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ORIGINAL
Review article

Packaging management in food preservation and its contribution to the supply chain of small and medium-sized companies*

La gestión del empaque y embalaje en la conservación de alimentos y su aporte en la cadena de suministros de las pequeñas y medianas empresas

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Abstract
The purpose of this paper is to investigate the design of strategies that could be used by SMEs -small and medium-sized enterprises- in the management related to packaging and packing for the conservation and malleability that help to guarantee the quality of the products, as well as the reduction of costs attributed to reprocesses; that allow SMEs in the development of their logistic processes in aspects such as quality, quantity and delivery time to increase their competitiveness. The methodology used for the development of this article responds to a documentary review. The results indicate that there is an interest in improving the logistic processes in the supply chain, as well as in using new strategies in the management of packaging and packing that guarantee in terms of quality, time and durability the conservation

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of their food products, in such a way that small and medium-sized companies can be more competitive.
Keywords: Packaging, Competitiveness, Logistics, Quality, PYMES

Resumen
El presente trabajo, tiene como propósito indagar sobre el diseño de las estrategias que podrían ser empleadas por parte de las PYMES-pequeñas y medianas empresas- en la gestión relacionada con el empaque y el embalaje para la conservación y la maleabilidad que coadyuvan a garantizar la calidad de los productos, así como la disminución de costos atribuidos a los reprocesos; que permitan a las PYMES en el desarrollo de sus procesos logísticos en aspectos como la calidad, cantidad y tiempo de entrega incrementar su competitividad. La metodología empleada para el desarrollo del presente articulo responde a una revisión documental. Los resultados señalan que existe un interés por mejorar los procesos logísticos en la cadena de suministro, así como emplear nuevas estrategias en la gestión del empaque y embalaje que garantice en términos de calidad, tiempo y durabilidad la conservación de sus productos alimenticios, de tal manera que conlleven a las pequeñas y medianas empresas poder ser más competitivas.
Palabras clave: Empaque, Embalaje, Competitividad, Logística, Calidad, PYMES

SUMMARY

Introduction

Given the increased pressure on companies to be competitive in a globalized world, they have had to improve all their processes to meet customer expectations or increase the risk of being left out of the market. One of the processes that has become increasingly important is everything related to storage and delivery to the end user; accordingly, packaging development has become a high priority and, if well done, can maintain and even increase market share. It is also a field continuously impacted by technology, so companies must have the mechanisms to incorporate it frequently, ensuring, at least in this area, to be competitive.

Among the main characteristics of packaging, the theory states that it has two main objectives: firstly, to protect goods from external elements that affect their quality characteristics (product attributes), and secondly, to provide consumers with information on the characteristics and particularities of the contents (Coles, 2003). It considers the presence of an increasingly demanding consumer, with a greater tendency towards the care and conservation of the environment and who, therefore, prefer companies that take this variable into account and that use packaging whose material minimizes the impact on the environment.

Several theorists have reflected on these trends. Thus, for example, Bo Rundh (2005) studies the business modifications within the food production sector and raises the need to reinforce competition in the packaging process, making a difference in consumer products. Given the above, the analysis of the ideal packaging, according to Smith & White (2000), leads to an analysis in quantitative terms for the case of environmental costs, taking into account the materials used, reprocesses, and waste, as well as the energy consumed in the manufacturing process. Based on a documentary review, this article sought to reflect on theoretical aspects of logistics, referring specifically to the areas of packaging and packing.

Resolution scheme

1. Research problem

What strategies could be applied by SMEs in the management of packaging for preservation and malleability to help ensure product quality?

2. Methodology

The qualitative study relies on a documentary review to respond to the research objective (Taylor & Bogdan, 1984: 5). The review was made from databases such as Redalyc and Scielo.

3. Writing Plan

3.1 Supply Chain

The logistics process in companies is one of the most important functions that today's management must assume with diligence because this activity manages and plans for the supply chain to develop most efficiently for all stakeholders. The supply chain refers to a series of activities and means to deliver those products to the consumer or end customer. The supply chain identifies aspects such as transportation, distribution, customer service, and other aspects that will differ according to the needs and technical specifications of the product throughout the chain.

For this reason, management needs to clearly understand how to articulate the different aspects involved in logistics and the supply chain so that this function can contribute to better organizational performance and, therefore, to greater productivity in an environment that is often highly competitive. Table 1 shows some definitions and/or approaches to the logistics process in organizations.

