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Optimization of Supply Inventory Control Systems for Product Differentiation and the Educational Tourism Attraction of Bakpia Djava Yogyakarta

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Abstract

Bakpia Djava Yogyakarta is a traditional culinary business that develops product differentiation and educational tourism to increase its competitiveness. This study aims to analyze the implementation of inventory control systems to support the company's smooth operations. The method used is descriptive qualitative through observation, interviews, and documentation. The results show that effective inventory control can maintain raw material availability, maintain product quality, and support educational tourism. Thus, inventory control is a crucial factor in supporting business sustainability and the company's competitive advantage.

Keywords: Bakpia Djava; Educational Tourism; Inventory Control; Product Differentiation, Raw Material Inventory.

INTRODUCTION

The culinary industry is one of the most significant subsectors of the creative economy, contributing substantially to economic growth and regional tourism development. In the Special Region of Yogyakarta, the culinary industry not only fulfills consumers' food demands but also represents an essential component of the region's cultural identity and tourism appeal. One of the most iconic culinary products and souvenirs from Yogyakarta is *bakpia*. Along with the increasing number of tourists and the rapid development of the creative industry, the bakpia industry has experienced remarkable growth, characterized by the emergence of numerous producers offering diverse product characteristics and

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marketing strategies. One company that has successfully maintained its existence amid this competitive environment is Bakpia Djava Yogyakarta.

Bakpia Djava was established in 2000 in the Patuk area, which is widely recognized as the center of the bakpia industry in Yogyakarta. Historically, the company is closely associated with the early development of the bakpia industry in Patuk, where the traditional Chinese bakpia recipe, originally filled with pork, was modified by replacing the filling with mung beans to accommodate the dietary preferences of the predominantly Muslim population. To this day, Bakpia Djava continues to preserve the authenticity of traditional bakpia by emphasizing high-quality raw materials, avoiding chemical preservatives, and maintaining the distinctive flavor that has been passed down through generations.

The increasingly competitive bakpia industry presents various challenges for the company. The emergence of both home-based producers and large-scale manufacturers has intensified competition in terms of price and product quality. Furthermore, innovations such as steamed bakpia have shifted consumer preferences and altered market dynamics. In response to these challenges, Bakpia Djava has strengthened its business strategy through the concept of *"The Past is New,"* which seeks to preserve the authenticity of traditional bakpia while presenting a modern image that aligns with current market trends.

In addition to product differentiation, Bakpia Djava has developed an educational tourism concept by providing opportunities for tourists, students, university groups, and travel agencies to observe the traditional bakpia production process firsthand. This educational experience enables visitors to learn about the history, production techniques, and cultural values embedded in the bakpia industry. Consequently, Bakpia Djava serves not only as a food producer but also as an educational tourism destination that supports the development of culinary tourism in Yogyakarta. The success of its product differentiation strategy and educational tourism activities is closely related to the effectiveness of its inventory control system. Inventory control plays a crucial role in ensuring the availability of raw materials, maintaining product quality, and supporting uninterrupted production processes.

For food manufacturers that do not use chemical preservatives, effective inventory management is essential to minimize the risks of raw material spoilage and stock shortages. Therefore, the inventory control system functions not only as an operational control mechanism but also as a strategic tool for maintaining product quality and enhancing the educational tourism experience offered to visitors.

Previous studies have highlighted the importance of inventory management in supporting business sustainability, particularly for small and medium-sized enterprises (SMEs) and tourism-related industries. Muliani et al. (2024), in their study on an integrated

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inventory management system for SMEs in Wates Jaya Tourism Village, Bogor Regency, found that integrated inventory management helps businesses overcome challenges related to raw material availability, inventory recording, cost calculation, and product development. Their findings emphasize that effective inventory management is a key factor in sustaining businesses associated with tourism activities.

Similarly, Harahap et al. (2026) evaluated the strategic feasibility of Fishchips and Miesteriuzz products using SWOT and Grand Strategy approaches. Their study revealed that product differentiation, innovation, raw material quality, and market expansion are essential factors in creating competitive advantages. Businesses offering distinctive products and clear differentiation strategies were found to have greater growth opportunities than those competing primarily on price. The study also highlighted the importance of collaboration, product development, and strengthened marketing strategies in maintaining competitiveness within increasingly competitive markets.

Despite these contributions, previous studies exhibit several limitations. Muliani et al. (2024) primarily focused on improving inventory management systems and SME development in tourism villages, while Harahap et al. (2026) emphasized product differentiation and business development strategies through SWOT analysis. Neither study examined the interrelationship among inventory control systems, product differentiation, and educational tourism within a single research context. In traditional culinary businesses such as Bakpia Djava Yogyakarta, however, these three aspects are closely interconnected and simultaneously influence business sustainability.

