Rijksdienst voor Ondernemend Nederland

Mooooi Dairy Opportunities for Colombia-Dutch collaboration

Fact finding study developed and authored by Business Bridge

MOOOOI DAIRY OPPORTUNITIES...

For a Colombian-Dutch win-win collaboration

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List of Abbreviations

ANALAC	Asociación Nacional de Productores de Leche
AP	Alianzas Productivas
APC	Agencia Presidencial de Cooperación Internacional de Colombia
APC en los Países Bajos	Asociación de Profesionales Colombianos en los Países Bajos
ASOLECHE	Asociación Colombiana de Procesadores de la Leche
BANCOLDEX	Banco de Comercio Exterior de Colombia
BPG	Buenas Prácticas Ganaderas (Good Livestock Practices)
CNL	Consejo Nacional Lácteo
COLCIENCIAS	Departamento Administrativo de Ciencia, Tecnología e Innovación
CONPES	Consejo Nacional de Política Económica y Social
COP	Colombian Pesos
CORPOICA	Corporación Colombiana de Investigación Agropecuaria
DUE	Delegación de la Unión Europea
DNP	Departamento Nacional de Planeación
FAO	Food and Agriculture Organization
FEDEGAN	Federación Colombiana de Ganaderos
FTA	Free Trade Agreement
FTZ	Free Trade Zone
ICA	Instituto Colombiano Agropecuario
ICR	Incentivo a la Capitalización Rural
MADR	Ministerio de Agricultura y Desarrollo Rural
MCIT	Ministerio de Comercio, Industria y Turismo
MoU	Memorandum of Understanding
PCH	Profesionales Colombianos en Holanda
PEGA	Plan Estratégico de la Ganadería Colombiana de FEDEGAN
PPP	Proyecto público-privado (Public-Private Partnership)
PTP	Programa de Transformación Productiva
RedH Colombia	Espacio de Reflexión Académica
RVO	Rijksdienst voor Ondernemend Nederland (Netherlands Enterprise Agency)
SENA	Servicio Nacional de Aprendizaje
SME	Small or Medium Enterprise
UE	Unión Europea
USP	Unidad de Seguimiento de Precios de la leche del MADR
WASCA	Wageningen Association of Colombian Alumni
WUR	Wageningen University and Research Center

This fact-finding study was performed by

Business Bridge

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1. Introduction to the study

In September 2014, the Netherlands Enterprise Agency (RVO.nl) and the Embassy of the Kingdom of the Netherlands in Bogotá commissioned Business Bridge the realization of a fact-finding study on the Colombian dairy sector. The study will be used as guidance tool to develop a strategy for Dutch companies to enter or increase activities in the Colombian dairy sector.

This document presents findings from desk and field research conducted in Colombia and the Netherlands during the realization of the study. It includes an analysis of the Colombian dairy sector, current programs and initiatives, and opportunities and business leads for the Netherlands in Colombia. In addition to this, the fact-finding study provides a concept strategy based on the following components/questions:

- How can G2G cooperation in the subsectors between Colombia and Dutch parties be stimulated? (Government starts projects with the Government, and/or Knowledge and/or Businesses)
- How can K2K cooperation in the subsectors between Colombia and Dutch parties be stimulated? (Knowledge institutes start projects with Knowledge institutes, and/or Government and/or Businesses)
- How can B2B cooperation in the subsectors between Colombia and Dutch parties be stimulated?
- Identification of specific leads/opportunities for Dutch companies in the sector
- A strategy for follow up on this fact-finding study
- Chances for services offered by or in cooperation with the Holland House Colombia

The main sources for the identification of the leads proposed in these documents are the various quantitative and qualitative research activities developed during this study, including:

- Desk research and previous studies review
- Interviews with sector, government and private organizations in Colombia
- Meetings with sector entities (CNL and PTP among others), and discussion with them around sector strategies, policies, prioritization of topics that require (additional) support, and how the Netherlands could help Colombia overcome identified challenges
- Dairy sector workshops with key sector stakeholders in Colombia in October and December 2014
- Interviews and visits to Dutch dairy-related organizations in the Netherlands, in order to assess the strengths that could potentially offer a solution to the Colombian challenges

During the realization of this study and on behalf of the Dutch government, the required contacts and trust relationships with key persons at the relevant Colombian organizations were established. Attention from Colombia was drawn to the Netherlands as a valuable dairy sector partner. The Dutch sector's strengths and expertise was presented and broadly discussed with government and sector representatives at decision-making levels. Through the initiation of these relations, the terrain was prepared for the Netherlands to move into Colombia.

The main findings of the study were presented in Colombia to experts and sector organizations during an event that took place at the Holland House in Bogotá (December 2014). The final results of the study will also be presented to the Dutch dairy sector during a seminar organized by RVO in The Hague (March 2015).

(Notes: All images in this report have been elaborated by Business Bridge based on the indicated sources. For all prices originally in COP and expressed in EUR, the exchange rate of 16-12-2014 has been used: 2989 COP for 1 Euro).

2. Overview of the Colombian dairy sector

Having an extension of 1.141.748 square kilometers - or 28 times the size of the Netherlands-, and an amount of milk producing cows that is about 8 times fold the amount of Dutch ones, **Colombia produces about half the amount of milk that the Netherlands does**. Still, with a yearly production of almost **6800 million liters**, the country ranks **fourth largest milk producing country in Latin America** after Brazil, Mexico and Argentina. Milk productivity varies significantly in different regions from the country, ranging from around 15 liters per milk per day in the most productive regions, to around 4 liters in the least productive ones.

The dairy value chain in the country comprises mainly production of raw milk, pasteurization and production of sour milk and cheese. The dairy sector has an important participation in the country's economy, accounting for 10% of agricultural GDP [1], 24% of livestock GDP [1] and 3,5% of the industrial GDP [2]. The share in the national GDP is close to 2.3%. The Colombian dairy sector generates around 618,000 jobs in milk production and more than 15,000 in the dairy processing industry.

Low milk productivity and external economic and climatic factors largely account for one of the most important challenges the Colombian dairy factor faces today: **low international competitiveness.**

Various **free trade agreements** with the United States and the European Union among others, put significant pressure on a Colombian milk production sector that is not yet prepared to compete internationally, or to take advantage of these new markets. The low competitiveness of the sector - reflected in the relatively high production costs and therefore commercialization prices - has given place to milk smuggling, worsening the situation. As a result of this, milk producers – and producers of other agricultural products – have in the last two years organized strikes and made clear demands to the government for structural changes. In addition to this, **climatic disturbances** have caused large losses and a significant reduction of the milk producing capacities of farms.

Government and sector organizations acknowledge the challenges and the need to support the sector's development in the current circumstances, though they also see the sector's potential **to become a world-class sector** once the main challenges are overcome. Via the dairy development policy and the Productive Transformation Program (PTP), the government and private dairy sector are carrying out various plans and initiatives. They are committed to help the sector become an important player both in the local markets as in international arenas.

MILK PRODUCTION REGIONS

CNL, the Colombian dairy value chain organization, has prioritized eight (8) milk producing regions or **milksheds** in the country, as illustrated in the following image.

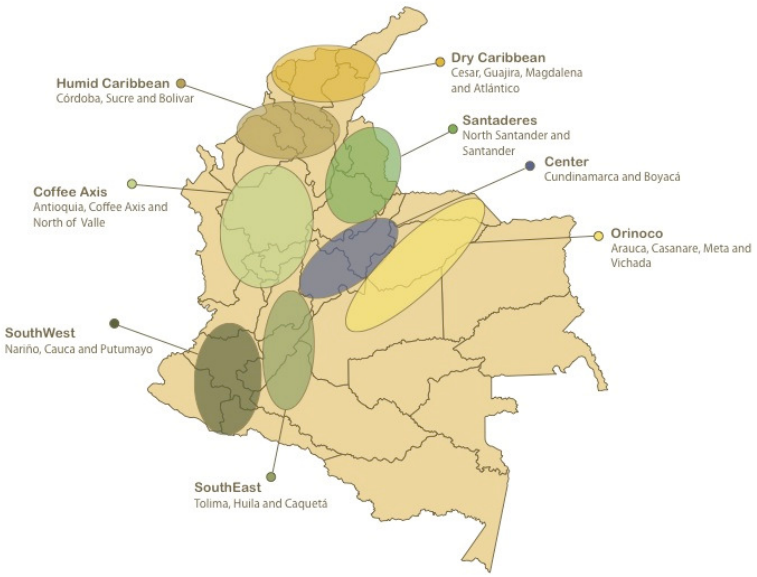


Figure 1 – Milksheds in Colombia

The classification of the various milksheds is based on their geographical and climatic characteristics. These milk producing regions have altitudes ranging from sea level until 3000 meters above sea level. In the low altitude milksheds (Dry Caribbean, Humid Caribbean and Orinoco), climate is typically tropical with temperatures between 25 and 35 degrees Celsius, while in the other regions temperatures range between 14 and 18 degrees Celsius. These different characteristics influence the milk production.

Another factor affecting milk production is the seasonality. This refers to rainfall and dry seasons that vary per milkshed. In the Dry and Humid Caribbean, the dry season (known as ***summer*** in Colombia) goes from December to March - April approximately, while in the Central, South and Coffee Axis this season starts in June - July and goes until October approximately. Rain occurs throughout the rest of the year, becoming more intense and frequent in certain periods (known as ***winter*** in Colombia) that also vary per region.

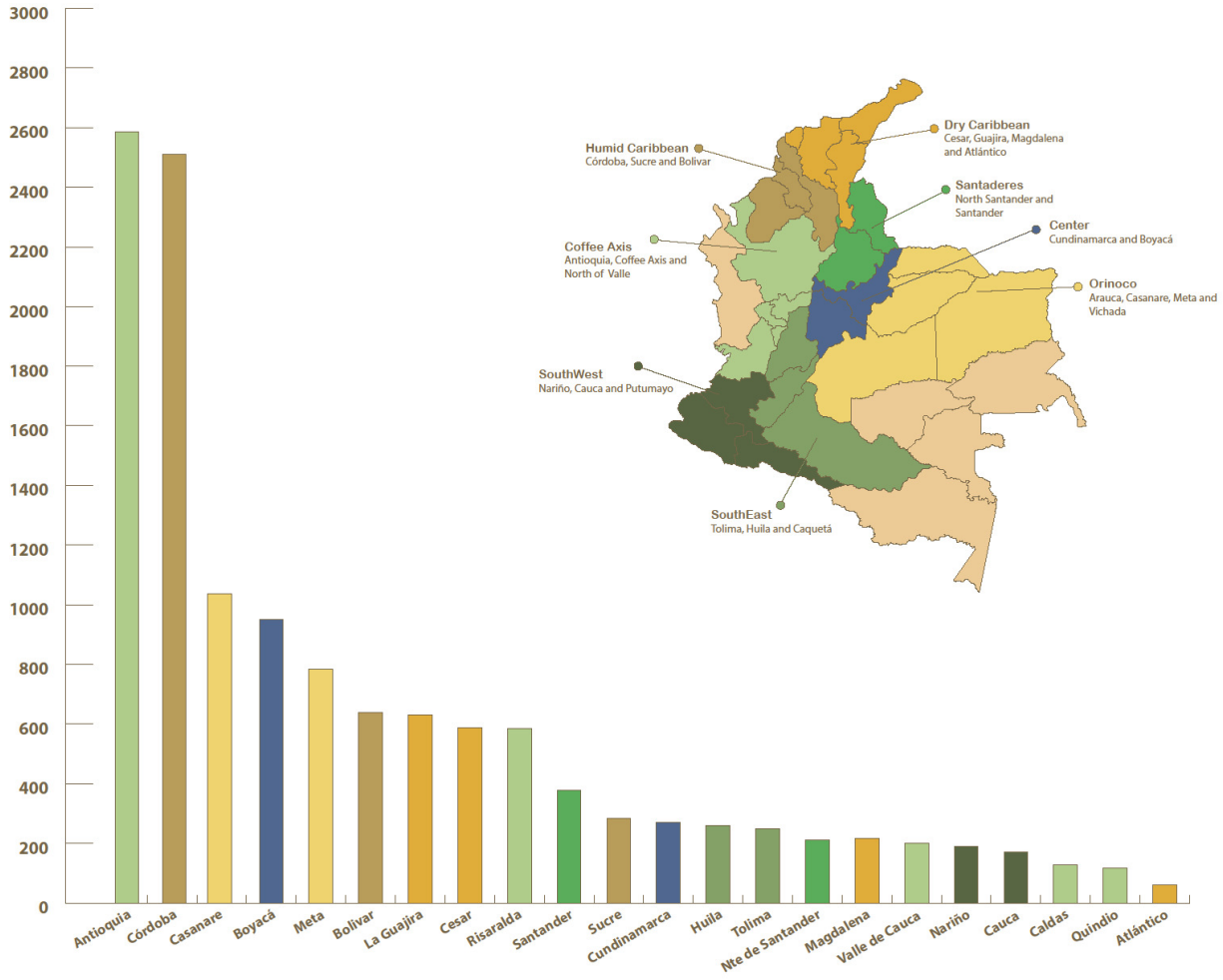


Figure 2 – Milk production share per province (average amount of liters per day in 2013). Elaborated based on source [3]

3. The Colombian Dairy Value Chain

The Colombian dairy value chain can be graphically described through the following image:

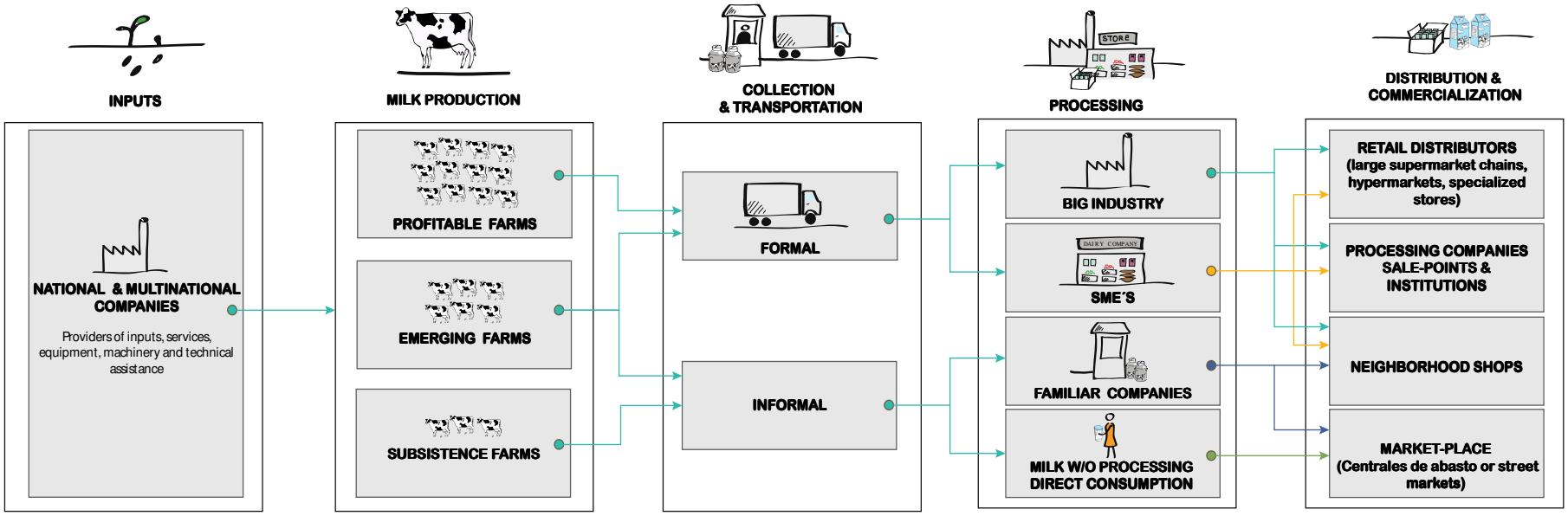


Figure 3 – Colombian Dairy Value Chain, as compiled by Business Bridge for the study

3.1 Inputs and services for milk production

Main inputs for milk production in Colombia mainly consist on pasture seeds, fertilizers, herbicides, fungicides, feed supplements, sperm, medicines and vaccinations, machinery and equipment for milk production, and ingredients and equipment for dairy processing [4].

These supplies largely compose the structure for milk production costs. The following table shows the cost structure per milk production activity in some of the most important milk production provinces in Colombia: Antioquia, Cundinamarca, Boyacá and Nariño [5].

Activity	Cost per activity (EUR per liter)					
	Antioquia		Cundinamarca & Boyacá		Nariño	
Milking practices Milking, concentrate feed, pasture feed, cleaning, products against mastitis	€ 0,1151	**61%** Out of which: concentrate feed: 62% pasture feed: 34%	€ 0,1449	**37%** Out of which: concentrate feed: 33% pasture feed: 24%	€ 0,1582	**39%** Out of which: concentrate feed: 17% pasture feed: 0%
Sanitaire practices Vaccinations, anti-swelling products, hormones, painkillers	€ 0,0003	0%	€ 0,0047	1%	€ 0,0040	1%
Herd management Artificial insemination, mineral salts, cleaning of barns	€ 0,0090	5%	€ 0,0425	11%	€ 0,0756	19%
Pasture management Silage, irrigation, fence maintenance, fertilization, undergrowth and plague & disease control	€ 0,0274	15% Out of which: fertilization 71%	€ 0,0325	8%	€ 0,0177	4%
Labor	€ 0,0298	16%	€ 0,0943	24%	€ 0,0893	22%
Others	€ 0,0000	0%	€ 0,0000	0%	€ 0,0010	0%
Total direct costs	**€ 0,1817**	**97%**	**€ 0,3188**	**81%**	**€ 0,3459**	**86%**
Indirect costs	€ 0,0064	3%	€ 0,0726	19%	€ 0,0555	14%
Total costs of producing 1 liter of milk	**€ 0,1880**	**100%**	**€ 0,3914**	**100%**	**€ 0,4015**	**100%**

Table 1 - Cost per activity of milk production in representative milk production provinces. Elaborated based on source **[5]**

As it can be seen from the table, the largest proportion of costs is assigned to milking practices. Pasture feed costs are significant in these provinces except in Nariño, where no costs seem to be allocated to pasture feed. But the highest percentages are allocated to concentrate feed, making the impact of this input considerably large.

The further away the farms are located, the highest the concentrate feed costs for them. The Colombian concentrate feed market is stable and mature, with traditional, relatively dominant producers that make the market rather closed to new entrants. This kind of product is mostly produced nationally with mainly imported raw materials such as maize, oilseeds and cereals. Contrarily to other countries as the Netherlands, Argentina or New Zeeland, Colombian milk livestock has a large dependence on concentrate feed. In spite of the benefits in animal health, production and costs that pasture-based feed has to offer to milk production cattle, livestock in Colombia is fed with relatively few pasture-based feed.

Regarding other inputs, the ones that make up for the highest proportion of costs are mineral salts, which are also produced locally with imported components. Fertilizers are, on the contrary, often supplied by multinationals that have representation in Colombia.

With respect to pasture feed, this is a subsector that is still quite rudimentary. Pasture feed providers are farmers that maintain, cut and process pastures and deliver them to livestock farmers without any insight in quality and accurate feed contents. In general, no long term relationships exist between suppliers and customers of pasture feeds, whereby the latter are often seeking reliable suppliers who can provide them with a good quality product, and with whom they can develop a long term relationship. An interesting finding for the Netherlands, given the broad expertise this country has to offer in the subject of pasture management.

The costs shown in the previous table indicate that Antioquia seems to have the best levels of pasture feed and genetics, since costs allocated to the latter are the lowest. In these aspects, this region can be seen as the benchmark to which other milk producing regions can be brought to. At the same time, Antioquia can be the region where most advanced projects can be implemented for these subjects.

3.2. Milk Production

NATIONAL MILK PRODUCTION

Historically seen, in 2008, Colombia's average milk productivity was approximately 6 liters per cow per day. It was then lower than the Mexican and Argentinian ones (approximately 16 liters per cow for both countries), but higher than the Brazilian one (approximately 4 liters per cow per day). However, the yearly rate of productivity growth in Colombia had been between 2000 and 2008 by far the highest compared to these countries: 8,4%. This is even higher than productivity growth of milk production leaders like France, Switzerland and the United States [6].

More recently, milk production in Colombia during the last decade has also registered a growing trend, especially in the last 3 years. According to figures from MADR, the Colombian Ministry of Agriculture and Rural Development, milk production increased from 6.284 million liters in 2011 to 6.773 million liters in 2013, as shown in the following image. It has been stated by sector organizations that the growth in production is a result to the adoption of international technological developments for milk production like: genetic improvement, livestock feeding and nutrition programs.

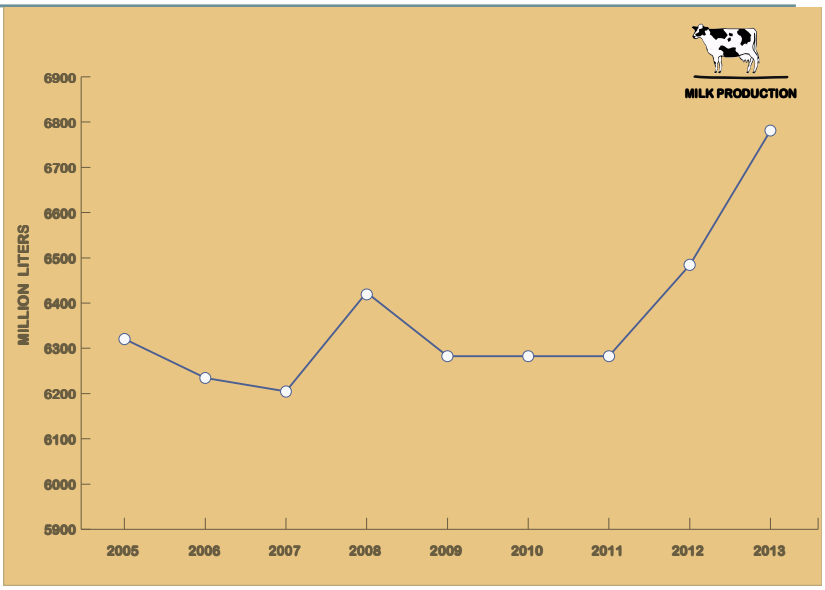


Figure 4 – Milk production in Colombia between 2005 and 2013. Elaborated based on source **[7]**.

LEVEL OF ORGANIZATION OF MILK PRODUCERS

Some Colombian milk producers have organized themselves someway into producers associations (a group of producers associate as a group in order to negotiate supplies, transportation services, etc.), producer cooperatives (a group of producers create a cooperative in order to collect milk and fulfill volumes for processing companies) and processing cooperatives (a group of producers create a cooperative in order to collect milk an produce dairy products). This last type of organization is, however, not very common. This strongly contrasts to what happens in the Netherlands, with FrieslandCampina being one of the most famous and successful examples of a milk producers cooperative created with the aim of producing dairy products based on the producing members' milk, put them in the market and distributing the profits among all member producers.

None of the organizations mentioned above are a general trend or pattern in the Colombian dairy sector: the milk production sub-sector is generally not organized and not well coordinated / integrated with the processing industry. This prevents producers from becoming a solid economic group with enough knowledge on efficient production, negotiation power, and therefore financial strength. Facing additional obstacles related to poor infrastructure – crucial for the transport and delivery of such a perishable product as fresh milk – and frequent harsh climate phenomena, the *Producers* link in the dairy chain suffer from high vulnerability.

There is a general lack of articulation of producers (livestock farmers) for collective innovation processes. However, some small and medium farmers have organized themselves for joint artisanal/basic innovations in their production processes and associativity initiatives. There is interest in promoting and encouraging the development of these inclusive innovations by supporting and giving assistance for model standardization, as well as replication and scaling to other regions.

Figure 5 - *Artisanal Refrigeration Milk System – Nariño*

PRODUCTION CYCLES VS. PREPARATION AND PLANNING OF FARMERS

The milk production cycles in Colombia are closely related to the country's dry and rainfall seasonality. This can impact the availability of water and the condition of pastures, affecting in turn the livestock feed and subsequent productivity. During the Colombian summer season the quality of the pastures deteriorates and therefore production falls. During the winter, production initially increases as a result of the sprout of pastures. However, when rainfall becomes excessive – which has been the case during the last couple of years -, production falls as animals tend to get sick and pastures become mudflats, reducing the availability of feeding material (pastures).

Milk farmers in Colombia are generally not well prepared for this seasonality and therefore do not plan ahead or carry out measures as pastures cutting, processing and conservation. Many farmers have a limitation on knowledge and application of good management practices in production, specifically storage of pastures in times of abundance, and use in times of scarcity. Knowledge in these kind of practices would compensate feed shortage during summer seasons, as well and improve the overall quality of feed by improving the feed mix (optimal variety and balance between pastures-based feed and concentrate-based feed), making the cow healthier and more productive It would significantly reduce costs for the farmer by decreasing the need for products external to livestock farming.

In terms of additional measures that could alleviate the impact of summer and extreme winter seasons, most farmers do not have irrigation systems - or enough capital to install and/or maintain them -, let aside water management systems to reduce the effect of intensive rains.
Changes in seasonality - and therefore production - cater for an unstable supply that is not connected to demand but to climatic factors, which farmers generally cannot prepare due to lack of knowledge and tools. This affects not only consumer demand but the planning of the processing industry as well.

