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Farmers' perceptions of learning through dairy producer organizations in Colombia

Percepções de aprendizagem dos agricultores através de visitas guiadas a associações de produtores de leite na Colômbia

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RESUMO

O setor lácteo colombiano é muito relevante para a economia rural deste país, que enfrenta grandes desafios com sua dinâmica no comércio internacional. Diversos programas de extensão rural surgiram para fortalecer o elo produtivo da cadeia responsável pelos resultados. No entanto, ainda permanece sem solução o estabelecimento de formas mais efetivas de promoção de conhecimento aos produtores de leite do país empregando técnicas de aprendizagem social. Neste estudo questionamos se interações diretas envolvendo duas organizações de produtores de laticínios exerceriam influência positiva em seus membros. Desta forma, ele tem como objetivo avaliar qualitativamente as percepções de aprendizagem de produtores de leite do Departamento de Caldas, na Colômbia, durante visitas territoriais guiadas com o fim de promover a interação entre os membros de suas organizações setoriais. Neste sentido, 10 organizações de produtores de leite que estavam em busca de melhorias foram acompanhadas em visitas guiadas a outros territórios rurais em companhia de cinco organizações de produtores de destaque, reconhecidas por suas capacidades e inovações. Após as visitas, 81 entrevistas foram conduzidas com produtores voluntários de todas as associações visitantes. A avaliação constatou percepções de aprendizagem positivas nos produtores que realizaram as visitas guiadas com associações reconhecidas a outros territórios. Os temas de maior interesse constatados no processo de aprendizagem foram (nesta ordem): as questões associativas e organizacionais das referências visitadas, os recursos tecnológicos utilizados no nível da exploração leiteira e o papel da família no contexto produtivo. Por outro lado, questões relacionadas à coleta, à transformação e à comercialização (*marketing*) foram os temas de menor interesse entre os produtores visitantes.

PALAVRAS-CHAVE: produção de leite; associações e cooperativas; aprendizagem.

ABSTRACT

The dairy sector is of great relevance for the rural economy in countries like Colombia, but at the same time it faces great challenges related to international trade dynamics. To seek to strengthen the production link in the chain, various rural extension programs have emerged for this purpose. However, within the framework of dairy farmer social learning, challenges still remain related to the best ways to promote learning. Therefore, in this study we asked ourselves if interactions directly between two dairy producer organizations could have positive influences on people. Therefore, this study aims to carry out a qualitative evaluation of learning perceptions among milk producers in the Department of Caldas, based on territorial guided tours with a focus on interaction between producer organizations in the sector. In this sense, 10 dairy producer organizations were taken who were in search of strengthening, and guided tours were carried out to other rural territories with five outstanding dairy organizations recognized for their capabilities and innovations. After that, 81 interviews were carried out with volunteer producers from all the visiting associations. The evaluation of learning perceptions after the guided tours with associations that are recognized in other territories had a positive influence on the producers. The greatest thematic learning interest focused on the associative and organizational issues of the visited reference, followed by technological aspects used at the level of the milk producing farm, and finally the role of the family in the context of production. Furthermore, the issues related to collection, transformation and marketing were the least relevant.

KEYWORDS: milk production; associations and cooperatives; learning.

INTRODUCTION

Specialized dairy cattle production in Colombia primarily occurs in high-altitude tropical regions, at elevations exceeding 2,000 meters above sea level. The dairy industry plays a significant role in the Colombian economy, contributing 36.7% of the national livestock sector's Gross Domestic Product (GDP) (MOLANO-BERNAL et al. 2021). Furthermore, it is a significant product in household food consumption, contributing to the creation of approximately 735,000 direct jobs (SIOC 2020). Nevertheless, this productive sector's value chain still faces significant challenges related to competition from lower-priced imported products in the Colombian market. This necessitates enhancing the competitiveness of domestic products, primarily through improved production cost efficiency, milk quality (hygienic, sanitary, and compositional), sanitary conditions of collection facilities (admissibility), production volumes, and environmental factors (such as infrastructure, regulations, and others) (CARULLA & ORTEGA 2016).

