



PERSPECTIVES OF RURAL EXTENSION FOR DAIRY CATTLE IN THE COLOMBIAN HIGH TROPICS

PERSPECTIVAS DE EXTENSION RURAL PARA GANADERÍA DE LECHE EL TROPICO ALTO COLOMBIANO

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RESUMEN

En Colombia, diagnosticar la situación actual del sistema lechero exige un análisis complejo relacionado con la comprensión de los desafíos que debe enfrentar el sector. Así como identificar estrategias de cómo la finca podría ser un sistema que permitiese a ganaderos, investigadores, agentes comerciales y extensionistas integrar una cadena de valor bajo un mismo objetivo: competitividad y ventajas comparativas. Este artículo relaciona generar una reflexión analítica, crítica y propositiva que contribuya a enfocarse en la competitividad y sustentabilidad de los sistemas lácteos con énfasis en el desarrollo territorial. Algunas experiencias en los departamentos de Boyacá, Cundinamarca y Nariño tuvieron como objetivo realizar la planificación integral de la finca para mejorar la calidad de vida de los agricultores, a través del empoderamiento y la adecuada toma de decisiones. En conclusión, aprender haciendo en equipo, con un alto grado de compromiso, enfocados en un mismo objetivo, contribuye a generar beneficios para los actores de la cadena de valor láctea y podría ser un ejemplo para aplicar en otras cadenas productivas.

Palabras clave: competitividad, planeación en finca, sistema de producción lechero, sostenibilidad, tomador de decisiones.

ABSTRACT

In Colombia, recognize the current situation of the dairy farming system requires a complex analysis related to understanding the challenges that the sector must face. In the same way, identify how the farm could be a system that let farmers, researchers, commercial agents, and extension agents integrate a value chain with the same objective: competitiveness and comparative advantages. This article is related to generate an analytical, critical, and propositional reflection that contributes to focus on the

competitiveness and sustainability of dairy systems with an emphasis on territorial development. Some experiences in Boyacá, Cundinamarca and Nariño departments implemented the whole farm planning. The objective was to improve the quality of life of farmers, through empowerment and adequate decision-making. In conclusion, learning by doing as a team, with a high degree of commitment, focused on the same objective generates benefits for the actors in the dairy value chain and could be an example to apply in other production chains.

Keywords: competitiveness, dairy system, decision-making, farm planning, sustainability.

INTRODUCTION

The dairy system to Colombian agriculture and rural development is an important sector. Dairy farming represents 2.3% of the national gross domestic product (GDP), 10.2% of agricultural GDP and 24.3% of livestock GDP ^[1]. It is also considered a sector of promotion, innovation, and territorial development. Besides, milk production is present in 400,000 farms, distributed in 22 departments of the country. In Colombia, the market demands to improve the quality and safety of milk. Thus, political guidelines territorial, national and gremial have been implementing; through technical and operational strategies in the production and transformation of milk, with quality and safety.

However, productivity and competitiveness have limitations such as climate variability phenomena, inefficient use of local resources, informality in milk collection, lack of machinery, transformation, and marketing. Also, limited technical assistance services, extension, and knowledge transfer from research to the dairy sector. A solution to the above and to achieve innovation processes in the dairy value chain is to motivate and promote alliances that integrate actors in the

value chain, researchers, academia, and government entities. Also, working together, identifies and solves the main problems present in the value chain. However, it is a great challenge due to the high degree of collaboration required from the parties involved.

Colombia created the agricultural innovation system -SNIA- in 2017. System orients concepts and methodologies to develop public policies related to the effectiveness of improvement strategies for the milk value chain. Which, as an experience, in three departments of Colombian high tropics (Boyacá, Cundinamarca, and Nariño), New Zealand technologies were validated for milk production systems. This experience developed the dairy sector, and the strategy was the integration of several actors who participated in the project (i.e., farmers, associations, research, academia, extension agents, etc.). The main topics discussed according to the needs of each region were: i) farm plans, ii) soil management, iii) establishment of pastures, iv) grazing management, and v) decision-making.

LEGISLATIVE CONTEXT

Dairy chain competitiveness Agreement ^[2] developed actions of the dairy sector to face commercial challenges related to free trade agreements. This scenario allowed the construction of policy instruments to improve the competitiveness in this system. Likewise, the National Council for Economic and Social

Policy ^[3] integrates guidelines to improve competitiveness. Through the development of strategies and instruments that reduce production costs and increase productivity, focused on farmers, guaranteeing economic income, through formalization processes, training and improvement of competitive

conditions, and the consolidation of the health and safety policy of the dairy and meat chains. Also, there are decrees, laws, and regulations for the control of the milk value chain.

Decree 616 of 2006 ^[4] presents technical regulation indicating the requirements of cow's milk for human consumption, from production to distribution at national and international levels. However, some regions of Colombia had difficult situations to commercialize and collect milk, and which was necessary to regulate commercialization, through the decrees 2838 of 2006 ^[5], 2964 ^[6] and 3411 of 2008 ^[7], modifying the decree 616. Likewise, decree 1880 of 2011 ^[8] corrects the requirements to commercialize raw milk for human consumption in Colombia. Although there is no exact data, currently, there are farms, especially non-associated smallholders,

that are unaware of these decrees, failing to comply with the requirements for obtaining, distribution and safety of milk for human consumption.

