Characterization of the logistic process of products with plastic containers in dairy companies in the department of Norte de Santander.

Eng. Adriana Bautista Villamizar[1], Mg. Leonor JaimesCerveleón[2]   Wilberto Cabrales Castrillo [3]

[1]Student, Master's Program in Industrial Engineering
[2]Teacher,Master's Program in Industrial Engineering
[3]Teacher,public accounting program
[12]INGAPO Research Group
[123]University of Pamplona
[1]adriana.bautista2@unipamplona.edu.co, [2]leonor.cerveleon@unipamplona.edu.co,
[3]wilberto.cabrales@unipamplona.edu.co

_____

Abstract: The dairy sector in the department of Norte de Santander is considered a booming sector in the economy of the region. Due to the fact that these companies have a variety of product lines, it is considered important to characterize the logistic process, as well as the quantity and types of plastic packaging used by the company, being its management a competitive advantage in the market: This article presents the characterization of the logistic process currently carried by the dairy producing companies in the department, taking into account variables such as production, procurement, storage, purchases, inventories, distribution and customer service, related to all these products that use for their packaging or packaging plastic containers, forming a fundamental part of the operational and strategic processes of a company, and additionally expectations of implementing a reverse logistics within the processes were taken into account. Finally, it is presented as a result the current diagnosis of all these variables of the logistics process in terms of plastic containers by the dairy companies in the department, considering that this type of companies need to improve aspects concerning the logistics system, which allows them to have greater control and competitiveness in the market, and finally they can contribute within their process to the sustainability of the company.

Keywords: Supply chain, Logistics, Reverse logistics, Dairy products, Customer service.

_____

1. Introduction

Logistics or the logistics process within an organization is a fundamental part of its strategic processes (Serrano, 2019), it is defined as a discipline that is composed of planning, management, monitoring, control and continuous improvement of the flow of materials, raw materials, components, human resources, directed from the company to the final customer(Carreño, 2018).

It should be noted that most companies maintain good discipline throughout this cycle to deliver their final product (Alvarado, 2019), being considered a major problem when the company loses responsibility for the product when it is already consumed by the customer, that is, when there is a large amount of consumerism a large amount or volume of waste is generated (Benítez, Lujan & Navarro 2017). Companies still do not have an environmental awareness, or have strategies that they could implement, or how they could contribute to the environment avoiding that all the waste generated by their product diversity is finally directed to landfills (Ortiz, 2017). Likewise, by taking into account sustainable processes, companies may be contributing to corporate sustainability; this kind of sustainability is defined as a balance between economic, social and environmental aspects, increasing their resources with the good management of available resources.

Therefore, sustainability can strategically go hand in hand with reverse logistics (Lattorre, 2020), since it allows to determine how to return all those products that have already fulfilled their life cycle (Barrios, 2017), and give them a good end, all this is possible by having clear management of the logistics process, and also to establish strategies to inversely manage the entire process, since reverse logistics includes all operations related to the reuse of products and materials (Morales, 2012).

In fact, the analysis of a logistics process that a company is currently carrying out has a great relevance, since this process is the one that leads to success and the creation of competitive advantage (Guevara, 2015). This process is made up of variables such as; production, procurement, storage, purchasing, inventories, distribution

and customer service, which can guide the achievement of objectives and define monitoring measures for the control of each of them (Fernández, 2018) The research conducted by the National Association of Supermarkets ANSA, indicates that Accenture one of the leading consulting firms has proposed principles for the management of the supply chain, based on experiences in improving the supply chain in more than 100 companies (Pulido, 2014), in which it has achieved an excellent service to customers, profitability and growth.

For instance, a characterization of a distribution network for a logistics operator in Bogota determined the opportunity to increase customer satisfaction by 98.22%, which reflects a quick attention to customer requests and therefore can be translated into customer loyalty (Cortés, 2019). Similarly, some problems can be highlighted, due to the lack of a good diagnosis of the logistics processes within the organization, such as insufficient purchasing policies and product demand, the waste of the information system, inappropriate storage, lack of staff training and lack of communication between the different company departments (Arias, 2019).

