

Competitiveness and Innovation in the Pasto Municipality's Dairy Chain

Competitividad e innovación de la cadena láctea en el municipio de Pasto

Marleny Cecilia Farinango-Vivanco and Genys Patricia Rodríguez-Hernández

Abstract

This chapter is one of the results of a research study undertaken to identify and measure factors related to competitiveness and innovation in the processing section of the dairy chain in the municipality of Pasto. The research was conducted with a population of twelve processing companies and was descriptive, using a non-experimental design and a quantitative approach. Surveys and direct observation were the instruments used, and the research was divided into two phases, one documentary and the other in the field.

The research determined that the production companies in the dairy chain do not develop or innovate their products or processes despite the existence of strong motivation for change in terms of reduced costs, competition, and opening of new markets. This, in turn, shows that there is no real awareness of the benefits offered by innovation, or of the concept itself.

Finally, the research offered the conclusion that due to the lack of technical and productive development projects in dairy regions, competitiveness and innovation cannot be improved in the different sections of the dairy chain. Accordingly, a proposal is put forward to promote the integration of public and private sectors in the interests of development and growth in the dairy chain.

Keywords: dairy chain, competitiveness, processing section, innovation.

Resumen

El presente capítulo surge como uno de los resultados de una investigación que propone identificar y medir factores relacionados con la competitividad y la innovación de la cadena láctea en el eslabón de transformación del municipio de Pasto, realizada en una población de doce empresas transformadoras, de tipo descriptivo, con diseño no experimental y de enfoque cuantitativo. Los instrumentos utilizados fueron la encuesta y la observación directa, y se dividió en dos fases, una documental y otra de campo. Como resultado se determinó que las empresas productoras de la cadena láctea no realizan innovación y desarrollo de sus productos y procesos a pesar de que existe una gran motivación de cambio dado por la reducción de costos, la competencia y apertura de nuevos mercados, lo cual evidencia, además, que no existe una real sensibilización de los beneficios que brinda y del concepto mismo de la innovación. Finalmente, la investigación permitió concluir que debido a la falta de proyectos de desarrollo tecnológico y productivo en las zonas lecheras, la cadena láctea no puede mejorar la competitividad y la innovación en sus etapas, por lo cual se propone promover la integración del sector público y privado en aras de lograr el desarrollo y crecimiento de la misma.

Palabras clave: cadena láctea, competitividad, eslabón de transformación, innovación.

Author profiles / Perfil de autores

Marleny Cecilia Farinango-Vivanco

Specialist in Statutory Auditing, in Project Management, and in Administration of Educational Technology. Professor and researcher in the Department of Administrative and Accounting Sciences, Institución Universitaria Cesmag - Colombia.

E-mail: mcfarinango@iucesmag.edu.co

Genys Patricia Rodríguez-Hernández

Specialist in Finance. Professor and researcher in the Department of Administrative and Accounting Sciences, Institución Universitaria Cesmag - Colombia.

E-mail: gprodriguez@iucesmag.edu.co

How to cite this work / ¿Cómo citar?

APA

Farinango-Vivanco, M.C. & Rodríguez Hernández, G.P. (2014). Competitiveness and Innovation in the Pasto Municipality's Dairy Chain. In Hernández Arteaga, I. & Pemberthy-Gallo, L.S. (Comps.), *University-Company-State: Towards a Culture of Research and Innovation. Second Conference of Business Innovation in Cauca and Nariño* (pp. 241-253). Bogotá: Editorial Universidad Cooperativa de Colombia - Red UREL.

Chicago

Farinango-Vivanco, Marleny Cecilia and Rodríguez Hernández, Genys Patricia. "Competitiveness and Innovation in the Pasto Municipality's Dairy Chain." In *University-Company-State: Towards a Culture of Research and Innovation. Second Conference of Business Innovation in Cauca and Nariño*, comps. Isabel Hernández Arteaga and Luz Stella Pemberthy-Gallo. Bogotá: Editorial Universidad Cooperativa de Colombia - Red UREL, 2014.