In this context, the coexistence of diverse dairy production systems in Colombia, characterized by varying levels of labor, techniques, and technologies—including some rudimentary practices—has led to increasing disparities among current production methods. (BARRIOS et al. 2019). The adoption and intensity of technology use in the sector vary due to territorial and institutional factors, as well as those related to farm size, land tenure, and access to technical training and assistance. The combined effect of these factors diminishes producers' ability to make informed decisions on their farms (RODRÍGUEZ et al. 2016).

From this perspective, Colombia, like many other regions worldwide, has been implementing rural extension program strategies to enhance producers' capabilities and learning, enabling them to address the challenges of the commercial environment. The systemic approach to rural extension has become an impactful tool in the country, enabling diverse local stakeholders' participation, fostering relationships and exchanges that contribute to information network formation, enhancing knowledge flows and elevating producers' capacities (RAMIREZ-GÓMEZ et al. 2023). From this perspective, rural properties have been conceptualized as learning environments, where agricultural plans are formulated and producer associations play a coordinating role in these processes (TIBADUIZA-CASTAÑEDA et al. 2021), organizing visits and promoting producer-to-producer learning (TIBADUIZA-CASTAÑEDA 2021).

Furthermore, various dairy industry organizations implement multiple agricultural extension approaches to foster learning and capacity building. This applies to small producer excellence circles, the Asistegan program (Municipal Extension and Improvement Centers for Small Livestock Farmers), Farmer Field Schools (FFS), associative and cooperative practices, the Farmer Training Program (FOCA), among others (HURTADO et al. 2020).

It is evident that each of these approaches, aimed at producer learning, is grounded in empirical evidence regarding potential impacts across various scales. However, it is widely recognized that farmers can achieve social learning through mediated connections with other producers (OCHIENG et al. 2022), and the effects of membership of a producer organization on learning and the implementation of social policies for technical change are well known (WOSSEN et al. 2017), there is still not enough evidence on the influence of interaction between producer organizations on the learning of the farmers involved. This study aims to qualitatively assess learning perceptions among dairy farmers in the Caldas Department through guided territorial visits designed to foster interaction between producer organizations in the sector.

MATERIAL AND METHODS

Context of the study

The Department of Caldas, situated in the central-western Andean region of Colombia, has an estimated population of 993,866 inhabitants (Figure 1), accounting for 2% of the country's total population. In addition, 48.9% of the population of Caldas is made up of men and 72.4% of the population lives in the regional capital, which represents a large gap of inhabitants in the urban-rural spectrum (CERQUERA-LOSADA et al. 2020). This region has a long-standing tradition in coffee production. However, following the crises of the 1980s and 1990s, strategies emerged to develop and leverage the skills of the rural population in other productive activities, such as promoting rural dairy agribusiness (MONTOYA & GIRALDO 2021).

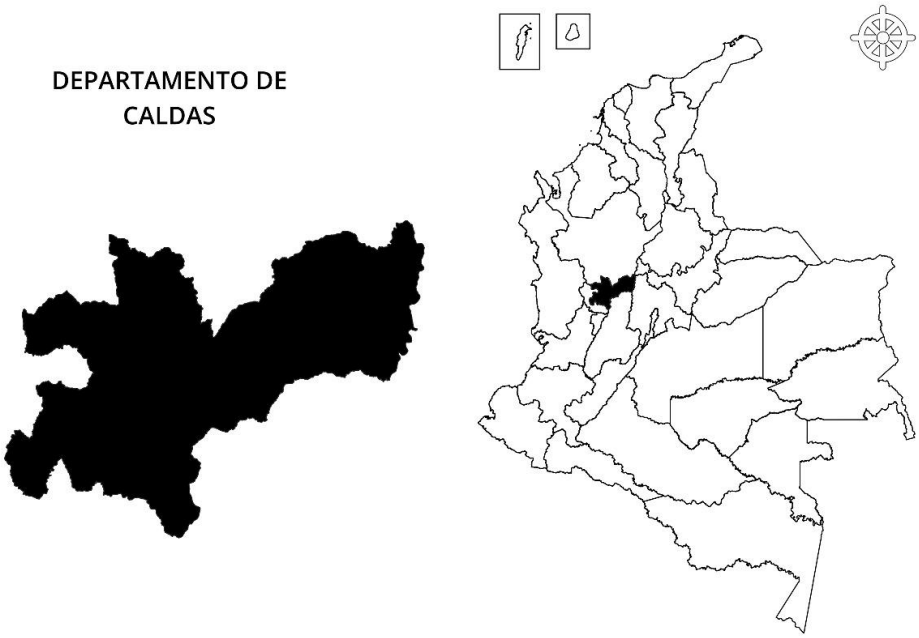

Figure 1. Administrative map of the Department of Caldas (Colombia).

