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The influence of inventory management on loss reduction and operational efficiency: a case study in a bakery

A influência da gestão de estoques na redução de perdas e na eficiência operacional: estudo de caso em uma padaria

La influencia de la gestión de inventarios en la reducción de pérdidas y la eficiencia operativa: estudio de caso en una panadería

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Abstract:
Inventory management is highly important for ensuring operational continuity and controlling losses, especially in small businesses in the bakery sector, which handle perishable raw materials, daily production, and fluctuations in demand. This study aimed to analyze inventory management in a small bakery and its contribution to material control and operational performance. Methodologically, an applied research study was conducted, using a qualitative approach, an exploratory-descriptive design, and a case study procedure, complemented by bibliographic research. Data were collected through direct observation of the company's routine, with particular attention to storage, purchasing, replenishment, material control, losses, and raw material flow. The results revealed the absence of systematic records of incoming and outgoing items, the lack of periodic physical inventory counts, the absence of item classification, insufficient structured control of losses, and the predominance of manual procedures. Situations involving emergency replenishment, weaknesses in purchasing planning, and strong dependence on the experience of those responsible for inventory-related decisions were also observed. On the other hand, the practice of using older products before newer ones and the existence of procedures aimed at material replenishment were identified. It was concluded that the objectives were achieved and that the research problem was answered, since more structured control practices can contribute to reducing losses, improving purchasing planning, and increasing operational efficiency. The main limitations were the fact that the study was conducted in a single company and the absence of longitudinal monitoring of indicators related to losses, costs, and inventory performance.

Keywords:
Inventory Management; Small Businesses; Bakery Sector; Losses; Operational Efficiency.

Resumo:
A gestão de estoques é de grande importância para a continuidade das operações e para o controle de perdas, sobretudo em pequenas empresas do setor de panificação, que trabalham com matérias-primas perecíveis, produção diária e variações de demanda. Este estudo teve como objetivo analisar a gestão de estoques em uma pequena padaria e sua contribuição para o controle dos materiais e o desempenho das operações. Metodologicamente, realizou-se uma pesquisa aplicada, de abordagem qualitativa, caráter exploratório-descritivo e procedimento de estudo de caso, complementado por pesquisa bibliográfica. A coleta de dados ocorreu por meio da observação direta da rotina da empresa, com atenção aos processos de armazenamento, compras, reposição, controle de materiais, perdas e fluxo de matérias-primas. Os resultados evidenciaram ausência de registros sistemáticos de entradas e saídas, inexistência de inventário físico periódico, falta de classificação dos itens, ausência de controle estruturado das perdas e predominância de procedimentos manuais. Também foram observadas situações de reposição emergencial, fragilidades no planejamento das compras e predomínio de decisões de compra sem parâmetros formalizados de previsão e dimensionamento. Em contrapartida, identificou-se a utilização do princípio de retirada dos produtos mais antigos antes dos mais recentes e a existência de práticas voltadas à reposição dos materiais. Concluiu-se que os objetivos foram alcançados e que a problemática foi respondida, uma vez que práticas mais estruturadas de controle podem contribuir para reduzir perdas, melhorar o planejamento das compras e ampliar a eficiência operacional. Como limitações, destacaram-se a realização do estudo em uma única empresa e a ausência de acompanhamento longitudinal dos indicadores de perdas, custos e desempenho do estoque.

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Palavras-chave:
Gestão de estoques; Pequenas Empresas; Panificação; Perdas; Eficiência Operacional.