MLA

Farinango-Vivanco, Marleny Cecilia and Rodríguez Hernández, Genys Patricia. "Competitiveness and Innovation in the Pasto Municipality's Dairy Chain." *University-Company-State: Towards a Culture of Research and Innovation. Second Conference of Business Innovation in Cauca and Nariño*. Hernández Arteaga, Isabel and Pemberthy-Gallo, Luz Stella. (Comps.). Bogotá: Editorial Universidad Cooperativa de Colombia - Red UREL, 2014, pp. 241-253.

Introduction

Within the agro-industrial situation that Colombia and the world are currently facing, there is a visible need to identify the competitive advantages of companies compared with others in the same sector. This should be done in terms of productivity, product quality, management of costs and prices, and innovation, with the aim of responding to possible changes in the environment and measuring themselves against national and international markets.

For Serrano (2006), the country's dairy industry comprises five structural sections (primary production, collection, processing, commercialization, and consumption), and three transversal sections (transport, human resources, and materials). These operate within political, institutional, regulatory, technological, socioeconomic, and environmental frameworks.

Thus the researchers, taking various factors into consideration, limited the subject of this study to the transformation section of the dairy chain because of its relative importance in the dynamic of the national economy, and particularly the regional economy.

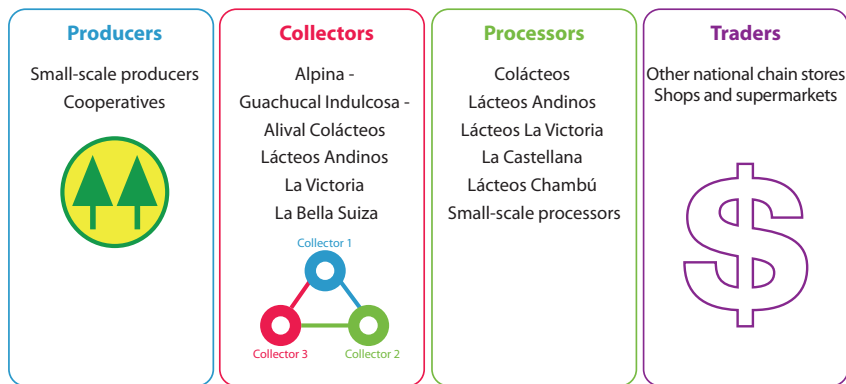
There are no previous studies specifically about this subject in the municipality of Pasto; however, related documents were reviewed in the carrying out of this research. These included "Analysis of Production Chains in the Pasto, Túquerres, and La Unión Municipalities," (2006) published by the Pasto Chamber of Commerce, which presents a general statistical diagnostic analysis of the production chains in each of the municipalities mentioned. Additionally, the study conducted by Fabio Mejía Zambrano titled "Prospects for the Dairy Chain in the Nariño Department for 2020" provided important supplementary material and was consulted in the writing of this chapter.

Economic activity in the municipality of Pasto (see Figure 15.1) is focused on identifying and organizing production chains, and the dairy sector plays a leading role in the legal exploitation of the resources included within the regional strategic plan. Furthermore, the dairy sector promotes local development that not only involves the producers and their families in rural areas, but also creates and drives social organizations that contribute to development. Within the processing section of the production chain, it is therefore important to conduct a diagnostic study, analysis, and assessment of the position of companies with respect to the competition and of innovation in their products and processes.

This type of study is important in the region as it strengthens coordination of academic research organizations and the support of public and private institutions, contributing to the growth and development of the economic entities involved in

this production chain. Likewise, it makes it possible to identify and measure factors related to competitiveness and innovation.

Figure 15.1 Structure of the dairy chain in the municipality of Pasto



Source: The authors.

The research was carried out in processing companies in Pasto's dairy sector, and included fieldwork with direct observation and surveys in these companies. Prior to this, a documentary review of existing studies on the municipality's dairy chain was conducted, enabling the researchers to identify the main positions of the companies with respect to competitiveness and applied innovation in the region. After completing the work, the researchers studied similarities in relation to the objectives formulated in the structural analysis in order to finally establish appropriate recommendations and conclusions.