Table 1. ***Concepts or focuses about the logisitcs procesess***

AUTHORS	YEAR	CONCEPTS
Antún, J. P.	2005	In essence, logistics encompasses interrelated activities involving the planning, coordination, and control of various stages of the flow of goods, from acquiring raw materials to delivering the final product to the customer. These activities include inventory management, transportation and distribution, warehousing and product handling, and the optimization of the supply chain as a whole.
Vásquez, P. C. F.	2008	The logistics process of a company is configured through the integration of production, transportation, maintenance, and storage means to achieve an uninterrupted and efficient flow of products from their raw material status stored at suppliers to their final product condition. Effectively managing these elements is crucial to achieving a successful logistics operation, optimizing resources, minimizing costs, and meeting customer demands promptly.
Servera-Francés, D.	2010	The approach proposed by the authors emphasizes the importance of optimal and differentiated management of the logistics function through integration among all the companies in the supply channel, including customers. This integration seeks to improve joint processes and generate greater value for the end consumer. Close collaboration, information sharing, and the strategic allocation of logistics responsibilities are fundamental elements in this management to achieve greater efficiency, reduce costs, and offer a quality logistics service.
Castelazo A.	2017	Logistics is focused on the physical delivery of products and the management of information and data flow along the supply chain. It involves using information technologies and logistics management systems to ensure efficient communication between the different actors and facilitate informed decision-making.
Mikl, J., Herold, D. M., Ćwiklicki, M., & Kummer, S.	2020	Logistics is characterized by its diversity and complexity, resulting from the growth of service sectors and the interaction between people and technology. Globalization, supply chain networks, and new technologies have played a key role in the evolution of logistics, generating

		the need to address logistics challenges more efficiently and effectively and to take advantage of the opportunities offered by emerging technologies to optimize logistics operations.
Kawa, A., & Światowiec-Szczepańska, J.	2021	The document's publication by the Logistics Management Council in 1997 marked a turning point in the study and understanding of value creation in the logistics field. Since then, there has been a growing interest and attention to the value generated through logistics activities, leading to a new stream of literature and studies dedicated to this topic. This renewed focus has prompted research and analysis of various value-oriented logistics strategies and practices. Different approaches and theoretical perspectives have been explored to understand how logistics can contribute to value creation for the organization, customers, and other stakeholders.
Timbila, L. G. G., Vega, R. F. V., Cisneros, V. A. G., & Molina, P. G. V	2022	Green logistics involves comprehensively transforming logistics strategies, structures, processes, and systems to create environmentally sustainable logistics practices and promote resource efficiency. This integrated approach seeks to reduce the environmental impact of logistics operations and promote sustainability, generating economic benefits and improving corporate image.

Source: Own elaboration from the referenced authors.

The supply chain is based on three points: supply, manufacturing, and distribution. The first aspect has to do with guaranteeing those raw materials that are indispensable for production, which is the second aspect that has as a final result the product that leads to distribution and delivery to customers or end consumers.

Supply Chain Management (SCM) is a valuable tool that could guarantee a competitive advantage and improve the organization's performance since competition today is between organizations and supply chains (Fontalvo & De la Hoz, 2019). In that order of ideas, authors such as Balza & Paternina (2019), Rengifo (2018), and Cardona (2017) recognize the importance every the supply chain to achieve to be more competitive and strengthen the leadership and positioning of companies in the national and international market.

In this sense, Carmignani (2009) points out that the supply chain becomes important from the interpretation of the ISO 9001:2000 standard that allows adjustments to be made to this standard in the field of general requirements that can address the entire process that addresses aspects of quality management not only within companies but throughout the supply chain; which would facilitate the application of the principles and modern techniques of SCM. In that sense, quality with information technology allows supply chain management to be constantly nurtured to generate better practices and thus be more competitive (Kaya & Azaltun, 2012; Liu & Choi 2022).