Accordingly, this study addresses both a research gap and a theoretical gap. Existing inventory control studies generally regard inventory management as an operational efficiency tool aimed at maintaining raw material availability and controlling costs. Conversely, product differentiation studies mainly emphasize marketing strategies and competitive advantage, while educational tourism research focuses on visitor experiences and destination development. Limited research has integrated these three perspectives within the context of traditional culinary industries that incorporate educational tourism.

Therefore, the novelty of this study lies in integrating operational management and tourism management perspectives to analyze the inventory control system implemented at Bakpia Djava Yogyakarta. Unlike previous studies that examined inventory management or product differentiation separately, this research investigates how optimizing the inventory control system supports both product differentiation strategies and the attractiveness of educational tourism. Furthermore, Bakpia Djava represents a unique research setting because it combines preservative-free traditional products, the *"The Past is New"* concept, a

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one-stop shopping strategy, and educational tourism centered on traditional production processes.

As one of the industrial tourism destinations in Yogyakarta, Bakpia Djava currently faces several challenges, including intense competition within the bakpia industry, rapidly changing consumer preferences, and fluctuating demand from walk-in customers, tourists, educational groups, and online consumers through social media platforms. At the same time, the company remains committed to producing preservative-free products, resulting in limited shelf life for both finished products and raw materials.

Under these circumstances, the company is required to implement an effective inventory control system capable of balancing raw material availability, product quality, operational efficiency, and the service requirements of educational tourism. Excessive inventory increases storage costs and the risk of raw material deterioration, whereas insufficient inventory may lead to stock shortages, production disruptions, decreased customer satisfaction, and diminished educational tourism experiences.

Based on these issues, the central research problem is to determine how the optimization of the inventory control system is implemented at Bakpia Djava Yogyakarta and how the system supports both product differentiation and the development of educational tourism attractions.

Accordingly, this study aims to:

1. Analyze the implementation of the inventory control system at Bakpia Djava Yogyakarta.
2. Examine the role and optimization of the inventory control system in maintaining product quality while supporting business sustainability and educational tourism.
3. Analyze the contribution of the inventory control system to the product differentiation strategy implemented by Bakpia Djava Yogyakarta.
4. Investigate the role of the inventory control system in enhancing the attractiveness of educational tourism at Bakpia Djava Yogyakarta.

THEORETICAL REVIEW

Inventory Control Theory explains that effective inventory management is essential for maintaining production continuity, minimizing operational costs, and ensuring product quality. Inventory control refers to the systematic process of planning, procuring, storing, monitoring, and utilizing raw materials to ensure that production activities operate efficiently without experiencing shortages or excessive stock. According to Ramadhanti et al. (2022), effective inventory control helps organizations determine optimal inventory levels while supporting uninterrupted production processes. Similarly, Karahap and Siswati (2021)

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argue that proper inventory management enables companies to reduce storage costs and improve operational efficiency.

In the context of Bakpia Djava Yogyakarta, inventory control plays a crucial role in maintaining the availability and quality of raw materials used in producing traditional bakpia. Since the company does not use chemical preservatives, raw materials have limited shelf lives and require careful monitoring throughout the storage and production process. Consequently, effective inventory control ensures consistent product quality, prevents production delays, and supports customer satisfaction. Furthermore, the implementation of the First In, First Out (FIFO) method allows older raw materials to be used before newer ones, thereby reducing the risk of spoilage and maintaining product freshness (Agustin, 2022; Hamidy, 2024).

Inventory control also contributes significantly to product differentiation, which refers to a company's strategy of creating distinctive products that provide superior value compared to competitors. According to Kawengian et al. (2022) and Juliani et al. (2022), product differentiation positively influences consumers' purchasing decisions because unique product characteristics increase competitive advantage. At Bakpia Djava Yogyakarta, differentiation is achieved through the preservation of authentic traditional recipes, the use of high-quality preservative-free ingredients, innovative branding under the concept *"The Past is New,"* and the integration of educational tourism into its business model. These distinctive characteristics enable the company to maintain a strong competitive position within Yogyakarta's highly competitive souvenir industry.