Resumen:
La gestión de inventarios es de gran importancia para la continuidad de las operaciones y para el control de pérdidas, especialmente en pequeñas empresas del sector panificación, que trabajan con materias primas perecederas, producción diaria y variaciones en la demanda. Este estudio tuvo como objetivo analizar la gestión de inventarios en una pequeña panadería y su contribución al control de materiales y al desempeño de las operaciones. Metodológicamente se realizó una investigación aplicada, con enfoque cualitativo, de carácter exploratorio-descriptivo y procedimiento de estudio de casos, complementada con una investigación bibliográfica. La recolección de datos ocurrió a través de la observación directa de la rutina de la empresa, prestando atención a los procesos de almacenamiento, compras, reposición, control de materiales, pérdidas y flujo de materias primas. Los resultados mostraron la ausencia de registros sistemáticos de entradas y salidas, la falta de inventario físico periódico, la falta de clasificación de artículos, la ausencia de un control estructurado de pérdidas y el predominio de procedimientos manuales. También se observaron situaciones de reabastecimiento de emergencia, debilidades en la planificación de compras y predominio de decisiones de compra sin parámetros formalizados de previsión y dimensionamiento. Por otro lado, se identificó la utilización del principio de retirar los productos más antiguos antes que los más recientes y la existencia de prácticas orientadas a la sustitución de materiales. Se concluyó que se lograron los objetivos y que se respondió el problema, ya que prácticas de control más estructuradas pueden contribuir a reducir pérdidas, mejorar la planificación de compras y aumentar la eficiencia operativa. Entre las limitaciones se encuentran la realización del estudio en una sola empresa y la falta de seguimiento longitudinal de los indicadores de pérdidas, costos y desempeño bursátil.

Palabras clave:
Gestión de Inventario; Pequeñas Empresas; Hornada; Pérdidas; Eficiencia operativa.

1 Introduction

In a small business, few decisions are as frequent as those related to purchasing materials. Every day, the manager needs to decide what to purchase, in what quantity and when to replenish it. Although these choices may seem routine, their effects reach different areas of the business, as they interfere with production, customer service, cash flow and the ability to meet financial commitments (Garcia; Reis Filho, 2022).

In this sense, inventory no longer represents just a set of stored products and starts to constitute an operational and financial resource that needs to be planned, monitored and controlled in a systematic way (Jenuino et al., 2023). Therefore, it is important to highlight that inventory management integrates the planning and control of the flow of materials, from the acquisition of raw materials to the availability of products to the consumer.

Thus, its purpose covers analyzing demand, monitoring inputs and outputs, defining replenishment times and evaluating the costs associated with storage. When this information is handled in an organized way, the company therefore has a greater ability to plan purchases and reduces dependence on decisions based solely on experience or the manager's immediate perception (Puspitawati; Lhutfi; Qudratov, 2024).

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The need for this control becomes more evident in small companies, which generally operate with limited capital, reduced administrative structures and less capacity to absorb losses. In these businesses, a purchase made above the need can compromise resources that would be used to pay suppliers, employees or operational expenses (Lefebvre, 2025).

To support this control, companies can use tools that help define quantities, monitor movement and replace items. Among the most used are the ABC Curve, which classifies materials according to their economic relevance; the minimum and maximum stock, which establishes limits for product maintenance; the reorder point, which indicates the appropriate time for a new purchase; safety stock, which reduces the risk of shortages due to fluctuations in demand or supplier delays; and periodic inventories, which allow records to be compared with existing quantities. Furthermore, spreadsheets and computerized systems favor the recording of inputs and outputs and increase the reliability of the information used in decision making (Puspitawati; Lhutfi; Qudratov, 2024; Marques, 2025).

This relationship presents some specificities that must be taken into consideration in the bakery sector. A bakery works with raw materials of different characteristics, such as flour, yeast, milk, eggs, cold cuts, packaging and complementary ingredients, in addition to selling ready-made products whose shelf life is usually reduced. Production occurs daily and needs to follow fluctuations in consumption related to the time of day, day of the week, commemorative dates and customer preferences. In this environment, failures in control can generate both a lack of essential inputs and an excess of materials subject to expiration, deterioration or loss of quality (Jankowski; Lara; Santos, 2021).

Given this context, the following research problem is formulated: How can inventory management contribute to reducing losses and improving operational efficiency in a small company in the bakery sector?

This study has the general objective of analyzing inventory management in a small bakery and its contribution to the control of materials and the performance of operations.

Carrying out the research is justified by the importance that inventories assume in the routine of small companies, especially those that work with perishable products and daily production. In a bakery, small control failures can continually repeat themselves and, when accumulated, compromise the profit margin, cash flow and quality of service.

