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Composition, operation, and challenges of the value chain of cow's milk in Gonzanma, southern Ecuador

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ARTICLE SECTION

Composition, operation, and challenges of the value chain of cow's milk in Gonzanma, southern Ecuador

Abstract: The high dependence of rural inhabitants on income from the sale of agricultural products, the heterogeneity of production processes, and the permanent allocation of public and private resources to the primary sector have strengthened value chains. In this context, the article's main objective is to identify the composition, functioning, and challenges of economic agents in the production process that generates value for cow's milk in Gonzanamá canton. For that, information from 101 milk producers and two micro-entrepreneurs was applied and processed, supplemented with secondary information derived from government institutions and NGOs. We obtained a cow's milk value chain with six productive chains with their segmentation, features, and challenges. We concluded that Gonzanama's rural and local agri-food chain characterize by small farmers with traditional and temporary production systems, informality in the collection of raw materials, and transformed products. Micro-enterprises with scarce human talent, raw materials, infrastructure, and little differentiated products for the consumer market. Indirect agents only regulate agricultural activity and its value generation processes.

Key words: Agri-food chain, Milk, Cattle, Dairy products.

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IDEAS CLAVE / HIGHLIGHTS / IDEES CLAU

1. Analizamos la composición, operación y desafíos de la Cadena de Valor (CV) de leche.
2. La investigación se desarrolló en Gonzanamá con la participación de productores y transformadores.
3. Utilizamos la fase diagnóstica de las CV para estudiar el comportamiento presente y pasado.
4. La CV de leche es local y rural caracterizada por sistemas de producción tradicionales.

1. We analyse the composition, operation and challenges of the milk value chain (VC).
2. The research was carried out in Gonzanamá with the participation of producers and processors.
3. We use the diagnostic phase of the CVs to study present and past behaviour.
4. The milk VC is local and rural characterized by traditional production systems.

1. Analitzem la composició, operació i desafiaments de la Cadena de Valor (CV) de llet.
2. La investigació es va desenvolupar en Gonzanamá amb la participació de productors i transformadors.
3. Utilitzem la fase diagnòstica de les CV per a estudiar el comportament present i passat.
4. La CV de llet és local i rural caracteritzada per sistemes de producció tradicionals.

EXTENDED ABSTRACT¹

Primary activities' dynamics have been heterogeneous. Its results in the economy and well-being of Ecuadorians have been asymmetric. Ecuador's production structure shows that primary sector activities contribute less than 10 % and livestock are below 1% to the Gross Value Added, and absorb about 30 % of the labor supply. At the national level, the primary sector population characterizes by old male farmers with primary education, low-income, informality labor, and high poverty rates.

The production processes of vaccine milk have been highlighted by low productivity and innovation, except for some provinces located in the center of the country, which has generated variations in the productivity and trade balance of related products. The cantons in the south-east of Ecuador, including Gonzanama, are engaged in livestock and milk production under adverse climatic conditions, traditional livestock management, and breeding models. However, their inhabitants have managed to organize to form a cow's milk production chain, even though the production's destination is self-consumption.

The value chain (VC) is a set of entities or activities, economic and institutional agents for generated value, and supporting productive transformation processes. The VC involves different heuristic and analytical advantages. These properties allow us to identify the composition and functioning of the cow's milk production process, the challenges of economic agents to generate value, and the allocation of the resources available in the canton Gonzanama, province of Loja – South of Ecuador.

We analyzed the diagnostic phases of the value chain to understand its past and present behavior. We designed a questionnaire with 11 structural variables and applied it to a statistical sample of 101 Gonzanama's producers from the rural and urban towns. Besides, we consulted two micro-entrepreneurs of the canton about the transformation, distribution, and sale phase. The collected information was contrasted and complemented with secondary sources derived from government institutions and NGOs.

The information from the questionnaires was compiled and processed in the Statistical Package for the Social Science (SPSS) version 24.0 program, which allowed structuring the cow's milk value chain into six links: suppliers, supply systems, primary production, collection centers, dairy industry, distributors and consumer market.

