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Raw Material Efficiency Analysis in The Main Kitchen of Best Western The Lagoon Hotel Manado

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Abstract

Purpose: This research employed a descriptive qualitative approach.This study analyzed raw material efficiency in the Main Kitchen of Best Western The Lagoon Hotel by comparing standard and actual usage, evaluating Standard Operating Procedures (SOPs) implementation, identifying sources of waste, and assessing inventory control strategies. A descriptive qualitative approach was employed.

Research Methodology: Data were collected through observations, in-depth interviews, documentation, and literature reviews. Informants were selected using purposive sampling and included the Executive Chef, Storekeeper or Cost Controller, Demi Chef or Commis, Cook 1, and Cook. Data analysis involved data reduction, data presentation, conclusion drawing and verification.

Results: The findings indicate that raw material usage is generally efficient because procurement and consumption are adjusted to hotel occupancy, breakfast guest numbers, and banquet requirements. SOP implementation is supported by the First-In-First-Out (FIFO) system, standardized recipes, and inventory planning based on room forecasts. However, waste still occurs due to inconsistent FIFO implementation and less effective utilization of certain raw materials in the production process.

Conclusions: The study concluded that applying SOPs, FIFO principles, standardized recipes, and forecast-based inventory control effectively reduces waste, strengthens inventory management, and maintains food quality.

Limitations: The findings are limited to one hotel and a specific observation period, reflecting only the operational conditions observed during the study period.

Contributions: This research contributes to hospitality management by providing practical insights into efficient raw material use, inventory control, and sustainable kitchen operations.

Keywords: *Food Waste, Hotel, Inventory Management, Raw Material Efficiency, Standard Operating Procedures*

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1. Introduction

Efficient use of raw materials is a crucial aspect of hotel operations, particularly in the Main Kitchen, as it directly influences production costs, food quality, and overall profitability. Inefficient raw material management can lead to increased food costs, excessive waste, and reduced operational

efficiency, which may ultimately affect a hotel's competitiveness and financial performance (Artajaya, Wijaya, & Febrianto, 2022). Previous studies have reported discrepancies between standard and actual food costs caused by weaknesses in purchasing, storage, and inventory control systems, indicating that effective management practices remain a significant challenge in food service operations (Suardana & Saputra, 2026).

In hotel kitchen operations, raw material efficiency is closely associated with effective inventory management, procurement planning, and systematic control procedures. A consistent supply of raw materials is essential to support uninterrupted production activities and to maintain service quality standards (Ali-momoh & Samuel, 2022). Research has shown that efficient raw material utilization can be achieved through accurate planning, inventory monitoring, and continuous supervision of production processes to minimize waste and operational losses (Firmansyah, & Destira, 2023; Hartono, & Andaresta, 2020; Luthfi, & Elvandari, 2024). Furthermore, effective raw material handling, including purchasing, receiving, storage, and inventory control, contributes significantly to operational effectiveness and cost efficiency in the hospitality industry (Artajaya et al., 2022; Utami, Ishak, & Faqih, 2022; Wijaya, & Widhiastuty, 2021).

Another important factor affecting raw material efficiency is the implementation of Standard Operating Procedures (SOPs). SOPs function as operational guidelines that support consistency, food safety, quality control, and efficiency in kitchen operations (Sumaco, 2019). Studies have indicated that well-implemented SOPs contribute to improved organizational performance and operational consistency, whereas non-compliance with established procedures may result in inefficiencies, food waste, and increased production costs (Wiradirga, & Octaviany, 2025; Kayikci, Demir, Mangla, & Subramanian, 2022; Arisuta, 2022; Hawari, & Suroto, 2017). Therefore, the integration of effective inventory management and SOP implementation is essential for achieving efficient raw material utilization in the hotel kitchen.

Several studies have examined raw material management, inventory control, food cost efficiency, and SOP implementation in hospitality and food service operations (Bendesa, Astuti, Astawa, Susanto, & Sarjana, 2022). However, most studies have focused on these aspects separately, while limited research has investigated how procurement planning, inventory management, SOP implementation, and daily kitchen operations collectively contribute to raw material efficiency in hotel kitchens. Furthermore, studies specifically examining raw material efficiency practices in hotel kitchens in Indonesian remain limited. Therefore, this study seeks to address this gap by analyzing raw material usage efficiency in the Main Kitchen of Best Western The Lagoon Hotel Manado, with particular attention to operational practices that support waste reduction and efficient resource utilization in the kitchen.