The above situation opens up opportunities for Dutch expertise in both pasture management knowledge transfer and advice, as in implementation of water management improvements for the milk production sector.

MILK PRODUCTION SYSTEMS

Fresh milk in Colombia is produced in 22 out of the 32 Colombian provinces. There are in the country two types of production systems, the specialized and the dual dairy systems. The specialized dairy system, is exclusively dedicated to milk production while in the dual purpose system is possible to produce milk or meat. The following image shows the 22 Colombian provinces where milk is produced and the main production system used in those regions:

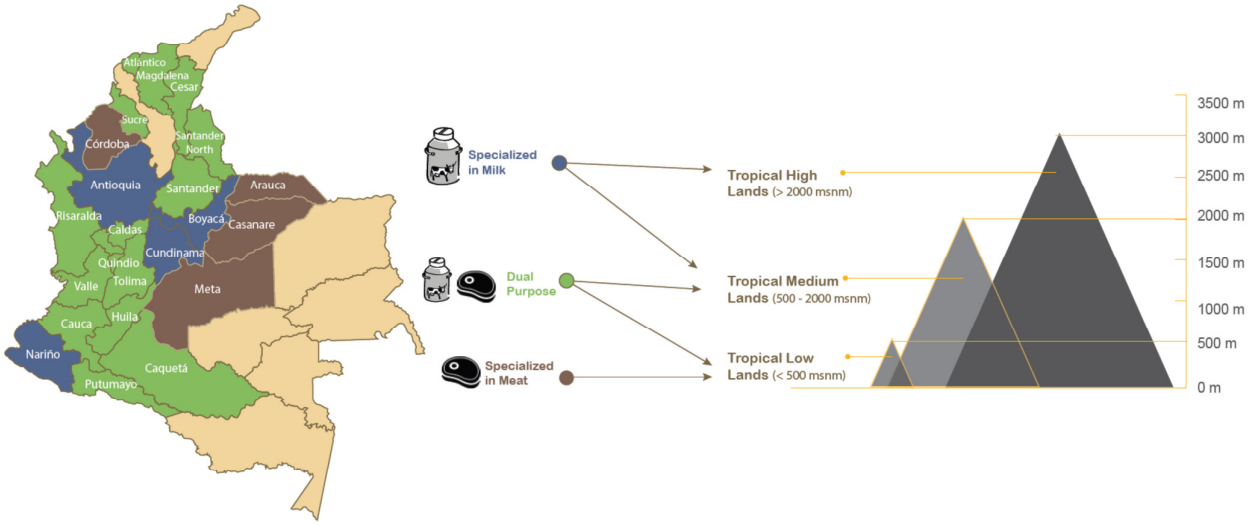


Figure 6 - Production systems used in the different regions and altitudes of Colombia.

In the dual purpose system, farmers' production is based on tropically adapted breeds crossed with dairy breeds. Depending on the market, they specialize their cattle to produce milk, meat or both of them.

The specialized dairy systems are more intensive (more dense) than dual purpose systems. These production systems mostly take place in the cold areas (highlands) of the country and they are usually located very close to urban centers. Farmers are engaged in the exploitation of pure dairy breeds or with high percentage of genes from European races. Feed for this livestock is based on grazing on pastures supplemented with concentrates feeding. Usually animals are milked once or twice a day.

The dual purpose systems are typical from the lowlands of the country (see previous image). These dairy systems are often located in remote marginal areas, far from the markets and usually with poor provision of resources and physical infrastructure. In this system, farmers' production is based on tropically adapted breeds crossed with dairy breeds. The ones that dominate are Bos Indicus and Bos Taurus and Cebu. Their diet is based on extensive pasture systems of low quality, which is a strong limitation in terms of milk productivity and profitability.

The particular characteristic of this system is the fact that thanks to the capabilities of the breeds, farmers can specialize their cattle to produce milk, or feed beef cattle, or both of them, depending on the market. If milk price is high, the cow is used to produce milk for commercialization. If milk price is low, the cow also performs well when used to feed calves that are destined for meat production (contrarily to pure dairy breeds, which do not perform as well as source of feed for beef cattle). From the economic point of view, dual purpose systems are very attractive for small and medium scale farmers with limited technical and financial resources.

COMPARATIVE ANALYSIS

	Dual Purpose System	Specialized System
Livestock number (20.4 million in total)	7.900.000	2.400.000
Amount of frams (497.747 milk producing farms in total)	174.211 **35%**	29.865 **6%**
Cow productivity [2]	4 lts per day	15 lts per day
Production (lts per year)	3.639 million	2.977 million
	Although these are les productive abimals, they produce 55% of the total produced milk in the country	More productive animals in these areas, the dairy produuction is the basis of the livestock business
Milk quality	Better composition, but in average hygiene is deficient	Solids composition not as good as in dual purpose systems, but hygene is much better
Average milk prices per liter- Feb 2014 (formal market)	5844	5914
	€ 0.28	€0.31
		Usually 5% to 10% higher than the price for dual purpose system
Jobs created per 100 animals	5 to 6	7 to 8

Table 2 - Comparative analysis dual and specialized systems. Elaborated based on analysis.

BOVINE LIVESTOCK IN THE COUNTRY

The livestock inventory in Colombia in 2012 amounted almost 20,4 million cow cattle units [4], out of which only 2.4 million allocated to the specialized production systems, and 7.9 million allocated to the dual production systems [1]. The rest, 10.1 million, was dedicated to meat production systems. These animals are distributed along the almost 500,000 Colombian cow cattle farms, of which 6% are specialized in milk and 35% are dual purpose farms [8].

The following image shows the proportion of cattle and of farms around the country together with some of the breeds used in the different production systems:

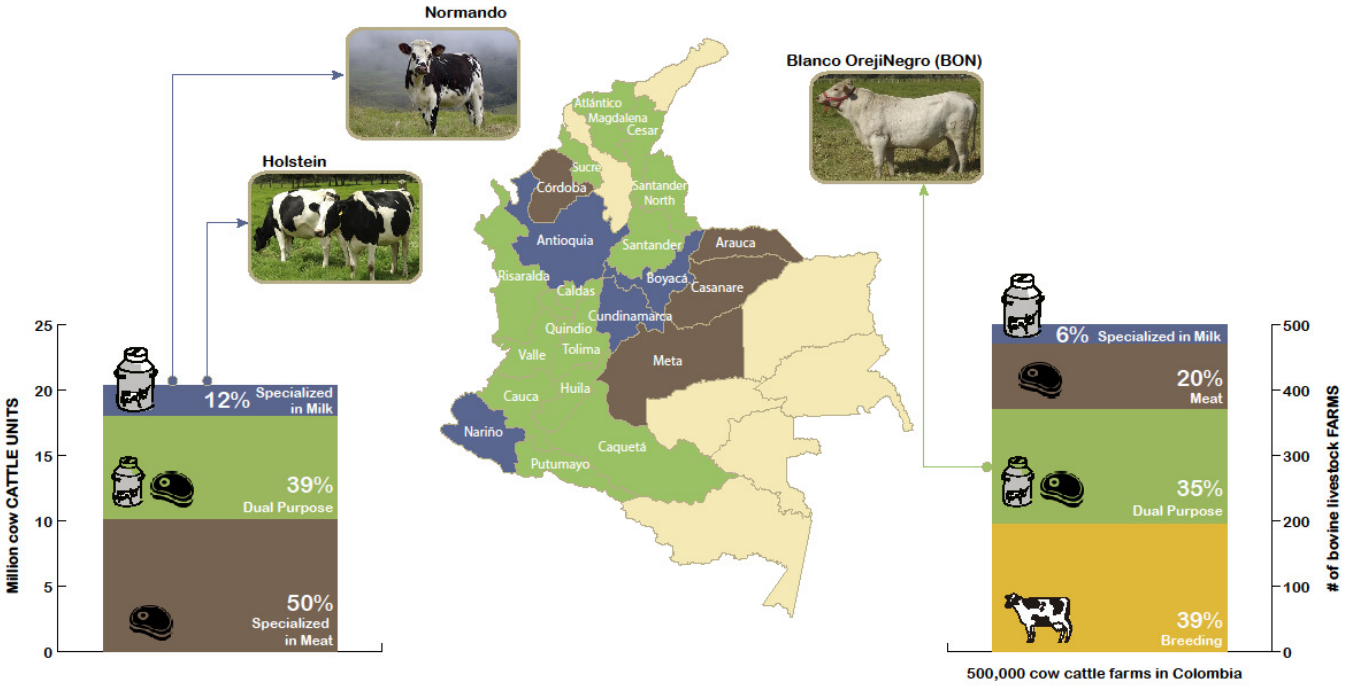


Figure 7 – Cattle units, livestock farms and breeds used in relation to the different production systems.

MILK QUALITY PER REGION AND PER PRODUCTION SYSTEM

The following table shows the differences in composition and hygiene along the different Colombian milk producing regions (numbers in green refer to values that are considered "better"; numbers in red refer to values that are considered "less good").

	2011	2012	2013	2014
Average levels in regions that **include** prioritized milksheds **Center, Altioquia/Coffee Axis & Southwest -> specialized system**				
Fat (%)	3,6	3,6	3,6	3,7
Protein (%)	3,1	3,1	3,1	3,1
Solids (%)	12,0	12,0	12,0	12,1
Hygiene (colony forming units)	384.928,3	416.016,7	364.840,7	447.405,0
Average levels in regions that **include** prioritized milkshed **Dry Caribbean -> dual purpose system**				
Fat (%)	3,8	3,8	3,8	3,7
Protein (%)	3,4	3,3	3,3	3,3
Solids (%)	12,6	12,5	12,5	12,5
Hygiene (colony forming units)	1.601.517,4	1.129.175,5	1.096.561,4	1.831.466,3
Average national levels				
Fat (%)	3,7	3,7	3,7	3,7
Protein (%)	3,1	3,1	3,1	3,1
Solids (%)	12,2	12,2	12,2	12,2
Hygiene (colony forming units)	662.075,3	575.393,3	537.009,0	690.640,6

Table 3 – Average milk quality in the different prioritized milksheds. Based on information from Agronet. Elaborated based on source **[9]**

The main reason for the differences in compositional quality lies on the livestock breeds. The animals used on the Dry Caribbean milksheds (see previous image) belong to breeds which per nature produce milk with higher levels of protein, fat and solids. These breeds adapt well on the climatic conditions that are present in the Dry Caribbean zones, but not on the climate of the Center, Antioquia/Coffee Axis or Southwest milksheds. The breeds adapted to and used in these last 3 zones, are animals which by nature produce milk with less levels of protein, fat and solids.

Regarding the large differences in hygienic quality, these can mainly be explained by the levels of professionalization and handling of the animals and the milk. In addition to this, in many remote milk production areas, there are often power supply problems or electricity is too expensive. Therefore farmers or cooperatives do not have access to cooling systems (or milking machines) on the farm or nearby. This lack of refrigeration of fresh milk after its production affects its quality especially in warm temperature regions (low tropical lands). These obstacles lead to the fact that all milk producing areas in Colombia produce milk whose hygiene levels are lower than the government defined standard. However, in dual system regions these levels are much worse than in specialized regions. As a result of this, surplus production that cannot be consumed, is often destroyed.

Low quality also has economical history roots. As a result of 90´s market liberation in Colombia (*apertura económica*) many cereal, potatoes and maize farmers lost competitiveness and transferred their activity to milk production. However, the land than they owned was not always suitable for this activity. In addition to that, their real vocation was to be farmers. They never really adapted to the culture and routine of milk production, having as result milk produced with **low quality and most probably sold on the informal channels.**

THE INFORMAL MARKET

Agents or companies that buy fresh milk are obliged by law to report this purchase to the MADR's USP division (*Unidad de Seguimiento de Precios de la Leche*, or Unit for the Follow up of Milk Prices), and to perform the transaction following the specifications of this regulation. Information that needs to be reported consists on volume purchased, price paid, composition (levels of protein, fat, etc.) and bacterial levels. Milk purchases executed and registered according to this regulation, are considered to belong to the formal milk commercialization channels. The formal milk market offers certain guarantees to producers, whose milk reaches consumers through established food stores and institutional buyers.

Contrarily, purchases that do not get reported by the buyer are categorized as informal milk commercialization. Informal markets – usually originated near the milk producers that supply them – supply consumers and artisanal processors either directly or via intermediaries. Milk and dairy products sold through these channels are practically invisible to the rest of the market and regulatory instances. In Colombia, more than 41%, or approximately 2900 million liters of the total milk produced is estimated to be sold via informal channels.

Informality varies at the regional level and it is more predominant in remote rural areas with small milk producers (having 8 to 10 cows), rather than medium and large ones. In these areas, populations show mainly low income and high unemployment rates, and there is deficient transportation and electrification infrastructure. Informality in raw milk is also related to difficulties in social infrastructure, problems of public order and the presence of armed groups [10].

Although informal commercialization does not have the same magnitude in all milk producing areas, it does cause major distortions in milk quality, processing and pricing. Milk that is sold via informal

channels is usually collected while still warm, and often through rudimentary technologies. Handling and manufacturing processes do not follow protocols and lack the control systems imposed by regulation, a phenomenon that poses a threat to public health.

In terms of price, informally sold milk is paid at lower prices than the ones indicated by the MADR's regulation and imposed on the formal market. Higher prices of formal (pasteurized) milk in relation to informal (raw) milk are related to travel costs on unpaved roads and profit margin from the industry, the middle-man and supermarkets commissions.

Payments to the official cattle national fund of sector organization FEDEGAN (see Appendix II for description of this organization) are also not paid during informal transactions. Adding to all this, the approximately 2900 million liters that do not reach the processing industry is a volume that processing companies do need in order to realize their growth plants.

Main reasons for the existence of such a large informal milk market in spite of these disadvantages, are:

- difficult accessibility to formal markets in urban centers due poor infrastructure
- large local demand for low cost raw milk by low income populations (since formal markets impose higher prices)
- consumers' perception of low health risk of consuming low quality milk, thanks to practices like boiling the raw milk before consumption
- the existence of sufficient intermediaries for informal commercialization
- short term vision and perception from producers that they will get a better net price than in formal markets, thanks to not having to pay taxes and contributions to official funds

The following image shows the percentage of milk that gets sold via formal channels (51% to industry), informal channels (41%) and used internally at producing farms (8%).

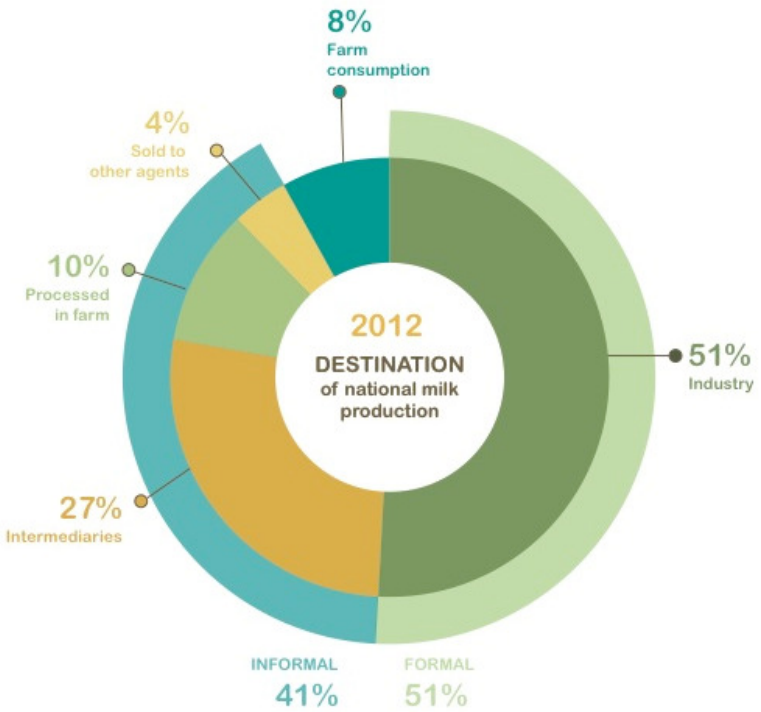


Figure 8 - Destination of national milk production. Elaborated based on source **[10]**

Informality was perceived during the study as one of the main chain problems in the Colombian dairy sector. In can be reasoned that informality blocks and slows down the realization of the Colombian dairy industry's potential and growth. Viewed from another perspective, informality brings an opportunity for that same dairy industry growth, as stated by Dutch knowledge institution WUR in its report *Milking to Potential*: "Informality can be considered as a measure of resilience in the dairy sector and an opportunity for growth in multiple directions" [11].

As a matter of fact, the sustained economic growth of Colombia and the increase of acquisition power of the consumers targeted by the informal channels offer a suitable terrain for successful actions to reduce informality and increase formality in the dairy chain. This can be the origin of commercial as well as cooperation leads for the Dutch sector, either by stimulating dairy processors to build more formal chains, or by stimulating increase in milk volume and quality of informal farmers so that they get transitioned into the formal chain. Part of the solution for informality could be a combination of law enforcement of illegal situations together with promoting regularization.

PRICE SYSTEM

Raw milk price in Colombia is regulated by MADR. The price system is based on [12]:

- a base price per liter: 797 COP (approximately €0,27).
- plus bonuses/discounts for hygienic qualities
- plus bonus for compositional and sanitary qualities
- plus bonus for cooling the raw milk between 0 and 6 degrees Celsius
- minus transportation costs (optional)

A graphical explanation of the milk price system is provided in Appendix VI.

The bonuses and discounts are defined in the price regulation based on quality results that have historically been achieved in various regions. In this way, milk from the Dry Caribbean milkshed with a low hygiene is in a certain way punished less hard than milk from other milksheds. At the same time, equal compositional qualities from the Dry Caribbean milkshed is compensated less than in other milksheds. The fact that dual purpose production system is predominant in the Dry Caribbean milkshed, while the specialized system is predominant in the high zones, explains the fact that the price paid for the dual purpose system ends up being lower than the price paid in the specialized system.

TURNOVER OF THE MILK PRODUCTION BUSINESS IN COLOMBIA

As discussed, informality is a heavily weighing variable in the equation of the Colombian dairy sector performance. The following table makes a comparison between the turnover of the milk production business in the formal and the informal channels.

Annual Turnover of Milk production (2013)

Amount of Milk produced 6.773 Million Liters

COP- EUR exchange rate on 16-12-2014 2.989 COP for 1 EUR

	Formal Channels	Informal Channels
Estimated % sold	51%	41%
Estimated Amount of Milk Sold (Litres per year)	3.454	2.777

Average Selling price per Litre	€ 0.27	€ 0.25 9% less than the formal channel
Turnover (million per year)	**€ 932,64**	**€ 694,23**
Turnover being missed due to informality per year (income that could be generated if the informal milk would be sold in the formal channels price of 0.27 Euro		**€ 749,77**

Table 4 - Comparison between the turnover of the milk production business in the formal and the informal channels. Calculation based on sources **[7] [3] [13]** .

FARMS SIZE

Primary milk producers in Colombia are many in number, mostly small in farm size, and scattered along various geographical areas of the country. This is illustrated in the following table.

Ranges according to number of animals	Production Units	Milking cows	Production (lts)
Less than 8	264.334	807.040	3.664.410
From 8 to 15	54.772	447.654	2.175.751
From 15 to 30	36.450	552.156	2.657.115
From 30 to 50	16.550	392.037	1.979.705
Higher than 50	23.109	1.085.196	5.276.091
Total National	**395.215**	**3.284.083**	**15.753.073**

Table 5 – Milk Production per farm size range (production measured in liters per day). Elaborated based on source **[7]**

Small scale producers (up to 8 animals) dominate the Colombian dairy farm landscape, representing around 67% of the total dairy farms in the country but holding only around 25% of the dairy cattle. They produce about 23% of the total milk production. As a matter of comparative analysis, the following table presents a comparison between the farm size horizon in Colombia and the Netherlands.

Dairy Farm Size

Netherlands (2012)			Colombia (2011)			
Amount of cows	Amount of farms	% of total	Amount of cows	Amount of farms	% of total	
1 to 30	1.945	10%	1 to 10	219.282	44.3%	66.6%
			11 to 25	110.312	22.3%	
31 to 70	6.973	37%	25 to 50	72.139	14.6%	
71 to 100	5.072	27%	51 to 100	44.259	8.9%	
Total farms until 100 cows	**13.990**	**75%**		**445.992**	**90%**	
101 to 150	3.416	18%	101 to 250	32.079	6.5%	
> 150	1.286	7%	251 to 500	10.873	2.2%	
			501 to 1000	4.166	0.8%	
			> 1000	1.483	0.3%	
Total amount of farms	**18.692**	**100%**		**494.593**	**100%**	

Table 6 – Contrast between Dutch and Colombian dairy farms size. Elaborated based on sources **[8] [14]**

Similarly to the Netherlands, where most (75%) of the 18,000 Dutch dairy farms have a maximum of 100 animals, most of the Colombian cattle farms have also maximum of 100 animals [8] (90%). However, there is a significant difference on the size of the farms in this range: while only 10% of the Dutch dairy farms have a maximum of 30 cows, 67% of Colombian dairy farms have a maximum of 25 animals. At the same time, mega-size farms with more than 500 and more than 1000 cows are also found in Colombia, while lack of space and other resources would not allow this scale in the Netherlands.

FARMS SEGMENTATION

Based on farm characteristics observed during the study, the Colombian milk producing farms have been segmented as profitable farms, emerging farms and subsistence forms. This classification, shown in the following table, has been useful all along the study in order to determine the target farms for the different leads that have been identified for the Dutch dairy sector (these leads are discussed towards the end of the document).

	TYPE	CATTLE	SIZE & PRODUCTIVITY	FEED	TECHNOLOGY	MANAGEMENT	EDUCATION LEVEL	BUSINESS	MILK DESTINATION
PROFITABLE FARMS 5.8%	◦ **Obtains monthly profit.** ◦ Obtains high volumes and high quality ◦ Professional management of breeds, nutrition, reproduction ◦ Ocassionally have environmental plans	◦ **High cost & very good breeds** always investing on better breeds ◦ Most used breeds are Holstein, Jersey, Pardo Suizo, Ayrshire	◦ **More than 50** milking cows ◦ Production per cow **20 to 40 lts** ◦ up to 3 daily milkings	◦ **Improved pastures** ◦ use of improved pastures, concentrates and high-end supplements ◦ Sometimes process and store pastures and even sell them to smaller farmers	◦ **Medium level (Average)** - Usually mechanic (portable) sometimes with milking parlour - Own cooling tank - Some of them use irrigation systems	◦ **Managers are proffesional assisted by technician(s)** - General personnel usually local farmers	◦ **Manager and technicians:** university degree in livestock sciences, zootechnical sciences, veterinary, agronomy or business administration ◦ General personnel: low educational background	◦ Company **managed under law regulations** ◦ Keep accounting in a structured and periodical manner ◦ Keep records on performance. Measure it and improve it ◦ Follow sanitation protocols ◦ Certified or in process of certification on Good Farming/Livestock Practices	◦ Raw milk often **sold directly** to only **one large processing company** (very close relationship). ◦ Rarely they sell to multiple companies - Milk collected on tank trucks usually in the farm - Price is almost guaranteed thanks to high and constant quality of the milk
EMERGING FARMS 13.4%	◦ **Break-even** ◦ Ocassionally able to invest ◦ Can tolerate mode-rate risk	◦ **Average price cattle** ◦ Most used breeds are Normando and Criollas - Already with or in transition to holstein	◦ **15** to **50** milking cows ◦ Production per cow **10 to 20 lts**	◦ **Mainly based on concentrates** ◦ Average quality pastures ◦ Grassland rotation	◦ **Low level (Basic)** - Usually manual milking system sometimes mechanic (portable) - Access to cooling tanks (not their own) - Electric fence to protect animals	◦ **Managed** by a **farm employee (Administrator)** ◦ Administrator family memebers help with multiple tasks at no salary ◦ Administrator receives salary and legal benefits, is allowed to live in farm with family. All are allowed to perform agricultural activity on farm for own consumption in exchange for their work	◦ **Basic education:** Mostly primary, sometimes secondary ◦ Rarely agro-technicians	◦ **Mostly but not always comply with law regulations** ◦ Often keep basic records on daily milk production, vaccination and reproduction of cattle ◦ Willing to be certified in the future if profit allows	◦ Raw milk is **sold to medium size** processing **companies**, sometimes to local large ones - Milk collected in tank trucks on the road near the farm - Clients test samples every day for acidity and antibiotics, and every month for protein, fat and somatic cells - Clients adjust price according to government's pricing table "not accurately". Big company ends up determining its own price
SUBSISTENCE FARMS 80%	◦ **Often give losses** ◦ Not possible to save significantly ◦ Unable to invest ◦ Small-holders	◦ **Low price cattle,** usually inhereted from family ◦ Most used breeds are Normando, Criollas	◦ Less than **8 to 15** milking cows ◦ Production per cow **6 to 10 lts**	◦ **Low quality pastures**, sometimes buy/rent pastures for a period ◦ Feeding complemented with other products from the farm (potatoes, carrot, salt and water)	◦ **Very low level (Artisanal)** - Manual Milking system - No cooling system	◦ **Labor** is **mosty familiar** ◦ Often the mother, elderly or children are in charge of the farm, while the father usually work in local temporary jobs such as construction, potato production or coal mining to earn an extra income	◦ **Very low** educational background - Usually they even lack primary education - However, very good acquired experience in agricultural and livestock production - Usually are part of traditional farmer families	◦ Usually **Informal business** ◦ Rarely keep records or do so in an unstructured manner ◦ Unaware or not interested in acquiring certifications (do not see their value or cannot afford them)	◦ A percentage of the milk produced used for **family or farm consumption** - Rest is sold to **informal distributors,** or local artisanal cheese and dairy producers at low prices - Payment is done monthly after enough milk is collected (around 800 lts) - Milk transported to the collection centre by the intermediaries, where it gets gathered

Table 7 – Farmers segmentation in the Colombian dairy sector

INTERESTING MILK PRODUCERS

The list of milk producers below can be interesting to consider for future collaborations. However is recommended to contact producers and regional dairy committees through CNL in order to be in line with the national strategy and to create more impact. Further information of regional committees can be found in Appendix III.