Likewise, resolutions 017 of 2012 ^[9], 468 of 2015 ^[10], and 077 ^[11], established the payment system for raw milk to the supplier; through the evaluation of hygienic-sanitary and compositional quality. Also, evaluate the safety of milk in accredited laboratories. These resolutions intend to create a price regulation system that contributes to implementing the dairy sector policy competitively and articulated with the different participants. However, as in the collection and marketing of milk, smallholders and collectors generally do not comply with the requirements. Delivering products without safety and guarantee to the final consumer.

INSTITUTIONAL BACKGROUND

The Agriculture and Rural Development Ministry in Colombia – MADR – is the most important public actor associated with agriculture growth and progress through formulation, coordination, and evaluation of public policies. To the livestock sector, MADR has defined several programs and projects; to integrating the value chain stakeholders and institutions and contribute to the improvement of competitiveness.

Colombian Federation of Livestock Farmers – FEDEGAN - is one organization promotes the unionization, sectoral analysis, political and livestock information. Also, collect and manage the parafiscal funds of the livestock sector. Finally, it provides technical assistance services to the farmers.

The National Association of dairy producers -ANALAC- is a private organization, not governmental that, contributes to the interests of milk producers and their relationship with other actors associated with the value chain.

The National Dairy Council -CNL- is a space for permanent dialogue between dairy chain links and the government. CNL, advise and guide the government to design sector policy. Also, identify and agree on appropriate solutions to the various problems that affect the dairy chain. Besides, to coordinate at the national level activities that promote integral and equitable development.

The Colombian Agricultural Institute -ICA- is a public organization that promotes, monitors, and controls the compliance with the regulation related to the sanitary control of the sector, supported by the National veterinary diagnostic laboratory service. Likewise, it carries out preventive actions in conjunction with livestock farmers to protect milk production and quality.

Finally, Agrosavia is the Colombian Corporation for agricultural research, oriented to improve the agricultural sector through research and technology transfer. The livestock network in Agrosavia involves different

process-oriented to attend the main national economic, social, and environmental demands to the productive sector.

All previously organizations demonstrate the dairy sector capacity to understand market diversification and trend from production to

commercialization. Also, integrate the different institutions with innovative objectives. The experience derived from Colombia - New Zealand value chain project showed that, for each region, working with the institutions focused on clear targets, promotes the development of dairy basins.

ECONOMIC AND SOCIAL BACKGROUND

The Colombian milk sector has 395.000 farmers, approximately (24,3% of the GDP of livestock). 45% of them has dairy production (15 lt per day/animal), and 55% has dual-purpose production (milk and meat with around 4 L per day/animal) ^[12].

In 2016, smallholders represented around 81% of the livestock farmers are with an animal inventory per hectare between 1 and 50. Milk production most representative is in Colombian high tropic, especially in the departments of Antioquia (20,56%), Boyacá (9,93%) and Cundinamarca (16,27%) ^[13]. Although climatic variability (El niño and la niña phenomenons) has impacted the milk production of tropical countries like Colombia, this production and the formal milk collection has grown in the last years around 7% and 19%, respectively. Likewise, milk production

has generated about 618,000 jobs in Colombia. 84% correspond to dual-purpose systems and 16% to dairy systems.

The departments mentioned above have around 2,500,000 animals for milk production. Therefore, the dairy chain and stakeholders must guide the development and execution of processes focused on strengthening. Besides, to form dairy clusters that integrate from the producer to the consumer to guarantee economic, social, and environmental well-being at the territorial level. However, this process requires the empowerment and leadership of the different stakeholders. Also, consider the capabilities to taking decisions and systemic strategies that guarantee the well-being and local development under specific extension techniques.

TOWARDS A SYSTEMIC APPROACH WITH A TERRITORIAL FOCUS TO MILK PRODUCTION

In Colombia, the agricultural sector has the potential for economic development, associated with the availability of resources to production. Which, the national government and New Zealand government implemented strategies to promote the competitiveness of the agricultural dairy sector with a systematic and territorial approach. However, articulating the different links of the value chains such as legislation, institutions, academic and research with comprehensive objectives according to social conditions was necessary. Also, the project integrated a systemic approach territorial in three departments of Colombian

high tropic (Cundinamarca, Boyacá, and Nariño). Through the validation of a production model with the knowledge of the New Zealand dairy industry and the adaptation of New Zealand and Colombia technologies, **through “learning by doing”**. Finally, according to the necessity, the project linked different actors of the dairy value chain.

Through a proposal for rural extensions, farmers and associations strengthened their technical and administrative capacities to improve milk production and quality, considering the farm as a business. The four associations, two located in the department of

Nariño (Las Playas and Proleñ), one in the department of Boyacá (Asproleche) and one in the department of Cundinamarca (Asohatorhur), belong to small and medium milk farmers.