The Main Kitchen of Best Western The Lagoon Hotel Manado is responsible for providing food products for breakfast services, restaurants, and banquet events, making efficient raw material management essential for its operations. The hotel has implemented various control measures, including standardized recipes, inventory management systems, and the First-In, First-Out (FIFO) method. Nevertheless, challenges related to raw material utilization and operational efficiency may still occur because of fluctuating demand and day-to-day operational conditions.

Therefore, this study aimed to analyze the efficiency of raw material usage in the Main Kitchen of Best Western The Lagoon Hotel Manado, evaluate the implementation of Standard Operating Procedures in raw material management, identify factors contributing to inefficiency and waste, and examine strategies implemented to improve operational efficiency. The findings are expected to provide practical recommendations for improving inventory management, reducing food waste, enhancing cost efficiency, and supporting sustainable kitchen operations in the hospitality industry.

2. Literature Review

2.1 Raw Material Efficiency in Hotel Kitchen Operations

Raw material management is an important component of food and beverage operations because the quality, quantity, storage, and utilization of ingredients directly influence operational costs and the quality of food served to guests. In hotel kitchens, efficiency in raw material usage refers to the ability of the kitchen to utilize ingredients according to predetermined standards while minimizing unnecessary losses during purchasing, storage, preparation, cooking, and serving. Efficient use of raw materials is therefore closely related to food cost control, operational productivity, and sustainable kitchen management (Degong, Sunata, & Raditya, 2026; Suhardin, Trianingrum, & Arini, 2026).

The characteristics of hotel food production make raw material management particularly challenging. Unlike conventional restaurants, hotels must accommodate fluctuating demand generated by room occupancy, breakfast covers, individual restaurant customers, meetings, weddings, and banquet events. Consequently, kitchen production cannot rely solely on fixed daily quantities. Production needs to be adjusted to expected guest demand to prevent both shortages and excessive preparation. Filimonau and De (2019) explain that food waste in hospitality operations is influenced by interconnected activities across purchasing, storage, preparation, production, and consumption. Consequently, reducing waste requires managerial control throughout the entire food production process rather than focusing only on leftover food.

Efficiency can therefore be evaluated by comparing standard material requirements with actual material consumption. When actual usage consistently exceeds predetermined requirements, the difference may indicate excessive trimming, inappropriate portioning, spoilage, inaccurate forecasting, or deviations from operational procedures. Conversely, material utilization close to established standards indicates stronger control over kitchen operations.

2.2 Standard Operating Procedures in Kitchen Operations

Standard Operating Procedures (SOPs) provide formal guidelines for ensuring that operational activities are performed consistently. In hotel operations, SOPs are important because several employees may perform similar tasks across different shifts while being expected to maintain the same standards of quality, hygiene, efficiency, and service. Previous research published in *Jurnal Studi Perhotelan dan Pariwisata* demonstrates the importance of SOP compliance in maintaining operational consistency. Yudistira et al. (2024) found that most room-service procedures at Mandapa a Ritz-Carlton Reserve had been properly implemented, although several instructions were not consistently followed because of situational factors. This finding indicates that possessing formal procedures alone does not guarantee full operational compliance. Actual implementation remains influenced by employee behavior and working conditions.

Similarly, Putra et al. (2024) found that standardized procedures supported the smooth operation of food and beverage services, while employee discipline, training, teamwork, and operational efficiency remained necessary to ensure consistent implementation. These findings are relevant to kitchen operations because food production also involves repetitive procedures that require coordination among chefs, cooks, stores, purchasing personnel, and cost control personnel. Within kitchen operations, SOPs can regulate receiving procedures, ingredient storage, labeling, stock rotation, portioning, preparation, and production. Consistent SOP implementation can reduce variations between employees and provide measurable standards for evaluating material usage (Amalia & Elvandari, 2024). Therefore, SOP compliance becomes an important foundation for identifying whether raw-material inefficiencies arise from operational conditions or deviations from established procedures.

2.3 FIFO and Inventory Rotation

The First-In-First-Out (FIFO) method is widely applied in food storage because ingredients are highly sensitive to time and storage conditions. FIFO requires ingredients received earlier to be used before

ingredients received later. Its primary purpose is to maintain stock rotation, minimize expiration, preserve ingredient quality, and reduce spoilage. FIFO is especially important for perishable materials such as vegetables, fruit, meat, seafood, dairy products, and other refrigerated products. Ineffective stock rotation may result in older ingredients remaining unused while newer stock is consumed first. Eventually, ingredients may deteriorate before they enter the production process.