On the other hand, the importance of logistics management can also be observed, where it is considered that the strategies implemented should be focused on achieving an adequate unification of all the techniques of the supply chain, using efficiently the available information systems (Betancurth, 2019). As it is indicated in the study on the characterization of SMEs in the cosmetics and toiletries industry in Bogotá D.C., the logistics cost for Colombian companies is equivalent to 18.6% of the total cost of sales, and in Colombian SMEs logistics costs represent an average of 26.4% of the cost of sales (Ramírez, 2016).

Furthermore, an analysis carried out in a study of transportation logistics and local development in organizations exporting table grapes from Sonora concluded that logistics is developing in accordance with the requirements of international logistics, which has forced managers to seek efficiency mechanisms and accomplish the demands imposed by the market (Hurtado, Robles, Preciado & Bañuelos, 2018).

Consequently, dairy companies are one of the industries with a great variety of products, existing between medium and small companies, of which it is unknown in the department how they are carrying out this logistic process, having a characterization of this, the enterprises could implement improvements, incorporate new technologies that allow increasing competitiveness and productivity in their processes, guaranteeing their sustainable growth.

Therefore, the methodology of this article will allow to know the logistic behavior of the companies dedicated to the production of dairy products in the department of Norte de Santander, through the characterization of the different agents involved in the process, in addition to the behavior of its variables, resulting in the identification of the logistic process.

2. Literature Review

The following is a description of concepts that are fundamental for the development and characterization of logistics processes and management in the supply chain, so that the reader can expand the ideas on the subject presented in the article, derived from the research carried out.

Logistics

The concept of logistics has been defined in different ways during the last decades, of the most relevant definitions we find, the one created by the council of supply chain management professionals, defining traditional logistics as packaging, transportation, loading, unloading and warehousing, etc. In addition, modern logistics reaffirms the concept of integrated logistics management and its implementation (Serrano, 2019). It is important to highlight that modern logistics should be understood as the means for procurement, production and operation of the entire process until delivery to the consumer (Pinheiro de Lima, Breval, Rodriguez &Follmann, 2017).

Supply chain

The supply chain is mainly known as the planning, organization and control of all goods, supplies, tools, materials, etc., from their transformation to final consumption (Bernal& Torres, 2018).We can also define it according to the author Luis Garcia as a very clear way to connect the origins of this discipline, from the military orbit; to then become an essential ally in business management and customer satisfaction (García, 2016), integrating the management of supply and demand within and between companies (Gualdrón, 2019).

Production chain.

The production chain in a company can be defined as an ordered set of production processes that have in common the same market and in which the characteristics of each link affect the efficiency and productivity of production as a whole (Isaza, 2009); this means that each of the processes within a company are related to each other, giving added value to the products in an efficient way (Simanca, Montoya & Bernal 2016).

Product traceability.

According to the conceptualization of traceability given by Rincón Ballesteros defines it as the ability to follow the downstream trajectory of a product along the supply chain, while traceability is the ability to determine the origin and characteristics of a particular product(Ballesteros, 2016), the definition proposed by Golan can also be highlighted as a recording system designed to track the flow of products in a supply chain (Herrera & Orjuela , 2014).

Transportation.

The transport activity in the logistics process is essential to be able to move the materials or products themselves, as well as the final products (Serna, Fonseca &Duque, 2017), for their distribution and to finally get the products to their customers.

Logistic process.

This logistic process is related to the administration of the flow of goods and services, it contributes significantly in the prediction of the variable customer satisfaction (Gallardo de Requejo, 2017).It also takes into account the procurement that is responsible for the control of the supplies necessary for the proper functioning of the production in the company, it is also about defining what, how, when and where you want to acquire(Lassis, 2014).

It is also necessary to have a warehouse management in such a way that ensures the supply of materials and supplies needed in an effective and timely manner, to ensure continuous production without interruptions (Gallardo de Requejo, 2017). This logistics process involves purchasing, commonly known as the procurement function, looking at the need, location and selection of one or more suppliers, negotiating the price and other important factors at the time of purchase, ensuring delivery and proper follow-up (Lassis, 2014). Similarly, the implementation allows an effective way control the storage of different goods and raw materials from their birth to their point of arrival, with the purpose of meeting all the requirement that the customer wants (Perez, 2018). Another essential aspect in the logistics process is the distribution, since it refers to the gap of time and space between the processing points of the company and its customers, being important to take into account the delivery times, which allow providing a good customer service, being differentiating, improving competitiveness in the market (Serrano, 2019).