The farm development plan was a tool that organized and optimized the planning processes, focused on the life project of the farmers in each association. This plan considered the management of finances, pastures, animal health, feed Budget, environmental aspects, and the personal development of the farmers. The associations that best adopted this technology were the farmers of the associations of Las Playas (Nariño) and Boyacá, showing an increase in

the production and quality of milk, reflected in the economic income per farmer and association ^[14].

Besides, characterizing the main challenges by region was key to decision-making. Evidenced in improving the economic income of farmers and associations. The main common problem in the four associations was soil and grassland management. Therefore, the Agrosavia research system, in company with New Zealand researchers, defined and published good livestock practices ^[15]. Likewise, animal management, the food budget were key tools to feed the farm plan. However, the adoption of this technology was a challenge for the extension agent ^[16].

PLAN, EXECUTE AND PROVIDE FEEDBACK

The Colombian dairy system faces problems such as the low level of technology adoption due to the lack of facilitators or extension agents at the territory or region. Countries like New Zealand have extension agents ready to provide dairy sector innovations to farmers. However, this process of transmitting new technologies takes time, and extension agents must identify the needs of the region and the farmers through an accompaniment, focused on a holistic and systemic vision.

Likewise, visualizing the farm, favoring decision-making, strengthening social skills, knowledge of the human, physical and economic environment in which it interacts are basic capacities to plan and develop a good job. An example was the limited forage production, and inadequate forage management reflected the low milk productions and reproductive problems in the three departments mentioned.

The extension agents and actors from the dairy value chain identified these common territorial problems. According to that situation, it was necessary to define an interaction strategy and participatory action

research with the local farmers associated with the value chain. This interaction identified other problems with the process of milking, involving more actors.

The above evidence that the strategies extension and the actors involved (i.e. farmers, collectors, the market, consumers, etc.) execute a role will depend on the problem identified. Also, considering the combination of technologies, practices, policies, and changes in the market. Likewise, defining planning strategies with the actors that intervene is decisive for its effectiveness. Besides, the actors involved must be clear that farmers initiate the value chain. The farmers and extension agents define which actors intervene according to need or problem.

In the departments mentioned (Boyacá, Cundinamarca, and Nariño), the extension agent with farmers and the actors involved (i.e., research, academia, dairy association, etc.) from the region planned, interacted, and executed actions to face the problems identified. The extension agent linked and led the construction of knowledge and the exchange of knowledge. Also, the extension

agent with each actor involved had feedback to detect failures or errors in the actions. Feedback with farmers evidenced the

development of capacities, promoting performance in the value chain, transforming milk production systems in the regions.

FARMERS PARTNERSHIPS

This figure is a collaborative process for improving the institutional representation of the value chain and its consequent impact for taking decisions according to the local development. In Colombia, there are different institutional strategies to promote the partnerships between farmers due to the technical change requires the empowerment of the associative schemes and the development of capabilities to improve the value chain. The associativity level should be a fundamental element in the framework of a business model, but not for attracting public and private resources.

According to the experiences with the project mentioned previously, the extension agents have an important role, because must promote associativity, and empower farmers with a territorial approach. This process was oriented since the beginning of the project and

the agent extensionist generated trust and motivated different kinds of meetings with a previous recognition of all possible relationships between different actors that influence the dairy sector.

Finally, the methodology for planning and executing these meetings depends on the characteristics of the people who participate. The communication is different to farmers in comparison with the technical assistants. Likewise, working with territories is different (i.e., Cundinamarca farmers is different from Nariño farmers). Besides, the extension process requires practical knowledge how development skills to make transference (i. e., working discussion groups). Also, logistics aspects are key (i.e. define the number of participants, duration time, the place, the topics, and the mood of the public).

CONCLUSIONS

The milk production in Colombia expresses one of the most representative sectors for the economic rural development, these situation means that the dairy value chain is an important process that must be attended for different actors associated.

The agricultural innovation system in Colombia (SNIA) has promoted the management of the knowledge for the dairy value chain since different strategies, one of them is expressed in the roll that extensionist has, and the methodologies they must use for guaranteeing the capabilities development. The experience, in three departments of Colombian high tropic (Boyacá, Cundinamarca, and Nariño), contributed to validate this process.

Integrate the different factors of production in the farm development plan, improve the efficiency of the farm and the territory. Also, improve economic income and the quality of life of farmers. Likewise, linking actors in the value chain helps in decision-making.

The promotion of rural extension for dairy cattle in Colombia must have different strategies of implementation according to the specific conditions of the territory attended.

It is important to carry out a systemic analysis that contributes to generating spaces for discussion for making the right decisions and improving the capacity of research, extension, and training in the dairy sector of a specific territory. It is necessary a permanent

interaction with all actors of the value chain and how each one of them contribute to solution for specific problems.

Discussion groups is a special strategy for the producers of the territory to adopt and validate technologies that contribute to addressing the main problems of the territory and reflect competitiveness for the dairy sector.

Learning by doing between the extension agent, farmers and actors of the dairy value chain is an important experience to provide feedback, reflect, and make decisions. Likewise, for the development of the territory and of the productive systems, it is recommended to document and write more about projects or similar experiences.

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