Mutanda (2026), through a systematic review of food waste management in hospitality, identifies FIFO, routine expiry monitoring, appropriate storage temperatures, and inventory inspection as important pre-kitchen waste-prevention practices. The review further demonstrates that inventory control is closely interconnected with purchasing decisions and food production. Therefore, FIFO should not be viewed only as a storage technique but as part of an integrated raw-material control system. However, the effectiveness of FIFO depends on consistent implementation. Proper labeling, storage arrangement, receiving records, and routine stock inspections are required to ensure that employees can easily identify which items should be used first. Inconsistent implementation can reduce the effectiveness of otherwise appropriate inventory policies.

2.4 Standardized Recipes and Production Control

Standardized recipes are another important instrument for controlling raw-material usage. A standardized recipe specifies ingredient types, quantities, preparation procedures, cooking techniques, yield, and serving portions for each menu item. It allows hotel kitchens to reproduce food consistently while controlling ingredient consumption. Standardized recipes contribute to efficiency because they establish an expected quantity of materials required for a particular production volume. This standard can then be compared with actual usage. Significant differences may indicate excessive trimming, inaccurate portioning, cooking losses, employee errors, or ineffective utilization of ingredients (Trisdayanti, Atmaja, & Hendrayana, 2026).

Production and portion control are particularly important in reducing kitchen waste. Mutanda (2026) reports that hospitality food-waste management at the kitchen stage is strongly associated with portion control, demand-based cooking, batch production, minimized trimming, and maximum utilization of edible raw materials. Pirani and Arafat (2016) emphasize that preventing waste at the source is more effective than managing waste after it has already been generated. Standard recipes therefore perform both financial and operational functions. Financially, they facilitate food-cost calculation and purchasing planning. Operationally, they support consistency in taste, appearance, portion size, and ingredient utilization. Their effectiveness, however, depends on employees following the established recipes rather than relying exclusively on personal estimates.

2.5 Forecast-Based Procurement and Production Planning

Demand forecasting is essential in hotel kitchens because food demand changes according to occupancy levels and scheduled activities. Forecasting enables the kitchen and store departments to estimate how much material should be purchased, issued, and prepared within a particular period. In hotel operations, room occupancy forecasts can provide an initial estimate of breakfast covers, while banquet event orders provide information concerning expected participants, menus, and food quantities for meetings or events. Combining these sources allows kitchen personnel to align production with anticipated demand.

Recent hospitality research identifies demand-based forecasting as one of the most frequently implemented strategies for preventing food waste at the pre-kitchen stage (Mutanda, 2026). Accurate forecasting helps purchasing and inventory personnel determine appropriate order quantities and prevents excessive stock accumulation. Kattiyapornpong et al. (2023) also demonstrate that five-star hotels use bookings, events, expected guests, inventory planning, and production controls as part of sustainable food-waste management practices. Nevertheless, forecasting cannot entirely eliminate

uncertainty because actual guest numbers may differ from expected numbers. Hotels therefore require flexible production planning, continuous coordination among departments, and periodic adjustments based on updated occupancy and banquet information.

2.6 The Role of the Store Department in Inventory Control

Efficient raw-material management is not exclusively the responsibility of kitchen personnel. The store department plays an important supporting role by controlling the receipt, storage, recording, issuance, and monitoring of food materials. Effective store management ensures that kitchen departments receive the appropriate materials in the required quantities while maintaining accurate records of inventory movements. Coordination between the kitchen, purchasing, store, and cost-control departments allows management to detect discrepancies between purchased quantities, issued materials, actual production requirements, and remaining inventory (Viyanti, 2025).

Inventory control also contributes directly to waste prevention. Mutanda (2026) concludes that procurement optimization and inventory-based interventions dominate pre-kitchen food-waste management practices. This indicates that waste prevention should begin before ingredients enter food production. Regular inspections of expiration dates, storage temperatures, physical stock levels, and material quality can prevent unnecessary losses and improve the accuracy of purchasing decisions. The store department therefore functions not merely as a storage facility but as an operational control point connecting procurement and food production.

2.7 Food Waste and Sustainable Kitchen Management

Food waste has become an important issue in hospitality because it creates both financial and environmental consequences. Ingredients discarded during storage, preparation, production, and service represent financial resources that fail to generate revenue. At the same time, wasted food represents unnecessary use of water, energy, transportation, labor, and other resources involved in food production. Pirani and Arafat (2016) emphasize that effective food-waste reduction in hospitality requires attention to purchasing, storage, preparation, serving, and waste handling. Martin-Rios et al. (2018) similarly argue that successful food-waste management depends not only on technical practices but also on managerial commitment, organizational knowledge, and innovation (Fitriani, 2023).