Another important theoretical perspective is Educational Tourism Theory, which emphasizes learning experiences as an integral component of tourism activities. Educational tourism combines recreation with knowledge acquisition by allowing visitors to directly observe, experience, and participate in production processes or cultural activities. Sri Puspa Dewi and Brenda Pingkan Vania (2023) explain that educational tourism enhances destination attractiveness by introducing visitors to local history, culture, and production processes. At Bakpia Djava Yogyakarta, visitors can observe the traditional bakpia-making process, learn about its historical development, and participate in production activities, creating a unique and memorable tourism experience.

These three theoretical perspectives are closely interconnected. Effective inventory control ensures the continuous availability of quality raw materials, which supports consistent product quality and enables the company to maintain its product differentiation strategy. Simultaneously, uninterrupted production processes enhance the implementation of educational tourism activities by ensuring that visitors can observe and participate in every stage of production. Therefore, inventory control functions not only as an operational

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management tool but also as a strategic resource that strengthens competitive advantage, business sustainability, and the attractiveness of educational tourism.

The present study is based on the proposition that optimizing the inventory control system contributes significantly to maintaining product differentiation while enhancing the attractiveness of educational tourism at Bakpia Djava Yogyakarta. Through effective inventory management, the company is expected to sustain product quality, improve operational efficiency, and provide a high-quality educational tourism experience for visitors.

METHOD

Research Design

This study employed a descriptive qualitative research design to examine the optimization of the inventory control system in supporting product differentiation and enhancing the attractiveness of educational tourism at Bakpia Djava Yogyakarta. A qualitative approach was selected because it enables an in-depth understanding of operational practices, inventory management processes, and their contribution to business sustainability within a real-world context.

Research Setting and Participants

The research was conducted at Bakpia Djava Yogyakarta, a traditional culinary enterprise that integrates bakpia production with educational tourism activities. The participants consisted of individuals directly involved in inventory management, production, and educational tourism operations, including the business owner, operational manager, warehouse staff, production employees, and other relevant personnel. These participants were selected because they possessed comprehensive knowledge regarding the company's inventory control practices and operational activities.

Sampling Technique

A purposive sampling technique was employed to select participants who were directly involved in inventory management and production activities. This technique was considered appropriate because it allowed the researchers to obtain rich and relevant information from individuals with extensive experience and responsibilities related to the research objectives.

Data Collection Techniques

Data were collected using three complementary techniques:

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Observation was conducted to examine raw material procurement, storage systems, inventory monitoring, production processes, and educational tourism activities. Semi-structured interviews were carried out with key informants to obtain detailed information regarding inventory control implementation, product differentiation strategies, and the role of inventory management in supporting educational tourism. Documentation was used to collect supporting data, including inventory records, operational procedures, company documents, photographs, and other relevant archival materials. The researcher served as the primary research instrument (human instrument), supported by interview guidelines, observation sheets, audio recording devices, cameras, and field notes.

Data Analysis

The collected data were analyzed using the interactive qualitative analysis model, consisting of data reduction, data display, and conclusion drawing/verification. Data reduction involved selecting and organizing relevant information, followed by systematic presentation to facilitate interpretation. Finally, conclusions were drawn and continuously verified throughout the research process to ensure consistency and credibility.

To enhance the trustworthiness of the findings, source triangulation and method triangulation were employed by comparing information obtained through observations, interviews, and documentation. This approach ensured the validity and reliability of the research findings and provided a comprehensive understanding of the implementation of inventory control systems at Bakpia Djava Yogyakarta.

RESULTS

Based on the observation results, Bakpia Djava has implemented a comprehensive inventory control system that includes raw material planning, procurement, storage, inventory recording, and inventory monitoring. This system is designed to ensure the continuous availability of raw materials, thereby supporting uninterrupted production processes and maintaining product quality in accordance with the company's standards. Raw material planning is conducted by considering daily production targets, customer demand, and projected increases in demand during specific periods, such as public holidays, tourism seasons, and religious celebrations. This planning enables the company to determine the appropriate quantity of raw materials required, minimizing the risk of both shortages and excess inventory.

Based on the interview findings, raw materials at Bakpia Djava are procured from multiple suppliers according to the type of material required. The primary raw materials, including wheat flour, mung beans, sugar, cooking oil, and other supporting ingredients, are

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sourced from suppliers that meet the company's quality standards. The use of multiple suppliers aims to ensure the continuity of raw material supply while minimizing the risk of production disruptions caused by delivery delays or stock shortages from individual suppliers.

The observations also revealed that the company performs routine inventory recording to monitor the quantity of raw materials available in the warehouse. These inventory records serve as the basis for determining future purchasing requirements. In addition, regular stock inspections are conducted to verify the consistency between inventory records and the actual physical stock available.