The research showed that although the business leaders in the dairy sector recognize the success factors for their companies, there is an invisible barrier that prevents them from making the fundamental decisions needed to improve internal operations with a view to achieving high levels of production based on innovation. Consequently, it is suggested that processes of research into competitiveness and innovation should be strengthened with the support of interinstitutionality (University-Company-State).

Methodology

Information was collected using primary sources, such as surveys conducted with the heads of different industries in the dairy chain, as well as through a review of files that provided a foundation for information related to the dairy chain. Secondary

sources included existing studies by private and governmental entities that were published in research brochures, magazines, and books related to the topic of study. Some of the main secondary sources used were documents produced by the Pasto Chamber of Commerce, Colombian Association of Micro, Small, and Medium-sized Enterprises (ACOPI), National Federation of Livestock Breeders (Fedegan), National Training Service (SENA), Universidad de Nariño, Nariño Cooperative of Dairy Products (Colácteos), the Colombian Agricultural Institute (ICA), Colombian Corporation of Agricultural Research (Corpoica), and Nariño Society of Farmers and Livestock Breeders (Sagan). These documents contributed to the researchers' knowledge of the topic of study.

The primary and secondary sources used also allowed the researchers to measure several variables examined in the study in order to reliably describe the results.

According to the database of the Pasto Chamber of Commerce (2009), there are 20 registered establishments dedicated to processing dairy products located in the municipality. Of these companies, twelve agreed to supply information and thus became the study population.

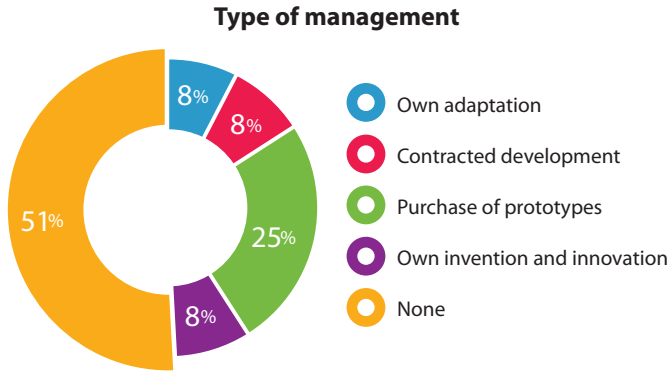
The research was conducted using a quantitative, descriptive approach. Within this approach, quantifiable variables that are directly and immediately applicable were analyzed, facilitating the economic and strategic study of the processing section of Pasto's dairy chain. The research was non-experimental because through direct observation of dairy processing entities, researchers were able to identify the principal factors of competitiveness and innovation in the sector.

Once information was collected from primary and secondary sources, the following activities were carried out: creation of scheduled progress reports, data systematization and analysis, structuring of final report, presentation to the university institution's Research Council, peer review, and dissemination of results. The corresponding analysis of the information obtained was conducted using instruments applied and accepted as valid for research, through tables, indexes, and figures with their respective interpretations and recommendations.

Results

To determine and analyze the management of companies in the dairy sector in terms of competitiveness, innovation, and development of new products, as well as the reasons for innovation and development of new processes, a survey was conducted that allowed results to be systematized, interpreted, and analyzed. In order to better illustrate these results, the main findings are shown in Figure 15.2.

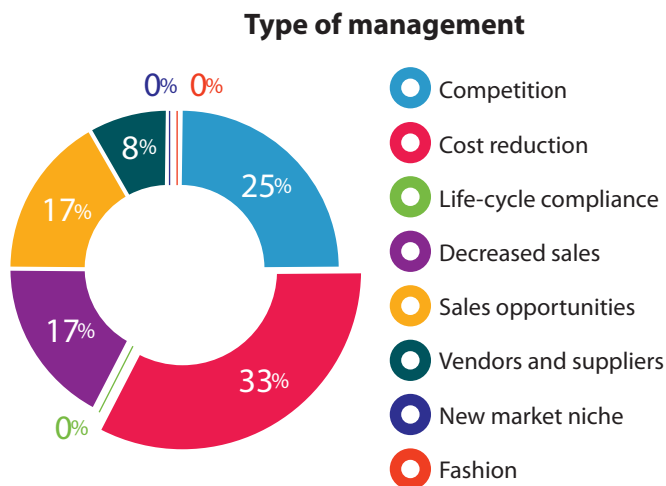
Figure 15.2 Management for innovation and development of new products



Source: The authors.