More recent evidence reinforces this integrated perspective. Mutanda (2026) classifies hospitality food-waste management into pre-kitchen, kitchen, and post-kitchen stages. Pre-kitchen strategies include forecasting, procurement control, FIFO, and inventory management; kitchen strategies include portion control, batch cooking, appropriate trimming, and maximum ingredient utilization; while post-kitchen strategies include redistribution, recycling, and other waste-management activities. This framework indicates that efficient raw-material management must be understood as an integrated process rather than an isolated kitchen activity.

2.8 Research Gap

Previous studies have extensively discussed food waste, SOP implementation, inventory control, forecasting, and sustainable hospitality operations. However, these aspects are often examined separately. Studies discussing hotel SOPs generally focus on service consistency, whereas food-waste studies predominantly examine overall prevention strategies or environmental sustainability. Limited research specifically evaluates raw-material efficiency by comparing operational practices with established usage standards while simultaneously examining SOP implementation, FIFO practices, forecasting, ingredient utilization, and the role of the store department.

Therefore, this study addresses this gap by examining raw-material usage in the Main Kitchen of Best Western The Lagoon Hotel as an integrated operational system. By comparing standard practices with actual conditions and identifying the factors responsible for waste or inefficiency, this research provides a more practical understanding of how kitchen production, SOP compliance, inventory

rotation, forecasting, and store control collectively influence raw-material efficiency in hotel operations.

3. Research Methodology

3.1 Type of Research

This study employed a descriptive qualitative approach to explore and analyze raw material management practices, inventory control systems, and the implementation of Standard Operating Procedures (SOPs) in the Main Kitchen of Best Western The Lagoon Hotel Manado. A descriptive qualitative design was selected because the phenomenon under investigation, raw material efficiency, is not merely a numerical outcome but a process embedded in daily operational behavior and the extent to which formal procedures are actually enacted by kitchen personnel. This approach is considered appropriate because efficiency in a hotel kitchen cannot be fully understood through cost figures alone; it also requires an understanding of how procurement planning, storage practices, and production routines interact with one another on a day-to-day basis, an interaction that is closely tied to how well raw material control systems are managed in practice (Viyanti, 2025). Data were collected through observations, in-depth interviews, documentation, and literature reviews, allowing the researcher to build a comprehensive understanding of operational practices and the factors influencing raw material efficiency in hotel kitchen operations.

3.2 Research Location and Time

This research was conducted in the Main Kitchen of Best Western The Lagoon Hotel Manado. The data collection schedule was adjusted based on the agreement, opportunity, and time availability of hotel management and relevant kitchen staff, to ensure optimal observation and interview processes without disrupting daily production activities in the hotel's operational area. Observations were conducted across different operational periods, including breakfast preparation, à la carte service, and banquet event days, so that the data captured would reflect variation in demand rather than a single operational condition, consistent with the way food production planning in hotels must account for fluctuating occupancy and event-based demand (Bendesa, Astuti, Astawa, Susanto, & Sarjana, 2022).

3.3 Variables and Measurement

This study identified several key variables considered to influence raw material efficiency in hotel kitchen operations, namely purchasing policy, inventory management, and compliance with Standard Operating Procedures. Purchasing policy refers to the extent to which the quantity and timing of raw material procurement align with anticipated demand derived from room occupancy forecasts, breakfast guest counts, and banquet event orders, an alignment that is central to preventing both material shortages and excess procurement (Aprilianti & Hidayat, 2019). Inventory management refers to how raw materials are received, stored, rotated, and issued for production, with particular attention to the consistency of First-In-First-Out (FIFO) practices (Yudiarta, 2025). Compliance with SOPs refers to the degree to which kitchen personnel follow established procedures for receiving, storing, portioning, and preparing raw materials, rather than relying on individual judgment or habitual shortcuts. These variables were measured through a comparative analysis of standard and actual material usage, in which standardized recipe requirements were compared against the quantities actually consumed in production, and through direct evaluation of the extent to which SOPs were implemented in daily operational practice.

3.4 Data Types and Sources

Primary data were collected through direct observation and in-depth interviews with relevant staff, together with documentation of work processes within the kitchen environment. Observation allowed the researcher to record actual practices as they occurred in real time, including how raw materials were received, stored, portioned, and prepared, providing a basis for comparison against the procedures described by informants during interviews. Secondary data were obtained from internal financial reports and operational records maintained by the hotel, including raw material purchase reports, standardized recipe records, sales reports, and internal audit reports related to food and

beverage expenses. Secondary data of this kind provide the quantitative basis, such as standard cost figures and actual consumption figures, needed to identify the size and pattern of any variance between planned and actual usage, consistent with how standard-cost information is used to evaluate operational performance in food and beverage settings (Ali-momoh et al., 2022).