Regarding storage practices, raw materials are placed in clean, organized, and well-maintained storage areas according to their respective categories. The company also applies the First In, First Out (FIFO) method, whereby raw materials that arrive first are used before newly received materials. The implementation of this method helps preserve the quality of raw materials while reducing the risk of spoilage during storage.

Inventory monitoring is carried out continuously by both the warehouse and production departments. This monitoring aims to ensure sufficient raw material availability, maintain the quality of stored materials, and support the continuity of production activities. Through regular monitoring, the company can promptly reorder raw materials when inventory levels begin to decline.

Although the inventory control system has been implemented effectively, the company still encounters several challenges, including fluctuations in raw material prices, increased demand during peak seasons, and differences in delivery schedules among suppliers. To address these challenges, Bakpia Djava conducts regular inventory monitoring, maintains close communication with suppliers, and keeps safety stock for raw materials with high consumption rates.

These findings are consistent with the study conducted by Hartono and Prabowo (2023), which reported that raw material inventory control plays a crucial role in supporting the continuity and efficiency of production processes. Through effective raw material planning, accurate inventory recording, proper storage practices, and continuous inventory monitoring, Bakpia Djava is able to maintain adequate raw material availability, allowing production activities to operate efficiently while ensuring consistent product quality.

Table 1. Raw Material Procurement Process at Bakpia Djava

Stage	Activity
1	Identify raw material requirements based on production targets.

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2	Check the availability of raw material inventory in the warehouse.
3	Prepare a list of raw materials to be purchased.
4	Order raw materials from multiple suppliers according to the type of materials required.
5	Receive and inspect the quality of the delivered raw materials.
6	Record the received raw materials in the inventory management system.
7	Store raw materials according to the company's storage standards.
8	Distribute raw materials to the production department.
9	Monitor the utilization of raw materials throughout the production process.
10	Evaluate inventory levels to support future purchasing and production planning.

As presented in Table 1, the raw material procurement process at Bakpia Djava is conducted systematically, beginning with the identification of raw material requirements and ending with inventory evaluation. Each stage plays a crucial role in ensuring the availability of raw materials required for production activities. This structured procurement process enables the company to minimize the risk of inventory shortages while maintaining the continuity of production operations.

The involvement of multiple suppliers in the procurement process also provides greater flexibility in fulfilling raw material requirements. This strategy reduces the company's dependence on a single supplier while enhancing its ability to respond to fluctuations in market demand and supply conditions. Consequently, the inventory control system implemented at Bakpia Djava not only supports uninterrupted production but also contributes significantly to the long-term sustainability of the business.

At Bakpia Djava Yogyakarta, maintaining product quality largely depends on the continuous availability of high-quality raw materials. Essential ingredients, including wheat flour, sugar, mung beans, and other supporting materials, must always be available in good condition to ensure that the bakpia products maintain consistent taste, texture, and aroma. Product consistency is one of the key factors in maintaining customer trust and strengthening the company's competitiveness in Yogyakarta's traditional souvenir market. Through a well-structured inventory control system, the company is able to manage raw material utilization more effectively, thereby preserving product quality throughout every stage of the production process.

In addition to improving product quality, the inventory control system also plays an important role in supporting business sustainability. Effective inventory management enables the company to control operational costs associated with purchasing and storing

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raw materials. Larasati et al. (2021) reported that inventory control using the Economic Order Quantity (EOQ) method helps companies determine the optimal order quantity, thereby reducing inventory costs while maintaining efficient production processes. These findings indicate that inventory control functions not only as a mechanism for monitoring inventory but also as a strategic approach to maintaining operational stability and ensuring long-term business sustainability.

The optimization of the inventory control system can be further enhanced through the implementation of safety stock and reorder point (ROP) policies. Safety stock serves as a buffer against uncertainties in customer demand and potential delays in raw material deliveries from suppliers. Meanwhile, the reorder point determines the appropriate time to replenish inventory before stock levels become critically low. According to Larasati et al. (2021), safety stock protects companies from the risk of raw material shortages during lead times, while the reorder point establishes the minimum inventory level that triggers a new purchase order. The implementation of these two inventory control mechanisms helps reduce the likelihood of production disruptions resulting from insufficient raw material availability.

Inventory control also plays a vital role in supporting educational tourism activities. As a company that integrates production with educational tourism, Bakpia Djava must ensure that the entire production process can be continuously demonstrated to visitors. The availability of sufficient raw materials enables tourists to observe every stage of bakpia production, from raw material preparation to the final packaged product. Conversely, any shortage of raw materials may interrupt educational activities and reduce the overall quality of the visitor experience.