Of the companies surveyed, 51% have not worked towards implementing strategies for the development and innovation of products. Meanwhile, 25% purchase prototypes that they adapt to production needs, and 24% give priority to aspects such as their own innovation and hire other parties to develop new products and adaptations specific to the company. These results show that production companies in Pasto's dairy chain do not carry out innovation or develop new products or processes, despite the latent need for change in order to reduce costs and deal with competition, decreased sales, more open markets, and free trade agreements.

The innovation applied by companies with national and international success has delivered excellent results, as is the case for Alpina (as cited in Londoño & López, 2007). This innovation is based on five areas: the quality of the product, the latest technology packaging, brand strengthening, new categories, and consumer knowledge. The companies studied in this research, however, are greatly constrained by the absence of a business culture that promotes the creation and updating of banks of innovation projects, an essential foundation for them to conduct their own research.

Figure 15.3 Reasons for innovation and development of new processes

Source: The authors.

The reasons given by participants in the dairy chain to justify innovation and the use of new technology include cost reduction, for 33% of those surveyed, followed by competition, in 25% of cases, while the others consider the reasons to be decreased sales and supplier suggestion. These results show that there is a lack of real awareness in the sector of the concept of innovation and the benefits offered by applying and developing it, both in processes and products; in other words, knowing how to introduce products, open new markets, and familiarize consumers with the company's innovation to achieve competitiveness.

In relation to the above, and given the state of the production chains, the dairy chain has requested various measures in the different sectoral boards that the government has installed in livestock farming and dairy regions. These include strengthening the industrial processing section of the production chain, promoting strategic projects with producers, implementing practices to improve the productivity of traditional products, and support for research, innovation, science, and technology to improve productivity and competitiveness and give rise to strategic and productive partnerships among production companies of dairy products in order to develop a portfolio of regional products.

Among the key factors that enable industries in Pasto's dairy sector to compete in the market, the most important is capital investment, at 67%. This indicates that one of the greatest restrictions for these industries are economic resources, not because they do not exist, but because of the industries' lack of confidence

in investing and taking risks. The second most important is the quality of human talent, at 33%; however, companies do not have training policies in line with the needs of the sector. Trading capacity and technology are considered significant, but are not priorities in the development and expansion of the company.

Although the heads of the industries in the dairy sector recognize the key factors of success for their companies, there is an invisible barrier that prevents them taking fundamental decisions to improve their internal operations with a view to achieving high levels of productivity based on innovation.

Discussion of results

It is important to compare the terms under consideration in this study, that is, competitiveness versus productivity and innovation. To do this, the concepts of expert visionaries were used, such as those of Luis Jorge Garay (1998), which despite the passing of time remain valid. For this author:

Competitiveness can be defined as the ability of countries to successfully incorporate themselves into the world economy. The competitiveness of a nation is the degree to which it can, under free market conditions, produce goods and services that satisfy international markets and, simultaneously, increase the real incomes of its citizens. Competitiveness at the national level is based on superior performance in productivity (p. 560).

In Pasto's dairy chain, productivity should be understood as the improvement of production capacity and the general environment in order to achieve efficiency and effectiveness. To improve the region's productivity and competitiveness, it is essential to think about scientific and technological innovation, to the extent that knowledge and its many applications are central elements in the economic and social development of modern societies. This is especially true if the goal is to improve the socioeconomic conditions of a region such as the municipality of Pasto, where there is a lack of awareness about the value added by formulating and implementing policies for innovation.

According to the Organization of Ibero-American States for Education, Science, and Culture (OEI) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) (1999):

The gap between the scientific and technological capacities of industrialized and developing countries is one of the contemporary manifestations of the persistence of underdevelopment—and also one of its main causes. Likewise, a country's human potential is fundamental in implementing these new influxes of technology, just

as the degree of foreign capital is important in propagating the technology (OEI & UNESCO, 1999).