By analyzing a concrete situation, the study can produce information applicable to the reality of the enterprise, helping to organize purchases, reduce waste and more efficiently use resources. In the academic context, this work brings the fundamentals of operations management closer to the difficulties experienced by small businesses, demonstrating how Production Engineering tools can be adapted to less complex organizational structures.

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2 Theoretical framework

2.1 Inventory management: concepts, objectives and importance

In many companies, inventory is still perceived strictly as the set of goods stored on shelves, warehouses or storage chambers. However, it is worth highlighting that this understanding, although common, is limited. According to Jenuino et al. (2023), inventory represents a portion of organizational resources temporarily maintained to ensure the functioning of operations. It contains raw materials, packaging, auxiliary materials, products in process and finished items that will be used in production or made available to customers.

Managing these resources means deciding what to buy, in what quantity, at what time and for how long each item should remain stored, considering the needs of the operation and the company's financial conditions (Sacramento; Didini, 2021).

Inventory management can be characterized, therefore, as the process of planning, monitoring and controlling materials that circulate throughout the organization. Therefore, this entire process begins before purchase, when the company analyzes its needs, estimates demand and checks available items, and continues during receipt, storage, internal movement and use or sale of products (Sinchetti; Bertaci, 2021).

Effective management also involves monitoring expiration dates, the physical organization of materials, identifying losses and generating information that assists managers in purchasing and replenishment decisions. Puspitawati, Lhutfi and Qudratov (2024) highlight that the efficiency of this process depends on the availability of accurate and timely information, capable of offering a reliable view of the quantities stored and the company's needs. That said, the main objective of inventory management is to ensure that the necessary materials are available when requested, without the company maintaining quantities greater than its consumption or sales capacity.

But, as Garcia and Reis Filho (2022) point out, insufficient stock can interrupt production, delay deliveries, limit sales and compromise customer service. On the other hand, excess merchandise takes up space, increases storage costs, immobilizes financial resources and increases the possibility of losses resulting from deterioration, expiration or obsolescence. Efficiency, in this case, does not lie in accumulating products or indiscriminately reducing the quantities stored, but in finding a level compatible with demand behavior and the operational reality of the business.

This search for balance becomes even more relevant in small companies, where financial resources tend to be more restricted. Each amount used to purchase goods that remain idle is no longer used for other needs, such as paying suppliers, maintaining equipment, salaries or improvements to the establishment (Jenuino et al., 2023).

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Lefebvre (2025) explains that the adoption of leaner inventories can provide financial flexibility and reduce costs related to storage, presenting particularly important benefits for small and medium-sized companies. Maintaining reduced inventories, however, requires greater knowledge about the pace of sales, the regularity of suppliers and the time required to replenish materials.

Another important objective of inventory management is to promote the continuity and stability of production processes. When materials are properly controlled, the company is able to plan purchases, organize production and meet customer requests with less improvisation (Sacramento; Didini, 2021).

Conversely, the lack of knowledge about available quantities means that decisions are only taken when the problem has already become evident. In these situations, emergency purchases are frequent, generally carried out without planning the price, deadline or quantity. In addition to increasing costs, this behavior makes it difficult to standardize operations and reduces the company's ability to anticipate its needs.

2.2 Particularities of inventory management in small businesses

Inventory management in small companies has its own characteristics, mainly due to the reduced administrative structure and the concentration of decisions. In many cases, the owner himself monitors purchases, sales, storage and replacement, which makes control quite dependent on his experience and daily perception (Carvalho; Mazzotti, 2024).

Another important aspect is the reduced availability of financial resources. Purchasing more than demand can keep capital tied up in goods, while insufficient quantities increase the risk of stockout. Therefore, small businesses need to reconcile product availability and cash flow preservation (Schroeder, 2024).

Financial limitations also interfere with the technology used to monitor inventories. Small companies still resort to manual records, spreadsheets and lower-cost systems, which are not always integrated with other business activities. This reality can favor divergences between the registered stock and the quantity actually available (Januário; Marquez, 2025).

Januário and Marquez (2025, p. 15) highlight this limitation when they state that: “due to less investment power, these companies often depend on manual and unsophisticated systems to control their inventories, which can result in frequent errors.”