Acronym	Name	Town/ City (Province)	Comments
1 CORPOLEG	Cooperativa de productores Lecheros de Guatavita	Guatavita (Cundinamarca)	- 92 members - 724 Animals - Member of ASOGÁN
2 COLEGA	Cooperativa Lecheros de Guatavita	Monquetivá Guatavita (Cundinamarca)	- Received Subsidy from United Nations. - Member of ASOGÁN
3 SUCOLAC	Cooperativa Agropecuaria de Subachoque	Subachoque (Cundinamarca)	- Has certified lab
4 COLÁCTEOS	Cooperativa de Productos Lácteos de Nariño	Pasto, Ipiales (Nariño)	- Has certified lab
5 CODELAC	Cooperativa Lechera de Córdoba	Monteria (Córdoba)	- Has certified lab
6 UNILAC	Cooperativa Multiactiva de Ganaderos y Productores de Leche del Oriente	La Unión (Antioquia)	- Has certified lab
7 COBILAC	Cooperativa de Productores de Leche de Ventaquemadura	Ventaquemadura (Boyacá)	- Has certified lab
8 ASOPROLEBOY	Asociación de Pequeños productores de Leche de Gutiérrez	Gutiérrez (Cundinamarca)	- 265 members - Ambition to enter processing activities

Table 8 – Interesting milk producers to get in touch with for future collaborations

FOCUS MILKSHEDS SELECTED DURING THE STUDY

In alignment with the 8 milksheds prioritized by CNL, in this study 4 of them have been selected that will form the basis of the further analysis. The selection of these four milksheds is based on the following criteria:

A. Current production and efficiency levels
B. Potential for increasing production
C. Level of organization of the producers in these regions and their degree of interest and involvement in the dairy development initiatives of CNL and PTP.

The 4 selected milksheds are presented in the following table.

Milkshed prioritized during study	Focus province within selected region	Main production system used	Levels of informality [2]	Level of development
Center (highlands)	Cundinamarca Boyacá	Specialized	Medium (Boyacá) Minimal (Cundinamarca)	+ Higher level of industrialization and productivity - Lack of research and innovation - Low adoption of technologies in animal feed, genetics, quality and added value
Antioquia / Coffee Axis (highlands)	Antioquia Caldas Risaralda Quindío	Specialized	Minimal (Antioquia, Caldas and Quindío) High (Risaralda)	
Southwest (highlands)	Nariño Cauca North of Putumayo	Dual purpose	Medium (Nariño) Critical (Cauca) (not indicated for North of Putumayo, but estimated high to critical there)	- High informality + High productive potential
Dry Caribbean (low tropic lands, dry and humid)	César Magdalena	Dual purpose	Low (César) High (Magdalena)	- High informality - Lack of hygiene protocols + High productive potential

Table 9 – Summary of the Colombian milksheds that have been selected in this study. Elaborated based on analysis during this research.

The selected milksheds in this study have been the focus of the analysis of needs where the Dutch dairy sector can offer solutions, devising in this way business and cooperation opportunities for the sectors in both countries. This is the foundation for concrete Colombian business and cooperation leads that will be presented at the end of the document. The following image summarizes these needs per region:

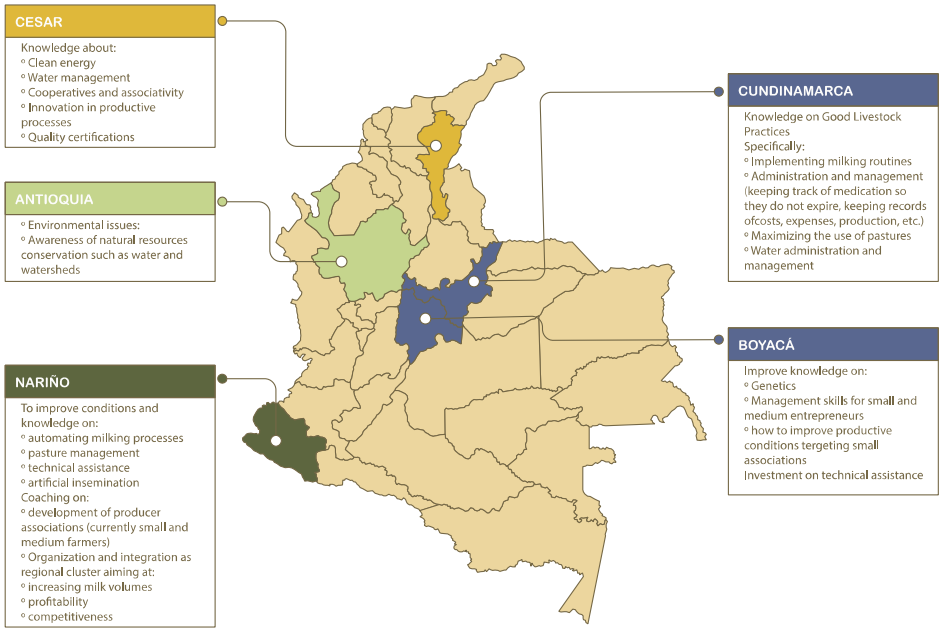


Figure 9 – Overview of identified needs per selected milksheds. Elaborated based on analysis during this research.

The following image summarizes the extent to which the regions are certified in good livestock practices. The difficulty to implement and achieve the goals proposed by the government in this regard, is evident. It is also clear how dual purpose milk producing farms are far behind compared to those producing in specialized systems.

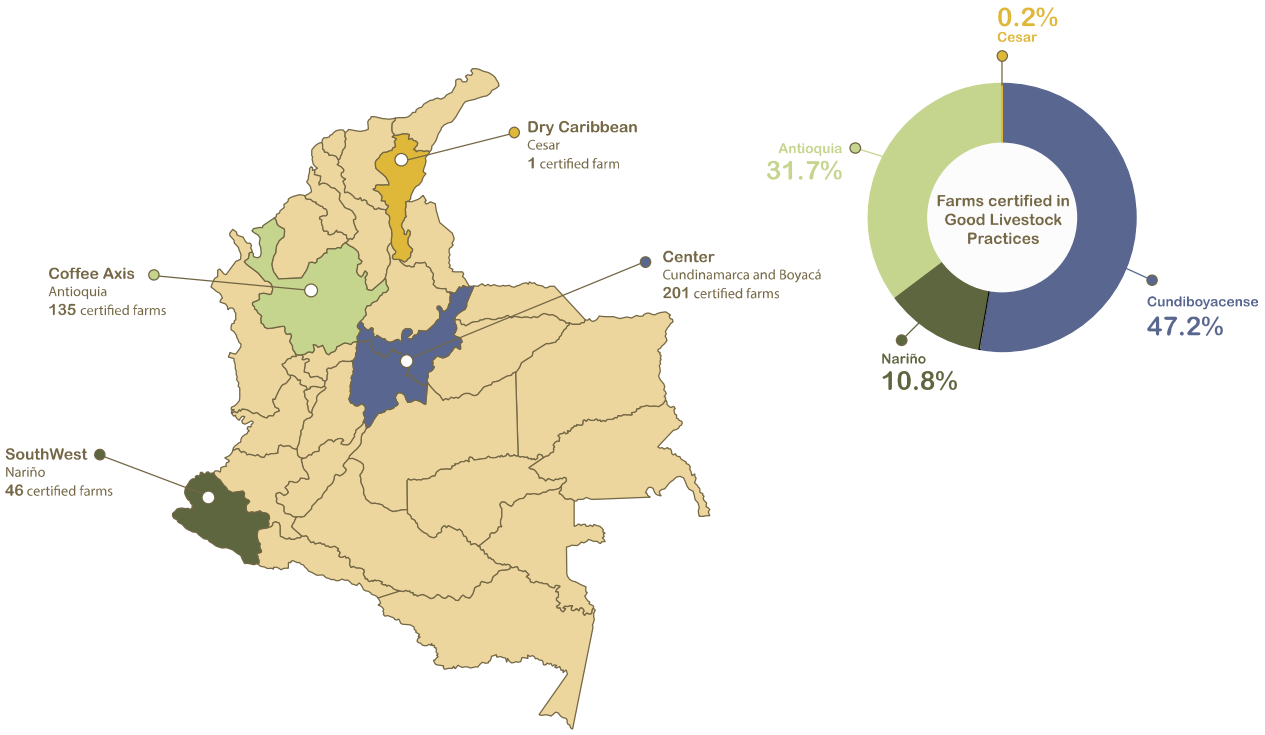


Figure 10 – Farms certified in Good Livestock Practices (BPG´s). Elaborated based on source **[15]**

3.3. Collection and Transportation

Three types of transportation systems exist in Colombia to transport raw milk from the production farm to the collection center or the processing companies:

a. **Tank trucks**. Large processing companies pick up the milk from medium or large producers directly in the farm or in the collection centers through cooled tank trucks
b. **Trucks carrying milk pails.** Producers bring the milk to the edge of the roads while still warm, stored in plastic or metal containers with a capacity of 40 liters or 140 liters. Small or medium size trucks pick it up and bring it to a collection center, or directly to rural consumers or artisanal processors. Milk is often not cooled. Also, milk produced at different farms often gets mixed into larger containers, making it difficult to accurately establish the specific hygiene quality of the various farms.
c. Farmer's own means. In some cases, small producers bring themselves the milk to the collection center in rudimentary transportation means such as motorcycles or horses, and equally rudimentary containers such as large jars or plastic bottles.

Through one of the transportation modalities described above, fresh milk reaches **collection centers** (*centros de acopio*). There exist in Colombia 3 types of collection centers [16]:

a. **Cooperative collection centers**. While milk cooperatives in the Netherlands are in charge of milk collection and processing, and dairy products commercialization, many cooperatives in Colombia do not cover all this steps in the chain. In Colombia, cooperatives are created by producers mainly with the purpose of collecting their fresh milk, cooling it and then selling it to the processing industry through **formal** / legal commercialization channels. Thanks to these cooperatives, producers reached higher volumes and improved quality.

b. Collection centers **created by processing companies**, through which fresh milk enters the **formal** commercialization channels and find its way to the processing industry

c. Collection centers **created by intermediaries**, also known as *cruderos*, (Spanish word stemming from for the term *leche cruda*, or fresh milk) or *porongueros*. These persons collect fresh milk either at these collection centers or directly at the farms, and then sell **informally** to **rural** artisanal producers, small grocery stores and consumers. In (remote) areas that are not reached by large industry, these informal intermediaries are the main commercialization channel.

Due to the "invisible" character of the informal channels, there is no exact information on how many illegal collection centers there and how much milk is being collected by these cruderos.

Regarding milk collected in the **formal** channels, 353 companies are known to collect fresh milk from approximately 175.000 medium and large milk producing farms. This imbalance in amount of suppliers and amount of buyers is made even worse by the fact that around **68% of all this fresh milk is being purchased by the 10 large processing companies** mentioned in figure 11 and in table 10 below. The low bargaining power that medium and even large milk producers face to buyers is largely explained by this unbalanced relationship. The image below shows who the largest milk buyers are and how much milk they collect.

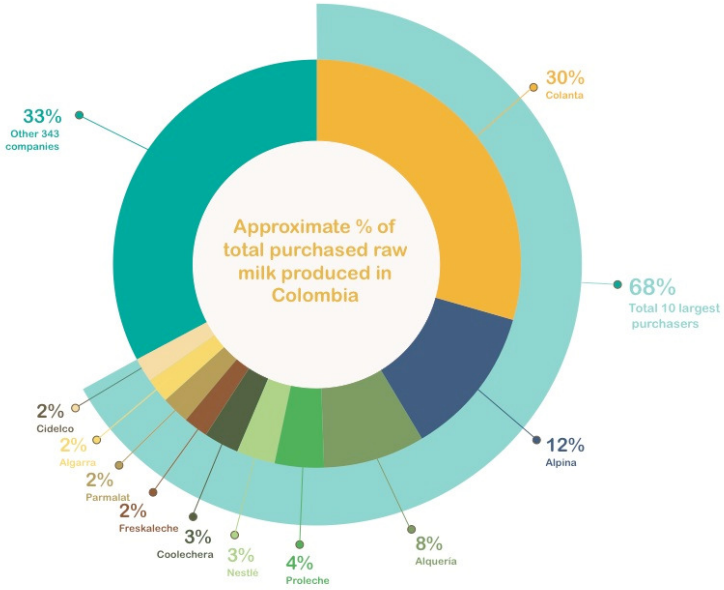


Figure 11 - Percentage of raw milk purchased by largest companies. Elaborated based on source **[10]**

Another reason for the week negotiating conditions of milk producers rely on the lack of a standardized and independent laboratory network. Currently, milk quality is often measured in laboratories that belong to the milk-buying companies themselves, which inevitably poses objectivity and standardization questions, as they use different methodologies and different levels of precision

3.4. Processing & Packaging

Although the Colombian dairy processing industry has been able to increase the added value of their products in recent years, the value they add still lags behind the national added value average. It also shows lower levels of technology than the general national industry.

PROCESSING COMPANIES SEGMENTATION

Dairy processing companies consist of pasteurization, pulverization and dairy production factories. Based on the volume of milk they process, these companies are classified as **micro** (**familiar companies**, regional artisanal processors producing mostly cheese in rural and low developed milk producing areas), **small, medium or large** (dominating the national market)**.** The following table shows these categorizations.

	SIZE	INNOVATION & TECHONOLOGY	PRODUCTION	PRODUCTS COMMERCIALIZATION	STRENGTHS	WEAKNESSES	OPPORTUNITIES FOR NL	TOP 10
LARGE COMPANIES 3%	° **Very small number** ° Large national coverage	° **Good technological level,** specially in production of liquid, dried and fermented milks **- Basic product innovation**	° **Wide variety of products** (e.g. pasteurized yogurt distributed in supermarkets)	° Wholesale - Supermarkets - Retail distributors - Own company sale points	° Capacity to invest - Support & trainning of their suppliers (producers) - Engaged in a mentality of knowledge acquisition	° Lack of product innovation compared to international (specially EU) levels - A big challenge is getting enough milk supply to grow	° **Dairy processing technology**	Colanta / Alpina / Alquería / Danone / Nestle / Proleche - Parmalat / Coolechera / Freskaleche / Parmalat / Cidelco / Coolechera / Algarra
SMALL & MEDIUM COMPANIES 10%	° **Mainly regional companies**	° **Average technological level** - Lack of product innovation - Competition is mainly based on prices rather than added value	° Mainly cheese & fermented milk	° Neighborhood small shops - Own company sale points - Direct sell to institutions and/or supermarkets (maquila or white label activity)	° Stable market - Large growth potential	° Usually do not support producers: need themselves support - Need to increase capacity - No close relation with government institutions, no power in branch organizations -Limited dairy product diversication - Lack of market strategies - In general facilities with obsolete equipment (need of refurbishment) - High number of human resorces	° Dairy processing technology - Advice on technical, innovation, marketing and business subjects	° Campo Real / Primma / Colquesos / del Vecchio / Recreo / Dona Lache / Klaren´s / Andinos de Narino / La Florida
FAMILIAR COMPANIES 87%	° **Often informal or not legalized** - Huge number in the whole country (around 4850 workshops)	° **Artisanal production technology** - Traditional products like cheses and sweets production	° Home produced cheese and artisanal dairy products sold in regional markets	° Artisanal processing farms - Local street farmer markets - Fresh markets - Farm consumption (not for commercialization)	° **Origin & traditional products**	° Inadequate hygiene conditions - Lack implementation of quality control procedures - Not complying regulations - Need significant reconfiguration	° Implement practices to improve productivity of artisanal cheesemakers	

Table 10 - Companies segmentation in the Colombian dairy value chain. Elaborated based on the research.

TOP TEN SME PROCESSING COMPANIES

The largest and most traditional processing companies mentioned in figure 11 above are obvious organizations to keep an eye on when considering entering the Colombian sector. However, there is also a large potential in the segment of small and medium companies analyzed in the previous table. These companies are less renowned than the large ones, therefore they can be more difficult to identify and assess. In this section, a selection is proposed of top ten SMEs Dutch dairy organizations should consider when seeking collaborations in Colombia.

In identifying the *top ten* SMEs of the Colombian dairy sector during this study, a selection system has been used to select the most relevant companies. A score between 1 and 3 has been given to each one of the following characteristics of the analyzed companies (where 1 means not remarkable at all, and 3 means very remarkable):

1. **Size, or significant and continuous growth.**
2. **Tradition and experience: positioning of reliable and quality products, solid tradition, know-how and experience**. Production base with potential for innovation and growth
3. **(Potential) added value.** Successfully active in a **niche, highly added value market**, or with potential new markets of this type that will be explored them in the short / medium term
4. **Investment capacity.** **Mentality to invest**, as well as the **capacity to invest**.
5. **Professionalization and level of marketing,** as evidenced through their website, attractive packaging, house style. Can be white label or own Brand.
6. **Colombian organization.** In selecting the top ten organizations, the focus has been set on originally national, rather than foreign organizations.

The previous criteria apply to processing organizations (processing cooperatives and processing companies) that are identified in the following image**.**

Figure 12 – Interesting dairy processing SMEs s to follow in Colombia

The prioritized SMEs are listed and their characteristics summarized in the following table.

Name	Town / city (Province)	Comments
1 **Lácteos Campo Real**	Bogotá (Cundinamarca)	- Obtained certification of Good Innovation Practices (2013) from COLCIENCIAS, ICONTEC and Chamber of Commerce - First dairy producer company to obtain this certification - Small but very competitive . Niche market ("pera" cheese and other high quality cheeses)
2 **Lácteos Primma**	Chía (Cundinamarca)	- One of the few companies that applies sustainable and responsible production practices - Products characterized by not having preservatives, hormones or antibiotics - They have their own milk producing farms
3 **Planeta Rica**	Planeta Rica (Córdoba)	- One of the few companies producing buffalo milk and products - Located in Córdoba, province with the highest population of buffalos in the country - Already selling in wholesale supermarkets and willing to export - Currently transforming only 1000 lts of milk but with capacity for 20.000 lts
4 **Colquesos**	Medellín (Antioquia)	- Founded in 1988, focus on marketing cheese from the Colombian Caribbean coast - Obtained three distinctions in the National Contest of Cheeses from the National Council of Quality of Milk and Prevention of Mastitis (CNLM 2012) - Winner with the following products: Suero Costeño, Traditional cheese Momposino, Mozzarella cheese with spices
5 **Del Vecchio**	Bogotá (Cundinamarca)	- Specialized in producing and marketing Italian-type cheeses - One of the first national companies to focus in a specific niche market - Recently growing and opening own distribution points around Bogotá (9 in total). Also selling on-line
6 **Recreo Productos Lácteos**	Zipaquirá (Cundinamarca)	- Founded 30 years ago. Performs quality tracing of their milk and other diverse products - Provider of multiple government institutions as well as restaurants and vending machines, a strategy that allows a constant growth
7 **Doña Leche**	Ubaté, Bogotá, (Cundinamarca)	- Started in 1969 buying and selling milk. Some time later they started a cooling centre and after that they built a processing plant - Due to its excellent quality, they are suppliers for Wyeth laboratories, producers of baby milk - Currently 3 distribution points in the cities of Bogotá, Girardot and Ubaté
8 **Klaren´s**	Valledupar (Cesar)	- Created in 1984. Currently supplying mainly local market and gradually expanding to national market - Specializes in products from the Colombian Caribbean coast - Currently supporting Alpina to enter to Colombian Caribbean coast market
9 **Lácteos Andinos de Nariño**	San Juan de Pasto (Nariño)	- Founded in 1984. Currently processing 18.000 liters of milk - One of the few dairy SME´s from the region -Received in 2014 consultancy from PUM experts program from the Netherlands
## **La Florida**	Puerto Rico (Caquetá)	- Founded in 1998. Producing artisanal cheeses and distributing in the city of Cali (province Valle de Cauca) and 12 other cities in Colombia - Started with a focus on institutional clients, bakeries, restaurants, cheese distributors - Small and growing

Table 11 - Interesting dairy processing SMEs to follow in Colombia

In the above ranking, some of the companies are identified based on their size, tradition and processing capacity. These companies are interesting as targets to provide consultancy and support in multiple areas, especially in their processing plant design and production processes with the objective of increasing efficiency. These actions may lead to acquisition of adequate equipment and Dutch technology.

Other smaller processors are considered interesting based on their efforts to generate added value and consequent growth. These companies are dynamic and somehow innovative. They are interesting as targets for support innovation processes and new product development as well as specialized or customized equipment and consultancy from the Netherlands. They have also the potential of becoming local partners in Dutch-Colombian join ventures for new products to be launched in Colombia

and the rest of Latin America. Given the fact that most of these companies are located in the province of Cundinamarca, other regions like Nariño are worth considering for reaching unattended markets.

3.5. Distribution & Commercialization

Distribution of dairy products in Colombia to final consumers is done by various types of channels determined by the location and degree of urbanization of the target customers. These channels are:

- Artisanal processing farms. Rural consumers buy their dairy products directly at the dairy farms. These channels are often informal channels.
- Neighborhood small food shops (*tiendas de barrio*). Rural and urban low income consumers buy dairy products in these shops
- large urban wholesale intermediaries (including large agricultural supply centers, or *centrales de abasto* selling to other distributors)
- street farmers markets
- retail distributors (large supermarket chains, hypermarkets á la Sligro / Makro, etc., specialized stores)
- Sale points of medium / large processing industries selling their own brand
- Institutions, buying for poverty assistance programmes, army and hospitals

Industries work with both wholesale intermediaries - which in turn sell to retail channels - as well as with retail channels directly. While in the past Colombian dairy processing companies were largely dealing with small local stores and had the highest power in these negotiations, nowadays large national retail companies that have replaced small local stores have the highest negotiation power.

An innovative distribution channel was recently created by dairy processing company Lácteos El Pomar. Created in 1953 and traditionally a white label processing company, or maquiladora, El Pomar has recently renewing its processing plant and creating its own brand. In 2013 the company launched a new distribution channel consisting on bringing its products – whole milk, no-lactose milk and whole yogurt – directly to low income households and owners of small food shops, or tiendas de barrio. The products are delivered through cooled carry-on containers easy to pull by the company's commercial representatives who walk up the streets in low-income neighborhoods to reach households and shops [17].

Figure 13 – *Representatives of El Pomar ready to walk and deliver dairy products to households and small food shops. Source of the photograph:* **[17]**

The commercialization of milk in Colombia faces a challenging issue: smuggling practices of powder milk coming mostly from Venezuela. In the first half of 2013, 96 tons were smuggled into the country representing a value of 1.130 million COP (almost 400.000 Euro).

Another type of "smuggling" sometimes takes place though misuse of trade agreements made with

other countries. In these practices, powder milk get imported into the country in amounts that exceed the amounts for which zero tariffs are applicable, but still enter the country at zero tariffs. The companies purchasing this powder milk then re-hydrate it and sell it in the market at lower prices than national fresh milk.

3.6. Consumption

Due to the variety of geographical regions, cultural habits of their populations and consumers' levels of income, there is no homogenous characterization of Colombian consumers of dairy products.

Low income populations in (remote) rural areas consume raw milk – which they boil themselves at home – and locally artisanal cheeses mostly commercialized in the informal market. Low income populations in urban areas consume milk and fresh cheese bought in small food shops. This milk is for a large part pasteurized (more than 82% of small food shops sell milk that is pasteurized [10]) and comes from medium and large processing companies.

Medium and high income customers consume different kinds of pasteurized milk, as well as more sophisticated dairy products like matured cheese, yogurts and desserts. This segment buys these products from large food stores (supermarkets and hypermarkets à la Makro).

LOCAL CONSUMPTION OF MILK

Colombia is the **ninth milk consumer market in the world**. Almost half of the Colombian population consumes milk daily [10]. The internal milk consumption average in Colombia is around 140 or 145 liters per person per year, figure which is lower than the recommended by OMS, which ranked 170 liters/year [18] [19]. According to FEDEGAN (2013), the demand for milk is concentrated in the upper socioeconomic levels, with an average of 179 liters/year, number that exceeds the OMS recommendation. In low income populations, consumption levels are as low as 35 liters or less, as seen in the following image.

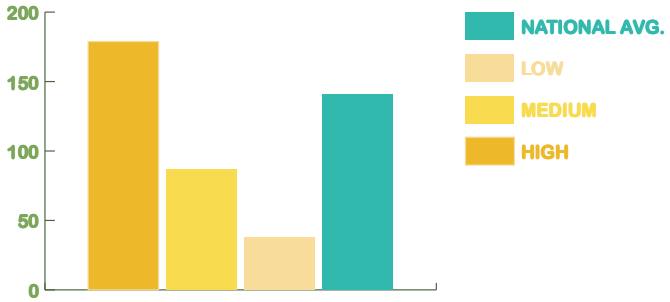


Figure 14 - Milk consumption per income level (liters per capita in 2012) **[10]**

From the previous graph it can be concluded that the low-income population consumes less than one liter of milk per week, an average of half a glass per day. This is mostly raw milk that is boiled in the household.