It should also be noted that livestock farming in the Department of Caldas has been gaining importance in its economy, having reached an inventory of 444,875 animals by 2021 (GOBERNACIÓN DE CALDAS 2021). In Brazil, 67% of dairy farms are smaller than 25 hectares, and 56% of milk production is sold through informal channels, highlighting issues with productivity, quality, and product safety (VARGAS 2019). Within this context, data were collected from the "Technical Assistance for the Dairy Chain in Caldas Department" project, which involved 10 guided visits with producer associations, all of which were duly planned and executed (Table 1).

Thus, guided tours comprised excursions to other rural regions to disseminate innovative experiences implemented by various dairy producers' associations, each showcasing representative strengths in their operational activities, including production, collection, processing, and marketing of milk within their respective territories. These leading associations (see Table 1) were selected not only for their prominence in various processes but also for becoming benchmarks in specific departmental regions of Colombia.

Data collection and analysis

This research employed a multiple case study approach, a method designed to enhance understanding of contemporary individual, organizational, or social phenomena where the boundaries between the phenomenon and its context are not clearly defined (YIN 2009). This approach is typically employed when a statistically representative sample is not required; rather, a theoretical sample is used, from which it is possible to generalize the social phenomenon under investigation (YIN 2009).

Considering that 153 small and medium-scale dairy farmers (Table 2) participated in guided tours during the analyzed period, we conducted a random and voluntary process to identify producers who agreed to undergo a brief learning assessment following each targeted field visit. Thus, the study involved the direct participation of 81 producers in total.

Table 1. Groups of participants in guided tours.

Groups	Municipality of origin (Caldas Department)		Municipality of Destination/Experiences	
Group 1	Samaná	Agasad: San Diego Cattle Raisers Association	La Unión-Antioquia	Lácteos Buena Vista Unilac: Cooperative of Milk Producers of the Antioquia Union
Group 2	Riosucio	La Fynca: Riosucio Milk Producers Association	La Unión-Antioquia	Lácteos Buena Vista Asproler: Agricultural Association of Milk Producers of Oriente Antioqueño
Group 3	Salamina Marulanda	Coopronori Cooperative of Agricultural Producers of the Northeast of Caldas	La Unión-Antioquia	Lácteos Buena Vista Unilac Asproler
Group 4	Viterbo	Asolvir: Dairy Association of Viterbo and Region	Riosucio Caldas	La Fynca: Riosucio Milk Producers Association
Group 5	Aranzazu	Aranzazu Cattle Breeders' Committee		
Group 6	Neira	Neira Cattle Breeders' Committee		
Group 7	Philadelphia	Philadelphia Cattle Breeders Committee		
Group 8	Pácora	Norte Lácteos: Pacora and Aguadas Milk Producers Association		
Group 9	Aguadas	Proagroa: Aguadas Agricultural Producers Association		
Group 10	Norcasia	Norcasia Cattle Breeders' Association	Cajamarca Tolima	Apacra: Association of Agroecological Producers of the Anaime River Basin

Table 2. Producers participating in the learning assessment.

Groups and guided tours	Reviews	% Evaluations
Group 1 (n=20)	n=8	40
Group 2 (n=8)	n=5	63
Group 3 (n=20)	n=13	65
Group 4 (n=15)	n=5	33
Group 5 (n=15)	n=6	40
Group 6 (n=20)	n=7	35
Group 7 (n=12)	n=7	58
Group 8 (n=12)	n=9	75
Group 9 (n=15)	n=5	33
Group 10 (n=16)	n=16	100
Total: 153	81	53%

Following producer consent, semi-structured interviews with open-ended questions were conducted to explore their perceptions of learning through interactions with other successful and recognized producer organizations and process managers. The interviews were recorded and later transcribed for analysis, and their interpretation was based on thematic categories of learning that emerged during the guided tours (McLELLAN et al. 2003). Following the identification of producer learning themes, comparative analyses were conducted across the 10 participating producer groups using a qualitative methodological approach.