In practice, however, the use of simple resources does not mean the absence of management. Silva et al. (2026) identified, in a small company, the joint use of software, spreadsheets, manual records and physical checks. This hybrid model shows how controls are usually adapted to the financial and operational conditions of each enterprise.

The physical organization represents another relevant particularity, especially when the available space is limited. Unidentified materials, slow-moving products and locating

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difficulties can compromise the use of stock. Picanço, Costa and Silva (2023) found that improvements in the organization and classification of items favored control in a small company.

The variety of products also requires the manager to establish priorities in monitoring. Santos and Pacheco (2022) observed that goods with higher value and low turnover can remain stored for prolonged periods and compromise financial resources. In this way, tools such as the ABC Curve help to identify items that require greater management attention.

The relationship with suppliers also influences the stock of small businesses. Delivery times, regular supply and the possibility of delays need to be considered before defining purchase quantities. Planning based on sales history helps to bring acquisitions closer to the effective needs of the business (Januário; Marquez, 2025).

Furthermore, changes in control methods may encounter resistance within the company itself. The introduction of computerized systems and standardized procedures requires adaptation of routines and employee participation. Januário and Marquez (2025) emphasize that this process occurs gradually and also depends on changes in organizational culture.

Thus, the particularities of inventory management in small businesses involve both financial restrictions, but also technological limitations, reduced division of functions, restricted physical space and strong dependence on the owner's decisions. In this scenario, simple controls compatible with the reality of the business can improve the organization of materials, reduce losses and offer greater security in purchasing decisions.

2.3 Inventory control methods and tools

Inventory control requires methods capable of transforming the daily movement of materials into useful information for management decisions. It is worth remembering that it is through these tools that it is possible to define priorities, estimate replacement needs and monitor the items that have the greatest impact on costs and continuity of operations (Carvalho; Mazzotti, 2024).

Among the most used tools is the ABC Curve, which separates items according to their economic importance. Class A products concentrate a greater portion of the value moved and, therefore, require more rigorous control; Classes B and C receive progressively lower levels of attention. This classification directs efforts to the materials most relevant to the company's results (Santos; Carnaúba; Gomes, 2022).

The application of the ABC Curve can also serve as a starting point for other control parameters. Vitorino et al. (2022) used this classification in conjunction with minimum stock, maximum stock, safety stock, reorder point and economic order quantity. The combination of

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these tools expands control by relating financial importance, consumption and the need to replenish materials.

Safety stock acts as a hedge against demand fluctuations, supplier delays and other supply uncertainties. Its sizing needs to avoid two extremes, an insufficient reserve, which increases the risk of stockouts, or an excessive volume, which increases maintenance costs. Salatino and Ferrarezi Junior (2024) associate this tool with the replenishment point to maintain greater regularity in the supply of materials.

The reorder or replenishment point indicates when a new acquisition must be made before the available stock reaches a critical level. The tool considers the item's consumption and the time needed to replace it, which reduces dependence on decisions based solely on the manager's visual perception. Its use favors greater predictability of purchases (Vitorino et al., 2022; Salatino; Ferrarezi Junior, 2024).

The Economic Order Quantity (EOQ) adds another dimension to control by helping to define the most appropriate quantity for each order. Its main objective is to find an economically favorable relationship between acquisition costs and inventory maintenance costs. Carvalho and Mazzotti (2024) incorporated this resource into a tool developed to support the purchasing decisions of a micro-enterprise.

The physical inventory, in turn, allows comparison of what appears in the records with the quantities actually existing in the establishment. In this way, this verification helps to identify entry errors, losses, misplacements or differences accumulated throughout the operation. In the study by Silva et al. (2018), the absence of periodic counts appeared among the weaknesses of the control carried out by the company analyzed.

Another important method, especially for companies that work with perishable products, is FIFO (First In, First Out). In this system, older materials receive output priority, which reduces prolonged retention in stock and the risk of expiration, deterioration or obsolescence. This logic has direct application in food sector operations (Silva et al., 2018).