3.5 Data Collection Tools

To support the smooth and systematic collection of data in the field, this study employed several operational tools designed to minimize information loss and to ensure that findings could be traced back to their original source. An interview guide was used, consisting of a list of written questions to keep conversations with informants focused on raw material management, inventory control, and SOP implementation, while still allowing sufficient flexibility for informants to elaborate on operational conditions unique to their respective roles. A field notes form was also used, functioning as a structured note-taking sheet for the researcher to document the results of direct observation of personnel's work activities in the Main Kitchen, including deviations between observed practice and documented procedure. In addition, digital support tools were employed, namely an audio recorder (voice recorder) used to capture interviews with informants verbatim, and a camera used to document physical evidence of operational processes in the field, such as storage arrangement, labeling practices, and portioning activities.

3.6 Population and Sample

The research population consisted of all operational entities in the Main Kitchen, including all employees involved in the planning, procurement, production, and processing of raw materials. Because the population encompasses several distinct functional roles, ranging from managerial oversight to hands-on production, the sample was drawn using a purposive sampling technique, in which informants were deliberately selected based on their direct involvement in, and knowledge of, raw material management and SOP implementation. Five informants were selected to represent the full operational hierarchy of the kitchen: the Executive Chef, who oversees menu planning and overall kitchen policy; the Storekeeper or Cost Controller, who manages the flow of incoming and outgoing materials; the Demi Chef or Commis, who supervises daily technical execution; Cook 1, who is directly responsible for production-level material usage; and Cook, who supports mise-en-place and interdepartmental coordination. This structure of positions reflects the standard division of roles and responsibilities within a hotel kitchen brigade (National Culinary Service Academy, 2024).

3.7 Data Collection Methods

The data collection method in this qualitative research employed source triangulation to obtain in-depth and objective data, combining several complementary techniques. Face-to-face interviews were conducted using an interview guide to gather information regarding operational constraints, raw material management practices, and the reasoning behind specific procedural decisions. Observations were conducted by directly observing the workflow of personnel in the Main Kitchen, focusing on raw material handling during daily operations, including receiving, storage, portioning, and preparation activities across different shifts and demand conditions. Documentation was carried out by collecting and reviewing relevant internal hotel documents, such as Kitchen Standard Operating Procedures, periodic inventory reports, and raw material purchasing records, in order to compare documented standards with the practices observed in the field. A literature review was also conducted by gathering data from various academic and industry sources to establish a theoretical basis for operational standards, raw material management, and hotel classification within the hospitality industry.

The list of informants identified for this study, along with the rationale for their inclusion, is presented as follows. The Executive Chef or Head Chef was interviewed as the highest authority in the kitchen to understand the operational monitoring system, menu planning, and raw material handling policies. The Storekeeper or Cost Controller was interviewed to understand the flow of incoming and outgoing goods, purchasing documents, and the arrangement of ingredients within the warehouse storage area.

The Demi Chef or Commis, representing kitchen staff, was interviewed to understand daily technical challenges in the field and the level of compliance with SOPs during food processing. Cook 1 was interviewed to understand efficient raw material usage practices and the operational obstacles encountered during the production period. Cook was interviewed to explore perceptions regarding the consistency of interdepartmental coordination in supporting mise-en-place within the operational area. The overall stages of this research process, from problem identification through to the resulting findings, are illustrated in Figure 1.

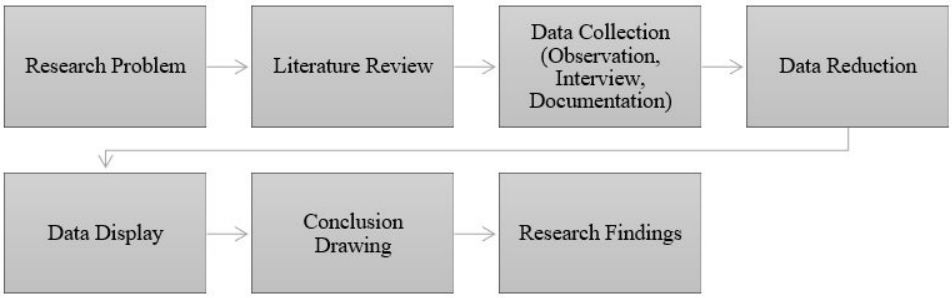

Figure 1. Research flow

Figure 1 illustrates the flow of the research process, beginning with the identification of the research problem and a review of the relevant literature, which together informed the design of the data collection instruments. Data were then collected through observation, interviews, and documentation, before being reduced to filter out information not directly relevant to raw material efficiency. The reduced data were subsequently displayed in an organized format to reveal patterns and discrepancies between standard and actual raw material usage, from which conclusions were drawn to produce the research findings presented in this study.