Reverse logistics.

The concept of logistics has been defined in various ways over the last decades, among the most relevant definitions we can find, that it is defined as the movement and storage that facilitates the flow of products from the point of purchase of materials to the point of consumption, as well as the information flows that are put in place, in order to give the consumer, the right level of service at a cost (Rentero, 2018). In the field of reverse logistics, the study of the integration of deliveries and collections, direct and reverse flows.

3. Material And Methods

This research was carried out qualitatively in order to fulfill the main objective of the research based on a field type design, exploratory and descriptive level with feasible modality (Sampieri, 2018), allowing the characterization of the dairy companies in the department; This characterization began with a consultation in the chamber of commerce to know the number of companies that represent the study population, resulting in a total of 24 companies; these companies are mostly concentrated in the metropolitan area of the city of (Cúcuta, Villa del Rosario and Los Patios) with a total of 12 companies and in another pole of development of the department such as Ocaña, city that has 3 companies.

The survey was the instrument used for the characterization which allowed to obtain in an exact way the logistic process involved with plastic containers and packaging, which is currently carried out in this type of companies, specifically the analysis of the variables of production, supply, storage, purchases, inventories, distribution and customer service; previously validated by statistical, methodological and disciplinary experts.

After having established the total population and locations of the companies, the place of study with the highest concentration of this type of companies was determined to be the city of Cúcuta and Los Patios, defining 5 producing companies; two companies from Cúcuta, two companies from Los Patios and one company from Pamplona, which after applying the survey to the companies, the results were analyzed and subsequently allowed to establish the characterization.

4. Analysis and results

The results of the research allowed to establish the characterization of the logistic process in products with plastic containers, currently handled in dairy companies in the department of Norte de Santander. In the first place, in the **production** area, dairy product lines such as cheese, milk, fermented milk, soft drinks and desserts are operated, and their containers, packaging and packing in their different presentations are mainly made of plastic material, highlighting that in the department of Norte de Santander only 20% of the dairy companies offer the complete line of dairy products, such as cheese, milk, fermented milk, soft drinks and desserts; the other 80% of these companies are dedicated or specialize only in some of these lines.

The **supply** of plastic containers and packaging in general, each dairy producer in the department has one to three suppliers for each of its products. These suppliers are generally national and regional, and it is important to note that they purchase Colombian products, which allows for greater control and monitoring of each of these inputs.

Likewise, the level of consumption in the dairy sector is reflected for each of the production lines and for each type of plastic as follows: for the milk line, 60% low density polyethylene and 40% low and high density polyethylene are used; for the cheese line, 60% low density polyethylene, 20% PET and 20% the combination of low and high density polyethylene are being used; and in the fermented products line, 60% PET and 40% the combination of low and high density polyethylene are being used.

In fact, the amount of consumption of plastic packaging and containers by dairy companies showed a monthly demand of 600 to 1000 packages per month per product. These results reflect a large amount of plastic consumption by these companies in the region, increasing the accumulation of plastic waste in the community in general.

Similarly, the results of the diagnosis of the dairy companies in the department of Norte de Santander, showed that the cost of a plastic container ranges between COP 300 -800 for 80% of the companies, being this cost really high and influencing the costs of the final products, for the determination of sales prices. Due to these prices, companies can begin to consider in their strategic decisions the reverse logistics of these plastic containers and packaging, which could help to reduce costs and thus avoid inappropriate decisions that affect the mission, vision and goals of the organization (Jiménez,Rojas&Galvi 2014).

It should be noted that the level of compliance of suppliers of packaging and plastic containers, 60% of the dairy companies give a rating to suppliers between 2 and three points being a good level of compliance, while 40% of the companies give a rating of 4 to 5 points, being excellent in terms of the level of satisfaction; this means that the companies have certain disagreements or nonconformities when acquiring their containers, they are not considered an excellent level of service.

In addition, it was found that the procurement system of the dairy companies in the region, 80% of them do not apply or use a procurement system for containers, packaging and/or packing, while the rest of the companies indicate that they are applying a mechanism such as the EOQ (economic order quantity) method. This reflects that the companies in the region are not using a system that allows them to have control when purchasing or acquiring these types of inputs.