However, certain low income areas do have access and consume pasteurized milk. According to CNL, more than 65% of pasteurized, long-life milk and powder milk was consumed in 2010 by low and medium income consumers [10]. As the general Colombian economy continues growing and poverty levels continue decreasing the average consumption per capita is expected to grow. The milk market in the country has therefore **high potential**, resulting from the 30% Colombian low income population

(approximately 14 million people) who do not frequently consume milk. Processing companies, often in joint initiatives with organizations as FAO, are executing programs to stimulate milk and dairy consumption in Colombia [19], and in this way, aiming at developing the huge existing potential consumption latent in the country.

LOCAL CONSUMPTION OF OTHER DAIRY PRODUCTS

Dairy products consumed in Colombia are mainly the ones illustrated in the following image:

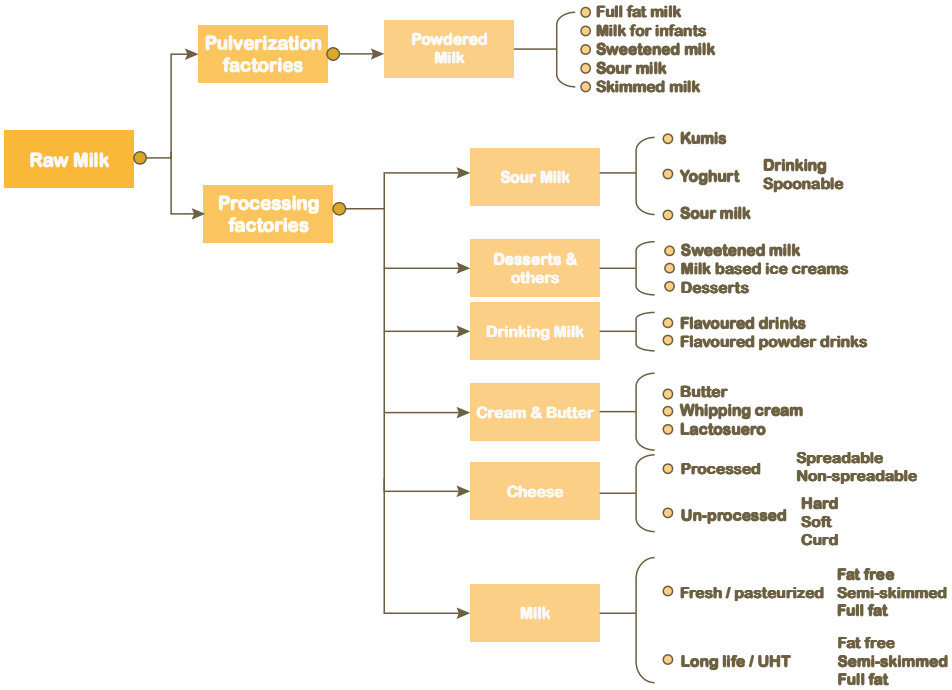


Figure 15 - Dairy products consumed in Colombia. Elaborated based on the research.

Besides pasteurized milk, other dairy products developed by the industry are mainly aimed at medium and high income niches of the population. There is a lack of convenient and diverse options for populations with lower income. This can be reflected in the following image, where it is clear that there are few options for this population regarding cheese, yogurt and desserts:

Figure 16 –Dairy products consumed per income level in Colombia

Lactosuero is a dairy product that is since recently being commercialized in the Colombian dairy market. It is a combination of milk and milk serum, and is sold in the liquid and also the powder form. It has lower nutritional value than milk, but is sold at lower prices. But more importantly, its packaging presentation is not completely clear to the consumer, who is not always conscious that he/she is buying a milk-serum drink instead of pure milk. There is currently no normativity in Colombia that regulates the way the product, its composition and its differences with respect to real milk, is communicated to consumers. Nor is there regulation in terms of the composition that this milk substitute should have in order to offer nutritional values that are comparable to those offered by milk [10].

Regarding cheese, the following picture shows the various types of artisanal and traditional cheeses produced in the country:

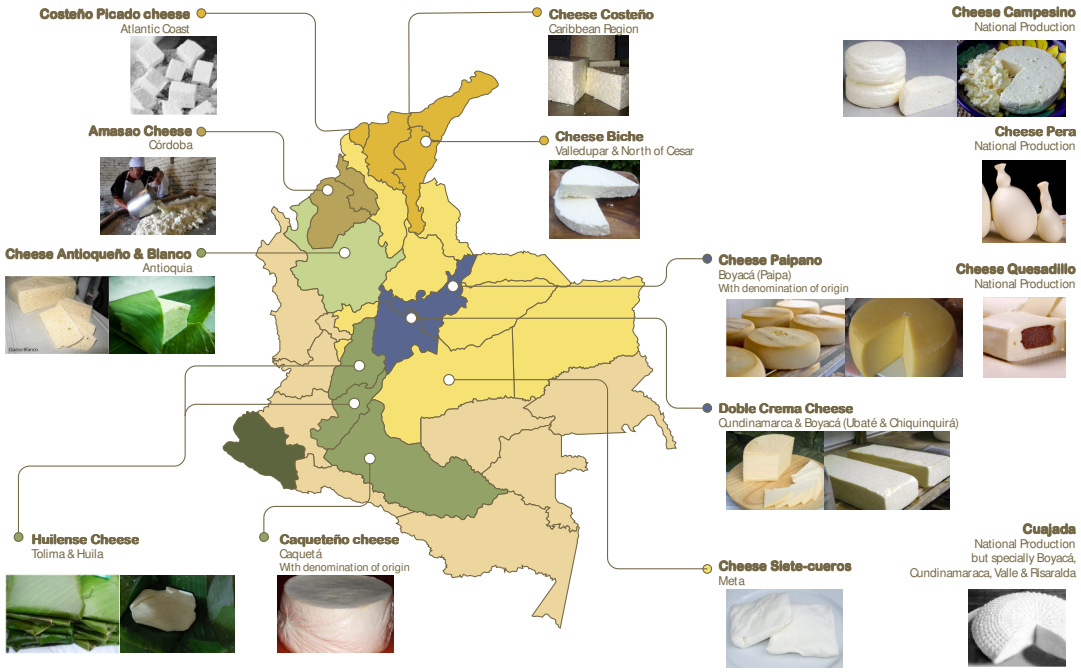


Figure 17 –Colombian cheeses per production area

EXPORTS OF MILK AND OTHER DAIRY PRODUCTS

The following image shows the history of Colombian dairy exports from 1995 until 2014.

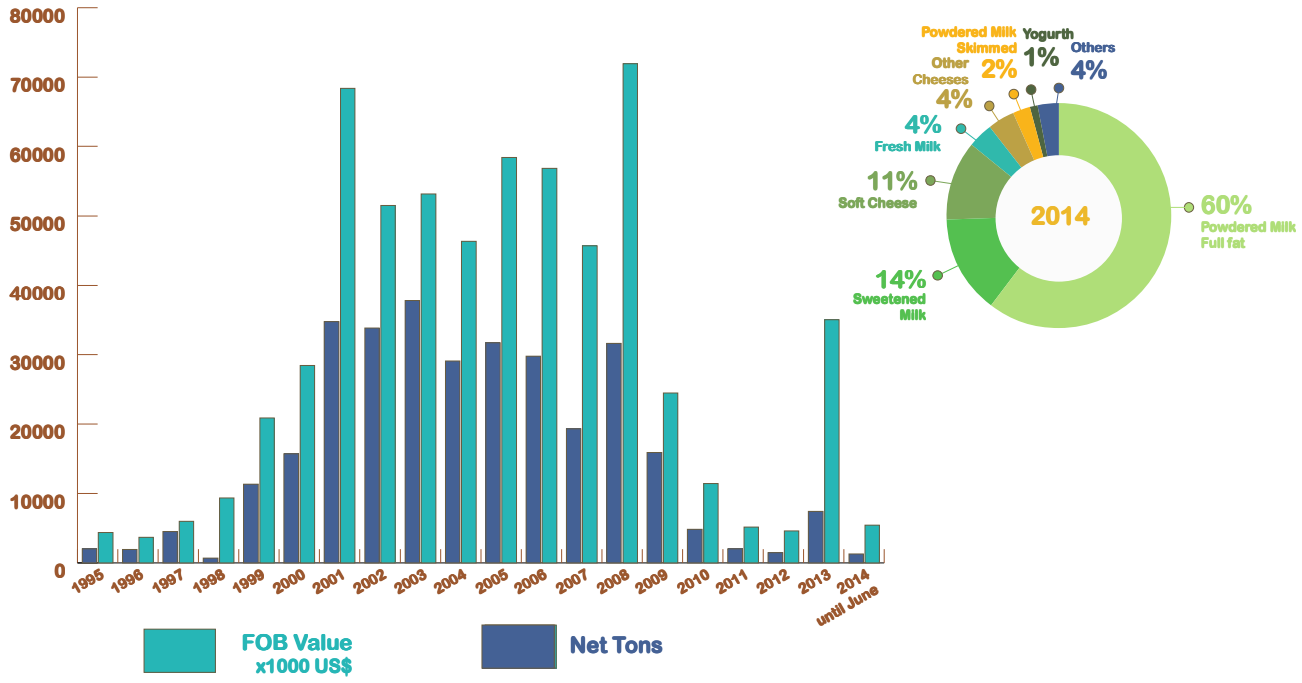


Figure 18 - History of Colombian dairy exports from 1995 until June 2014 and exported Colombian dairy products from January until June 2014. Elaborated based on source **[20]**

Colombian dairy exports had a boost in the year 2001 and remained at comparable export amounts but considerably higher prices until 2008. The exported Colombian dairy products in those years were [21] [22] concentrated powder milk (around 94% of dairy product exports going to Venezuela), (fresh) cheese (around 4%) and milk serum (2%). However, exports suffered a steady decrease since the year 2009, reaching a dramatic trade balance in the year 2012. The products with the most decreasing exports were non-concentrated, unsweetened powder milk, with an export fall of 99%, and (fresh) cheese with a fall of 91%.

The most important reason for the free fall of Colombian dairy exports between 2008 and 2012 was the **reduction of trade with Venezuela.** The trade agreement with Venezuela went through a crisis since 2006. Exports from Colombia to Venezuela dropped in many sectors. This, added to the offer of lower price products from competitor countries, made exports to Venezuela reach the bottom in 2009. In 2011, a new agreement between both countries was reached that started implementation in 2012, year in which milk exports to that country started to raise again, pulling general Colombian milk exports upwards.

Another aspect that influenced exports was the **climate:** extreme rains and overflowing. Colombia went through periods of intensive rains between 2010 and 2012, which enormously affected the agricultural production in general, including milk production. Many animals drowned and many others reduced productivity, shrinking the production of farms significantly.

In 2012 exports started to increase again. As a matter of fact, while total exports reached 4,6 million USD in 2012, they amounted 35 million USD in 2013, or more than 7 times more than in the previous

year. However, in the first half of 2014, exports had only reached almost 5,5 million USD, which predicts a low year with respect to 2013 again.

In the last years, Colombian dairy exports have historically concentrated on the countries indicated in the following pie charts:

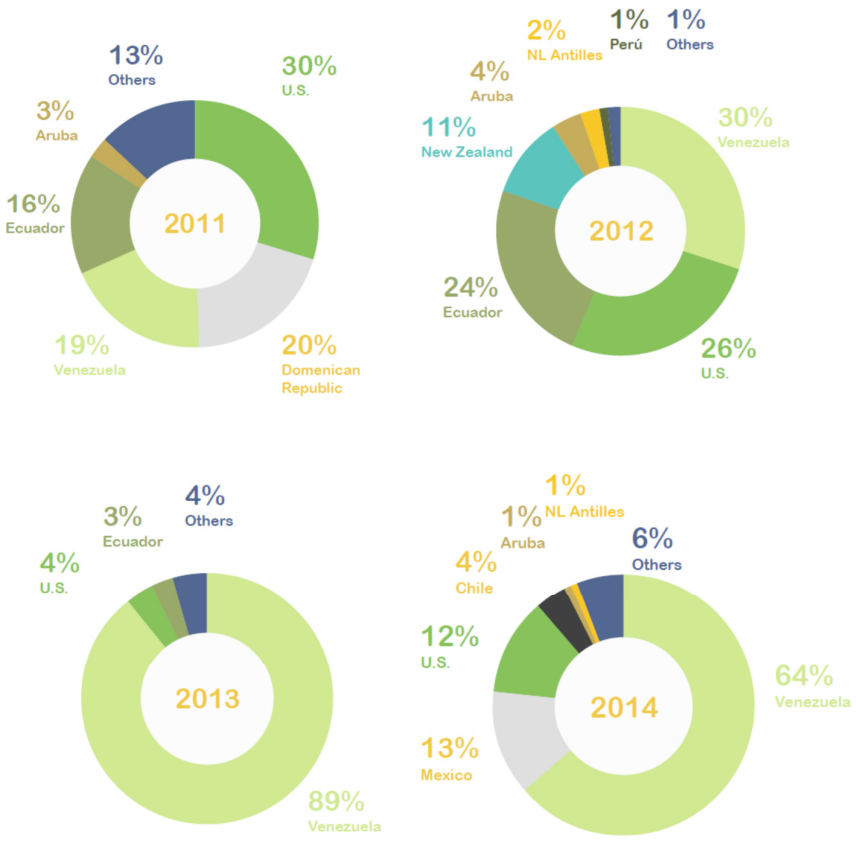


Figure 19 – Destination countries for Colombian dairy exports in recent years. Elaborated based on source **[20]**

Concentration of exports on few products (powder milk and condensed milk) and in a few countries (like Venezuela), brings again a significant risk which could be reduced by diversifying product and exports markets. It is possible to Colombia to export to other countries like Mexico, Chile, Peru and new destination regions such as Middle East, North of Africa and Russia, Belorussia and Kazajistan [1] [23]. However, low competitiveness in the Colombian sector makes it difficult to compete with other countries exporting to these locations.

THE IMPLEMENTATION OF FREE TRADE AGREEMENTS (FTA)

With the initiation of FTAs, certain amounts of dairy products can be imported with zero imports tariffs. Colombia has implemented these FTAs with countries/regions like Chile, Peru, the United States, the EFTA countries (Norway, Switzerland, Iceland and Liechtenstein) and the European Union.

Since the start of the FTA with the US, for example, Colombian exports to this country of dairy products like milk, yogurt, *lactosuero*, cheese and butter have increased. However, between January and September 2013, Colombia had sent to the US only about 2% of the amount that may be imported tariff-free in the US, while this country had sent to Colombia already 42% of its dairy tariff-free quota [24].

Regarding the FTA between Colombia and the EU, this agreement started implementation in August 2013. One month later, the EU had already exported almost 0,5% percent of its tariff-free quota of 4421 tons of cheese and other dairy products for the last 5 months of 2013. Contrarily, in that period Colombia had not yet exported any amounts of the condensed milk and yogurt that the country is allowed to export with zero-tariffs to that region [24]. In spite of the fact that Colombia is allowed to export 42 tons of condensed milk and 42 tons of yogurt with no tariffs to that region, a high barrier to reach those exports is the non-compliance to phytosanitary and traceability requirements imposed by the EU to food and particularly dairy imports (regulations that are stricter than when exporting to the US). Exports to the European Union require imported milk to be free of elements such as antibiotics, heavy metals, pathogens and other contaminants. Currently, there is no system in Colombia that can effectively measure these elements in the milk and most other products, which prevents exports to the EU in spite of the FTA.

In order to fully benefit from FTAs, and to protect itself from (external) risks impacting dairy exports, it is crucial for Colombia to increase competitiveness face to dairy competitor countries, develop the measurement systems that determine its levels of sanity and food security, and make sure its milk fulfills such destination regions' requirements.

IMPORTS AND MAIN IMPORTERS

The following image shows the history of Colombian dairy imports from 1995 until June 2014.

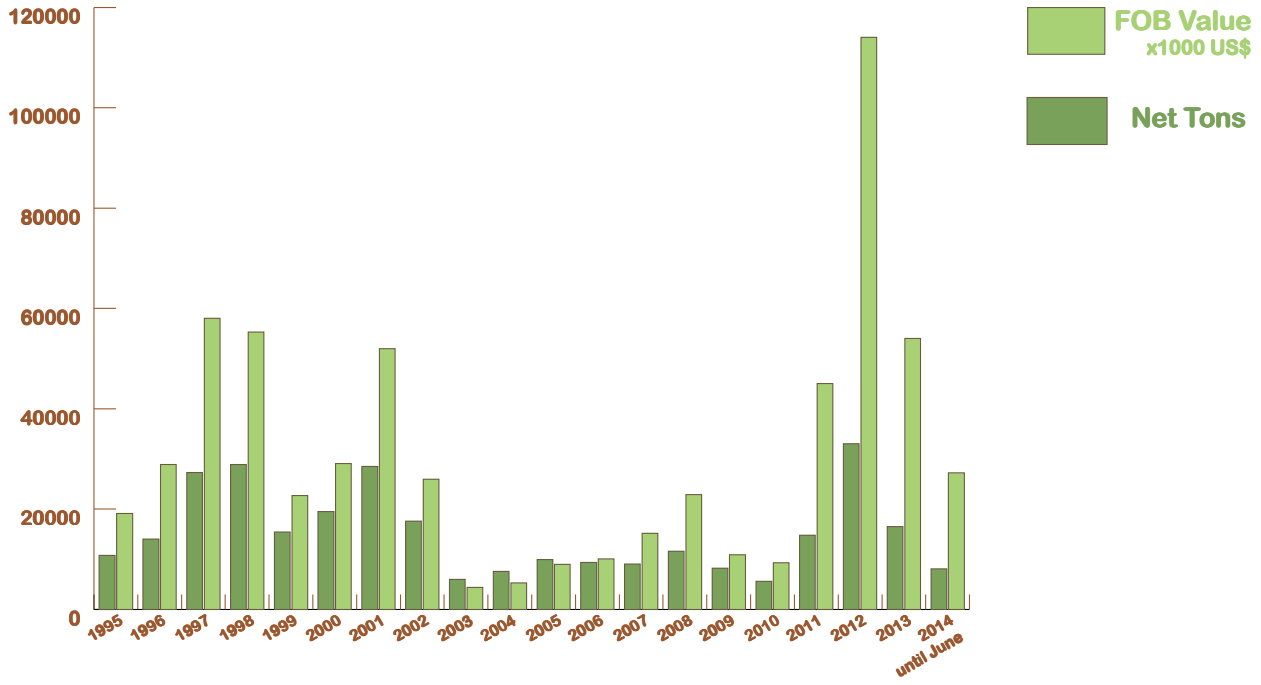


Figure 20 - History of Colombian dairy imports from 1995 until June 2014 **[20]**

Imports in the last years come mainly from:

- United States (total proportion of imports from this country increased 4% in 2011, 14% in 2012 and 47% in 2013)
- Argentina, Chile, and Uruguay, main suppliers to Colombia in 2011 (with an imports proportion of 37%, 30% and 11% respectively), but largely displaced in 2013 (with an imports proportion of 4%, 11%, 4%)

- Spain and Czech Republic, which thanks to the new FTA, accounted for 5% and 2% of the imports respectively between January and June 2014

Amounts doubled and import prices more than doubled from 2011 to 2012. This increase was due to increased imports from Ecuador and especially from the US - around the time that the FTA with that country started implementation – thanks to low international prices of powder milk.

A list of main dairy product importing companies is shown in the following table:

Company	Imported product	Percentage that the company imported out of the total product imports (2013)
ROSMI	Whole and low-fat powder milk	23%
NESTLÉ	Low-fat powder milk	33%
ALGARRA	Low-fat powder milk	25%
GESTIÓN CARGO ZF	Low-fat powder milk	20%
CI SOUTH COMMERCE GROUP	Whole powder milk	21%
DONUCOL	Milk serum	64%
INGREDIENTES Y PRODUCTOS FUNCIONALES	Milk serum	23%
ALIMENTOS LEYLA	Milk serum	18%
CENTURIÓN FOODS	Various types of cheese (fresh, grated, other)	Fresh cheese 51%
PJ COL	Various types of cheese (fresh, grated, other)	Fresh cheese 11%
PRICESMART	Various types of cheese (fresh, grated, other)	Fresh cheese 11% Grated and other types of cheese 23%
ARCOS DORADOS COL and/ or FRANCHISE SYSTEM COL	Various types of cheese (fresh, grated, other)	Grated and other types of cheese 38%
ALMACENES ÉXITO	Various types of cheese	Various types of cheese 74%
AXIONLOG	Various types of cheese	Various types of cheese 37%
PREMIUM CHOICE	Various types of cheese	Various types of cheese 25%

Table 12 – Main dairy products importing companies in 2013. Elaborated based on source **[4]**

A graphic summary of the Colombian dairy trade balance is shown in the following image.

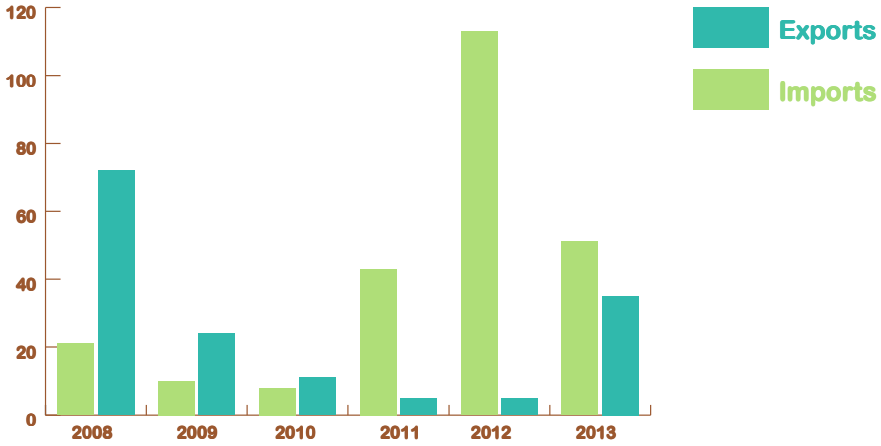


Figure 21 – Imports and exports of the Colombian dairy sector. Elaborated based on source **[21]**

3.7. Challenges in Colombia and opportunities for the Netherlands

All challenges discussed in the previous sections describing the various steps in the Colombian dairy value chain, are summarized in the image below.

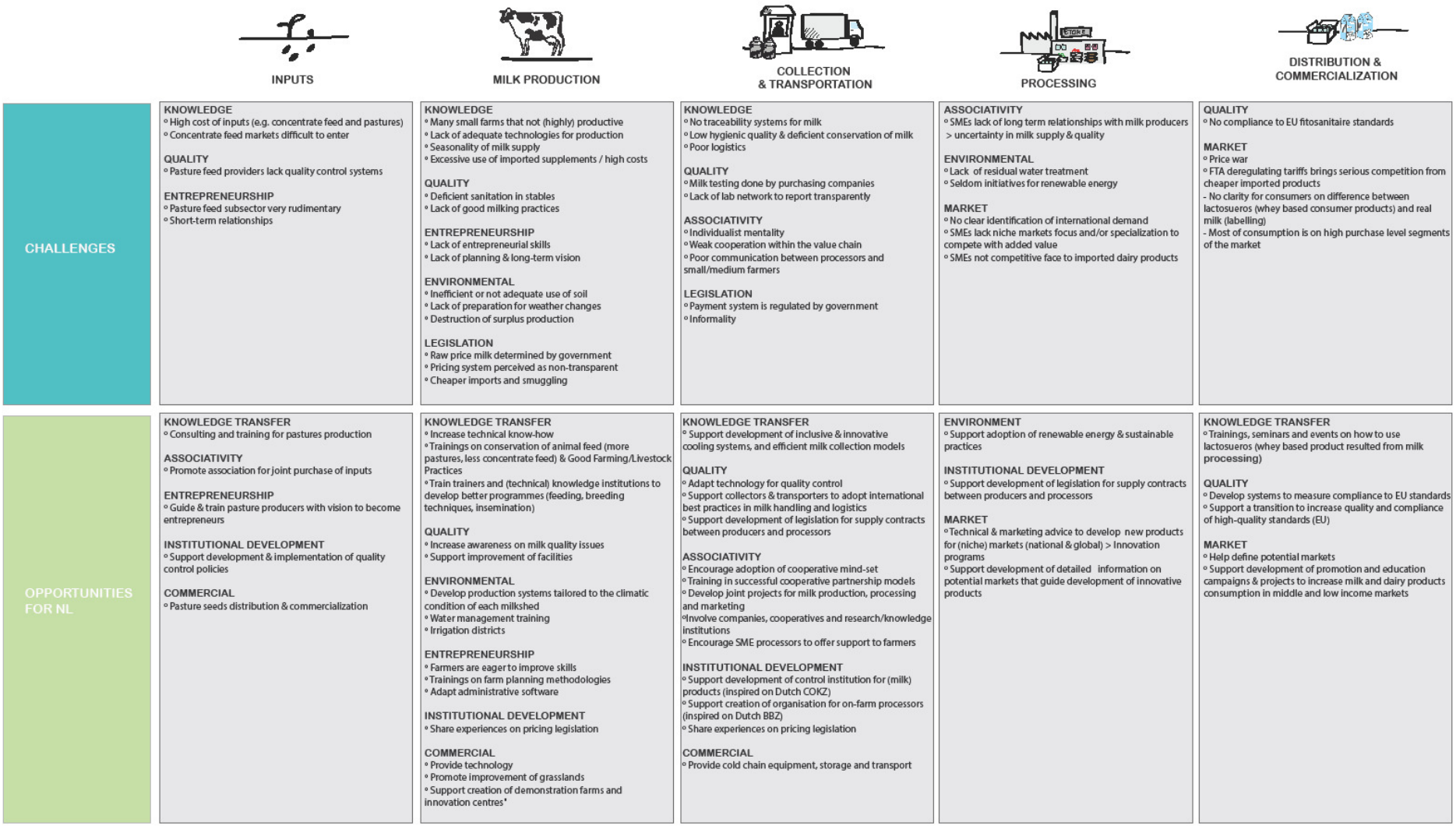


Figure 22 – Vertical challenges in the Colombian dairy value chain. Elaborated based on the research.