When evaluating a refrigerated food distributor, Silva et al. (2018, p. 15) summarize the importance of combining different control methods:

> The most appropriate tools applicable to the company's circumstances were: periodic physical inventory [...] FIFO [...] and the ABC curve, with which it would be possible to classify inventory items according to the company's needs (Silva et al., 2018, p. 15).

In addition to the tools directly linked to the quantities stored, the organization of the environment also affects control efficiency. Picanço, Costa and Silva (2023) used the ABC Curve in conjunction with resources such as 5S, Ishikawa Diagram and 5W1H, which made it possible to identify causes of problems, reorganize space and structure actions aimed at reducing inventory costs.

In companies with a wide variety of items, therefore, a single method is unlikely to meet all needs. The ABC Curve establishes priorities; safety stock protects against

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uncertainty; the reorder point guides replenishment; the EOQ assists with purchase quantity; and the inventory verifies the accuracy of records. The choice must respect the characteristics of the operation and the stored products (Carvalho; Mazzotti, 2024; Vitorino et al., 2022).

2.4 Management of raw materials and products in the bakery sector

The management of raw materials in the bakery sector requires constant attention, as most inputs have high consumption, frequent replacement and a limited useful life. Flour, yeast, milk, eggs, fats and fillings need to be available in the necessary quantities so that daily production does not suffer interruptions or generate unnecessary surpluses (Neves; Spairani; Valadares, 2025).

Among these inputs, wheat flour assumes a strategic position as it participates in the manufacture of a bakery's main products. Medeiros et al. (2024) identified flour as a priority raw material in the production of French bread and demonstrated that its control depends on the analysis of consumption, replacement time and maintenance of a quantity capable of sustaining continued production.

The purchase of inputs also needs to follow demand behavior. Neves, Spairani and Valadares (2025), when analyzing a bakery in Espírito Santo, found difficulties related to the unpredictability of consumption, the concentration of suppliers and the use of manual processes. These conditions can make it difficult to adjust purchases to the establishment's real needs.

Another sensitive point is the loss of raw materials during storage and production. Carvalho and Leite Junior (2022) showed, in a bakery, that the waste of resources directly interferes with the performance of the production process. Identifying the steps that do not add value allows you to locate causes of losses and direct actions to improve the use of inputs.

Perishability makes controlling the order of use especially important. Products stored for long periods are more subject to deterioration and expiration, which is why methods based on the entry and exit sequence can help reduce losses. This concern also appears in studies applied to companies that work with perishable foods (Silva et al., 2018).

Efficiency also depends on the relationship between inventory and the production process. Kruger et al. (2022) identified waste associated with the flow of materials, movement, storage and execution of the production stages of a bakery. Proper organization of these flows reduces unnecessary travel and favors greater use of resources used in production.

The use of reliable information increases this control. Lima et al. (2021) proposed the integration between the ERP system and Curva ABC in a bakery to improve inventory accuracy, favor product turnover and reduce waste. Digitization also makes it possible to bring purchasing, production, inventory and customer service data closer together.

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Therefore, the management of raw materials and products in bakeries needs to follow the entire flow, from purchase to transformation and sale. Controlling quantities, validity, suppliers, consumption and losses helps to keep inputs available without forming excessive stocks and favors more stable, economical production and compatible with demand (Neves; Spairani; Valadares, 2025; Medeiros et al., 2024).

3 Methodology

The research was classified, in terms of nature, as applied, as it seeks to understand a concrete situation and produce knowledge aimed at improving the inventory management of the company analyzed. As for the approach, it was qualitative in nature, since the investigation focused on understanding the practices, procedures and difficulties observed in the establishment's routine. In relation to the objectives, it was characterized as exploratory and descriptive (Gil, 2019).

As for technical procedures, a bibliographical research was initially carried out, based on scientific articles related to inventory management, small businesses, control methods and raw material management in the bakery sector. Subsequently, a case study was developed, with a bakery as the unit of analysis, which allowed a closer examination of the practices adopted in the management of materials and products.