3.8 Analysis Methods

Data were analyzed using qualitative methods consisting of three interrelated stages, corresponding to the data reduction, data display, and conclusion drawing steps shown in Figure 1. The first stage was data reduction, the process of summarizing, selecting, simplifying, and focusing raw data obtained from interviews, observations, and documentation into more relevant information directly related to raw material efficiency, SOP compliance, and inventory control. The second stage was data display, the process of organizing and presenting reduced data in a visual form or structured format, such as descriptive narratives and comparison tables between standard and actual material usage, allowing patterns and discrepancies in raw material consumption to be identified more clearly. The third stage was conclusion drawing, the process of interpreting the implications of findings obtained from the Main Kitchen regarding raw material efficiency to arrive at the research findings. Conclusions were continuously verified against the data collected throughout the study, including cross-checking interview statements against documentary evidence and direct observation, to ensure that the interpretations produced were credible and grounded in the actual conditions of the research site.

4. Results and Discussions

4.1 Result

Table 1. Interview Results

Interview Questions	Interview Results	Source Person
What is the efficiency level of raw material usage at the Main Kitchen of Best Western The Lagoon Hotel, based on a comparison between usage standards and actual consumption?	Raw material usage efficiency has improved. Procurement is now aligned with hotel occupancy rates, the number of breakfast guests, and banquet requirements. This planning ensures that raw material purchases do not exceed actual needs, thereby balancing usage standards with actual consumption. This approach helps minimize waste including food waste across chillers, freezers, and storage areas.	Executive Chef
How are Standard Operating Procedures (SOPs) implemented in the management of raw materials at the Main Kitchen of Best Western The Lagoon Hotel?	Raw material management employs the First In, First Out (FIFO) system, meaning that materials received earliest are used first. All kitchen staff have received training on FIFO implementation to prevent spoilage or deterioration during storage. Furthermore, food production for both breakfast and events is consistently adjusted based on occupancy levels to avoid overproduction.	Executive Chef
What factors contribute to waste or inefficiency in raw material usage?	The primary cause of waste is the failure to consistently implement the FIFO system, leading to the accumulation and eventual spoilage of older stock. Furthermore, suboptimal raw material utilization such as excessive vegetable trimming results in the disposal of usable material, thereby increasing the volume of food waste.	Cook
What strategies does the Main Kitchen at Best Western The Lagoon Hotel implement to improve the efficiency of raw material usage?	The strategies implemented include using standardized recipes as production guidelines, applying the FIFO system for the storage and use of raw materials, and storing materials in accordance with applicable standards. Additionally, raw materials are utilized optimally to minimize waste and spoilage during the production process.	Cook

Interview results in Table 1 indicate that raw material usage efficiency at the Main Kitchen of Best Western The Lagoon Hotel has improved. Raw material procurement is planned based on hotel occupancy, breakfast guest numbers, and banquet requirements to ensure that purchasing volumes correspond to actual operational needs. Consequently, inventory levels remain proportional to production demand, allowing the kitchen to balance standard usage with actual consumption while minimizing food waste from chillers, freezers, and storage areas. In addition, Standard Operating Procedures (SOPs) are implemented through the consistent application of the First-In, First-Out (FIFO) system, standardized recipes, and occupancy-based production planning. Kitchen staff are trained to use older stock before newer supplies, reducing the risk of spoilage and maintaining the quality of stored ingredients.

Nevertheless, interview findings also revealed that inefficiencies still occur due to inconsistent FIFO implementation and suboptimal utilization of certain raw materials, such as excessive vegetable trimming, which increases avoidable food waste. To address these issues, the Main Kitchen applies standardized recipes, FIFO controls, proper storage standards, and close coordination between the kitchen and store department. These strategies have contributed to reduced material waste, improved

inventory control, lower operational costs, and consistent food quality, thereby ensuring guest satisfaction.