In addition to that, there are horizontal challenges that impact various steps of the chain are described (horizontal challenges). These horizontal challenges are for a large part related to environmental aspects and associativity aspects.

The challenges are:

- the dairy sector does not have a policy for environmental aspects of production

- producers are unaware of the impact or optimal utilization of natural resources involved in production processes

- lack of information systems to measure the environmental impact of activities in the dairy sector

- absence of well-developed logistics, especially with the collection centers

- lack of clear policies that help achieve the advantages of associativity. Such policies should take into account others the type and most convenient use of the soil and the vocation of the producer

- there is no adequate productive and associative model for the dairy sector

- low investment in research and development

- smuggling

- lack of integration among the links of the chain

4. Stakeholders along the Colombian dairy value chain

Stakeholders in the dairy value chain are mainly institutions, sector organizations, knowledge institutes and financing institutions. The productive actors – milk producers and milk processors – are also important stakeholders to the chain. In the following image, the Colombian dairy value chain is represented indicating the most relevant stakeholders to all the steps in the chain (a description of these entities is provided in Appendix II):

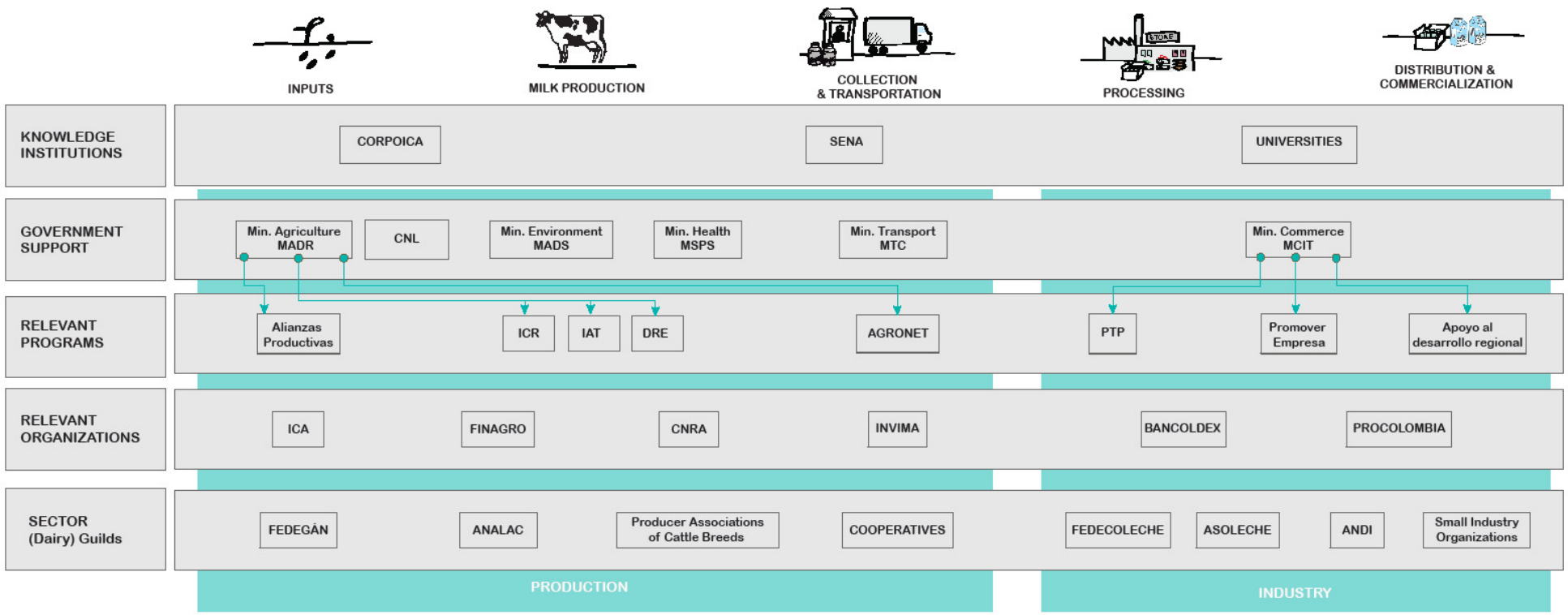


Figure 23 – Colombian dairy value chain with relevant stakeholders per step

The relationships and productive interactions between these stakeholders are not always close or well articulated in Colombia. Regarding knowledge institutes and their relationships to the commercial actors, the views of most parties that were interviewed for this study coincide in that there is an enormous gap between universities / knowledge institutes and milk production farms and industry: research results do not reach their application in the field, and many projects progress in misalignment with the reality of the country. In addition to this, there is a general perception that organizations in the sector are generally working in isolation and in an unarticulated manner.

STAKEHOLDER ANALYSIS

Any initiative coming from the Dutch dairy sector in Colombia should try to align with the goals and strategic plans of the Colombian dairy stakeholders. However, which stakeholders to work closely with will depend on the kind of initiative: commercial, cooperation, knowledge or government based. In designing a strategy to deploy activities in Colombia and select the most adequate stakeholders to approach, it is useful for Dutch organizations to understand:

- the degree of interest of that Colombian stakeholders might have to work with Dutch counterparts in commercial or cooperation projects aiming at developing and professionalizing dairy sector
- the degree of influence that these stakeholders might have in the success of these initiatives

As a means to support Dutch organizations in such a strategy design process, a stakeholders analysis is presented in Appendix IV. This analysis is based on the research that has been carried out in terms of Colombian stakeholders' strategic plans and their role in the dairy value chain

FINANCIAL STAKEHOLDERS

Colombian investment is crucial for the success of the implementation of Dutch-Colombian initiatives. Financial stakeholders that should be considered are (see definitions in Appendix II):

- Banco Agrario, state owned bank focused in financing agricultural projects in Colombia[1]
- Finagro, government fund for the financing of the agricultural sector
- CNCA, National Comission for Agricultural Credit
- Bancoldex, Colombian Foreign Commerce Bank
- INNPULSA, subsidy program financing innovative products or services developments

In addition to Colombian financial stakeholders, international financing organizations should be considered such as:

- World Bank - International Finance Corporation
- European Investment Bank (EIB) and European Investment Fund (EIF). This finance institution financed in 2013 projects in Latin America for 1.2 billion euros, out of the total 71 billion euros they allocated in loans for projects [25].
- Inter-American Development Bank

Interesting current development: Rabobank and Banco Agrario

Following the recommendation of Queen Maxima, Banco Agrario (BA) initiated contacts in 2014 with Rabobank in order to discuss the possibility to start a collaboration in which the Dutch bank would coach BA into becoming an organization that is perceived as a real partner for the Colombian

[1] One of the most striking findings of the current study is the significant lack of trust that the Colombian dairy sector has in agricultural financing institutions, especially Banco Agrario (BA). The sector in general does not feel supported by this entity, and small milk producers in particular feel BA's existing financial lines inaccessible. This situation seems to be not only applicable in the dairy sector but in order agricultural sectors as well.

agricultural sector. Last November, both entities signed a MoU during the Dutch economic mission that visited Colombia led by Dutch minister Ploumen. This collaboration brings opportunities for Rabobank to enter the country with financial services, besides development and CSR activities like the ones being carried out by Rabobank Development and Rabobank Foundation. In addition to this, this can lead in the medium term to Dutch dairy companies discover interesting investment opportunities in the Colombian sector, from which new joint ventures and other kinds of partnerships can flourish.

5. Government policy and dilemmas

The negotiation of a new Free Trade Agreement with the European Union opened an interesting window of new commercial opportunities for Colombia, but also a window of new challenges in the international arena. **Small and medium milk producers in particular** became exposed to a highly competitive and efficient European dairy sector. Competing with it has shown to be difficult for Colombia due to relatively high production costs, low productivity and efficiency, and lack of compliance to the European sanitary and traceability requirements.

Conscious of this risk, the Colombian government and dairy sector initiated the design of a new policy for the competitiveness development of the sector, currently embodied in the CONPES. In addition to that, conversations were initiated with the European Union that resulted in a cooperation agreement for EU financial support for the implementation of this policy during 7 years.

The following sections elaborate on these developments and the designed / updated policies.

5.1. CONPES 3675: National Competitiveness and Productivity Policy of the Dairy Sector

The CONPES 3675 document embodies the National Competitiveness and Productivity Policy of the Dairy Sector. This policy determines concrete strategies and activities aimed at achieving its 5 objectives [6]:

1. To reduce production costs of the primary production steps of the chain in the main dairy regions, by incorporating technological advances and implementation of innovative production processes

2. To promote associative and horizontal and vertical integration schemes in production areas to achieve economies of scale and strengthen the negotiation power for production, processing and commercialization of products of high added value

3. To increase competitiveness through development of productive clusters, in such a way that the areas with competitive advantages for milk production receive investments and reach optimal conditions for its development

4. Expand and supply domestic as well as international markets with quality dairy products at competitive prices to improve the profitability of the whole chain

5. Strengthen the governance and institutional support of the sector, in terms of availability of information and legal control of the authorities in the production and marketing of milk and its derivatives

CONPES involves also guidelines that are present in FEDEGAN's Livestock Strategic Plan from 2006 to 2019: PEGA 2019 *(Plan Estratégico Ganadero).*

The CONPES policy as a whole involves productive elements as well as sanitary regulatory elements for production, export and imports [6]. However, no environmental policy exists as such for the dairy sector (see section CSR Aspects – ENVIRONMENTAL).

5.2. CNL Dairy Chain Competitiveness Agreement

In order to align its strategy and activities with the new Colombian dairy policy, the Colombian Dairy Value Chain organization CNL, updated its strategic plan in December 2010 This new strategy is called the CNL Dairy Chain Competitiveness Agreement, and is the organization's strategic plan for the period 2010 until 2015 [26]. It is based on 7 pillars:

1. **Modernization of technologies and integration.** Targets include:
creation of a specialized center for the dairy productive chain / increasing the cooling network and sanitation capacity / increasing the offer of educational programs and education level of workers in the chain

2. **Formalization of the chain.** Targets include:
reaching certain levels of milk sanitation / good practices certification of milk producing farms

3. **Price system, quality and functioning of the markets.** Targets include:
creating a fresh milk pricing system based on quality / creating the corresponding laboratory network

4. **Development of clusters.** Targets include:
developing productive clusters of international allure

5. **Promotion of consumption**

6. **International markets development.** Targets include:
developing new export markets

7. **Institutional strengthening**

.

5.3. The Agriculture Pact (*Pacto Agrario*)

As a response to the claims and strikes performed in 2013 by various agricultural sectors - including the milk production sector –, who demanded solutions to previous structural problems and new challenges brought about by recently signed FTAs, the Colombian government and the involved sectors agreed on seeking more participation from the agricultural sector and consensus regarding rural development approaches. In order to implement the agreed points, the government is working of a 10-year plan for investments. The Agriculture Pact positions itself as an important means for promoting initiatives, activities and programs for rural development approached reached through participation and consensus.

6. Investment and Cooperation programs on the sector

COOPERATION PROGRAMMES

In the context of the negotiation for the FTA between Colombia and the EU, the European Commission and the Government of Colombia signed an agreement in the EU committed to a total of 30 million euros during a period of 7 years (2012-2019) to support the implementation of the CONPES policy. This agreement is meant to help Colombia become more competitive and in this way take more advantage of the new trade conditions approved by the FTA.

In addition to the financial support from the European Union, other international cooperation projects stand out:

- Implementation of Silvopastoral Systems for the Nariño province, financed by the government of **Spain**
- Cooperation project from the **New Zealand** government of around 6000 million COP (around 2 million Euros). The project aims to train technical consultants who can advise milk producers in the planning and management of their productive system. Currently the New Zealand private sector and MADR (through the organization CORPOICA), are implementing a pilot project on tropic highlands dairy systems in a research center in Nariño called Obonuco [27]
- Agreements between FAO and FEDEGAN conducted in 2014 for technical assistance and technology transfer in milk production for $ 27,500 million COP (around 9 million Euro), benefiting 19,240 livestock farmers nationally [28]
- Sustainable Livestock project, implemented by FEDEGAN with the support of the World Bank and the UK (please refer to section CSR – ENVIRONMENTAL in order to know more about this project)

Since 2012 MADR - supported by APC - has been organizing the cooperation received from the above countries through the figure of a Sector Cooperation Table *(Mesa Sectorial de Coordinación de Cooperación).* The Netherlands is at the moment not part of this Cooperation Table, since the country is not involved in any bilateral project on the Colombian dairy sector.

In relation to the above, the Holland House (Dutch-Colombian Chamber of Commerce located in Bogotá), is currently planning to initiate a bilateral platform to connect the agricultural sectors of both countries: ***Agriplatform***. Agriplatfom is conceived as an umbrella organization to include sub-modules, or sub-platforms, for particular sectors such as horticulture (fruits and vegetables), agroindustry, potato, and dairy. This initiative, as well as the realization of this dairy study on the part of RVO, can be seen as a first step of interest of the Netherlands to explore opportunities for the Dutch sector in Colombia.

GOVERNMENT INVESTMENT

MADR

MADR has invested resources for the development of productivity and competitiveness of the agricultural sector with a progressive emphasis on the dairy sector. Focus areas for investments are technical assistance for educating technical and professionals in dairy sector, and economic incentives for rural development in productive activities of the dairy sector.

		2011	2012	2013	2014
MADR Investment	**Million COP**	**$22.000**	**$20.732**	**$ 87.952**	**$77.688**
	Million EUR	**€8**	**€7**	**€30**	**€27**

Table 13 – MADR Investment in development of productivity and competitiveness of the agricultural sector, with a progressive emphasis on the dairy sector.

Out of MADR's total investment budget, budget allocation for to the dairy sector has increased from 2% to 6% from 2011 to 2013.

MCIT

In order to support the value chain steps of milk processing and transformation, and stimulate dairy products development, the MCIT has made progress on [2]:

- Increase in $663,040,000 million pesos its budget for support of activities in the dairy sector
- A budget of $1.773.000.000 COP (around 612.000 Euro) has been allocated for technical assistance, consultancy and training for program implementation of the Route Maps Program in the provinces of Cesar, Nariño and Boyacá.

INCENTIVES FOR PRIVATE INVESTMENT

The dairy sector is one of the sectors benefiting from the Colombian Free Trade Zones regulations (*Zonas Francas*). A dairy foreign company can start activities in any region of the country and request the Free Trade Zone status, enjoying benefits in income tax, VAT tax and exports through trade agreements with other countries / regions.

Requirements to apply for the Free Trade Zone status consist on making investments for 20 million USD (approximately 17.6 million EUR) and generate at least 500 new direct or indirect jobs [29].

DUTCH DAIRY-RELATED COMPANIES ACTIVE IN COLOMBIA

Dutch dairy organizations, or organizations providing inputs for the dairy sector that have done business in Colombia include:

Equipment providers:

Tetrapak Processing Systems: cheese processing equipment sales and installation / **Relco:** active with equipment for powder milk production through their sales office in Brazil / Mueller / DeLaval

Input providers:

CRV: currently supplying genetics-related products through their local programme in Brazil / Alta Genetics / **Sloten:** currently supplying animal feed products through local distributor / Semillas Saenz / DSM

Dairy products distribution:
Unilac

In terms of milk production and dairy processing, Friesland Foods (now FrieslandCampina) was active in Colombia from 1996 until 2006 in the southwest of the country, near the city of Popayan area. The company had a processing plant and was owner of the milk brand *Puracé*, with 215 employees, 1800 milk suppliers and a processing capacity of 250.000 to 300.000 liters per day [30] [31]. However, the Dutch company decided to exit the country and sold in 2007 its assets to Colombian dairy processor Alpina.

With respect to agricultural sector cooperation, Dutch cooperation organizations that have also performed projects and activities in the Colombian agricultural sector – although not specifically in the dairy sector – include SNV and Agriterra.

Regarding knowledge institutions, WUR is carrying out a project with Colombian partners for the utilization of by-products resulting from agricultural cultivation of certain products. This is a project financed by RVO (Transition Facility) and the Colombian MADR, COLCIENCIAS and branch organizations [32].

7 From opportunities to realization: what the Netherlands has to offer

The Netherlands has a clear vision of maintaining its leadership in the dairy global sector through constant evolution in technology and knowledge. The country is constantly seeking opportunities to sell its technology, expertise and knowledge to the world. The description of the Colombian dairy sector and its challenges make it interesting for the Dutch dairy sector to become (more) active in Colombian sector and pursue opportunities in business, knowledge transfer and advice for the government.

In this section of the report, the strengths of the Dutch dairy sector are examined with a focus on their applicability to the development priorities of the Colombian dairy sector. It is important to synthetize the unique selling propositions that the Netherlands can offer as dairy sector leader in the world.

7.1 The Dutch Dairy sector: leader in the world

The Netherlands is famous in the world for its success in optimizing production and quality in a context of limited physical space and strong societal and governmental demands for environmental, social and animal welfare aspects.

The countries that share with the Netherlands a comparable technical expertise reputation are the ones having and applying a similar level of knowledge and technology base in their dairy sectors. These countries are mainly Denmark, Sweden, Germany, UK, Japan, Canada, Australia and New Zealand[2]. A study performed by WUR on economic farm performance in Western Europe indicates that the

[2] It is worth noting that there are other countries that have also a good reputation as dairy producers, such as France, Italy, Ireland, Ukraine, Chile, Argentina, Brazil. However, these countries, having in general a much larger area than the Netherlands, do count on the space to produce large volumes of milk. They have therefore not necessarily faced many of the challenges and limitations that have "forced" the Netherlands to go through the steep learning curve that sets the country on the lead of technological knowledge and experience. Hence, in this study these countries have not been considered as relevant international competitors for the Netherlands in the context of the assets that are of interest to Colombia.

Netherlands has the highest milk production per hectare (13 ton milk per Ha in 2009) when compared to Ireland, UK, north-west Germany, Denmark and Sweden (period 2001 to 2009).

In terms of milk production per cow, the Netherlands, with almost 8000 kg per cow per year in 2009, was positioned as third after Sweden and Denmark (8000 kg and around 8300 kg respectively) [33].

Concerning the Dutch milk processing industry, one of the most successful Dutch processing cooperatives, FrieslandCampina (11,2 billion Euro turnover per year), is ranked number five in the top 20 largest dairy companies in the world after Nestlé (21,3 billion Euro) from Switzerland, Danone (15,2 billion Euro) and Lactalis (14,6 billion Euro) from France, and Fonterra (11,5 billion Euro) from New Zealand [14].

The strengths that the Netherlands has to offer to Colombia are clearly focused on efficiency, productivity and knowledge for milk production and processing.

7.2 The SWOT for the Dutch Dairy sector

When asked the question "In what aspects does the Dutch dairy excel compared to other dairy countries?", practically all Dutch diary experts consulted during the study provide an answer that involves notions mentioned in the following image:

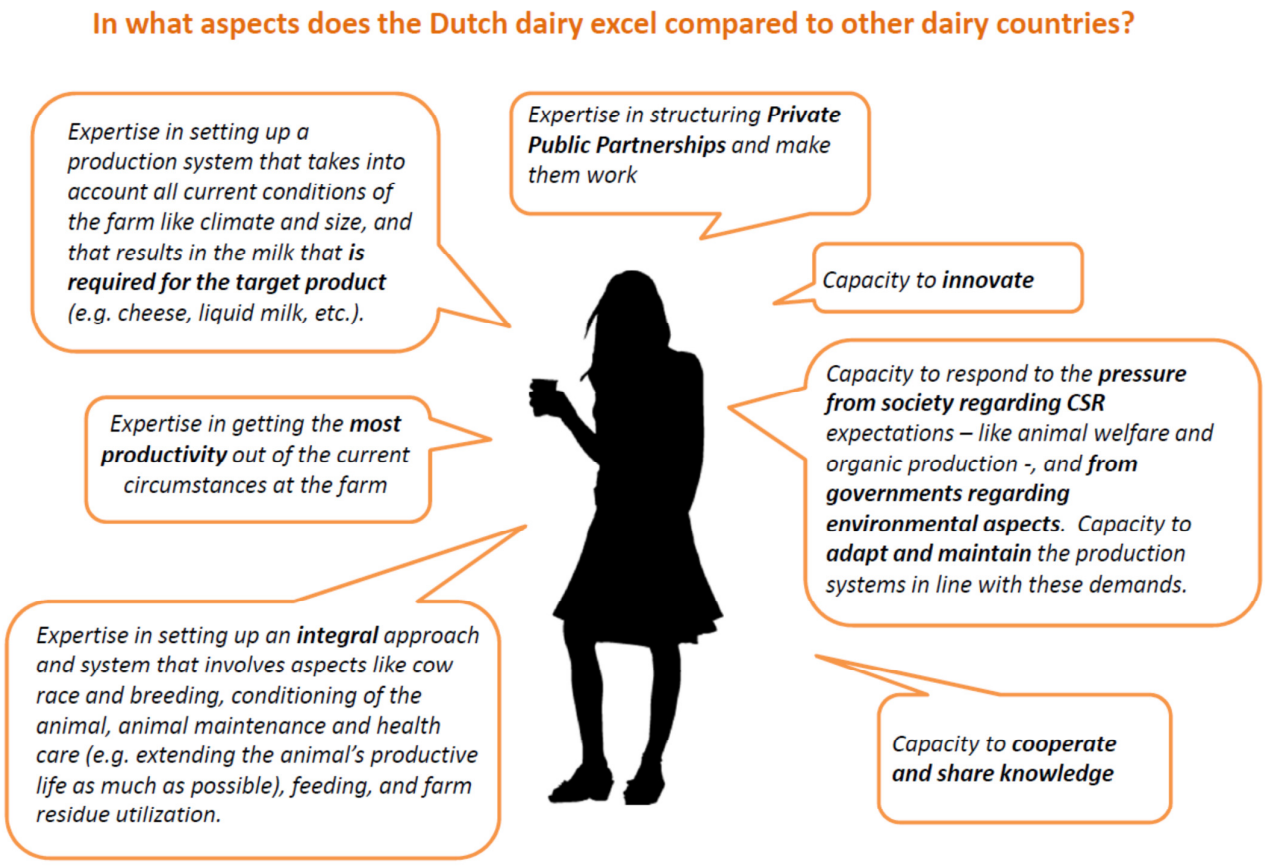


Figure 24 – Aspects in which the Dutch dairy sector excels. Elaborated based on the research.

In a more structured analysis, the following table shows the Dutch dairy sector SWOT analysis performed during the study. This SWOT is focused on the potential to contribute to the strategic priorities of the Colombian dairy sector, that is, on knowledge, technology and innovation.

Strengths	Weaknesses
º Agricultural sector extremely strong (economically) º High technical knowledge and expertise º High knowledge on CSR and environmentally responsible practices º Innovation and product development protocols and processes º Experience in trade º Experience in implementation º Experience in cooperative organizations and governance structures º Experience in dairy chain development programmes in emerging economies (Africa, etc.) º Attitude of fair revenue distribution in cooperatives º Attitude of sharing knowledge º Attitude of investing in knowledge and technology (long term vision) º Integral vision of the chain rather than "thinking in islands" º Reputation and visibility º Strong in other relevant (water management, residuals management and climate change) º Solid normativity (e.g. for farming contracts) º Efficient Dutch Embassy in Colombia, with native Colombian managers º Dutch-Colombian chamber of commerce in Colombia, with native Dutch management (Holland House)	º Limited room to expand and grow (space, environmental issues and public opinion) º High production costs º Low flexibility due to high amounts of (external) capital that need to be invested º Lack of knowledge on the Colombian dairy sector works, its situation is and its influencing groups º Lack of knowledge on the Colombian culture and communication styles º Few efficient communication channels for the Dutch dairy sector in Colombia
Opportunities	**Threats**
º Interest of Dutch government to support market entry in Colombia (Colombia = transition country) º Local (Colombian) cultural perception that what comes from outside is better than national (products, processes, knowledge, innovation, technology) º Free Trade Zones with (tax) benefits º The Colombian government's interest in developing dairy clusters, but lack of knowledge of how to do it	º High pressure of society regarding CSR aspects (environment, animal wellbeing, organic production) º Presence of other dairy countries in Colombia carrying out programs, or interest in doing so

Table 14 - SWOT of the Dutch dairy sector, focused on the potential to contribute to the strategic priorities of the Colombian dairy sector. Elaborated based on the research.