This supply chain process involves retail sellers, transportation, suppliers, warehouses, producers, and suppliers, i.e., a series of consecutive and repetitive actions that reach the market with a perception of value and satisfaction by the final consumer (Ballou, 2004; Stadtler, 2005; Chopra & Meindl, 2013). Other authors such as Correa & Gómez (2009), Gutiérrez & Infante (2017), Becerra, Pedroza, Pinilla, Vargas. (2017) and Manrique, Teves, Taco, Florez. (2019), the supply chain is not limited to storage spaces and reception of inputs. However, it must also respond to the proper articulation of both endogenous and exogenous functions of companies that allow, on the one hand, to reduce the cost structure and optimize the use of inputs and thus a synchronization of process flows along the entire supply chain.

Due to globalization and the pressures it entails, it is impossible to think that companies are not affected by a bad exercise of the logistics process. Supply chains are the application of the administrative process related to managing inputs, suppliers, and end users. However, every process is susceptible to improvement, and companies should conceive it this way. For this reason, the supply chain is part of the strategic direction of the organization since it is immersed in a context in which it needs to know how the market moves and, therefore, how it could do better what it is doing in the field of supply chain management (Krajewski Lee; Ritzman, Larry, Malhotra, Manoj, 2013).

In the 1990s, in 1996, the Supply Chain Council defined the SCOR model (Supply Chain Operations Reference Model), which is used as a reference to evaluate the performance of the SCM in organizations. The benefits of its application include linking measurement systems, technologies, and practices to ensure efficient and effective management.

3.2 Packing and packaging

One of the main attributes of packaging is related to the preservation of the product, i.e., not altering or affecting its chemical, physical, and organoleptic properties. According to ProColombia (2016), one of the fundamental characteristics of packing and packaging is related to the proper maintenance of the good or product that allows it to preserve its properties during each of the phases of the logistics process; likewise, the design of the packaging must facilitate handling, resist the effects of wrinkling and also allow marking or labeling for its location, identification, and routing.

For such reason, for companies, it is necessary to identify those good practices that could be applied in everything related to packaging for dispatches at national and international levels that have the purpose of guaranteeing the delivery of products with quality and preservation of their characteristics and properties, based on what is stated by Gavara (2018), some aspects that should be taken into account about the activity of packaging and packing in organizations are:

- The raw materials must meet the technical descriptions while maintaining the quality to protect or shield the contamination risks.
- Packaging should be designed to allow for easy stacking, and at the same time, products should be safeguarded in all transport operations along the supply chain.
- Packaging must meet the requirements of the products to be preserved and comply with the requirements of the authorities that regulate these provisions (phytosanitary, environmental, safety, and others).
- The materials used to manufacture the gaskets must have properties that can withstand the temperature changes they may undergo.

They must have adequate waste disposal systems that prevent the propagation and generation of microorganisms in the development phase in the packaging plant. Packaging, tertiary packaging, and packing processes contribute to customer satisfaction. In order to guarantee the delivery, quality, and quantity of the product, companies must consider the choice of good packaging and that it can be adapted to the particularities of the product and the customer's requirements in terms of quality standards, regulations, label, and that it is adaptable to the means of transport to be used.

Carvajal & Alonso (2019), concerning the types of packaging, the classification is established as primary, secondary, and tertiary; for example, a can of powdered milk can be the primary packaging given the protection it gives to the product and that it also has all the required information of the product and also contains a label attached to the container. Secondary packaging is any receptacle that protects the container or set of containers, for example, a separator, cardboard, or Styrofoam. It can be used as part of the marketing display of the good or product, corroborating its commercial importance. Tertiary, known as transport packaging, is to gather several products to facilitate their handling and manipulation; they are usually cardboard or wooden baskets.

3.3 Total quality

Quality is the characteristics inherent to an element, material, or thing using which its suitability, value, adaptability, and adequacy for the case of products and services are judged (RAE, 2020). Quality evaluation is established through the specifications and attributes offered by the product or service; one of the most important is customer satisfaction since the customer evaluates the degree of conformity about what he/she receives. It could be established that, when comparing products or services, the one that, according to its attributes and valued objectively (specifications) and subjectively (attributes), outperforms the other is considered to be of better quality.

Cortés (2017) analyzes quality in terms of the satisfaction generated by the service to the final consumer, defining it as the "level of performance of one or several conditions that establish its approval by the consumer." Quality is underpinned as an instrument that contributes to strategic positioning and competitive advantage in a market that increasingly points to the concept of quality, even above the concept of price. Nowadays, customers and final consumers of products or services are much more susceptible to quality than price, choosing sustainable manufacturing processes, environmentally friendly, good service, trust, and a high degree of satisfaction. In the case of perishable foods, national and international regulations guarantee confidence in the final consumer. The quality components of a food are related.