Similarly, for the selection of their plastic packaging suppliers, the first important aspect to take into account when selecting the supplier is delivery times, followed by the location and price of the products, and finally, with very little importance, packaging with a green seal and quality certification. This implies that companies in the dairy sector, in their processes, do not present strategies for product sustainability. At the moment of acquiring these packages, they are giving a very low value to the importance of the environmental impact, either by acquiring products with green seal, biodegradable, environmentally friendly.

On the other hand, in relation to storage, only 40% of the companies in the sector maintain or control in digital media the information related to storage, the rest of the companies indicate a manual management. This implies that having manual information does not allow for greater control or the existence of material control processes, since having manual records makes it difficult to have an optimal follow-up and control of the information.

It was also observed that only 40% of the dairy companies apply management indicators for the storage of finished products, products in process and raw materials of the company. This reflects a high percentage of

companies that are not using controls or monitoring of storage in their processes that would allow them to achieve and obtain greater control and quality in their system by implementing solutions and improvements to them.

Similarly, in relation to the flow of materials in the warehouse, 40% of the dairy companies use a FIFO (first in first out) method for the flow of their materials and elements within their warehouse. There is a high percentage of companies that do not use any material flow control mechanism. The research indicates that the handling of stored materials is done manually; there are no automated or specialized processes, showing the absence of updating and use of electronic and systematic mechanisms to control storage in the companies of this sector.

Then, in the analysis of a fourth variable regarding purchasing management, it was found that 100% of the companies in the sector start from the company's strategic plan, presenting a standardization of their purchases. There is also follow-up, with 80% considering customer complaints and claims at the time of purchasing. For the follow-up of their suppliers, there is a database with their respective information; this database maintained by the companies is manual and digital, while some companies do not have a database of their suppliers, nor a follow-up of their purchases, which is an important record for the control of purchases and selection of suppliers.

Therefore, the time that elapses from the moment a purchase order is generated and the arrival of the order at the company is between two to three days. Generally, most of the dairy companies have short delivery times for their purchase orders, which allows the companies to optimize their processes and times. The following is the result of the characterization using the most relevant results that give an answer to each variable of the whole logistic process with respect to production, imprisonment, storage and purchases by the dairy companies in the department, as shown in the following figure.

Figure.1 Characterization of production, supply, storage and purchases
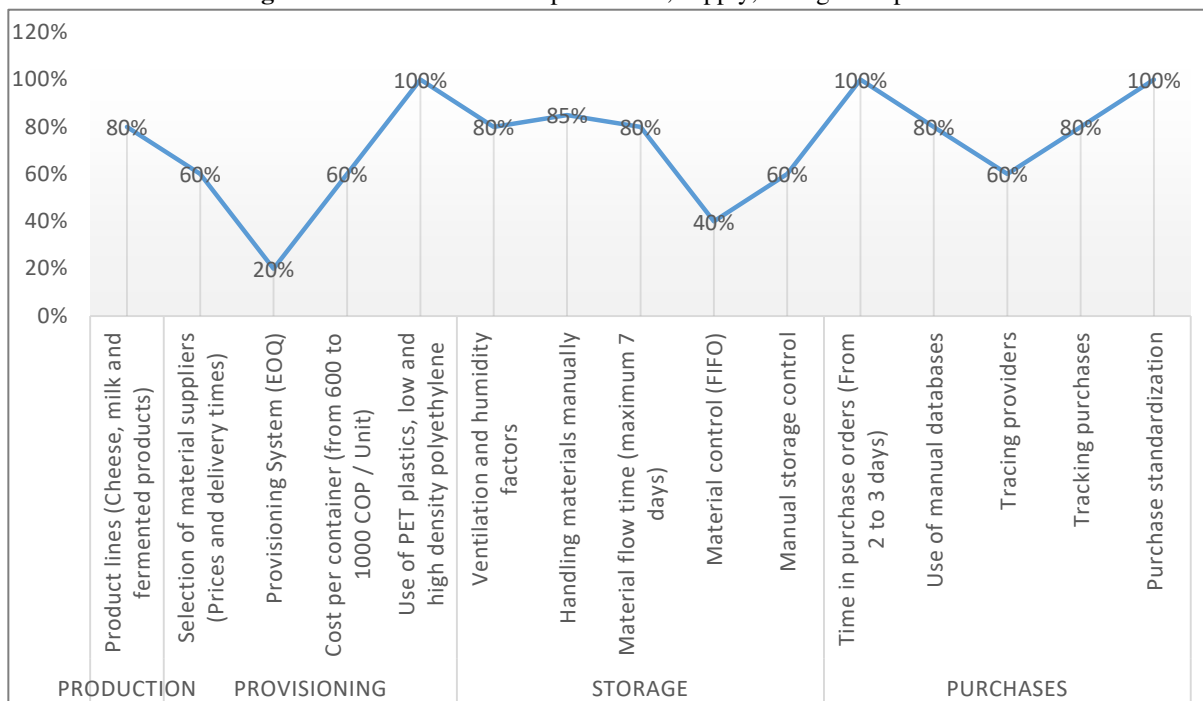
Afterwards, the analysis made to the dairy companies in the department showed that 60% of them do not make demand forecasts to keep control of their inventories, being few companies that make this type of forecasts, ignoring that demand forecasts allow companies to obtain valuable information of the current and future market in such a way that they can make the right decisions and generate growth strategies. The companies in the dairy sector in the region manage inventories in the company through periodic verification or revision, in which the inventory is revised in fixed determined periods; other companies do it through stock levels, making a control of inventories at the moment that a certain level of existing units is reached.