7.3 The Netherlands as advisor of other countries' dairy sectors

Dutch organizations with advanced technical knowledge in milk production and dairy processing, as well as expertise in entrepreneurship in agricultural activities, have for many years worked together

with local partners in Africa and Asia in various milk production and dairy development projects. The Dutch dairy expertise has created expert coaches in advising and guiding emerging countries in the development of their dairy sectors.

Projects range from **cooperation projects -** (partly) financed by the Dutch and the local governments and partners - to combination of cooperation funds and **private investment**, to **commercial projects** in which Dutch expertise is hired and honoraria are paid by customers and organizations in emerging those countries. Examples of Dutch organizations that have often been involved in projects in the African and Asian regions are knowledge institutes like Wageningen University & Research Center (**WUR**) and **Dairy Campus**, non-profit organizations offering coaching and consulting in agricultural entrepreneurship such as **Agriterra, KIT** and **SNV**, and commercial organizations such as **The Friesian, NIZO, FrieslandCampina** and **Rabobank**.

There are a large number of dairy development projects that the Netherlands has carried out in the mentioned regions. A short selection of these:

2. **Sino-Dutch Dairy Development Center (SDDDC):** research and knowledge center in Peking, China. **Objective:** to develop the Chinese dairy sector in terms of productivity, security and quality. **Partners:** FrieslandCampina (NL), WUR (NL) and China Agricultural University (CH), and since recently, CRV (NL).

3. **Dutch Dairy Development Partners (DDDP):** partnership between various dairy sector related partners in the Netherlands, Kenya and Uganda. **Objectives:** promotion of trade between Dutch and Ugandan / Kenyan parties; setting up projects to develop the Ugandan / Kenyan dairy sectors and carry out trainings and knowledge transfer. **Dutch partners:** various Dutch dairy companies and organizations.

4. **Small scale storage for fresh dairy**: pilot project for the development of a small cooling unit for small-scale dairy farmers in Ethiopia. **Objective:** to build a cooling unit based on solar power that enables producers to preserve the quality of their fresh dairy products. **Partners:** BoP – Business of the Pyramid Innovation Center (NL), Mueller (NL), WUR, SNV, local Ethiopian entrepreneurs.

The approach taken by the Netherlands in its dairy development projects is fundamentally integral in nature: Dutch dairy experts guide their colleagues in developing countries to structure a dairy chain in which all actors operate in a coordinated way with each other, according to the same standards.

In many of the realized initiatives, Dutch partners have applied the collaboration model known as **Public-Private Partnerships, or PPP,** a model which has historically produced excellent results for many sectors the Netherlands, and in which the country has become an expert in its project formulation, structuring and execution.

7.4 Constraints, challenges and needs for the Dutch sector in Colombia

Entry in the Colombian dairy sector for business, cooperation or government organizations poses challenges and generates needs to any European country, especially one with the Nordic culture and business dynamics as is the Netherlands. In this section, the main challenges, needs and recommendations are discussed

Business climate

Informality. Dealing with informality means no access to a large amount of milk input for dairy processing businesses. It also means no access to a large consumer base where an interesting profit could be reached based on volume. In addition to this, informality can also imply potential resistance in the target communities (producers, intermediaries and consumers) to formalize their activities and therefore committing to pay official, higher prices.

Dutch organizations need the Dutch and Colombian government instances to "pave the road" for them to come and do their job: they need both governments to work together in initiatives to increase formality. This can involve Dutch (knowledge) organizations that have can broad experience in addressing informality in other countries.

Gap and distrust between agriculture financing institutions and farmers. Dutch organizations and/or their local partners in Colombia might have trouble convincing Colombian agriculture financing institutions on the financial viability of projects. This is largely due to the fact that decision-making professionals in these organizations often do not relate to, of do not fully understand all aspects of those projects. This can result either on rejection of finance, or to less than convenient financing conditions, creating distrust between both parties.

Dutch organizations need the Colombian agriculture financing organizations to reach out (more) to farmers and agricultural entrepreneurs. Financing organizations need to be guided into making a bigger effort to understand and support the farmers businesses, ambitions, barriers to grow and innovative projects.

Distrust on FEDEGAN. Many (milk) farmers in Colombia feel that FEDEGAN does not represent everyone's interests, and that the National Cattle Fund that this organization collects and manages does not equally benefit all members. This distrust might hamper local partners' (intention of) working, collaborating and even interacting at all with this organization when needed.

Government regulated milk price. The fact that the government - and not the market - determines the milk price, is an important constraint in competitiveness. It limits the positive economic impact that good business practices could otherwise have on the profitability of the milk producing farms. In addition to that, the fact that the government sets a different price for milk produced in different regions, can cause not only market disturbances but also complications related to political forces and obstacles.

Dutch organizations working in the milk producing step of the chain need the Dutch government and Dutch dairy sector to share with Colombia their experiences with the effects of state-controlled prices and the advantages of a market-based the milk price. Guidance on the road to price liberalization will be important when the country is ready for it. In the meantime, Dutch organizations will need to guide their Colombian producing partners into design and implementation of measures aimed at reducing costs in order to increase competitiveness.

Distrust amongst productive actors. *El colombiano es por naturaleza desconfiado* (Colombians are distrustful by nature): a statement that Colombians sometimes use in a humorous way, but that holds a core of truth in it. As opposed to the Netherlands, Colombian agricultural / milk producers generally do not have a mentality of sharing knowledge, resources, information or experiences. This is due to the fear that others will misuse information to steal market or gain an advantage at the cost of their peers. This distrust hampers initiatives where collectivity is necessary to reach better negotiating conditions and execute activities and milestones that are greater than when working separately. It can also make it difficult to Dutch organizations to bring across to their Colombian local partners the importance of open collaboration and transparency in communication.

Dutch organizations need actors to become sensitized on the importance of an associative mentality and attitude in order to reach greater goals. Long-term attitude-changing programs that gradually but surely make the switch occur from individualism to collectivism will help bilateral initiatives succeed. The current moment that Colombia is going through, with peace talks advancing in the good direction, can improve the harsh conditions that lie at the base of distrust.

Difficulty to enter certain input markets. Entry in certain Colombian input markets like animal vaccinations and concentrate feed can be difficult for Dutch providers. Milk producers might be wary to increase purchases of concentrate feed due to their high costs, and would rather prefer a more structural solution like adding used more processed pasture. In terms of animal vaccination, this market has been disturbed by political influences and practices that make it difficult for new comers to compete in fair terms.

When considering entering this inputs markets, Dutch organizations need orientation from technical experts who can help match Colombian inputs situation to the Dutch products added value. Dutch providers need to have their specific markets researched and their strategy designed with close advice from experts with experience and knowledge of the markets in both Colombia and the Netherlands. Examples of such profiles are Colombian (postgraduate) alumni from Dutch agricultural universities like WASCA (Wageningen Association of Colombian Alumni).

Local business culture, communication styles and network

Few efficient communication channels for the Dutch dairy sector in Colombia. While performing the field research for study, it became evident during all interviews with key actors in the Colombian sector that these actors had little to no awareness of the Dutch dairy sector, its strengths, its history and its productivity and efficiency leadership in the world. This is not surprising given the fact that no too many Dutch dairy companies or related organizations have been present in Colombia (except for FrieslandFoods between 1999 and 2007, and a group of consultants that guided the creation of COOLECHERA in the years '70s.).

The above explains the current absence of communication channels between both sectors. Dutch organizations might become disoriented when trying to determine a strategy to enter the Colombian sector, the entities to establish contact with, and the subjects to address with them. In addition to that, key contact persons in Colombia are in general difficult to get hold to "on-cold" unless other relevant actors offer to make the necessary introductions. Due to the large amount of time, effort and energy this can take, the lack of efficient communication channels might slow down or even halt the planned initiatives of Dutch organizations in Colombia.

Dutch organizations need close contact and collaboration with local allies like the Dutch Embassy in Colombia, the Holland House and also sector related / sector expert organizations. These parties can introduce the Dutch organizations to the relevant entities, but most importantly, help maintain efficient communication lines.

Lack of knowledge on the Colombian dairy sector and the progressive moment it is going through. The lack of knowledge in Colombia about the Dutch dairy sector is reciprocal. The Dutch sector does not know much about the Colombian sector, where it comes from, where it is heading, and how all the involved national and international actors relate to each other and play a role in its functioning and its development.

Dutch organizations need support and guidance in exploring the Colombian sector. They need parties to facilitate for them to visit the country, get in touch with relevant organizations, talk to all relevant actors (commercial, sectorial and institutional), visit production and processing sites, and visit trade shows and fairs. Complementing this, Dutch organizations also need support and facilitation to attract Colombian organizations to visit Dutch organizations, production farms and dairy trade fairs.

Language barrier and different communication style. Not a lot of professionals in Dutch dairy-related organizations speak Spanish, and in the Colombian dairy sector there is in general a poor level of English knowledge. Poor word and tone choice resulting from the language barrier and from the difference in Dutch and Colombian communication styles might result in misunderstandings or misinterpretations that affect the bilateral collaboration.

Dutch organizations need accompanying in building the (commercial) relationship, bridging the communication and understanding the Colombian communication style.

8. CSR aspects

The situations described below mark needs and potential for Dutch organizations to offer cooperation or commercial services and products. They relate the following aspects: environmental, labor rights, land use, corruption and animal welfare.

ENVIRONMENTAL

In Colombia, there is not a widespread conscience of environmentally friendly practices for milk production and processing. Aspects like waste management, optimal use of water, water treatment, optimal use of energy or application of renewable energies, are hardly in the mind of productive actors. Producers or organizations that do have the intention to implement environmentally friendly practices are often alone in the definition of the approaches, practices or products to use.

Current policy addresses mainly sanity and productivity but no environmental aspects for the sector, except for some initiatives mentioned that are meant to have an environmental impact. However, the execution of these initiatives seems to be isolated and to lack momentum. Therefore, they are threatened to be left aside in favor of other aspects having a clearer connection with the overall strategy.

There is a PPP initiative worth mentioning that is being pursued by FEDEGAN with the support of the United Kingdom and the World Bank: the Sustainable Livestock project. This project, a part of the environmental component of FEDEGAN's strategic plan (PEGA 2019), aims at reducing the amount of space used for livestock from 39 million to 29 million hectares by 2019 (increasing livestock concentration from 0,6 to 1,5 cows per hectare [16]). The plan will also create 1 million hectares in silvopastoral systems[3]. In addition to this, the project seeks to create environmental guides and design a national program for soil recovery. Finally, it encourages research on biodiversity in agro-ecosystems, implementation of BPG (*Buenas Prácticas Ganaderas* – Good Livestock Practices) and cleaner production [8].

LABOR RIGHTS & FAIR OPERATING PRACTICES

The informal dairy commercialization channels not only pose sanitary and economic challenges, but it also creates less than ideal situations for the workers involved in these channels. Small milk and dairy farms as well as informal intermediaries have often workers for whom no formal employment contract exists, and therefore not enough guarantees are given in terms of social security and fair wages.

Regarding the relationship between milk producers and processing companies, there is often lack of official supply contracts. This brings instability and vulnerability for milk farmers.

[3] Combination of forestry and livestock grazing, offering advantages for soil protection, efficient water use, climate change mitigation and conservation of biodiversity. Silvopastoral systems also offer economic benefits through increased milk production.

LAND USE

Land use by small agricultural farmers has often been a challenging issue in Colombia, also for dairy farmers. Many of them do not possess official ownership documents of their lands. This limits their capacity to obtain financing from financial institutions and also leaves them in a vulnerable position when it comes to defend their land ownership.

CORRUPTION

There have been incidents of corruption in the Colombian agricultural sector regarding subsidies by the Colombian government targeted to small farmers for the improvement of their productive activities. One of the most discussed scandals started in 2008 around the MADR *Agro Ingreso Seguro* program. The program consisted in low interest loans for agricultural small, medium and large entrepreneurships. In this program, various large and wealthy family agricultural companies were said to have become beneficiaries of low rate loans meant for small companies. Two dairy processing companies from the city of Manizales (province of Caldas), *Industrias Normandy* and *Central Lechera de Manizales – CELEMA*, were questioned in 2009 by the Colombian in this regard [34].

POTENTIAL FOR IMPROVEMENT IN THE DESCRIBED SITUATIONS

Different actors in the Colombian dairy sector express interest, but especially curiosity on how a more sustainable approach can be adopted and implemented. The initiatives started by FEDEGAN in this sense are a good start that can be taken as example for other initiatives where Dutch organizations can offer their expertise and knowledge.

In terms of labor rights and fair operating practices, there are opportunities for Dutch–Colombian projects to reduce informality through the professionalization of production and the implementation of hygiene and cooling improvements in remote areas. These initiatives can allow producers to aim at selling at the formal and more demanding buyers.

9. Concrete Leads for the Dutch dairy sector in Colombia

Based the analysis presented in the previous chapters, three main areas of opportunities for the Dutch dairy sector in Colombia have been identified as having the highest priority. These areas are aligned with the Colombian Dairy Sector Strategies and the Dutch dairy sector strengths. They are:

1. **Research and innovation -** strong knowledge to knowledge component (K2K)
2. **Institutional development -** strong government to government component (G2G)
3. **Knowledge transfer on three main areas -** K2K
   - Technical: improving dairy farming practices, production, safety and quality levels through the entire value chain
   - Associativity and entrepreneurship
   - Renewable energy & water management

Concrete leads in these four categories are described below.

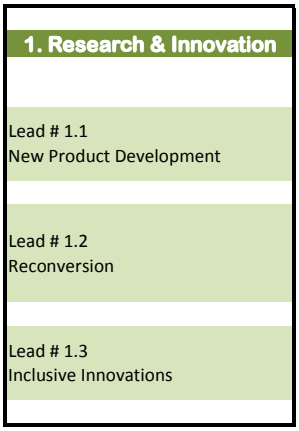
All leads in these categories have a higher probability of reaching the pursued Colombian development objectives, as well as the Dutch long-term relationship objectives, if more than one type of actor (Government - G, Knowledge institution – K, or Business – B) is involved.

Public-private partnerships (PPP), involving all three types of actors, are a model that often works well in successfully reaching the established results. However, other collaboration models that do not necessarily involve all three can also be suitable depending on the initiatives. One thing worth noting: knowledge institutes projects should definitely try to involve businesses (production actors and

industry) as much as possible, in order to ensure that the relevant knowledge will actually be applied by the sector.

Pursuing the leads to be presented here can bring both countries to a productive win-win where Colombia obtains the knowledge, consultancy, coaching and advice it needs to develop its dairy sector, and the Netherlands obtains business and cooperation contracts in Colombia, **re-enforcing in this way its positioning as dairy leader in the world.** Various Netherlands-based Colombian-Dutch sector experts and professional networks such as WASCA, APC en los Países Bajos, RedH Colombia and PCH, can bridge the bilateral projects.

9.1. RESEARCH AND INNOVATION



The Colombian sector finds it important to bring knowledge to the field and translate it into practical activities and/or products for farmer families, staff, entrepreneurs and industry along the chain. They express the need to implement innovative pilot projects for the various milksheds, and in this way define scalable models for capacity building. The proposed leads to achieve this are:

9.1.1. Support to processing SMEs on New Product Development processes.

Type of required service/product: Colombian dairy processing companies (especially small/medium enterprises or SMEs) urge support to develop innovative products according to market demands. It is necessary for them to redefine their value proposition and goals according to the current opportunities and to their own strengths.

Target audience: SMEs in the dairy processing industry

Colombian possible actors: PTP, ANDI, SME, Fedecooleche

***Possible Dutch Providers of services / products*:** NIZO food research, The Friesian, Holland House, CBI

9.1.2. Accompany reconversion to other productive activities that are suitable for that land.

Type of required service/product: Accompany and guide the process to reconvert to activities that are more suitable to the land and the farmers' vocation, taking advantage of the opportunities that the region can offer. Support them to become pasture, cereals and other livestock feed providers (entrepreneur vision) to supply local and regional milk producers

Target audience: current milk producers that were previously cultivate land. (Caldas, Boyacá near Chiquinquirá and Unión Antioquia)

Colombian possible actors: CNL, MADR, Ministry of environment.

***Possible Dutch Providers of services / products*:** Wageningen, Agriterra.

9.1.3. Inclusive innovations

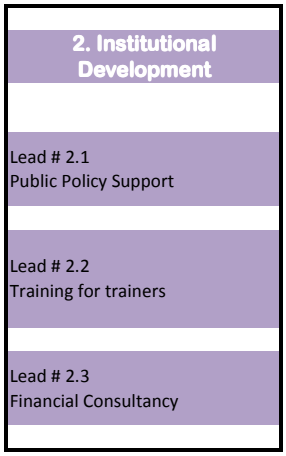
Type of required service/product: implement inclusive innovation pilot projects in different milksheds where bilateral industry, producers and knowledge institutions can work and innovate together. The innovation process is required to start by identifying innovative initiatives that could be developed further and replicated (Best Practices). This should be followed by a co-creation process in which all actors interact to develop products that could be commercialized not just in a regional level but in a national and even international level.

Target audience: Dairy Industry and SME, milk Producers, knowledge institutions

Colombian possible actors: CNL, PTP, private large companies, Colombian Universities, FEDEGAN, identified farmer or cooperatives initiatives

***Possible Dutch Providers of services / products*:** BoP Innovation Center, IDH, WUR, TU Delft, Mueller or other refrigeration system companies, solar and other renewable energy companies.

9.2. INSTITUTIONAL DEVELOPMENT



The Colombian sector finds it important to strengthen and build institutional capacity in order to support multi-stakeholder processes, especially for the implementation of already formulated policy like CONPES. The sector also requires to increase the amount of technical professionals and high-quality education programs that respond to the knowledge and expertise needs of the milk producing business activity.

9.2.1. Public Policy Support

Type of required service/product:

- Sharing knowledge and experiences in pricing systems for raw milk that are adequate for the current and near future situation in the Colombian sector
- Advice and coaching for setting up a unified and standardized laboratories network
- Advice and coaching for establishing regulation on farming contracts for milk purchase.
- Designing and implementing an environmental policy (such as an "environmental CONPES")
- Advice and coaching for designing, implementing and monitoring measures to reduce informality

Target audience: Policymakers, public authorities, government and public employees

Colombian Possible Actors: government and sector organizations (CNL, MADR, DNP – National Planning Department of the Government)

***Possible Dutch Providers of services / products*:** Mainly sector institutions as ZuivelNL, COKZ (Controlling authority for milk and milk products), QLIP (Private organization for certification and analysis in the dairy chain), WUR, NZO Dutch Dairy organization

9.2.2. Training for Trainers

Type of required service/product: Customized training programs delivered to organizations or groups of professionals. Customized programs designed especially for the local context and situation of participants. Oriented to management and strategy training

Target audience: Future or current trainers, consultants, managers, company staff

Colombian possible actors: SENA, private companies through or together with Fedecooleche, Asoleche, Analac and universities.

***Possible Dutch Providers of services / products*:** Wageningen, Agriterra, The Friesian.

9.2.3. Financial consultancy and capacity development collaboration

Type of required service/product: Advice and support on the improvement of current services and design of new ones to be offered particularly to the Colombian dairy sector in order to make from BA be recognized as a real partner for the sector

***Target audience*:** Banco Agrario

***Dutch Providers of services / products*:** Rabobank Development

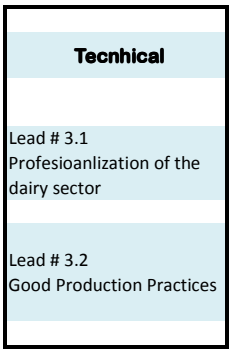
9.3. KNOWLEDGE TRANSFER

The need to improve skills and knowledge of dairy farmers, technical workers on the farm, entrepreneurs, cooperatives and even private companies was clearly identified as a top priority for the Colombian sector. Furthermore, it became clear during the study that there is a lack of programs for the sector in renewable energy and water management, which is a main challenge in all of the milk producing regions.

Given the various subjects comprised in this category, the leads proposed here have been divided in three main areas:

- Technical knowledge about dairy farming practices, production, safety and quality levels through the entire value chain in Colombia
- Associativity, entrepreneurship and rural development
- Progress achieved on creating environmental policy and programs applied to the sector, as well as preparing producers to cope with climate change

Technical knowledge leads



9.3.1. Professionalization of the dairy sector.

Type of required service/product: Improve training of producers in areas that include technical forage planting, breeding, production techniques, insemination, nutrition of cattle, crop rotation and optimum feeding. It is expected that the previous mentioned actions will stimulate professional exchange of students, professors and experts

Target audience: milk producers, technical and professional knowledge institutions, training centers. It is also possible to implement this action by creating partnerships with large companies like Alpina through Asoleche

Colombian possible actors: Private companies through or together with Fedecooleche, Asoleche, Analac and SENA, Universities, COLCIENCIAS.

***Possible Dutch Providers of services / products*:** Wageningen, Agriterra, Nuffic, WUR, Agriterra, The Friesian, SNV

9.3.2. Good Production Practices

Type of required service/product:

- Good Production Practices trainings and consultancies aimed to improve the sanitary situation in the country.
- Setting up a unique methodology to improve Good Production Practices per each one of the selected milk clusters.
- Production practices around processes to produce dairy products (yoghurt, sour milk, cheese, etc.) in hygienic and suitable conditions, especially for artisanal producers.

Target audience: milk producers and artisanal dairy producers

Colombian possible actors: FEDEGAN, CNL, PTP. Health Ministry, MADR

***Possible Dutch Providers of services / products*:** Wageningen, Agriterra

Associativity and entrepreneurship leads

The current gradual shift from subsistence to market oriented dairy farms requires more advanced management knowledge, dairy technology and efficient production processes. Milk farms require *"dairy managers"* with the objective to increase profitability.

9.3.3. Turn milk production into a profitable business for dairy farmers

Type of required service/product: Improve farmers' businesses skills in areas such as record keeping, finances, planning for the future and entrepreneurship, all with the objective to expand farms dairy operations. An important recommendation is to implement learning by doing and one-to-one methodologies such as workshops and customized consultancy for dairy farmers focusing on:

- Developing business management skills
- measure increases in profit
- prioritize management decisions

The need has also been expressed to compose teams of advisors (veterinarian, nutritionist, financial expert, account consultant, crop adviser and cooperative representative) that can together accompany and orientate (especially) medium farmers on the development of integral dairy business development plans.

Target audience: especially medium milk producers

Colombian possible actors: SENA, Universities, IDELI from EAN University, FEDEGAN, CNL, PTP, MADR

Possible Dutch Providers of services / products: Agriterra, WUR, Dairy Campus, The Friesian Consultancy, PUM.

9.3.4. Local dairy clusters development.

Type of required service/product:
Support and guidance on the development of milk and dairy clusters, while taking into account the diverse context conditions as their challenges, opportunities and milk sector development vary.

Each one of the clusters will require a complete package of support and guidance: first encourage the adoption of associativity, then implement technical and administrative knowledge transfer, and then make linkages with industry and markets.

Finally, information systems are required to centralize information related to each cluster and measure impact.

Target audience: CNL, clusters, local and regional governments and entities

Colombian possible actors: CNL, clusters, local and regional governments and entities, regional Universities, CORPOICA, COLCIENCIAS.

Possible Dutch Providers of services / products: Wageningen.

9.3.5. Dairy Community Cooling Chain Centers.

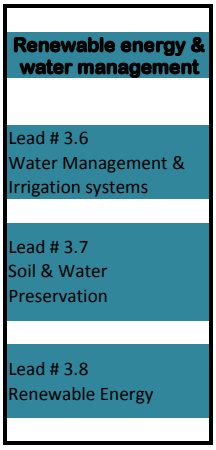
Type of required service/product: Basic solutions or systems than could improve the farmers access to affordable refrigeration systems to maintain milk quality

Target audience: small and milk producers

Colombian possible actors: FEDEGAN, CNL, MADR. Local government

Possible Dutch Providers of services / products: Mueller other cooling companies, others to be defined.

Renewable energy & water management



9.3.6. Water management & irrigation systems

Type of required service/product: there is a recurrent need for recommendations, guidance and methods on how to control water levels and avoid floods. Solutions for lake conservation, rainwater storage systems, the use of water for irrigation and possible irrigation infrastructures, are necessary, together with measures to conserve water and soil.

In addition to that, irrigation systems are required to optimize pasture production during dry seasons. There is a lack of efficient and effective irrigation systems all over the country.

Target audience: milk producers

Colombian possible actors: CAR, CNL, Regional milk committees of Cundinamarca and Boyacá, Ministry of Medio Ambiente

Possible Dutch Providers of services / products: *Wageningen, FAO.*

9.3.7. Soil & water preservation

Type of required service/product: Revision of current programs and recommendations for their improvement, such as the project by CAR and GTZ described at the end of section PRODUCTION CYCLES VS. PREPARATION AND PLANNING OF FARMERS. Develop a structure, guidelines a knowledge base on the importance for farmers and future generations to conserve and make good use of soils and water, and how to use them properly. This should be a scalable program that can be replicated at a national level through regional workshops.

Target audience: milk producers

Colombian possible actors: CAR, milk producer associations and cooperatives, CIAT, Environmental Ministry, local governments of the selected milksheds

Possible Dutch Providers of services / products: Wageningen, FAO (not Dutch).

9.3.8. Renewable Energy

Type of required service/product: Technology and knowledge transfer of renewable energy that can be used in the production and cooling of milk. Solar energy use.

Target audience: milk producers

Colombian possible actors: CAR, milk producer associations and cooperatives, FAO, CIAT, Environmental Ministry, local governments of the selected milksheds

Possible Dutch Providers of services / products: Wageningen.