Furthermore, an optimized inventory control system contributes to greater operational efficiency by minimizing the risks of both excess inventory and stock shortages. Haryanto and Santi (2025) explained that the implementation of the Economic Order Quantity (EOQ) and Reorder Point (ROP) methods enables companies to determine the optimal order quantity and appropriate reorder timing, resulting in more efficient inventory management. Moreover, these methods help reduce the risks of overstocking and stockouts, which are among the primary factors contributing to increased operational costs.

Table 2. Indicators of the Role of Inventory Control in Product Quality and Business Sustainability

Aspect	Role of the Inventory Control System	Impact on Bakpia Djava

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Product Quality	Ensures the availability of high-quality raw materials	Maintains consistent product quality, taste, and texture
Operational Efficiency	Reduces the risk of overstocking and stock shortages	Lowers inventory holding and ordering costs
Business Sustainability	Maintains the continuity of the production process	Enhances long-term business stability
Educational Tourism	Ensures the availability of raw materials during visitor activities	Enables educational tourism activities to be conducted smoothly and attractively

Therefore, optimizing the inventory control system is not only concerned with controlling inventory levels but also plays a significant role in maintaining product quality, improving operational efficiency, supporting business sustainability, and enhancing educational tourism, which has become one of the key competitive advantages of Bakpia Djava Yogyakarta.

The implementation of a product differentiation strategy is one of the company's efforts to establish a competitive advantage by offering products with distinctive characteristics that differentiate them from competitors. In Yogyakarta's traditional souvenir industry, product differentiation has become an important factor in attracting customers while maintaining their loyalty. At Bakpia Djava Yogyakarta, product differentiation is achieved through a variety of product flavors, consistent product quality, innovative packaging, and memorable customer experiences. The success of this differentiation strategy is closely associated with the implementation of an effective inventory control system, which ensures that raw materials are available in the right quantity, at the right time, and according to the quality standards established by the company.

The inventory control system contributes to the product differentiation strategy by maintaining the continuous availability of raw materials required for the production process. Raw material inventory is one of the primary factors determining production continuity because it directly influences the company's ability to meet market demand and develop product variations. Halima and Pravitasari (2022) explained that the availability of raw materials has a direct impact on production continuity and should therefore be managed effectively to ensure uninterrupted production activities. When a company

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consistently maintains adequate raw material availability, product innovation and development can be carried out without disruptions caused by inventory shortages.

In addition to ensuring production continuity, inventory control also plays a crucial role in maintaining product quality, which is one of the main elements of product differentiation. High-quality raw materials produce products with consistent taste, texture, and characteristics. Such consistency is essential because it distinguishes the company's products from those of its competitors. Poor inventory management may result in raw material deterioration, declining quality, and even product expiration, ultimately affecting the quality of the final products. Therefore, effective inventory control should focus not only on maintaining appropriate inventory quantities but also on preserving the quality of raw materials throughout storage and utilization (Halima & Pravitasari, 2022).

The contribution of the inventory control system to product differentiation can also be observed through improvements in operational cost efficiency. Effective inventory management enables the company to reduce ordering and storage costs, allowing organizational resources to be allocated to activities that support product innovation. According to Halima and Pravitasari (2022), the Economic Order Quantity (EOQ) method is designed to determine the optimal order quantity at the minimum possible cost while reducing the risks of inventory shortages and excess stock. Through improved cost efficiency, the company gains greater opportunities to develop new products, improve packaging designs, and enhance product quality as part of its differentiation strategy.

The inventory control system also supports product differentiation through the implementation of Safety Stock and Reorder Point (ROP). These inventory control tools help the company anticipate uncertainties in market demand and delays in raw material deliveries from suppliers. Halima and Pravitasari (2022) stated that the application of the EOQ method enables companies to determine appropriate safety stock levels and reorder points, thereby optimizing inventory management. By maintaining adequate safety stock, the company can ensure that all product variants, which represent its distinctive characteristics, remain available and can be produced according to market demand.

In the context of Bakpia Djava Yogyakarta, an optimized inventory control system enables the company to maintain the continuous availability of various product variants that serve as major attractions for both consumers and tourists. The company's ability to consistently maintain product quality and availability strengthens its reputation as an innovative and high-quality bakpia producer. Therefore, the inventory control system functions not only as an inventory management tool but also as a strategic resource that supports the creation of competitive advantage through product differentiation.