On the other hand, in terms of distribution, most of the dairy companies maintain their own distribution of their products, while some companies in the sector subcontract or maintain a mixed type of distribution (own and subcontracted) to distribute their products. This shows that most of the companies in the dairy sector have their own distribution while maintaining control of their processes, being more efficient and reducing costs.

Last but not least, in terms of customer service, the companies deliver their products to their customers in three to ten days, and take one to two days to deliver their products. This type of industry in the region has great compliance in delivery times, which is important for the company since late delivery could cause additional costs, loss of customers and loss of credibility in terms of quality and responsibility.

Indeed, all companies present and accept returns of their products, since they are perishable and easily consumed products, for these returns the company must make decisions efficiently and as economically as possible to deal with this type of situation, presenting 10% of returns per month in its different product lines. These returns are mainly due to causes such as product expiration dates, since the products have a short life cycle, product warranties, and shipping errors. By presenting a large percentage of returns for different reasons, the option of applying reverse logistics within the company should be considered, and thus optimize all these returned products, avoiding loss of time, materials, since the purpose of the returned products that are currently given by most companies, express that these products are eliminated, and only a small part are reusing, in order to give them a different use to which it was initially manufactured.

For this reason, the registration of information of each product is of great importance to maintain control of inventories and warehouses and also a better distribution of them, so that the product is delivered to customers without any problem. From these types of records, the companies present information recorded on the location, the batch of the products, movements, type of transformation process, keeping a complete record of the product. The following is the result of the characterization using the most relevant results that give an answer to each variable of the whole logistic process regarding inventories, distribution and customer service by the dairy companies in the department, as shown in the following figure.