According to Reeves & Bednar (1994), Feigenbaum (1951), and Ishikawa (1954), cited by Bernasconi (2015), the concept of quality identifies aspects that are associated with quality, service, price, and delivery times, aspects that are considered of vital importance for the end user; the above derives the concept of quality-price; which implies that quality is associated with the use and experience of the product or service with its price. Quality is present in each of the phases of the product's life cycle; about these stages, the idea, design, delivery, perceived quality, and service quality are mentioned. In that sense, Bernasconi (2015), citing Camisón & Col (2006), states that each stage will be important according to the activity to which reference is made. The concept of total quality (TQM) develops a multidimensional concept that seeks to meet the consumer's needs, ensuring long-term sustainability.

Roncalli (2011) establishes quality from a general perspective and defines it as the level of perfection of an object that is given by comparison with other objects, which can be determined by qualities and characteristics that the good is expected to possess. Given the above and in line with what the author states, the concept of quality is framed in the aptitude for use, that is to say, the capacity of the product to satisfy the needs. The definition of quality is preponderant given the need to compete in the market with goods and services for customer satisfaction in the criteria that are part of the concept (Pettinaroli, 2009).

Total quality is an integral orientation that is part of the top management strategy; it implies the joint work of all areas and departments from the lower part of the organizational structure (operational level) to the top management that involves all the different stakeholders. In this line of thought, it is essential that the company, with its management team and middle management, has clear strategies and actions whose purpose is to generate value not only for customers but for all stakeholders so that it can generate sustainable competitive advantages and thus have leadership in the market (LLorents & Fuentes 2001).

Bernasconi says that the quality model is proposed based on what is expected, what is translated into a program, and what is performed or achieved, leading to total quality, which is when the actions work and are connected harmoniously. On the other hand, Evans & Lindsay

(2008) state that the concept of quality was in constant evolution until reaching total quality, based on the development of a vision of systems focused on human talent based on continuous improvement that increases customer satisfaction. Now, about quality management, Quintero (2011) states that there are eight principles that top management must implement for the continuous improvement of processes and organizational performance, namely: customer focus, leadership, staff participation, process-based approach, system approach to management, continuous improvement, fact-based approach to decision making and mutually beneficial relationships with the supplier. Concerning total quality management models, Camisón, Cruz & González (2006) highlight the following EFQM model.

Other elements that support this process are change management with the responsibility of the human talent area, strategic direction, and good management (Boaden, 1997). Considering the importance of the subject, it is necessary to disseminate factors that contribute to the creation of companies and innovation from a global perspective of the process, supported by the creation of cultures that develop an institutional philosophy that fosters innovation and quality.

Los criterios que conforman el modelo EFQM abarcan diferentes áreas relevantes para la gestión de la calidad y el desempeño organizacional. Estos criterios incluyen aspectos como el liderazgo, la estrategia y la planificación, los recursos humanos, los procesos, los resultados en términos de clientes, empleados, sociedad y rendimiento. El enfoque interrelacionado de los criterios del modelo permite comprender que la excelencia organizacional no se alcanza únicamente a través de la mejora aislada de un área o factor, si no a través de la gestión integral y holística que aborde todos los aspectos relevantes de la organización.

Conclusion

The different theoretical reviews of this document show the importance of the issue of logistics management for the competitiveness of companies. It is reflected in quality standards where the best example, as previously mentioned, is a quality standard such as ISO 7000, designed for identifying and treating cargo and its corresponding handling. Packaging is today a process of technology, work, and design that seeks to achieve the care and protection of products in process and finished products for different purposes such as supply, distribution, sales, and consumption. It is vital to define the use of the packaging and the environment to which it will be exposed, in addition to the different markets in which these products will be marketed and the needs of the final consumer to achieve effective protection.

The materials currently used for creating packaging at the industrial level are evolving in composition and usability; today, there is a greater preference for presenting much more comprehensive and functional packaging and being eco-friendly. In the current environment where uncertainty, financial variations, and poor reading of supply and demand prevail, SMEs need to be strategic in making decisions that generate opportunities in research, development, and innovation, turning packaging into a differential factor for market positioning.

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