9.4. THE UNIQUE INTEGRATED CONCEPT: THE COLOMBO-DUTCH ECOSYSTEM for DAIRY INNOVATION (EDI)

What?

The most important opportunity that has been identified is to **align all described leads for a unique common goal**: to create **feasible opportunities for the Dutch dairy sector,** and at the same time **to have impact in a social, economic and sustainable way in the Colombian dairy sector.**

In order to realize this opportunity, the recommendation is to build a unifying concept that has been designed as one of the results of this study: the bi-national Ecosystem for Dairy Innovation (EDI), illustrated in the image below:

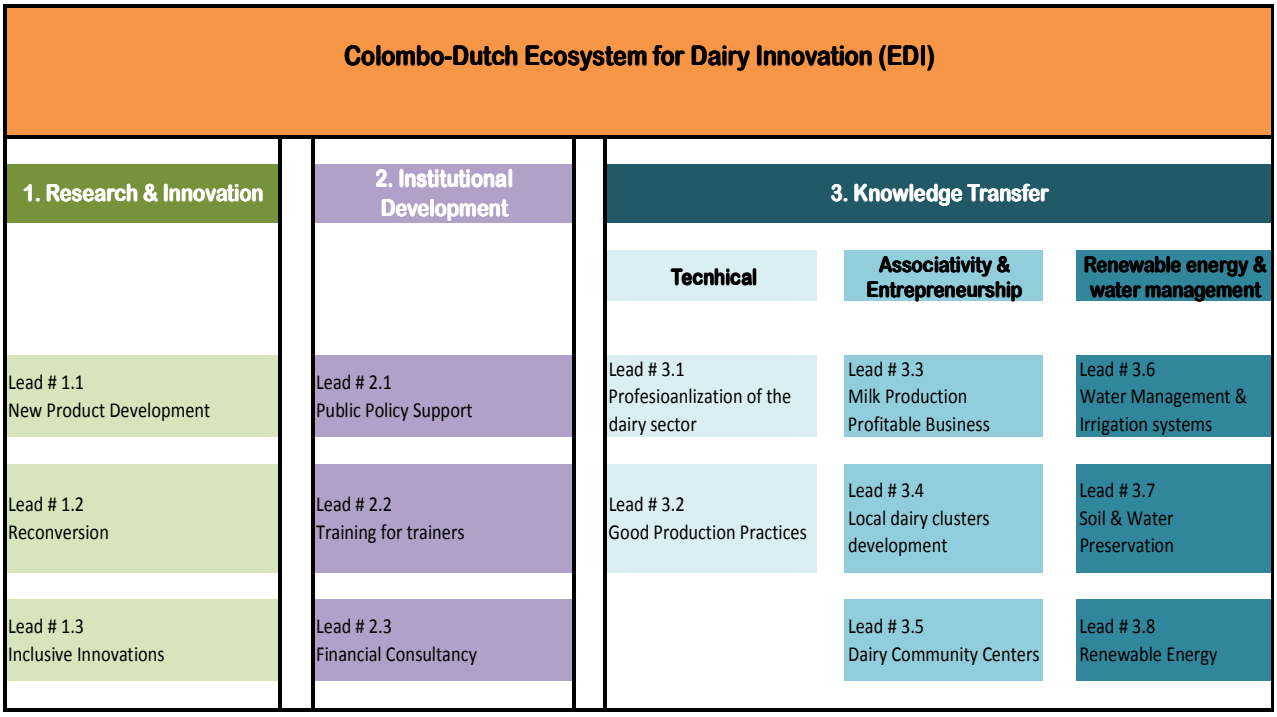


Figure 25 – Proposed unifying concept: Ecosystem for Dairy Innovation (EDI)

EDI is the mechanism that will **bring together all the different initiatives** (previously described leads) and stakeholders to support the improvement of the dairy Colombian sector. The EDI bi-national partners will support the sustainable development of the Colombian dairy sector through a broad portfolio of projects in which Dutch organizations and companies will have a determining role. The following image is a first approximation of some of the possible key bi-national partners for the development of this ecosystem.

Figure 26 – Potential key bi-national partners for the development of EDI

How?

The recommendation is to structure EDI through 4 components:

A bilateral dairy innovation platform (DIP)

+

Business & Institutional dairy development centers

Local Dairy Community & Learning Centers

Dairy Model farms

Dairy Innovation Platform (DIP): The recommendation is to create DIP as a sub-sector under the *Agriplatform* umbrella that is currently being initiated by the Holland-house.

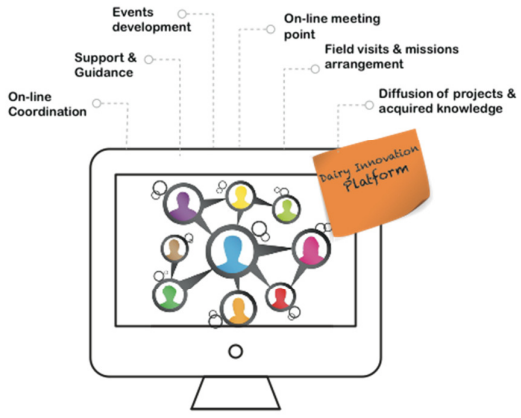


Figure 27 – DIP – Dairy Innovation Platform

This platform will offer support for Dutch organizations to start activities in the Colombian dairy sector. It will also organize selected strategic actors from the Dutch and the Colombian sectors and mobilize them to take part of it. The platform will visualize opportunities in the dairy sector for Dutch companies

to make businesses and invest. It will become the first point of contact by which Dutch organizations can get informed and oriented in order to define where they can bring all their knowledge and experience.

This platform will also become an on-line community to connect local milk farmer cooperatives, private industry, investors, social innovators and businesses coaches from both countries.

Target: especially Dutch companies and investors but also Colombian sector organizations, companies, knowledge institutions and dairy community members.

Provided services:

- On-line coordination of the dairy innovation ecosystem
- Support and guidance of Dutch organizations companies willing to enter the Colombian market
- Facilitation for actors of both sectors to meet and initiate collaborations, commercial relationships, business relationships, network development
- Organization of exposure visits to international and local dairy production farms and markets, and by doing so, facilitation of Colombian and international stakeholders to establish business linkages and other forms of support
- Diffusion of projects and acquired knowledge to increase impact through publications, exhibitions, communications, etc.
- Database
- Establishment and cultivation of collaborative partnerships in dairy

Business & Institutional dairy development center (BIDD)

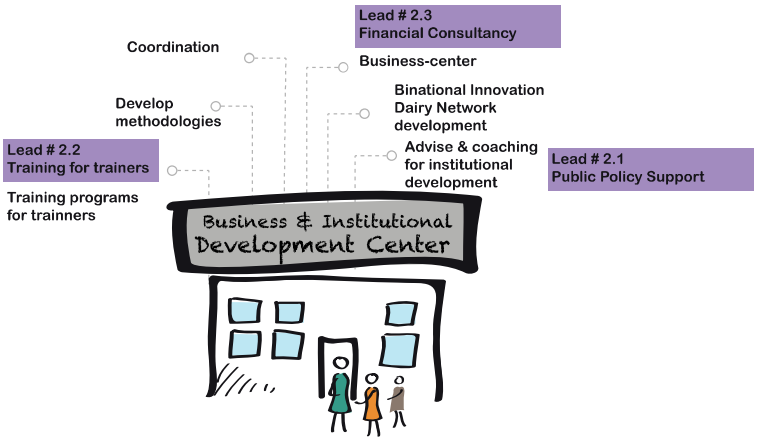


Figure 28 – BIDD - Business & Institutional Development Center

BIDD will be the local binational dairy business development space. Its objective will be to help Dutch and Colombian dairy and milk related companies, businesses and governments to discover and learn how to work jointly to solve dairy community challenges. It´s main objective will be to establish business linkages and other forms of support that lead to knowledge and technology transfer projects. It will also be the place where dairy trainings and consultancies can be done.

Target: especially Dutch companies and investors but also Colombian sector organizations, companies, knowledge and training centers related to dairy.

Provided services:

- Point of local and physical coordination
- Physical place to exchange ideas and experience

- Give trainings to trainers, companies and government institutions located or with representation in Bogotá
- Advise and coaching for institutional development
- Business Development Center: brainstorming of possible binational projects that could be created in the Colombian dairy sector around previously defined challenges
- Development of methodologies to be replicated

Local Dairy Community & Learning Centers (DCLC)

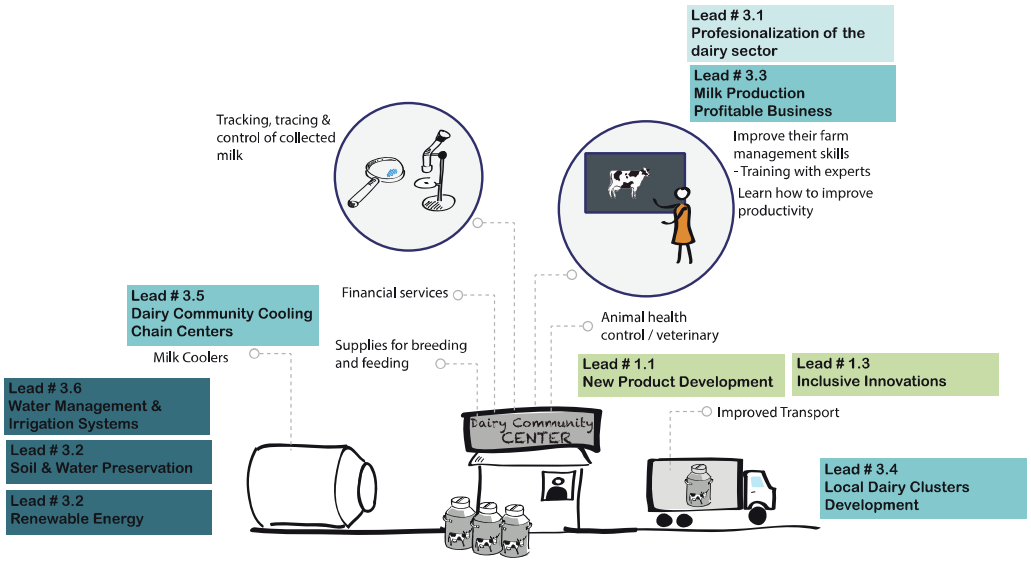


Figure 29 - DCLC - Local Dairy Community & Learning Centers

The goal is to create multiple community centers, or partner up with already existing (cooperatives community) centers in every cluster, in order to develop a national and local network of dairy development centers. The aim of that these will become community (or cooperatives) owned.

The DCLC will provide training, services and products to the small and medium cattle farms. Furthermore, they will become local scientific and entrepreneurial spaces for farmers to research and develop projects around the (environmental) challenges specific to their regions and contexts. These multiple centers will also provide the space for bilateral partners and community to work together on the adaptation and development of technologies adequate for the region that create mutual value. Among all these centers, successfully applied innovations will be shared, developed further and scaled at national level. **Dutch (private) organizations** will serve as **technical advisors and give trainings** in these community centers all around the country.

It is **highly advised** that dairy community members and milk producers will be included as partners in the jointly development of projects for their region. These community members will be assisted and trained on topics ranging from how to produce better and more milk, to what government plans are currently in operation in their area.

Target: especially community members but also Colombian and Dutch sector organizations, companies, knowledge and training centers related to dairy.
Provided services:

- Feeding, breeding, farm and veterinary supply store
- Veterinary and farm services, advise and coaching
- Farm equipment rental
- Cooling milk centers that will collect the community produced milk
- Tracking, tracing and control of collected milk
- Improved transport for the collection of produced milk
- Room and supplies for trainings and knowledge transfer
- Internet and computer connection for dairy related issues
- Research, development and entrepreneurial meeting space
- Milk processing equipment, in order to process milk from the community

Dairy Model farms:

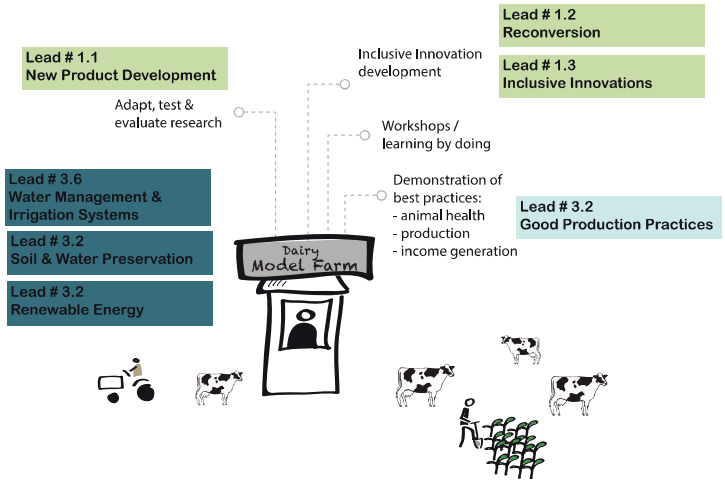


Figure 30 - Dairy model farms

DCLCs, private companies, and/or regional clusters will identify farms in the surrounding area to serve as model farms. Agreements with these farmers will be done in order to be able to show good examples of production, provide workshops and carry out demonstrations of best management practices for improvement of animal health, production and income. On these farms it will be also possible to develop pilot projects of research application and technology transfer, adaptation and development.

Target: especially milk producers
Provided services:

- Demonstrations
- Workshops
- Learning by doing
- Pilot research and technology projects

The whole concept of EDI is visualized in the following image:

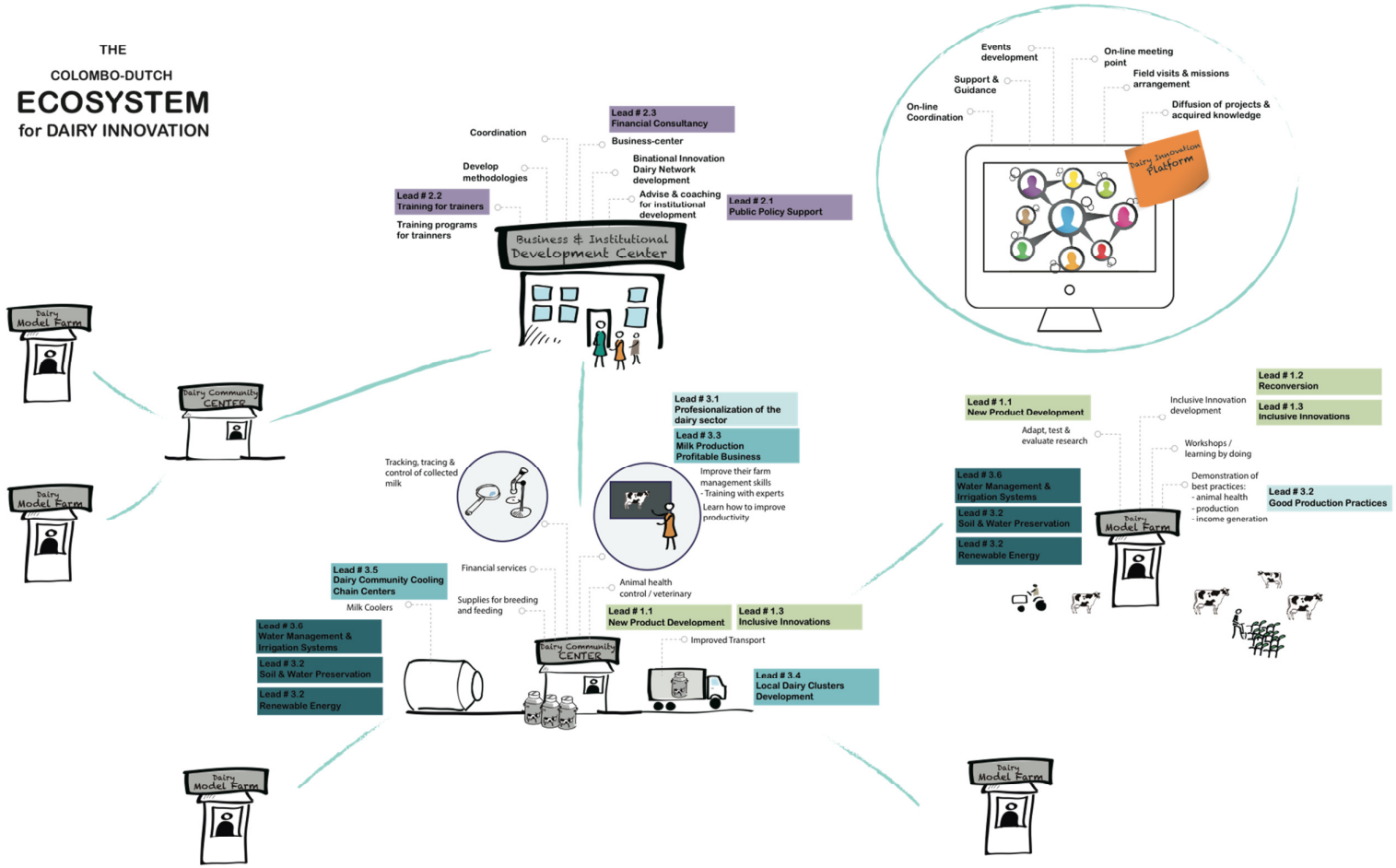


Figure 31 – Proposed concept: The Colombo-Dutch Ecosystem for Dairy Innovation

10. Proposed strategy to for the Netherlands to enter the Colombian dairy sector

Based on all the facts and analysis discussed in this document, a strategy is proposed for the Dutch dairy sector to seize the opportunities and pursue the identified leads in Colombia. The proposed strategy has 5 main pillars:

1. Cultivate the relationship with the Colombian entities that are relevant to the sector's development initiatives, especially: MADR, CNL, PTP and FEDEGAN, European Commission, APC. The good basis that was laid during the realization of the study for a productive, long-term relationship between the Dutch and the Colombian sectors must be maintained. This will keep the Dutch sector on the Colombian top of mind, as it already is thanks to the contacts that were initiated during the study.

2. Ensure a place for the Netherlands to join the cooperation group (*Mesa Sectorial de Coordinación de Cooperación)*. Now that the terrain is prepared as a result of the study, the Netherlands should manage to join the donors table. The Dutch sector should approach the coordination group with concrete proposals based on the leads described in this document. When preparing the approach and proposals, the Netherlands should make sure to communicate an intention for team work and for enriching existing efforts currently being carried out by the Colombian sector and by other international parties / countries involved. Setting a tone and attitude for collaboration and creation of synergies with other members of the group will result in long term relationships of the Netherlands not only with Colombia, but also with other dairy countries.

3. Create together with Colombia the proposed Ecosystem for Dairy Innovation (EDI) and all its proposed elements. The joint creation of EDI will position the Netherlands as a valuable partner for the Colombian dairy sector and will be the incubator for many bilateral business and cooperation deals. When implementing (proposed) leads, apply when suitable the bilateral public-private partnerships (PPP) partnership model in order to increase probability of success through synergies between government, knowledge institutions and companies.

4. Keep on looking for and pursuing other opportunities. Leverage EDI and its components to identify new opportunities for Dutch companies. Stimulate Dutch companies to pursue the new identified leads. Encourage and facilitate these endeavors through support instruments.

5. Further promote Dutch dairy expertise in Colombia. Initiate Dutch dairy marketing activities to pick up from where the study left. Promoting the Dutch dairy sector in Colombia should include traditional approaches – such as (special status) participation in relevant sector events, stimulating and supporting trade missions between the Dutch and Colombian dairy sectors, etc. – as well as innovative initiatives like the ones proposed in the context of EDI. Involve the Holland House in these activities. Disseminate the results of this study in Colombia.

11. Conclusions

Large amount of milk producing cows. Large extension of land. Low milk productivity. Large informality in commercialization. Capable but little innovative processing industry. All words that describe the Colombian dairy sector and reveal its opportunities.

As a matter of fact, the Colombian dairy sector has potential. Geographically, many areas in Colombia show climatic conditions that are ideal for milk production and that offer similar climatic conditions as in the Netherlands. In terms of market growth, the country's low income population is increasing consumption of pasteurized milk and dairy products thanks to increasing acquisition power. Regarding international trade relevance, the country has signed international commercial agreements such as the FTAs with the European Union and with the United States, the Pacific Alliance agreement, and other treaties in Latin America. This positions the country as an interesting hub for the Netherlands to reach several regions in the whole American continent. Finally, in terms of sector development, the government and the country's dairy sector are progressing in dairy policy implementation to increase the sector's currently low competitiveness. Investments in the execution of this policy come from the Colombian government together with the European Union.

Most of the challenges that have been identified in the current Colombian dairy scenario are related to areas where the Dutch sector is – and intends to stay - internationally renowned: knowledge transfer, associativity and entrepreneurship, and dairy policy development. The challenges in these areas are precisely the focus of the Colombian dairy development policy. A deep analysis of these challenges, the (policy) actions to address them, and the expertise required, resulted in the delineation of concrete opportunities - leads – for the Dutch sector in Colombia. Starting with relatively simple improvements, the Colombian and Dutch dairy sectors can work together to increase milk production with better quality and more profitably.

Although the identified leads can create impact for both countries when realized separately, their potential will be maximized when realized in articulation with each other, at all levels of the productive systems, and within concrete geographical contexts. Additionally, alignment of the Netherlands with the initiatives already being performed by Colombia and international partners such as EU, New Zealand and others, will create new synergies and further create momentum.

The EDI umbrella - Colombo-Dutch **E**cosystem for **D**airy **I**nnovation - will result in significant professionalization of the Colombian milk and dairy business. EDI will be the place where theoretical but especially practical knowledge will be transferred from the Netherlands to Colombia at the national but also the local level. EDI will also offer support to dairy-related institutions, reaching in this way institutional capacity development.

12.Recommendations

The Dutch dairy sector (productive actors and supporting instances) together with the Colombian dairy actors should organize their collaboration into the unifying concept EDI and realize the identified leads identified in the study (as well as other that will surely arise on the run). The first step to create EDI and

structure the main collaborations should be the creation of the bilateral Dairy Innovation Platform (DIP). Relevant involved actors from both countries should be invited to participate in the platform and in this way, have them converge in this coordination and facilitation point. Through DIP, involved actors should be supported in establishing and cultivating long term bilateral partnerships.

Parallel to the creation of DIP and EDI, Colombia and the Netherlands should find a place for the latter in the current international cooperation (*Mesa de Cooperantes*) that is taking place between Colombia and the EU and other regions. The Netherlands should permanently ensure that all Dutch-related projects are in synch not only with the (policy) plans being executed in Colombia, but also with the initiatives being carried out in collaboration with other countries. By seeking to align, complement and enrich these efforts and activities, the Netherlands will be able to use the existing momentum, further impulse it, and create new synergies. Very important, the Netherlands will in this way also be an example on how Colombia can switch to a tone of coordination and articulation that has largely lacked in many of the activities that have been initiated in the past.

Finally, when getting involved in all existing and new initiatives, the Netherlands should use its expertise in successfully structuring and initiating PPPs. This model of collaboration will maximize impact by reducing the wide gap that currently exists in Colombia among knowledge institutions, commercial parties and government.

Organizations in other dairy leading countries like New Zealand - and others that are also implementing projects in Colombia - do this based on a strategic interest to unleash the potential they see in the Colombian dairy sector, and turn the country into a large new market for their knowledge. This is a signal that the Dutch dairy sector should not ignore: the Netherlands should recognize in Colombia a new dairy region to become partners with. Now that the realization of this study has set the Dutch dairy sector on the radar of the Colombian one, the Netherlands should take the opportunity and starting moving into this emerging dairy country and in this way, further reinforce its position in the world as dairy knowledge leader.