RESULTS AND DISCUSSION

Six key learning themes emerged from the analysis of evaluation interviews: technical issues related to rural properties, family aspects of milk production, associative themes, and factors related to milk collection, processing, and marketing. The findings were corroborated by the fact that the emerging themes, accessed through guided visits to organizations recognized for their success, coincided with those assumed in learning itineraries involving supplier organizations, which highlighted: the associativity of the producers involved, technology adoption, good dairy production practices, commercialization, and market access (ERAZO 2008). The results indicated that in 74% of learning perception assessments, respondents identified only one of the six emergent themes post-experience. Conversely, 26% of perception evaluations revealed at least two themes recognized as sources of knowledge acquisition, with some cases highlighting multiple themes (see Table 3).

Among the approaches that yielded unique themes, those relating to associative aspects were most frequently mentioned by producers, followed by those referencing technical factors of rural properties. The visiting organizations' learning interests primarily focused on organizational experiences and collaborative work practices. As stated by RAMIREZ-GÓMEZ et al. (2023a) Producers affiliated with organizations and interested in collaborative experiences typically exhibit higher rates of productive technology adoption, as they maintain more practical learning habits, favoring methods such as guided visits.

Table 3. Thematic areas of producer learning.

Groups	Unique themes						Multiple themes
	(1)	(2)	(3)	(4)	(5)	(6)	
Group 1	1	0	4	0	0	0	3
Group 2	1	2	1	1	0	0	0
Group 3	0	0	9	0	0	0	4
Group 4	2	1	1	0	0	0	1
Group 5	2	1	3	0	0	0	0
Group 6	1	0	2	0	0	0	4
Group 7	4	0	3	0	0	0	0
Group 8	1	3	3	0	1	0	1
Group 9	0	0	3	0	0	0	2
Group 10	4	0	5	1	0	0	6
Total (81)	16	7	34	2	1	0	21
100 %	74%						26%

Topics: (1) Local Technical Factors, (2) Family, (3) Associative, (4) Storage, (5) Transformation, (6) Marketing.

Based on producers' heightened interest in associative aspects of other organizations, specific factors contributing to enhanced learning perception were identified through interviews. These included: characteristics ensuring organizational success, member participation dynamics, methods for sustaining motivation, commitment and sense of belonging, collaborative action plan structuring, network and resource management, and capacity building. As subsequent findings indicate, certain producers noted that:

Engaging with an established association offers invaluable insights for our fledgling organization. Their journey through challenges mirrors our own, inspiring us to overcome obstacles and excel through individual commitment and collective action. What happens is that we are very individualistic, we only think about individual benefit" (Producer, Viterbo Group).

"This guided tour taught us the importance of unity and organization in achieving our goals." (Producer, Group) Philadelphia).

I observe that the success of this association stems from effective regulation and a strong sense of organizational belonging among producers. "We have an association in name only, as each individual acts independently" (Producer, Pacora Group).

Furthermore, our findings emphasized the significance of producers' learning perceptions regarding technical issues at the farm level. In line with these findings, interviews revealed learning interests in topics such as soil management, pasture cultivation, electric fence usage, and milking management. Thus, it was also demonstrated that the use of reference organizations as intermediary sources of knowledge and information, duly supported by their legitimacy, served as a stimulus for the adoption of technologies and practices in agricultural production systems (GROOT-KORMELINCK et al. 2022, IYABANO et al. 2022). In line

with these arguments, one producer mentioned that:

"We gained valuable insights from the experience, learning how to enhance crucial aspects of our farm operations, including the significance of proper milking techniques, cattle nutrition, and maintaining optimal conditions across the board" (Producer, Samaná Group).

One of the most recurrent themes in producer interviews regarding farm-level learning pertains to the potential implementation of silvopastoral practices. However, the widespread perception that implementing silvopastoral practices on rural properties is highly complex continues to make this approach one of the least adopted by producers, who remain skeptical about its cost-effectiveness and other aspects. It was observed, both in this specific instance and elsewhere, that farmers who facilitate learning during guided tours may have been previously influenced by members of other cooperatives or organizations, whose impacts and perspectives could be evident (FREY et al. 2012). Regarding this matter, one of the producers stated:

"What I saw on one of the farms visited by someone from the association is very good. I'm going to start applying silvo-grazing little by little. You can do many things working like them. They have the conviction that they're going to do things well and that they're not going to stop despite the obstacles." (Producer, Norcasia Group).