The findings demonstrate that the efficiency of raw material management is primarily supported by inventory planning based on operational demand. Procurement decisions are adjusted according to occupancy forecasts, preventing excessive purchasing and reducing the risks of stock accumulation, material deterioration, and unnecessary food waste. These results are consistent with Viyanti (2025), who reported that effective inventory control based on actual operational requirements improves the efficiency of raw material management in hotel operations. Similar findings were reported by Setiaji and Hermawan (2025), who emphasized that aligning procurement with production demand enables hotels to maintain operational efficiency while minimizing waste through more accurate purchasing decisions.

The successful implementation of the FIFO system in the Main Kitchen also reflects the importance of systematic inventory rotation in maintaining ingredient quality and reducing spoilage. Compared with the findings of Yudiarta (2025), this study demonstrates a relatively stronger implementation of FIFO because kitchen staff have received training and daily production is planned according to operational needs. Nevertheless, both studies acknowledge that FIFO remains an essential inventory management strategy. Likewise, the findings of Putri (2025) indicate that continuous supervision and structured inventory control strengthen the effectiveness of FIFO implementation in hotel food and beverage operations.

Another important finding is that operational efficiency depends not only on inventory rotation but also on integrated production planning and food waste management. The implementation of standardized recipes, occupancy-based forecasting, and proper storage practices has enabled the Main Kitchen to optimize raw material utilization while maintaining product quality. These findings support the study conducted by Fitriani (2023), which demonstrated that combining FIFO implementation with menu planning and food waste reduction strategies effectively improves operational efficiency. Although the Hyatt Regency Yogyakarta study placed greater emphasis on waste recording systems and the utilization of food scraps, both studies confirm that systematic inventory planning and production control are fundamental to minimizing food waste.

From a broader sustainability perspective, the present findings indicate that the Main Kitchen has adopted practical measures that support sustainable food waste management through purchasing control, inventory planning, and standardized operational procedures. These results are in line with Dinan et al. (2025), who emphasized that sustainable food waste management requires employee involvement, continuous monitoring, and effective operational coordination. Likewise, Astawa et al. (2021) argued that environmentally responsible hospitality practices should begin with effective internal operational management, including inventory control and waste prevention. Therefore, the implementation of raw material efficiency strategies at Best Western The Lagoon Hotel represents an important operational foundation for achieving sustainable hospitality practices.

Overall, the results of this study are consistent with Firmansyah and Destira (2023), who concluded that raw material efficiency is achieved through accurate inventory control and procurement planning based on production requirements. Similar conclusions were reported by Facrureza and Zanani (2022), who stated that effective inventory management supports smoother production processes while preventing excessive stock accumulation. Furthermore, the findings regarding FIFO implementation reinforce the study conducted by Yudiarta (2025), although the present study indicates better operational consistency through continuous staff training and supervision.

This observation is supported by Hawari and Suroto (2017), who emphasized that consistent implementation of Standard Operating Procedures (SOPs) improves production consistency and employee performance. In addition, the findings corroborate those of Luthfi and Elvandari (2024),

who concluded that strategic raw material management, supported by continuous monitoring and inventory control, is essential for reducing food waste and improving operational efficiency in hotel food and beverage departments. Collectively, these findings demonstrate that kitchen operational efficiency is optimized through the integration of accurate demand forecasting, disciplined SOP implementation, effective inventory management, and continuous supervision.

4.2 Discussion

The findings of this study, when viewed collectively, indicate that raw material efficiency in the Main Kitchen of Best Western The Lagoon Hotel Manado cannot be attributed to a single operational practice but instead emerges from the interaction of several interconnected systems: demand-based procurement planning, FIFO-based inventory rotation, standardized recipes, and coordination between the kitchen and the store department. This pattern is consistent with the integrated view of raw material management discussed in the literature review, which frames food and beverage efficiency as a process spanning purchasing, storage, preparation, production, and consumption rather than a series of isolated activities (Filimonau & De Coteau, 2019; Mutanda, 2026). The results of this study reinforce that perspective empirically: when procurement is aligned with occupancy forecasts and FIFO is properly implemented, the Main Kitchen is able to keep actual material consumption close to established standards, whereas gaps between standard and actual usage tend to appear specifically at points where this integration breaks down, such as inconsistent stock rotation and excessive trimming during preparation.

At the same time, the findings reveal an important nuance that distinguishes procedural existence from procedural compliance. The Main Kitchen has formally adopted FIFO, standardized recipes, and occupancy-based planning, yet waste continues to occur because these procedures are not always followed with full consistency by kitchen personnel. This mirrors the pattern identified in the literature review regarding SOP implementation in hospitality settings more broadly, where the presence of a written procedure does not automatically guarantee that the procedure is enacted uniformly across shifts and individuals. The persistence of waste despite the availability of adequate procedures therefore points to a compliance and supervision issue rather than a design issue, suggesting that further gains in raw material efficiency are more likely to come from strengthening monitoring, training, and accountability mechanisms than from introducing entirely new control systems.