The research also made it possible to identify the key factors of success according to the actors themselves—that is, the businesspeople in the processing section of the dairy chain—including the essential points that permit a company to compete in the market. The factor seen as the most important is capital investment, followed by the quality of human talent, trading capacity, and technology. Although the last of these is considered significant by those surveyed, it is not a priority for them in developing and expanding the company within the sector's industries.

Additionally, identifying these points makes it possible to recognize the elements needed to achieve the business and differentiating goals that will allow the company to position itself and provide agility, continuity, higher profits, and improved productivity. This shows that industries in the dairy sector consider capital, or the economic and financial aspect, the most important factor of success, while forgetting other elements that are also important for business progress. These include:

- Human talent, which should be thought of as the team that will put the company's plans and objectives into action
- Trading capacity, as a ruling standard for identifying and covering markets
- Technology and innovation, providing the ability to adapt to changes and new situations
- Information collection and logistics, having active mechanisms and tools that allow the company to adapt to new market expectations and demands and guarantee that costs are minimized while benefits are maximized with an increase in productivity

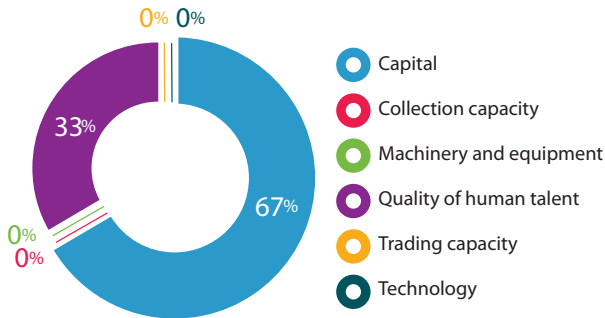
Theoretical work on the positive influence of research in science and technology reaffirms the importance of this factor. Additionally, it points to four types of innovation:

- a) *Product innovation*. Producers know the importance of introducing a technologically new dairy product onto the market with characteristics or expected uses that differ substantially from existing products at regional or even national levels, or whose performance has been perfected or improved. The dairy sector has a wide variety of products including ground cheeses, cottage cheese, mature cheeses, yogurt, butter, whey, condensed milk, powdered milk, and pasteurized and ultra-pasteurized milk; however, it

can be observed that the businesses have not developed major innovation processes to increase productivity.

- b) *Process innovation.* For processing businesses in the dairy chain, adopting new or improved production methods would enable them to make innovative dairy products that could not be produced using conventional methods, or increase production efficiency. As shown in Figure 15.4, innovation projects are implemented or would be implemented with the primary aim of reducing costs and increasing sales.

Figure 15.4 Key factors in competing successfully



Source: The authors.

- c) *Organizational innovation.* The best way for dairy processing companies to implement processes of innovation and productivity that will allow them to position themselves in the regional, national, and even international markets, is to introduce changes to organization and management, as well as changes in the organization and administration of the production process, incorporating improved organizational structures and establishing new or improved strategic policies. The majority of managers in Pasto's dairy companies are not formally trained, as the same person is the owner, manager, and head of purchasing, production, and sales, which does not allow them to exercise internal and external business management in line with market requirements. This is especially true in the innovation of products and processes, which therefore limits the possibility of increasing productivity. The industries in the cooperative sector are an exception to this.

d) *Trade innovation*. For the dairy sector, trade innovation consists of:

- Introducing methods for distributing and selling milk products
- Using new delivery methods
- Updating packaging design and materials in such a way that conserves the organoleptic characteristics of the dairy products, but also attracts consumers' attention

The changes listed are those most applied by Pasto's processing companies in relation to innovation in the trading of their products.

According to Mejia (2012):

In hindsight, it was found that the structure being used in the present with the aim of designing the future of the department of Nariño's dairy chain, has marked weaknesses in terms of technical ability, production capacity, and product-market lines that limit the prospects for agro-industrialization of the chain. (p. 40)

It should be noted that, given the lack of innovation, associativity, and other factors analyzed in this research, Nariño's dairy chain experiences difficulties with internal organization, qualification of human resources, and, therefore, the future of the company.