Furthermore, family dynamics emerged as a key learning area for dairy farmers. Although this topic was mentioned less frequently by a limited number of producers, it represents a crucial aspect of our study, given that small and medium-scale dairy production typically relies on family finances. In addition, several studies report that stable families composed of one or more children tend to predominate in this type of production. It is noteworthy that in these cases, while the entire family typically contributes labor to productive activities, external workforce is often hired to supplement their efforts (RESTREPO et al.). 2023).

According to interviews, some producers acknowledge the family's crucial role in milk production processes, whether through relatives' participation in fieldwork or young members' involvement in generational succession. In this vein, arguments from certain producers also highlight family involvement in relevant associations as a motivating factor for technological or productive transformations in agriculture. These perceptions coincide with the approaches of FRANCO-CRESPO et al. (2019), who suggest that family involvement contributes to increased income, as youth participation is typically associated with technological modernization processes, leading to improved productivity.

In this regard, guided tours of major dairy organizations were also valued for the involvement of producers' families in productive operations. Reinforcing this argument, one of the interviewed producers stated:

“The region's demographic advantage lies in its youthful population, including children, who contribute to the local agricultural labor force. We must cultivate in children a love for rural life and agriculture, as this forms the foundation for our future. By sending our children away to study for a better future, we parents are inadvertently driving the youth from rural areas." (Producer, Viterbo Group)

This perspective on the family's role thus emerges as a key theme in understanding learning processes during guided tours of high-performing dairy operations. For these reasons, this topic should be incorporated into rural extension processes and programs. As RAMOS (2021) asserts, family plays a crucial role in dairy production, influencing both task allocation and productive operations. This highlights the significance of family economic organization in decision-making and implementation within the sector. Finally, producers showed less interest in topics related to storage, marketing, and processing. About the guided tour, a producer said in the interview:

“Quality is paramount for competitive pricing and securing strategic business partnerships. It requires a collective commitment from all stakeholders. The guided tour was crucial, highlighting three interconnected elements: the farmers' rural properties, the association, and the milk storage facility—all essential for our growth.” (Producer, Aguadas Group).

Finally, our analysis of the data presented in Table 3 reveals that 26% of the surveyed dairy farmers reported learning about various topics during the referenced experience. While numerous outcomes hinge on both individual producer interests and collective concerns (e.g., systemic, institutional), it is crucial to recognize that process improvements aimed at enhancing competitiveness in the dairy supply chain are subject to territorial specificities and contextual dynamics, which serve as contingent factors in capacity development (GOMEZ & PELEGRINA 2023).

The narratives of interviewed producers revealed that guided visits to high-performing organizations enhanced their learning perceptions. While this experience does not necessarily lead to immediate adoption

of new practices or technological and social changes, it initiates an important persuasion process for these less developed dairy farmers. This perceptual learning process during guided visits is crucial in rural extension plans and programs, as it facilitates a reflective learning structure where producers observe, become motivated, and internalize knowledge (PARRA et al. 2022).

CONCLUSION

Guided tours are recognized as a crucial rural extension method employed globally, given that numerous studies demonstrate the significant impact of social learning on agricultural producers. Interaction as a learning mechanism has been recognized in these studies, encompassing family producer involvement, local producer relationships, peer-to-peer knowledge exchange, and internal dynamics within associative and cooperative organizations.

However, there is still insufficient accumulated knowledge regarding the effects that stimulated interactions between producer organizations may have on the learning processes of these dairy farmers. This study's primary contribution lies herein. The guided tours, incorporating recognized associations with other regions, positively influenced producers' perceptions of learning. The primary learning focus centered on associative and organizational aspects of the visited reference, followed by technological elements employed in dairy farming, and lastly, the family's role in the production context. Furthermore, topics concerning storage, processing, and marketing were deemed least significant.

This suggests that producers acknowledge that achieving enhanced competitiveness may hinge on agricultural practices, family involvement in production, and producer associations—areas that can be further developed through rural extension projects, programs, and other capacity-building initiatives. Producers acknowledged the significance of exchange and integration experiences among organizations, emphasizing their contribution to strengthening relationships and fostering learning. In turn, the main limitation of this study lies in the inability to measure the producer's perception of learning within the context of verifying socio-technical changes.

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