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Table 3. Contribution of the Inventory Control System to Product Differentiation at Bakpia Djava

Inventory Control Aspect	Contribution to Product Differentiation
Raw material availability	Supports the continuous production of various bakpia product variants.
Raw material quality control	Maintains consistent product taste, texture, and overall quality.
Implementation of the Economic Order Quantity (EOQ) method	Improves cost efficiency, thereby supporting product innovation and development.
Safety Stock and Reorder Point (ROP)	Reduces the risk of raw material shortages for the company's flagship products.
Inventory efficiency	Creates opportunities for product development and enhances the company's competitive advantage.

The inventory control system is a fundamental component that directly influences the quality of the visitor experience in production-based educational tourism at Bakpia Djava Yogyakarta. Unlike conventional tourist destinations that primarily rely on natural attractions or historical landmarks, educational tourism emphasizes the production process itself as its main attraction. Visitors do not merely purchase products; they also observe, understand, and actively participate in the bakpia-making process, beginning with raw material preparation and continuing through production until the final products are packaged.

This unique tourism concept makes the continuity of the production process highly dependent on the effectiveness of the inventory control system. The availability of sufficient and high-quality raw materials ensures that every stage of production can be demonstrated without interruption, allowing visitors to experience the complete production process as intended. Consequently, inventory control plays an essential role in maintaining the quality and attractiveness of the educational tourism experience.

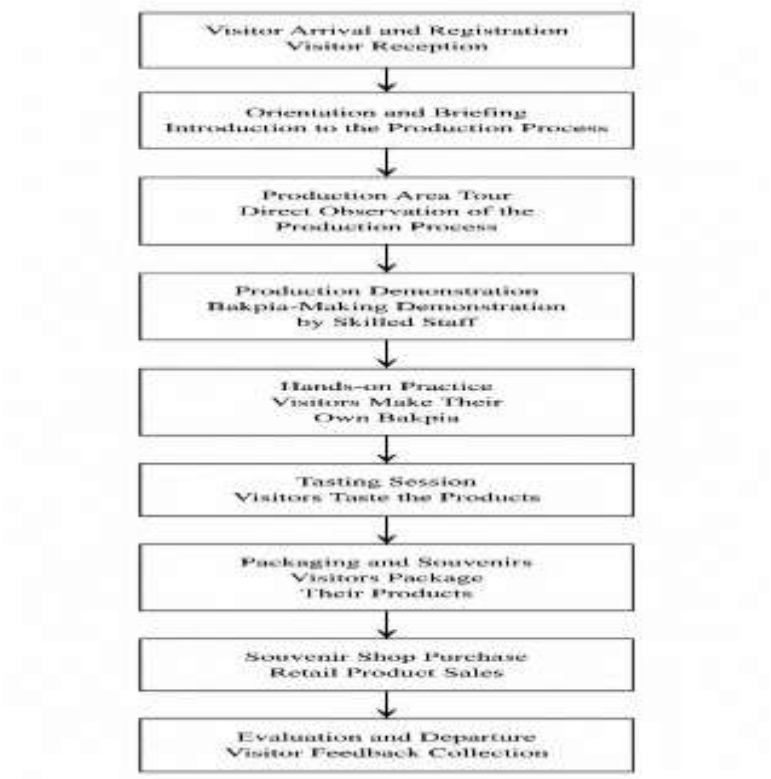
These findings are consistent with the study conducted by Fidelitasari et al. (2023), which emphasized that effective tourism management should enhance destination attractiveness, stimulate local economic growth, and promote sustainable tourism practices. In the context of Bakpia Djava Yogyakarta, a well-managed inventory control system not only supports production continuity but also strengthens the company's educational tourism program by providing visitors with an authentic and uninterrupted learning experience.

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To better understand the role of the inventory control system in supporting the attractiveness of educational tourism, it is necessary to illustrate the overall flow of educational tourism activities at Bakpia Djava. The sequence of these activities is presented in the following figure.

Figure 1. Flow of Educational Tourism Activities and the Inventory Control System at Bakpia Djava Yogyakarta



Based on the flow illustrated in Figure 1, the educational tourism program at Bakpia Djava consists of several sequential stages: visitor arrival and registration, orientation and briefing, production area tour, production demonstration, hands-on practice, tasting session, packaging and souvenir preparation, souvenir shop purchase, and evaluation and departure. Each stage is carefully designed to provide visitors with an experience that is not only informative but also highly interactive, allowing them to gain a comprehensive understanding of the traditional bakpia production process.