The study also clarifies the specific role of the store department within this broader system. Rather than functioning merely as a passive storage facility, the store department in this study operates as an active control point that verifies incoming quantities, monitors stock levels, and coordinates with the kitchen to prevent both shortages and overstocking. This finding is consistent with the conceptual role attributed to the store department in the literature review, in which inventory control functions as a connective mechanism between procurement and production rather than a standalone administrative task. Where FIFO discipline weakens, or where communication between the store and kitchen is delayed, the risk of spoilage and consequent waste increases correspondingly, indicating that raw material efficiency is as much a matter of interdepartmental coordination as it is a matter of individual task execution within the kitchen itself.

Positioning these findings within the pre-kitchen, kitchen, and post-kitchen framework commonly used in food-waste research further clarifies where the Main Kitchen practices are strongest and where they remain vulnerable. At the pre-kitchen stage, the hotel demonstrates relatively strong practice through occupancy-based forecasting and planned procurement, which limits the volume of raw material entering the system in the first place. At the kitchen stage, standardized recipes and portioning guidelines support consistency, although the reported issue of excessive trimming suggests that ingredient utilization during preparation is not yet fully optimized. Waste arising from inconsistent FIFO application, meanwhile, sits at the intersection of the pre-kitchen and kitchen stages, since it originates in storage and rotation practices but manifests as usable material being

discarded during production. This staged view suggests that future efficiency improvements should not be pursued as a single, undifferentiated initiative, but rather targeted at the specific stage where control is currently weakest.

From a practical standpoint, these findings suggest several directions relevant to hotel kitchen management more broadly. First, aligning procurement with occupancy and event forecasts remains an effective and low-cost strategy for controlling raw material volume, and hotels facing similar fluctuating-demand conditions may benefit from formalizing this alignment rather than relying on informal estimation. Second, the gap between having an SOP and consistently following it indicates that periodic refresher training and routine supervision, rather than one-time procedural instruction, are necessary to sustain FIFO discipline over time. Third, because waste in this study was linked not only to storage but also to preparation-stage inefficiencies such as trimming, kitchens seeking further efficiency gains may need to extend their attention beyond inventory systems to include hands-on production practices and portioning technique among line-level staff.

Taken together, these findings address the gap identified earlier in this study, namely the limited availability of research examining procurement planning, inventory management, SOP implementation, and daily kitchen operations as a single, interconnected system rather than as separate areas of inquiry. By analyzing these elements jointly within one operational site, this study shows that raw material efficiency is best understood not as the outcome of any one control mechanism in isolation, but as the cumulative result of how consistently forecasting, procedural compliance, and interdepartmental coordination are maintained across the full flow of raw materials from procurement through to production.

5. Conclusions

5.1 Conclusion

Based on the research conducted, it can be concluded that a comparative analysis between usage standards and actual consumption provides a clear measure of raw material usage efficiency. Furthermore, this analysis identifies instances of material waste resulting from inefficient usage that lead to spoilage or the need to discard raw materials at the Main Kitchen of Best Western The Lagoon Hotel.

5.2 Research Limitations

This study was conducted only in the Main Kitchen of Best Western The Lagoon Hotel Manado; therefore, the findings cannot be generalized to other hotels with different operational characteristics. In addition, the study relied primarily on qualitative data obtained through interviews, observations, and documentation, which reflect operational conditions during the research period. Future studies are encouraged to incorporate quantitative indicators such as food cost variance, waste percentages, and inventory turnover rates to provide a more comprehensive evaluation of raw material efficiency.

5.3 Suggestions and Directions for Future Research

Based on the findings of this study, the hotel is encouraged to strengthen the consistent implementation of the FIFO system, conduct regular stock-taking activities, improve food waste monitoring procedures, and enhance forecasting accuracy for raw material procurement. Continuous training related to inventory management, portion control, and raw material handling should also be provided to kitchen staff to maintain operational efficiency. For future research, it is recommended to involve multiple hotels or food service establishments to improve the generalizability of findings and to include quantitative measurements of food waste, food cost variance, inventory turnover, and operational performance indicators.

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Author Contributions

GS contributed to conceptualization, data collection, investigation, data analysis, writing-original draft preparation, and manuscript preparation. JWAK contributed to supervision, methodology validation, manuscript review, and editing. VLS contributed to supervision, validation, manuscript review, and final approval of the manuscript.

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