Appendix I - Colombian Dairy Sector Economic Indicators

COLOMBIAN DAIRY SECTOR ECONOMIC INDICATORS		
Economic indicators of the agricultural and livestock sector in general…		
Agricultural sector's participation in total GDP [8]		8,5%
Livestock sector's participation in agricultural GDP [8]		20%
Livestock sector's participation in total GDP [8]		1,6%
… and of the dairy sector in particular		
Milk production sector's participation in Colombian agricultural GDP [1]		10%
Milk production sector in 's participation in livestock GDP [1]		24%
Dairy processing's participation in industrial GDP [2]		3,5%
Colombian cow inventory		**Comments**
Amount of cattle units 2012 Amount of cattle units 2013 [3]	24,169,212 20,920,410	
Meat bound cattle	9.149.140	Approximately 38%
Milk bound cattle 2012 Milk bound cattle 2012 [3]	3.532.536 2,446,231	Approximately 15%
Dual purpose cattle	11.486.736	Approximately 48%
Colombian livestock farm inventory		**Comments**
Amount of livestock farms 2013 [8] Amount of livestock farms 2012 [1]	494,593 497.747	
Farms exclusively dedicated to milk production (2010) [8]	6%	Approximately 30,000 farms
Farms exclusively dedicated to meat production (2010) [8]	20%	
Farms dedicated to double production: milk and meat (2010) [8]	35%	Approximately 175,000 farms
Farms dedicated to breeding (2010) [8]	39%	
Colombian dairy production		
Millions of liters of milk produced in 2012 [35] Millions of liters of milk produced in 2013 [36]		6,483 6.773
Daily milk production (average amount of liters) [3]		13.119.456
Average production per cow per day in intensive production farms [2]		15 liters
Percentage of milk produced in intensive production farms		45%
Average production per cow per day in dual purpose farms [2]		4 liters
Percentage of milk produced in intensive dual purpose farms		55%
Millions of liters of milk processed by the industry in 2012		Approx. 3.566
Amount of processing companies		355
Added value produced in 2012 [35]		Approx. 1.000 million Eur
Employment in the Colombian dairy sector		**Comments**
Amount of jobs in the whole livestock sector [8]	950,000	
Amount of jobs in the milk production sector [1]	618,000	Approximately 65%

Table 15 – Indicators for a general view of the Colombian milk production sector

Appendix II – Sector Organizations in the Colombian Dairy Value Chain

DAIRY SECTOR ORGANISATIONS			
Primary sector			
FEDEGAN	*Federación Colombiana de Ganaderos Colombian* (Federation of Cattle Holders)	FEDEGAN represents the milk and meat producers. A non-profit union association, its objective is to converge the producers of the livestock sector and defend the common interests of its members. FEDEGAN carries out various activities related to livestock sanitation, increased productivity and monitoring of the sector. This branch organization is often the only source of information on the sector. This entity is the recipient and administrator of the National Cattle Fund (parafiscal mandatory contribution from members), which the organization uses to finance activities and projects, either independently or in cooperation with other national and international agencies.	www.fedegan.org.co
ANALAC	*Asociación Nacional de Productores de Leche*	ANALAC brings together and represents the Colombian milk producers.	www.analac.org
Industry			
FEDECOLE-CHE	*Federación de Cooperativas Lecheras*	FEDECOOLECHE is an enabling organization of COLANTA (the biggest dairy cooperative in Colombia) with 10,000 associated farmers and over 4,500 workers, also associated. It groups processing companies and/or cooperatives like COLANTA, COOLECHERA, CILEDCO, COOLESAR, COLÁCTEOS and COAHUILA.	www.colanta.com.co/index.php/colanta-institucional
ASOLECHE	*Asociación de Empresarios Lácteos*	ASOLECHE associates the large and medium dairy processing industries	www.asoleche.org
ANDI (Section Cámara Colombiana de Alimentos)	*Asociación Nacional de Empresarios Industriales de Colombia* (National Industry Companies, Food Chamber Section)	ANDI is the horizontal business association for every sector in Colombia. The Food Chamber Section groups industries in the food sector.	www.andi.com.co
GOVERNMENT ORGANISATIONS			
MADR	*Ministerio de Agricultura y Desarrollo Rural* (Ministry of Agriculture and Rural Development)	Management and coordination of dairy policy is being guided MADR. The Livestock Division (which belongs to the Vice Ministry of Agricultural Affairs) handles all matters related to the Dairy Chain.	www.minagricultura.gov.co/
Relevant organisms and programs in the MADR			

ICA	*Instituto Colombiano Agropecuario* (Colombian Agricultural Institute)	This entity is part of MADR. It verifies which milk producing areas are free of sicknesses and certifies cattle farms. It manages programs and regulates the phytosanitary aspects of exports and imports. Designs and implement strategies to prevent control and reduce medical, biological and chemical risks to animal and plant species.	www.ica.gov.co
CNL	*Consejo Nacional Lácteo* (Colombian Dairy Chain Organization)	CNL was created in 1999 as an advice body for the government in themes related to dairy sector policy. The organization groups various public and private sector entities from the different steps in the chain. The organizations that compose CNL are MADR, Ministry of Social Protection (MPS), Ministry of Commerce, Industry and Tourism (MCIT), and sector organizations ANALAC, FEDEGAN, ANDI, ASOLECHE and FEDECOOLECHE. In 2011, CNL was appointed as the official Colombian Dairy Chain Association.	http://www.cnl.org.co/
Dirección de planeación y seguimiento presupues-tal	Direction of planning & budget monitoring	Performs planning and budget monitoring at sector level	https://www.minagricultura.gov.co/ministerio/direcciones/Paginas/Direccion-de-Planeacion-y-Seguimiento-Presupuestal.aspx
PAAP	*Proyecto Apoyo a Alianzas Productivas* (Support Project for Productive Alliances)	Combines efforts and establishes methodologies for contract farming between producers and industries	www.minagricultura.gov.co/tramites-servicios/desarrollo-rural/Paginas/Proyecto-apoyo-a-alianzas-productivas-PAAP-.aspx
FINAGRO > ICR IAT	*Fondo para el Financiamiento del Sector Agropecuario* (Fund to finance the agricultural sector)	Assigns economic resources to the sector through the following programs:	www.finagro.com.co
		ICR (Incentive for the Rural Capitalization) for realizing investments aimed at modernizing, acquire competitiveness and sustainability from agricultural production	www.finagro.com.co/productos-y-servicios/ICR
		IAT (Incentives for Technical Assistance) which finances technical assistance	www.finagro.com.co/productos-y-servicios/IAT

CNCA > DRE	*Comisión Nacional de Crédito Agropecuario > Programa de Desarrollo Rural con Equidad* National Comission for Agricultural Credit has a program for Rural Development with Equity	**DRE** (Rural Development with Equity) The goal of this program is to finance equipment and infrastructure	www.minagricultura.gov.co/ministerio/programas-y-proyectos/Paginas/Programa-Desarrollo-Rural-con-Equidad-DRE.aspx
AGRONET	Agronet	Virtual information portal on agriculture	www.agronet.gov.co
MCIT	*Ministerio de Comercio, Industria y Turismo* (Ministry of Commerce)	MCIT is the maximum authority ruler of the policies in Colombia for all economic activities in industry, commerce, and tourism. It looks after the competitiveness and positioning of Colombia in foreign markets.	www.mincit.gov.co
Relevant organisms and programs in the MCIT			
PTP (Dairy Section)	*Programa de Transformación Productiva - Sector Lácteos* Productive Transformation Program – Dairy Section	Its objective is to promote the productivity and competitiveness of 17 selected certain sectors that have been identified as having high export potential. One of these sectors is the dairy sector.	https://www.ptp.com.co/categoria/sectorlacteo.aspx
INNPULSA		A government program for promoting competitiveness through innovation and entrepreneurship in Colombian companies of all sizes. It offers financing mechanisms to support entrepreneurship projects which are profitable and sustainable.	www.innpulsacolombia.com/es/oferta/fortalecimiento-de-mipymes-pertenecientes-la-cadena-de-transformacion-lactea
BANCOLDEX	Bank for External Commerce	Financial institution whose main objective is to finance the needs for working capital and fixed assets of companies of all sizes and all sectors of the Colombian economy.	http://www.bancoldex.com/portal/default.aspx
OTHER RELEVANT ORGANISATIONS			
CORPOICA	*Corporación Colombiana de Investigación Agropecuaria*	The Colombian agricultural research corporation is the sanitary and phytosanitary leading authority in the country. This institution generates and transfers scientific knowledge and technological solutions through research and innovation services and products for the agricultural sector in Colombia.	http://www.bancoldex.com/portal/default.aspx
COLCIEN-CIAS	*Departamento Administrativo de Ciencia, Tecnología e Innovación*	Colciencias is the Colombian department that promotes the national policies for science, technology and Innovation.	http://www.colciencias.gov.co/

INVIMA	*Instituto Nacional de Vigilancia de Medicamentos y Alimentos* National Institute for the Surveillance of Medicines and Food	INVIMA controls and guards the food quality and food security during production, imports, commercialization and consumption	https://www.invima.gov.co/
SENA	Servicio Nacional de Aprendizaje	The National Centre of Learning is an organization that provides technical training and education for activities in all sectors.	www.sena.edu.co

Table 16 – Descriptions of Sector Organizations in the Colombian Dairy Value Chain

Appendix III – Milk sector actors members of the CNL's regional committees

The Colombian Dairy Value Chain Organization, CNL, is represented in the different milk production regions through its Regional Committees. Different producers associations can become members of these regional committees. These producers associations contain, in turn, producer cooperatives that group individual milk producers. Through this structure (CNL regional committees -> associations -> cooperatives -> producers), access to parties in all these levels can be gained. The different actors that are members of CNL's regional committees are listed in the tables below [37].

CUNDINAMARCA

CNL Regional Committee: Province of Cundinamarca		
Contact person (secretary): Jorge Hernando Peña - clcundinamarca@cnl.org.co		
Name organization	**Contact person**	
Milk producers		
Asogán	Giovany Pinilla	gialpq@hotmail.com
Fedelac	Marlen Angel	marlenangelma@gmail.com
Comité de ganaderos área 5	Enrique Triviño	ganaderos2005@yahoo.es
Colacteos San Cayetano	Jorge Ernesto Villalobos	lacteos.sancayetano@gmail.com
Asoganaderos	Ricardo Pinzon	ripimo@yahoo.com
Asoganaderos	Maria Teresa Gaviria	mtgaviria@yahoo.com
Asolega	Jose Ignacio Tamayo	jitamayo@hotmail.com
Felecun	Jorge Moreno Rodriguez	felecun@hotmail.com
Asomegan	Orlando Ortega	asomegan@hotmail.com
Asolactac	Gustavo Herrera	asolactar@gmail.com
Processors		
La Alquería	Jaime Albarracin	jalbarracin@alqueria.com.co
Lácteos Ubaté	Fanny de Redondo	lacteosubate@hotmail.com
Lácteos mi Leche	Gonzalo Avellaneda	agropegas@hotmail.com
Knowledge Institutes		
Universidad de la Salle	Ruth Rodriguez	ruthrodriguez@lasalle.edu.com
Universidad de Cundinamarca	Lilian Marcela Robayo	lrobayo3870@gmail.com

Table 17 - CNL Regional Committee: Province of Cundinamarca

BOYACÁ

CNL Regional Committee: Province of Boyacá		
Contact person (secretary): Rolando Vanegas - clboyaca@cnl.org.co		
Name organization	**Contact person**	
roducers		
Fabegan	Jorge Eduardo Quintero	joequin2000@yahoo.com
Asogaboy	Oscar Triviño Gil	oscartrivipotosi@hotmail.com
Cobilac	Parmenio Gonzáles Escobar	parmeniogonzalesescobar@gmail.com
Asoagrolactin	Maribel Rodriguez Chillón	asoagrolactin@gmail.com
Asoregan	Angela Maria Salazar Gil	asalagil@gmail.com
Asoquesopaipa	Eduardo Campuzano Granados	educagran@yahoo.com
Agronit	Carlos Julio Ramírez	gerenciagronit@gmail.com
Collection & Transportation		
Enfriadora Bosconia	Yuri Marcela Colorado	mayuyis890830@hotmail.com
Independent transporter	Edwin Mauricio Mateus	emamaco2007@yahoo.es
Processors		
Peslac	German Meza Preciado	gemespreva@gmail.com
La Alquería	John Zambrano	jzambrano@alqueria.com.co
Knowledge Institutes		
UPTC – Universidad Pedagógica y Tecnológica de Colombia	Jorge Iván Londoño	jorgeivanlv@hotmail.com

Table 18 - CNL Regional Committee: Province of Boyacá

ANTIOQUIA

CNL Regional Committee: Province of Antioquia (also called CORLAC R2)		
Contact person (secretary): Bernardo Villa Machado - bernardovillam@gmail.com		
Name organization	**Contact person**	
roducers		
Fedelan	Mariano A. Restrepo	fedelan.colombia@gmail.com
Fedegán	Alejandro Cadavid	acadavid@fedegan.org.co
Input and Services		
Genetica Selecta S.A.	Roger Martens	romarte@une.net.co
Prolesa	Juan Mauricio Gomez	conriego@une.net.co
Bayer	Victor Guzman	victor.guzman@bayer.com
Processing		
El Zarzal	Ovidio Jaramillo	ovidioj@elzarzal.com
Knowledge Institutes		
Universidad de Antioquia	Holmes Rodriguez	holmesrodriguez@gmail.com
Universidad de Antioquia	Mario Fernando Cerón	cerongama@gmail.com
Universidad de Antioquia	Luis Guillermo Palacio	lgpalaciob@gmail.com
Cetan	Camilo Paez	camilopaez78@yahoo.es

Table 19 - CNL Regional Committee: Province of Antioquia

Appendix IV – Stakeholder analysis

Analysis

As a means to support Dutch organizations in developing a strategy to select the most adequate stakeholders to approach in Colombia, a stakeholders analysis is presented.

In the left-side image below, the **current** estimated degree of interest and influence of the various stakeholders is represented. In the right-side image, a **desired**, target degree of interest and influence of the various stakeholders is represented. The evolution from the current picture to the desired one, can be achieved as the proposed leads and projects start being implemented. For example, by implementing bilateral programs between Dutch and Colombian universities to carry out research in topics that are defined together with Colombian milk producers, the influence of universities in the success of such dairy development initiatives goes from medium to high. Similarly, their interest in general dairy development initiatives can go from low to at least medium. In that way, a greater room opens up in the medium/long term for Dutch-Colombian initiatives and commercial opportunities.

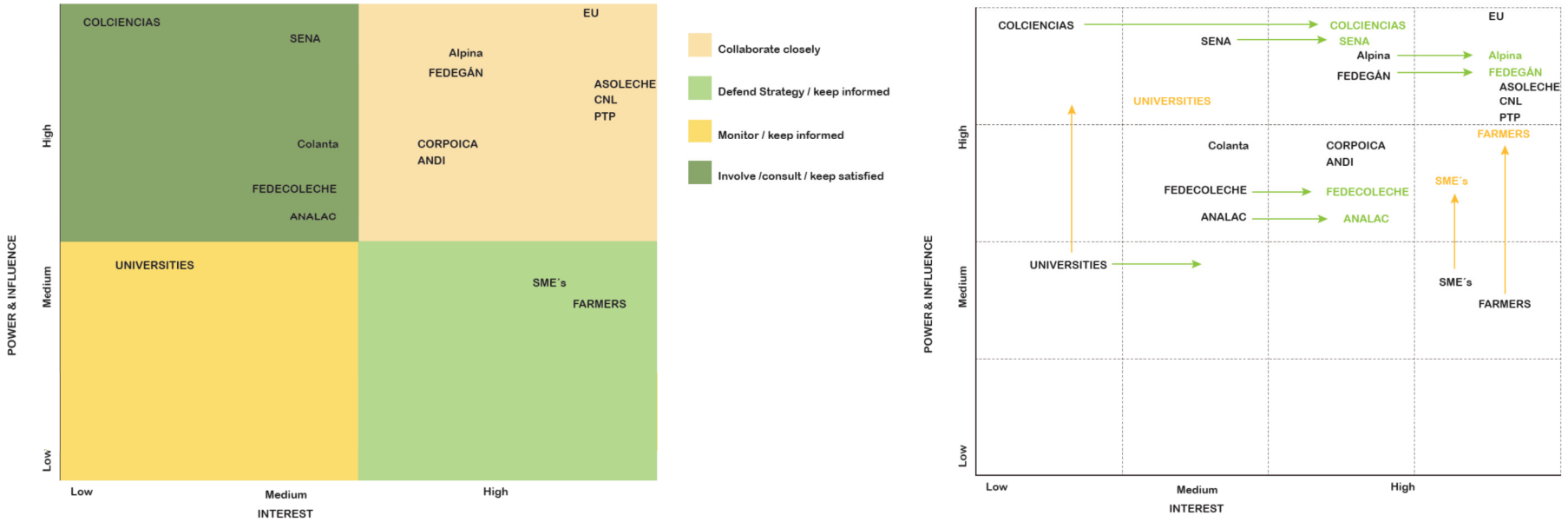


Figure 32 – Colombian dairy stakeholders analysis: current situation (left) and potential future situation (right). Based on the research.

Methodology for the Stakeholders Analysis

			INTEREST (1-5)				POWER (1-5)			
	Stakeholder		No interest	Weak interest	Medium interest	Great interest	No power	Weak power	Medium power	Great power
INPUTS	Feed Farmers									
	Feed Companies									
	Input companies									
SERVICE PROVIDERS										
FARMS	Livestock farmers	LIVESTOCK FARMERS				4		3		
TRANS-PORT	Distributors (Milk truck drivers)									
COOPERA-TIVES										
INDUSTRY	Private Processors	ALPINA			3					4
		ALQUERIA								
		COLANTA		2					3	
		SMEs				4		2		
	Milk processors									
	Dairy Processors									
COMMERCIA LIZATION	Retailers									
	PRIMARY SECTOR	FEDEGAN			3					4
		ANALAC		2					3	

			INTEREST (1-5)				POWER (1-5)			
	Stakeholder		No interest	Weak interest	Medium interest	Great interest	No power	Weak power	Medium power	Great power
ASSOCIATIONS	INDUSTRY	FEDECOOLECHE		2					3	
		ASOLECHE				4				4
		ANDI (Section Cámara Colombiana de Alimentos)			3				3	
GOVERN-MENT	MADR		4					5		
	MCIT		4					5		
	MS		2					4		
	PTP (Dairy Section)					4				4
	CNL					4				4
	ICA		2					3		
	CORPOICA				3				3	
	INVIMA		2					4		
	COLCIENCIAS		1							4
KNOW-LEDGE	SENA			2						4
	UNIVERSITIES	Universidad de Antioquia	1					2		
		Centro de Desarrollo tecnológico del Cesar								
		Universidad Nacional de Colombia Bogotá								

			INTEREST (1-5)				POWER (1-5)			
	Stakeholder		No interest	Weak interest	Medium interest	Great interest	No power	Weak power	Medium power	Great power
		Universidad de Nariño - Pasto								
		Universidad de Sucre - Sincelejo								
		Universidad Agraria de Col								
		Universidad de la Salle								
Financial institutions	FINAGRO									
	CNCA > DRE									
	BANCOLDEX									
SUPPORT	EU		4			4				4
	APC		4					4		
	HOLLAND HOUSE									
	DUTCH EMBASSY									

Table 20 – Scores for estimated interest and power of various Colombian dairy sector stakeholders. Elaborated based on the research.

Appendix V - Developments leading to current landscape of international cooperation

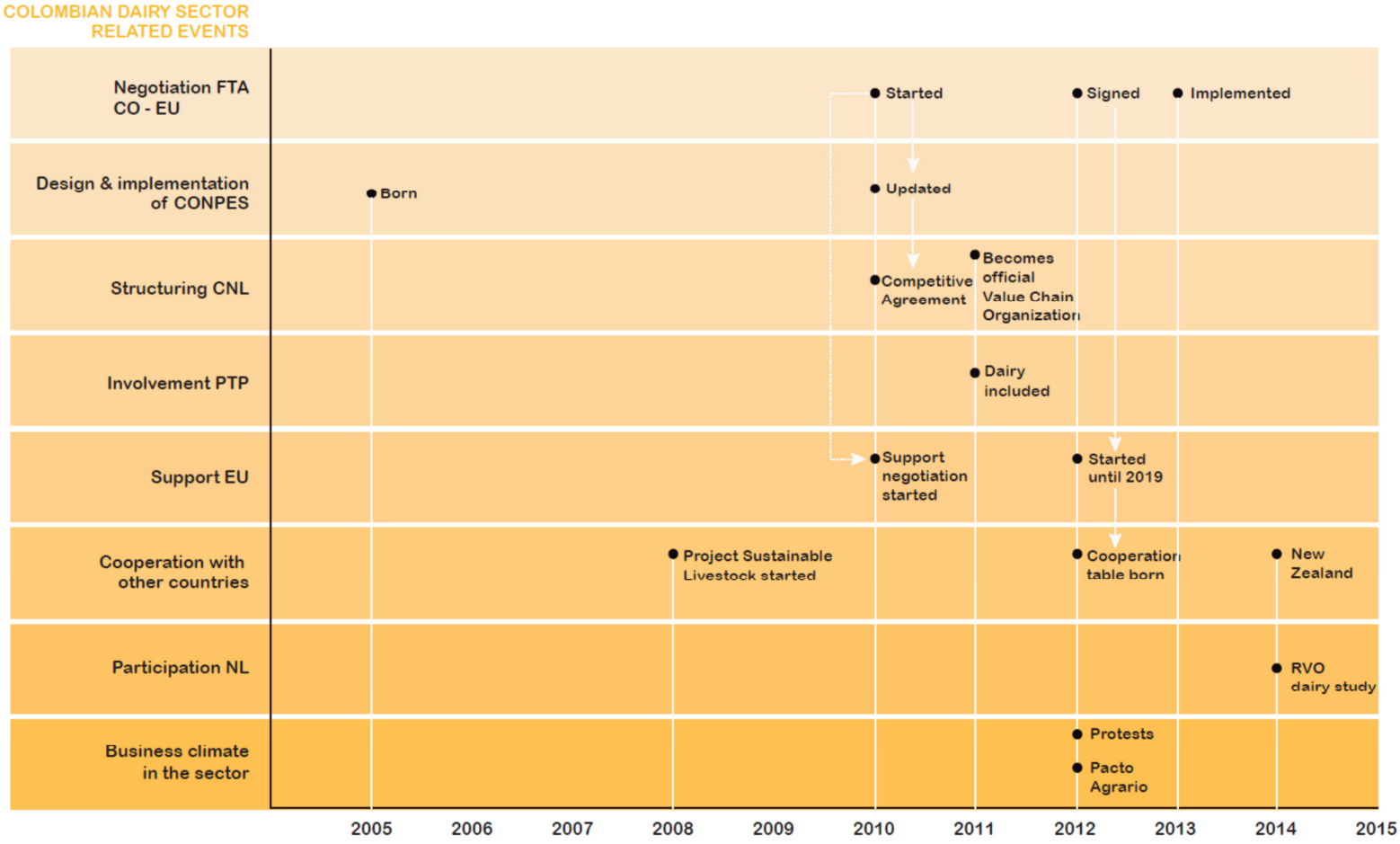


Figure 33 - Timeline of the evolution of developments that led to the current status of Colombian dairy policy implementation. Elaborated based on the research.

Appendix VI – Milk price system: bonuses and discounts per milkshed

The following image is based on the values indicated in the MADR Milk price regulation number 17 from 2012 for the milk price calculation in Colombia.

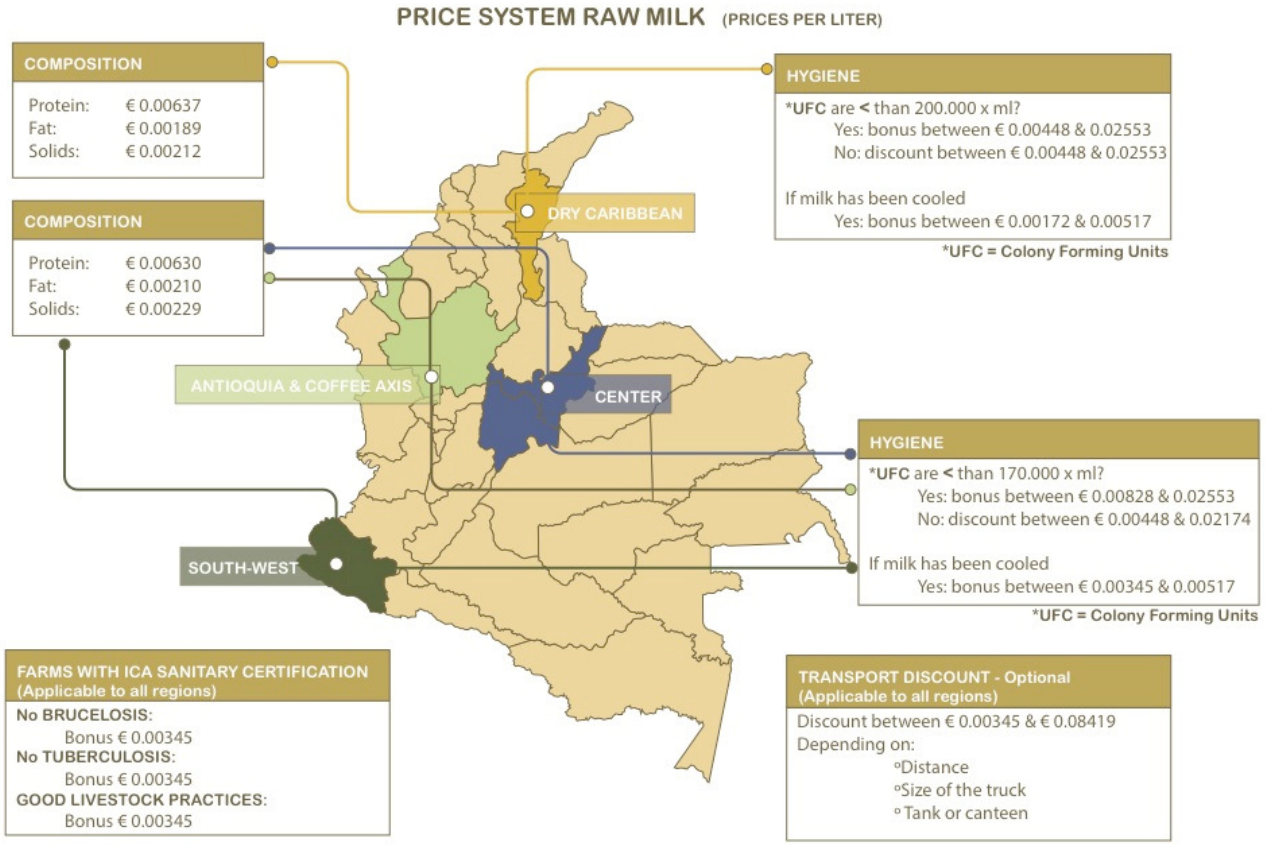


Figure 34 – Government-regulated milk price system in Colombia. Elaborated based on source **[12]**

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