quality degradation. Although storage facilities were available, improper arrangement and inconsistent application of storage standards increased the likelihood of raw materials being damaged or expired before use.

Third, portioning inaccuracies and overproduction during food preparation were significant sources of waste. Employees did not consistently follow standard portion sizes, leading

to excessive use of raw materials. This finding supports Smith and Jones (2022), who emphasized that weak portion control is a major driver of food waste in cafes and restaurants.

Fourth, human resource factors also played a critical role. Limited supervision and inconsistent adherence to standard operating procedures (SOPs) reduced employee discipline in managing raw materials. Employees' limited awareness of cost implications further exacerbated inefficiencies (Sibarani & Alhazami, 2022).

Implementation of PDCA-Based Waste Control

To address raw material waste, Cafe Hoffmann Lane implemented waste control measures based on the Plan–Do–Check–Act (PDCA) cycle. During the planning stage, management identified key waste problems and evaluated historical food cost data to determine improvement targets. Planning focused on adjusting purchasing quantities and improving inventory management. In the implementation stage, corrective actions included shifting from large-batch to small-batch food preparation, applying stricter portion control, and enforcing the First In First Out (FIFO) method in raw material storage. These actions aimed to minimize spoilage and overproduction.

The evaluation stage involved monitoring food cost levels and reviewing daily raw material usage to assess the effectiveness of the implemented measures. Regular evaluations were conducted to identify remaining inefficiencies. In the improvement stage, successful practices were standardized through revised SOPs and reinforced through employee training and closer supervision. Continuous improvement became an integral part of daily operations, in line with the PDCA concept (Mulyani & Saputra, 2025).

Impact of Waste Control on Operational Efficiency

The implementation of PDCA-based waste control produced a significant positive impact on operational efficiency at Cafe Hoffmann Lane. The most notable improvement was observed in cost efficiency, as food cost decreased from approximately 45% to 33%. This reduction reflects a substantial decrease in raw material waste and improved cost control. Time efficiency also improved as clearer workflows and standardized procedures reduced preparation time and minimized service delays. Employees were able to work more effectively due to better coordination and task clarity.

In addition, workflow effectiveness and labor productivity improved as standardized procedures reduced errors and rework. Employees demonstrated greater awareness of waste prevention and cost efficiency, resulting in more disciplined operational practices. Quality control also improved, as better inventory management ensured that raw materials used in production were fresher and met quality standards. This finding aligns with Dewi and Hidayat (2023), who noted that effective waste control contributes not only to cost reduction but also to improved product quality and customer satisfaction.

Discussion

Overall, the results demonstrate that raw material waste control plays a crucial role in

enhancing operational efficiency in cafe operations. The findings are consistent with previous studies emphasizing the importance of systematic inventory management and continuous improvement frameworks such as PDCA in the food and beverage industry (Mulyani & Saputra, 2025; Lee et al., 2023). By integrating waste control into daily operational practices, cafes can achieve sustainable efficiency improvements while maintaining product quality and service standards.

Conclusion

This study concludes that raw material waste represents a significant operational challenge for cafe businesses and has a direct impact on operational efficiency. At Cafe Hoffmann Lane, raw material waste was primarily caused by inaccurate demand planning, suboptimal storage systems, portioning inaccuracies, overproduction, and human resource-related issues, particularly inconsistent adherence to standard operating procedures.

The implementation of raw material waste control using the Plan–Do–Check–Act (PDCA) approach proved effective in reducing waste and improving operational efficiency. The findings show a substantial reduction in food cost from approximately 45% to 33%, indicating improved cost efficiency. In addition, improvements were observed in time efficiency, workflow effectiveness, labor productivity, and quality control as a result of more structured operational processes and continuous monitoring.

Overall, this study highlights the importance of systematic waste control and continuous improvement in the food and beverage industry. The application of the PDCA cycle provides a practical and sustainable framework for cafes to control raw material waste, enhance operational efficiency, and maintain competitiveness in an increasingly competitive market environment.

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