Among these stages, the production area tour, production demonstration, and hands-on practice represent the core activities of the educational tourism program, as they allow

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visitors to interact directly with the bakpia-making process. Through these activities, the attractiveness of Bakpia Djava's educational tourism lies not only in the final product but also in the authentic learning experience gained by visitors throughout their visit.

Furthermore, the inventory control system plays a crucial role in ensuring that every stage of the educational tourism program operates efficiently and meets the requirements of each activity. Effective inventory management ensures the continuous availability of raw materials, production equipment, tasting supplies, packaging materials, and other supporting educational resources. As a result, visitors are able to participate in every activity without interruption. Therefore, the inventory control system serves not only as an internal logistics management tool but also as a key supporting factor in creating an organized, comfortable, and high-quality educational tourism experience.

However, based on the observations and interviews conducted during this study, several challenges were identified within the inventory control system that directly and indirectly affect the quality and attractiveness of the educational tourism program at Bakpia Djava. These challenges, together with their impacts and proposed solutions, are summarized in the following table.

Table 4. Challenges and Recommended Solutions for the Inventory Control System

Challenges	Impact on Educational Tourism	Recommended Solutions
Fluctuating prices and unstable supply of primary raw materials.	Disrupts the continuity of production demonstrations and visitors' hands-on practice sessions.	Maintain a minimum safety stock sufficient for three days of educational tourism operations and establish a well-planned raw material procurement schedule.
No separation between inventory allocated for educational tourism and daily commercial production.	Increases the risk of raw material shortages for educational tourism activities during periods of high production demand.	Establish a separate inventory allocation system in which educational tourism supplies are managed independently from commercial production inventory.
The availability of special packaging for educational tourism is not	Reduces the souvenir value for visitors and weakens	Develop a procurement schedule for special tourism packaging that is directly

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synchronized with the visitor reservation schedule.	product differentiation as an exclusive local souvenir.	integrated with the visitor reservation system.
The absence of an integrated digital inventory recording system connecting the production and educational tourism departments.	Makes it difficult to monitor inventory readiness in real time before scheduled educational tourism activities.	Implement a simple digital inventory management system that can be jointly accessed by both the production team and the educational tourism management team.

The overall findings of this study demonstrate that the inventory control system at Bakpia Djava extends far beyond its traditional role as an internal logistics function. Instead, it serves as a strategic component that actively shapes the quality and uniqueness of the company's educational tourism experience. When the inventory control system operates effectively, visitors benefit from a comprehensive experience, including uninterrupted production demonstrations, hands-on activities supported by sufficient and high-quality raw materials, finished products packaged in distinctive and exclusive packaging, and an overall impression of professional business management. These positive experiences are likely to enhance visitor satisfaction and encourage positive word-of-mouth recommendations, thereby strengthening Bakpia Djava's competitiveness as an educational tourism destination.

The findings are consistent with Lisa et al. (2024), who emphasized that strong collaboration among all stakeholders involved in tourism management, including effective inventory and resource management, contributes not only to operational efficiency but also to sustainable and inclusive tourism development. In the context of Bakpia Djava, the integration of inventory control with educational tourism activities demonstrates how effective operational management can simultaneously support production continuity, improve visitor experiences, and generate long-term economic value for the business and the surrounding community.

DISCUSSION

The findings demonstrate that an effective inventory control system is essential for maintaining operational efficiency, ensuring product quality, and supporting business sustainability at Bakpia Djava Yogyakarta. The implementation of systematic inventory planning, procurement, storage, stock monitoring, and the First In, First Out (FIFO) method

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has enabled the company to maintain a stable supply of raw materials while minimizing the risk of shortages and spoilage. These findings are consistent with Ramadhanti et al. (2022), who argued that effective inventory control plays a vital role in ensuring production continuity and determining optimal inventory levels. Likewise, Karahap and Siswati (2021) emphasized that proper inventory management contributes to cost efficiency and smoother production activities.

The study also confirms that inventory control contributes significantly to maintaining product quality. Since Bakpia Djava produces preservative-free traditional bakpia, the freshness and quality of raw materials are critical to preserving the product's taste, texture, and overall consistency. The application of the FIFO method allows raw materials with earlier arrival dates to be used first, thereby reducing waste and maintaining product standards. This finding supports the study by Agustin (2022) and Hamidy (2024), who reported that FIFO improves inventory efficiency while preserving product quality through proper stock rotation.