Figure 2. Characterization, inventories, distribution, and customer service.
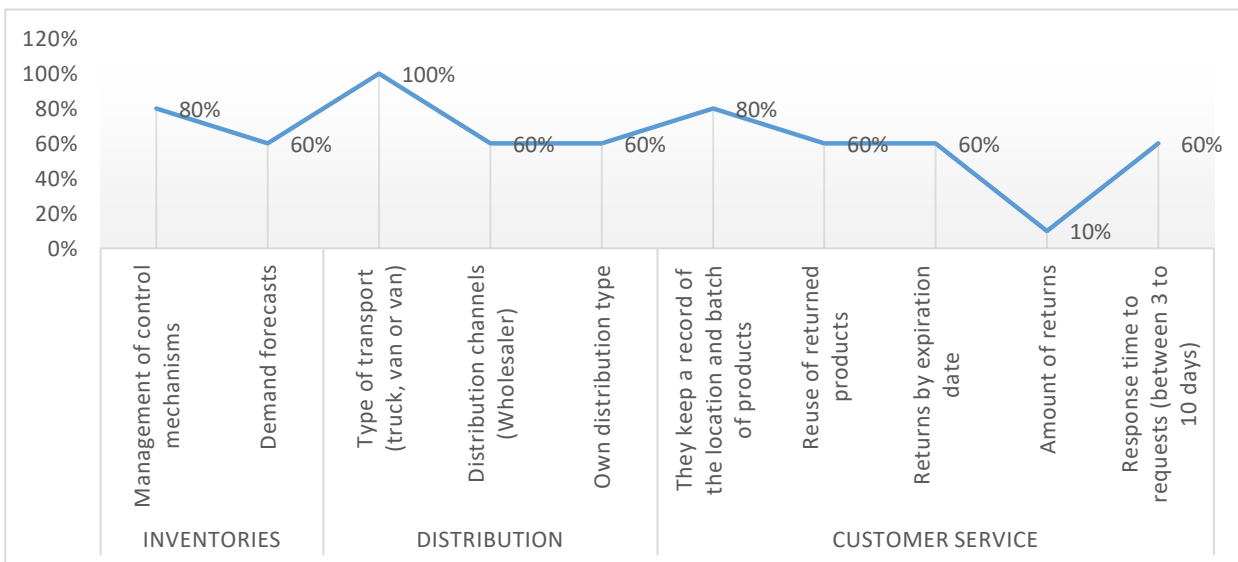
It is important to note that the logistics process of products that use plastic containers and packaging is directly related to the reverse logistics of the products, as indicated by Montoya in his research Reverse logistics a process of environmental impact and productivity, as it allows taking corrective actions that can responsibly mitigate the impact on the environment, that this type of products can cause (Montoya, 2010), likewise to become aware and see the importance of reusing the products giving them a new useful life, or the development of a culture of recycling, reuse, among others; may be supporting the development of a new culture, as expressed by Lopez and Angel in their research (Rodríguez& Vergara, 2015). Plastics are considered polluting materials that negatively affect the environment, but like other projects that have been developed such as reverse logistics in tires (Camargo,López, & Pantoja, 2017), reverse logistics in plastics in general (Rodríguez, Maecha & Peñaloza, 2014), among other investigations that have been carried out, it has been possible to provide solutions and begin to include within its logistics processes from customer service, distribution, inventories, procurement and procurement among others to provide support and solutions to reduce waste generation, as it could be directly related to the demand and directly related to the collection rate (Florian, 2016).

5. Conclusión

In conclusion, it can be said that currently in the dairy companies in the department of Norte de Santander we can conclude that the product lines that they offer the most are cheese, milk and fermented products, being these types of products the ones that generate the most waste from plastic containers and packaging. In order to offer all this type and variety of products, these companies need to have contact with different suppliers, especially the suppliers of their containers, packaging and packing, indicating that they have two to three suppliers, national and regional, considered to have a good compliance rating, allowing them to have greater control over the types of plastics they supply and use for their packaging in the future, predominantly low-density polyethylene, high-density polyethylene and PET, which are being used economically at low costs

As well as the supply system that these micro and medium-sized companies have, they do not have a supply system, which is a disadvantage because they do not have control when purchasing or acquiring this type of inputs. When selecting a supplier to purchase plastic containers and packaging, the aspects that are most taken into account are product prices, delivery times and location, giving little importance to the green seal and quality certification of the products.

Similarly, not having a material flow system does not allow the company to have an order or control of the movements that are constantly carried out in the companies. This percentage of companies that still do not use this type of system is largely due to the fact that this sector is made up of medium and small companies and they do not see the importance of applying this mechanism.

On the other hand, regarding the determination of the time of flow of materials, permanence of products in warehouse, products in process and finished products, it was determined according to the results of the analysis to the companies of the dairy sector of the region, that this time is defined between 0 to 7 days, being a prudent time for the handling of this type of food products, presenting greater care and greater control of storage times, showing short storage times, since these products rotate more easily in the market, presenting great demand, indicating a constant rotation, great movement in the market, great sales in the region; The high consumption of these products results in the generation of discarded plastic containers and packaging.

Likewise, this type of company reflects that they keep or control the information related to the storage of their materials manually, which makes it difficult to have a better control of all their existing materials. Some of the companies have implemented the FIFO (First In First Out) method for the control of the flow of materials, allowing to have a control and order of the movements that are constantly carried out in the companies.