Data collection occurred through direct observation of the company's routine, which took place from August to October 2026 with attention to procedures related to stock organization, storage of materials, purchasing, replacement, control of perishable products, losses and flow of raw materials. The observation also included the resources used to record and monitor stocks, as well as the way materials were moved and made available for production.

To guide the collection, the aspects observed were organized into six axes: characterization of the company; control and organization of stocks; purchases and replacement; control methods and tools; losses and waste; and operational efficiency. The records obtained were organized in a descriptive manner, identifying recurring practices, operational weaknesses and situations that could interfere with the performance of the storage process.

In the analysis stage, the results from the observation were compared with the foundations presented in the theoretical framework. This comparison made it possible to verify similarities and differences between the practices identified in the company and the inventory management methods discussed in the literature, with attention to the ABC Curve, the physical inventory, the reorder point, the safety stock, the PEPS method and the computerized control systems.

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4 Results and discussions

The observation carried out in the bakery allowed us to identify how stock is linked to purchasing, storage and production activities. The analysis focused on the practices actually adopted and the weaknesses perceived during routine monitoring. The results were organized into five thematic categories, according to the most relevant aspects for the company's operational functioning.

4.1 Organization and control of stock

The observed routine showed predominantly manual control, supported by a notebook or card, without integration of information regarding inputs, outputs and balances of materials. A formal physical inventory routine was also not identified, a condition that makes it difficult to continuously verify the correspondence between existing records and available quantities.

Carvalho and Mazzotti (2024) argue that movement control constitutes an indispensable basis for purchasing planning and the reliability of stock information. In the company studied, the absence of periodic conferences limits the early identification of differences and reduces the security of decisions related to replacement.

Observation of the space allocated to materials also showed the absence of properly identified locations for part of the products and raw materials. This condition can make it difficult to locate items, view available quantities and identify those with lower turnover. Picanço, Costa and Silva (2023) relate physical organization to improving control and movement of stocks.

Another aspect noticed was the lack of a professional dedicated exclusively to inventory activities. The duties are incorporated into the company's management routine, which can reduce the time allocated to monitoring materials. Carvalho and Mazzotti (2024) observe that lean structures are common in small businesses and require controls compatible with this reality.

4.2 Purchases, replacement and supply

The acquisition process showed a strong dependence on the quantity perceived in stock and the experience of those responsible for purchasing. No formal demand forecast records or standardized parameters were identified to define the quantities purchased, which keeps a relevant part of the decisions based on practical routine knowledge.

Neves, Spairani and Valadares (2025) found a similar situation in the bakery sector and highlighted that unstructured purchases make it difficult to adjust the availability of raw

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materials and real consumption. For an activity with daily production, differences between these two variables can cause excess materials or the need for unplanned replacements.

A formally calculated minimum stock for all materials was also not identified. Some raw materials remain available in additional quantities, but without uniform sizing criteria. Vitorino et al. (2022) emphasize that minimum stock and safety stock allow establishing more objective parameters to protect against fluctuations in supply.

During the analysis of the process, it was also verified that the replacement follows a moment recognized by the company's routine, but without evidence of calculation based on average consumption, lead time or demand forecast. Salatino and Ferrarezi Junior (2024) highlight that the replenishment point gains greater precision when considering consumption behavior and the time required for replenishment.

4.3 Methods and tools used in control

The use of formal classification of materials according to value, consumption or importance for the operation was not identified. In this way, items remain subject to similar forms of monitoring, even when they have different impacts on costs or continuity of production.

Santos et al. (2022) demonstrate that the ABC Curve allows you to establish priorities between materials and focus greater attention on the most representative items. Vitorino et al. (2022) add that this classification can be combined with replacement parameters, which expands control and planning capacity.

On the other hand, observation of the movement of perishable products showed priority for the use of items stored for the longest time. This practice is close to the PEPS method and helps to reduce the risk of deterioration. The procedure appears to be consistent with the characteristics of baking, marked by the presence of raw materials and products with a limited shelf life.

Despite this practice, there was no specific system designed to monitor expiration dates. Control takes place operationally, without a computerized resource that allows you to anticipate due dates or issue alerts. Lima et al. (2021) point out that integrated systems can expand inventory visibility and bring purchasing, production and storage information closer together.