According to the Bogotá Chamber of Commerce (2009), in the competitiveness agreements,

[...] the dairy chain has made important progress in terms of its competitive position by developing new products with varied brands and forms of presentation in a predominantly national market. To do this it has invested in industrial infrastructure with a view to regional specialization around products and markets (p. 2).

Nevertheless, at the regional level, competitive advances and the development of new products are not widely seen due to the approach of our dairy industries still being that of cottage industries.

There is only one large company in the region that has invested resources into expanding and positioning its products, implementing a number of innovations in products such as yogurts and cheeses, among others. The traditional and small companies are improving their processes, conducting training, and upgrading their infrastructure as a means of facilitating innovation; this creates the need to access higher levels of training for heads of business and workers, as well as incorporating technology and innovation in processes and products. Likewise, public policy must

be defined in relation to financing, investment incentives, environmental sustainability, and strategies of international integration to contribute to the comprehensive and sustainable development of the chain.

Conclusions

- The research conducted made it possible to identify and measure the factors related to competitiveness and innovation in the processing section of the municipality of Pasto's dairy chain, showing a lack of technological and productive development projects in dairy zones. Accordingly, cooperation among participants in the dairy sector —both public and private—must be ensured.
- It is essential for companies in the dairy sector to promote research at the regional, national, and international levels that will enable them to determine technological complexity and degree of location in order to initiate sound processes of innovation and competitiveness.
- Given the lack of opportunities that Pasto's dairy chain has to integrate itself into domestic and world economies, the national government, regional organizations, the private and productive sector, political representatives, and civil society should join forces to establish agreements and arrange regional dialogues about strategic actions that the regions should take to improve their productivity and competitiveness in the short and medium term. The responsibility for this would be assumed by all of those involved in the process, and would lead to innovation in products and processes.
- To initiate a successful process of competitiveness and innovation, the municipality's dairy chain should design and implement strategies that allow it to: Share a database between suppliers, processors, and distributors using information and communications technology (ICT); provide information to the consumer on product packaging; implement tools for environmental management; take advantage of current technologies; request state support to increase exports to other countries; create business partnerships, mergers, and specializations of SMEs; and access credit by taking advantage of current economic policies.
- Promote processes of association, and good processing and trading practices to improve prices. This should also be considered a competitive point of reference in order to strengthen processes of research, competitiveness, and innovation, with the support of interinstitutionality (University-Company-State).

References

- Cámara de Comercio de Bogotá. (2009). *Plan económico para la competitividad*. Bogotá: Cámara de Comercio.
- Cámara de Comercio de Pasto. (2006). *Análisis de las cadenas productivas de los municipios de Pasto, Túquerres, La Unión*. Pasto: Cámara de Comercio.
- Cámara de Comercio de Pasto. (2009). *Base de datos registro mercantil*. Pasto: Cámara de Comercio.
- Garay L. (1998). *La industria de América Latina ante la globalización económica*. Bogotá: DNP. Tomo I. Retrieved from http://books.google.com.co/books/about/Colombia_estructura_industrial_e_interna.html?id=evoyaaaiaaj&redir_esc=y.
- Londoño, B. & López, E. (2007). *La capacidad de innovación en Alpina*. Medellín: Universidad de Antioquia. Retrieved from <http://www.guerrasynavas.com/pdf/AL-07.01-CO%20ALPINA.pdf>
- Mejía, F. (2012). Prospectiva de la cadena láctea del departamento de Nariño al horizonte del año 2020. *Revista Tendencias*, 13(1), 40.
- Organización de Estados Iberoamericanos para la Educación, la Ciencia y la Cultura (OEI) y Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (Unesco). (1999, June). *La ciencia para el siglo xxi: una nueva visión y un marco para la acción. Conferencia Mundial sobre la Ciencia*. Budapest.
- Serrano, G. (2006, March). *El aseguramiento de la calidad como requisito para acceder a nuevos mercados*. Retrieved from http://www.agrocadenas.gov.co/eventos/ponencias/Presentacion_cnl.pps