On the other hand, for the realization of purchases, most of the companies start from the company's strategic plan, presenting a great control over them, considering also that the complaints and claims of the clients have an impact at the moment of making a purchase. It was also evidenced that the companies have a database of clients and suppliers, which allows them to have a standardization of purchases and follow-up of clients and suppliers. These companies also make demand forecasts, which allow them to obtain valuable information on the current market, so that they can make the right decisions and generate growth strategies.

Likewise, regarding the distribution of their products in the region, most of the companies in the dairy sector have their own distribution, maintaining control of their processes, being more efficient, reducing costs, few companies subcontract and maintain a mixed type of distribution (own and subcontracted). In terms of customer service, the companies' delivery times to their customers are between three and ten days, which is considered sufficient time to generate effective deliveries.

Finally, it can be said that having a good control by the dairy companies allows them to easily implement reverse logistics within their logistics process, especially in the plastic containers and packaging used, maintaining direct contact with suppliers, information and follow-up to their customers, having well defined lines and the type of distribution they have, a system of inventories and purchases, a control of supply and storage, in such a way that allows them to clearly define their return and recovery process, contributing to the ethics and responsibility of the company.

References

Alvarado Caicedo, J. R. (2019). Mejoras para el proceso de entrega de productos de la tienda de yeka, a partir del año 2018 (Bachelor's thesis, Instituto Superior Tecnológico Bolivariano de Tecnología.)

Arias del Aguila, S. T. (2019). Influencia del diseño de Layout de almacenes en la gestión logística de las empresas constructoras en la Banda de Shilcayo,San Martín.

Ballesteros, D. L. (2016). Conceptualización de la Trazabilidad en la Cadena de Abastecimiento.

Barrios, E. (2017). Ciclo de vida de un producto y sus estrategias relacionadas. Argentina: Universidad Nacional de la Patagonia Austral.

Beatriz Alejandra Hurtado Bringas, J. M. (2018). Logística de transporte y desarrollo local en organizaciones exportadoras de uva de mesa sonorense. Estudios sociales (Hermosillo, Son.), 18(51).

Benítez, S. O., Lujan, R. M., & Navarro, F. F. G. (2017). Análisis estadístico del comportamiento de los residuos sólidos domiciliarios en una comunidad urbana. Frontera Norte, 10(19), 65-76

Betancurth, J. P. (2019). La seguridad en la cadena de suministros como estrategia de competitividad de las organizaciones. Obtenido de https://repository.ucc.edu.co/bitstream/20.500.12494/10948/1/2019_seguridad_cadena_suministros.pdf

Isaza Castro, J. G. (2009). Supply Chains: Approaches and Concepts (Cadenas Productivas: Enfoques Y Precisiones Conceptuales).

Camargo Rodríguez, S., Franco López, J. A., & Chud Pantoja, V. (2017). Modelo de simulación dinámica para evaluar el impacto ambiental de la producción y logística inversa de las llantas. Ingeniería y desarrollo, 35(2), 357-381.

Carreño, A. (2018). Cadena de suministro y logística. Fondo Editorial de la PUCP.

Cortés García, J. G. (2019). Caracterización de una red de distribución para un operador logístico en Bogotá.

Rodríguez, D., Mahecha, D., & Peñaloza, C. (2014). Logística inversa en el sector de plásticos de Bogotá-Caso de estudio. Recuperado el, 6.

Serna, E. B., Fonseca, L. O. M., & Duque, E. R. (2017). Caracterización de Logística en las empresas del Altiplano del Oriente Antioqueño. Revista Loginn: Investigación Científica y Tecnológica, 1(1).

Escudero Serrano, M. J. (2019). Logística de almacenamiento 2. Ediciones Paraninfo SA.

Fernández, R. C. (2018). Análisis del proceso logístico de Industrias Jacinto Herrero.

García, L. A. (2016). Gestion logistica integral: las mejores practicas en la cadena de abastecimiento . Ecoe Ediciones.

Gómez Montoya, R. A. (2011). Logística inversa un proceso de impacto ambiental y productividad. Corporación Universitaria Lasallista, 5(2).

Guevara, J. E. R., & Urbina, A. M. (2015). Diagnóstico de la logística del carbón en Norte de Santander. Respuestas, 20(1), 30-37.