Each linkage in the cow's milk value chain in the canton of Gonzanama, Loja province – Southern Ecuador presented its characteristics. The primary production system segmented into urban and rural, whose farmers were mainly men with an average age of 52, married, and economic dependents. There was a differentiation in the level of education training, in which urban farmers recorded university studies, in the meantime that those in rural towns had basic and secondary education studies. Primary milk production systems are consolidated as generational and of subsistence.

Regarding the financing of agricultural activities, rural farmers stood out public financing for irrigation systems' construction. Although both segments of the link were characterized by having low-tech production systems and low productivity, certain advances observed in the breed of cattle, the type of feeding, and reproduction methods that urban farmers own and manage. Additionally, the interference of the Ecuadorian Ministry of Agriculture and Livestock in the milk production process has resulted in farmers having animals free of foot-and-mouth disease and brucellosis.

¹ Traducción exclusiva de los autores / Authors' exclusive translation.

Production's milk increased by approximately 2,5 liters per cow from 2000. However, given the conditions in which farmers in rural localities operate, the performance was slightly lower than their counterparts in the urban area. One of the most severe problems identified by the economic agents of the chain was seasonal production. In summer the performance fell by up to 40 %.

In the supplier linkage, we consider food supplies, biological products, equipment, machinery, and the intervention of public and private institutions as facilitators of knowledge in the field of training. Despite the shortage of commercial houses in the canton, farmers frequently purchased biological products, marginally food, and equipment.

There was a significant presence of international organizations and national public institutions in the training environment. However, the training agents were different in terms of location. NGOs and public institutions like FAO and Agriculture Ministry trained rural communities, while urban farmers trained primarily by commercial houses.

The dairy chain makes up of a weak link to collection points, due to the inexistence of accessible infrastructure for farmers. This situation has created that community farmers called "boteros" collect milk from family production units in inadequate conditions. The agent influence in the chain was little marked as an intermediary, considering that less than 8 % of the farmers supplied this actor; however, its ability to pay per liter of milk exceeded those stipulated as the Minimum Support Price.

In the processing linkage, two micro-enterprises regularly operate in the urban area and whose owners were part of the Gonzanama farmers' organization. Urban farmers supplied the micro-enterprises supplied and received a price per liter of milk higher than the Minimum Support Price. In summer, however, the micro-entrepreneurs have to pay more for obtaining raw milk with higher production costs to meet their commercial commitments. Even though these micro-companies compete with others whose participation in fresh cheese, mozzarella cheese, yogurt, and caramel markets exceeds 50 %, one of the micro-companies showed a high market concentration based on annual sales income.

The distribution of processed products in the agri-food chain characterize by a detailed segment and retail and direct sales (farmers). The retailers that intervened were micro-enterprises, stores, supermarkets, intermediaries, and farmers, primarily from rural locations. Gonzanama rural farmers stood out in the craft production of cheese. This product is offered to consumers, mainly, and in less quantity to intermediaries.

Products' prices varied depending on the distributor. Micro-companies, stores, and supermarkets set the price according to the market, while farmers and intermediaries value the products considering the climatic conditions. Taking fresh cheese's retail price of 2,50 USD by 450 gr of fresh cheese for calculating margin market excluding artisanal producers, we observed that the relative margin of the equivalent value to the producer of milk represented 59 % of the retail price.

The consumer market linkage divides into urban and rural consumers. At the national level, milk consumption predominated in urban areas, while in rural areas, consumption was mainly cheese. Gonzanama's inhabitants have a higher consumption of milk derivatives, considering that the micro-industry does not produce pasteurized milk. By raw material's perishability, milk transformed into cheese, yogurt, and caramel.

Finally, the dairy chain in Gonzanama showed a certain degree of efficiency and systemic integration. It reflected a system characterized by a local and rural chain located in the

first industrialization stage, where dairy farms are usually small with traditional production systems and seek to supply the local market with little different products. The value chain has various problems as the seasonality, the deficient infrastructure, technology, and knowledge for the collection and processing of milk, and the distance between production systems and the dairy industry, which does not allow the development of an effective chain of quality and hygiene standards.

Government intervention in the dynamism and development of the agri-food chain has not allowed a prompt productive transformation. Gonzanama farmers continue to allocate their production to the processing of milk in the production units, despite the efforts made by public institutions to develop regulations and manuals to the agricultural process productive. These farmers and economic agents' situation demonstrates the need for pragmatic, flexible, and permanent public policies.