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4.4 Perdas e desperdícios no estoque

Observation of the procedures did not identify a systematic record of losses of raw materials and products. There was also no control found that transforms waste into periodic values □□or indicators. As a result, the company has little information to recognize which products present the greatest recurrence of losses and what financial impact arises from these occurrences.

Carvalho and Leite Junior (2022) emphasize that measuring losses constitutes an important step to locate waste and direct corrective actions in the production process. When disposal is not recorded, the problem remains incorporated into the routine without its dimension being objectively known.

Among the finished products, leftovers related to homemade bread were observed. This finding deserves attention because it suggests the need for a closer relationship between volume produced and demand behavior. Kruger et al. (2022) highlight that waste in bakeries can occur at different stages and needs to be evaluated throughout the entire production flow.

The use of promotions was also observed as an alternative to accelerate the release of products close to the sales limit. Although this practice can reduce an imminent loss, its nature is essentially corrective. Neves, Spairani and Valadares (2025) reinforce that monitoring demand and turnover makes it possible to anticipate adjustments in purchases and production.

In this sense, a daily record of leftovers could provide data on product, quantity, period and recurrence. The formation of this history would make it possible to recognize waste patterns and adjust production more closely to actual consumption, which could reduce losses without compromising product availability.

4.5 Operational efficiency and opportunities for improvement

Routine observation showed that stock limitations have an impact on production dynamics, especially when the need for replacement arises in the short term. The absence of more precise parameters reduces the capacity for anticipation and can transfer situations that could be predicted by planning into daily operations.

Medeiros et al. (2024) highlight that inventory sizing in the bakery sector must consider consumption, availability and replacement time of inputs. These parameters are particularly important for essential raw materials, whose unavailability can compromise different products manufactured in the same period.

The analysis also showed room for greater professionalization of the process. The dispersion of responsibilities, combined with the predominance of manual records, limits the continuity of monitoring. In this context, training and a clearer definition of responsibilities are important measures even before the introduction of more complex technological tools.

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Schroeder (2024) points out that computerized systems can improve inventory organization in small companies, while Lima et al. (2021) relate the integration of information to greater accuracy in the baking sector. However, technology needs to be associated with defined procedures and continuous use to produce effective results.

Simply replacing the notebook with software, therefore, would not solve the observed weaknesses in isolation. The system would need to incorporate input and output records, periodic inventories, validity control, losses, consumption and replacement criteria. Without this routine, digitization would simply reproduce existing limitations in another format.

In general, the observation revealed management capable of sustaining daily operations, but still marked by informal procedures and low systematization of information. The gradual adoption of physical inventory, ABC Curve, minimum stock, safety stock, recording of losses and computerized control is compatible with the identified needs.

The results indicate, therefore, that the main advance needed is not in increasing the quantity stored, but in the quality of control exercised over the materials. More accurate information can increase the predictability of purchases, improve the adjustment of production to demand and reduce losses, which reinforces the influence of inventory management on the bakery's operational efficiency.

5 Final considerations

The research allowed us to understand how inventory management interferes in the routine of a small company in the bakery sector. The analysis showed that material control cannot be treated solely as a support activity, as it directly influences supply, production continuity, use of inputs and the ability to reduce losses throughout operations. The proposed objectives were achieved, as it was possible to identify how stock is controlled, which criteria guide purchases and replacements, which weaknesses are present in the process and how these practices impact operational efficiency. Limitations related to the use of manual controls, the absence of periodic inventories, the lack of measurement of losses and the reduced use of formal management tools were also recognized. As a suggestion to improve stock management, it is recommended to implement the *ABC Curve* as a tool for prioritizing stocked items. By classifying materials into classes A, B and C, according to their value, consumption and importance for production, the company will be able to focus greater attention and control on the most representative items, which are those that most impact costs and continuity of production, and adopt simpler controls for items with less impact. In this way, the ABC Curve helps to organize purchases, define replacement priorities, avoid shortages of essential inputs and reduce losses and excessive stocks, making control more systematic and less dependent on individual experience.

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