Herrera Ramírez, M. M., & Orjuela Castro, J. A. (2014). Perspectiva de trazabilidad en la cadena de suministros de frutas: un enfoque desde la. Ingeniería, 19(2).

Jiménez, J. I. S., Rojas, F. S. R., & Galvis, H. J. O. (2014). La planeación financiera: un modelo de gestión en las mipymes. FACE: revista de la facultad de Ciencias Económicas y Empresariales, 13(1), 137-150.

Aldana-Bernal, J. C., & Bernal-Torres, C. A. (2018). Factores Blandos en la Gestión de Integración de las Cadenas y/o Redes de Abastecimiento: Aproximación a un Modelo Conceptual. Información tecnológica, 29(2), 103-114.

Lassis, C. J. (2014). Logística de Aprovisionamiento. Recuperado el 01 de 2021, de https://www.academia.edu/34990020/Log%C3%ADstica_de_Aprovisionamiento

Vargas Lattorre, J. (2020). Procesos de logística inversa dentro de la cadena de suministro cerrada para las embotelladoras de plástico de Coca Cola Femsa México y Colombia (Doctoral dissertation, Universidad del Rosario).

López, L. K. R., & Ángel, R. A. V. (2015). Condiciones sociales y culturales de los recicladores en Colombia. Ensayos: Revista de Estudiantes de Administración de Empresas, (8).

Simanca, M. M., Montoya, L. A., & Bernal, C. A. (2016). Gestión del conocimiento en cadenas productivas: El caso de la cadena láctea en Colombia. Información tecnológica, 27(3), 93-106.

Morales, B. B. (2012). Recuperado el 15 de 01 de 2021, de https://www.legiscomex.com/Documentos/actualizacion-la-logistica-inversa-control-devoluciones-residuos-gestion-cadena-abastecimiento

Murcia Florian, J. A. (15 de 6 de 2016). Logística inversa, aplicada al manejo de residuos plásticos, como aporte estratégico del marketing verde. Recuperado el 1 de 2021, de https://repository.unimilitar.edu.co/handle/10654/14529

Napán Gallardo de Requejo, M. V. (2017). Proceso logístico y satisfacción de los clientes internos del Instituto Nacional de Salud del Niño – Breña 2017. Recuperado el 01 de 2021, de https://repositorio.ucv.edu.pe/handle/20.500.12692/13481

Pinheiro de Lima, O., Breval Santiago, S., Rodríguez Taboada, C. M., & Follmann, N. (2017). Una nueva definición de la logística interna y forma de evaluar la misma. Ingeniare. Revista chilena de ingeniería, 25(2), 264-276.

Ortiz, E. A. (2017). Generando conciencia sobre el manejo de los residos sólidos en los estudiantes del instituto Tecnico Industrial Lucio Pabón Nuñéz, sede Cristo Rey, en el municipio de Ocaña Norte de Santander.

Inca Perez, E. V. (2018). El Proceso Logistico en la Importación en la Agencia de Carga Rush Transport del Perú SAC-San Isidro, 2018.

Pulido, J. (2014). Gestión de la Cadena de Suministros. El último secreto. Caracas, Venezuela Rua, F.(2016)"El proceso de decisión de compra del cliente". Recuperado de: http://blogs. sefac. org/rincon-linimento/proceso-decision-compradel-cliente

Gualdrón, R. R., Smarandache, F., & Bohorquez, C. D. (2019). Aplicación de la teoría neutrosófica para el tratamiento de la incertidumbre en la gestión del riesgo en la cadena de suministro. Aglala, 10(2), 1-19.

Ramírez, D. J. (1 de 1 de 2016). Caracterización de la gestión logística en las pymes de la industria de autopartes en la ciudad de Bogotá D.C. Recuperado el 2021, de https://ciencia.lasalle.edu.co/cgi/viewcontent.cgi?article=2395&context=administracion_de_empresas

Rentero, A. (2018). La logística inversa: ¿qué es y para qué sirve? Recuperado el 01 de 2021, de https://www.hiberus.com/crecemos-contigo/la-logistica-inversa-que-es-y-para-que-sirve/

Sampieri, R. H. (2018). Metodología de la investigación: las rutas cuantitativa, cualitativa y mixta. McGraw Hill México.

Serrano, M. J. (2019). Logística de almacenamiento 2. Ediciones Paraninfo, SA.