Furthermore, the findings reveal that inventory control strengthens the company's product differentiation strategy. Stable raw material availability enables Bakpia Djava to consistently produce high-quality traditional products while maintaining its unique business concept, "The Past is New." Effective inventory management also provides opportunities for product innovation and packaging improvements by reducing unnecessary inventory costs. These results are in line with Kawengian et al. (2022) and Juliani et al. (2022), who found that product differentiation positively influences purchasing decisions and enhances competitive advantage by offering distinctive product characteristics.

Another important finding is the role of inventory control in supporting educational tourism. Unlike conventional manufacturing businesses, Bakpia Djava integrates production activities with tourism experiences, allowing visitors to observe and participate in the traditional bakpia-making process. Continuous raw material availability ensures that educational tourism activities can be conducted without interruption, thereby enhancing visitor satisfaction and strengthening the company's attractiveness as an educational tourism destination. This finding supports the perspective of Sri Puspa Dewi and Brenda Pingkan Vania (2023), who emphasized that educational tourism creates additional value by combining cultural learning with direct production experiences.

Despite these positive outcomes, the study identified several operational challenges, including fluctuations in raw material prices, seasonal demand variations, inconsistent supplier delivery schedules, and the absence of an integrated digital inventory management system. These challenges may affect production continuity and educational tourism

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activities if not managed properly. Therefore, implementing safety stock, reorder point policies, supplier diversification, and digital inventory management systems would further improve operational performance and reduce inventory-related risks.

Overall, the findings indicate that inventory control should not be viewed solely as an operational function for managing raw materials. Instead, it serves as a strategic management tool that supports product differentiation, operational efficiency, business sustainability, and educational tourism development. By integrating inventory management with marketing and tourism strategies, Bakpia Djava Yogyakarta has strengthened its competitive advantage and created added value for both customers and visitors. These findings also contribute to the literature by demonstrating the interrelationship between inventory control, product differentiation, and educational tourism within the context of a traditional culinary business.

CONCLUSION

This study examined the optimization of the inventory control system in supporting product differentiation and enhancing the attractiveness of educational tourism at Bakpia Djava Yogyakarta. The findings demonstrate that the implementation of a systematic inventory control system, including raw material planning, procurement, storage, inventory monitoring, and the application of the First In, First Out (FIFO) method, has successfully maintained raw material availability and ensured consistent product quality. Effective inventory management also contributes to operational efficiency by minimizing inventory shortages and reducing the risk of raw material deterioration.

Furthermore, the study confirms that inventory control plays a strategic role beyond operational management. It supports product differentiation by ensuring the continuous production of high-quality traditional bakpia while reinforcing the company's unique business concept. In addition, inventory control enhances the implementation of educational tourism by ensuring uninterrupted production activities, allowing visitors to observe and participate in the traditional bakpia-making process. Consequently, inventory control has become an important factor in strengthening business sustainability and improving the competitive advantage of Bakpia Djava Yogyakarta.

Recommendations

Based on the findings, several recommendations are proposed. First, Bakpia Djava should strengthen its inventory management practices by implementing digital inventory management systems that enable real-time stock monitoring and improve coordination between warehouse, production, and educational tourism divisions. Second, the company

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should establish safety stock and reorder point policies for critical raw materials to anticipate fluctuations in demand and supply disruptions. Third, maintaining long-term partnerships with multiple suppliers is recommended to ensure the continuity and quality of raw material procurement.

Furthermore, separate inventory allocations should be prepared specifically for educational tourism activities to prevent competition between commercial production and visitor programs. The company is also encouraged to improve coordination between production schedules and tourism reservations so that educational activities can be conducted without interruption. Finally, continuous evaluation of inventory control practices should be carried out to improve operational efficiency, maintain product quality, and strengthen the attractiveness of Bakpia Djava Yogyakarta as a traditional culinary and educational tourism destination.

Limitations and suggestions for further study

This study has several limitations that should be considered in future research. First, the study employed a qualitative approach at a single case study location, which may limit the generalizability of the findings to other traditional culinary businesses. Future studies are encouraged to involve multiple organizations or compare inventory control practices across different culinary enterprises to obtain broader insights.

Second, the study focused primarily on inventory control, product differentiation, and educational tourism. Other factors that may influence business sustainability, such as digital marketing strategies, customer satisfaction, service quality, supply chain resilience, and financial performance, were not examined. Future research should incorporate these variables to develop a more comprehensive understanding of business competitiveness.

Finally, future studies may adopt mixed-method or quantitative approaches to measure the statistical relationships among inventory control, product differentiation, educational tourism, and business performance. Such approaches would provide stronger empirical evidence regarding the effectiveness of inventory control systems in supporting competitive advantage and sustainable business development.

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