



Potential collaboration between Brazil and Dutch dairy sectors

Results of a dairy mission to the state of Parana

Jelle Zijlstra and Adolfo Alvarez Aranguiz

Report 1283



WAGENINGEN
UNIVERSITY & RESEARCH

Exploration collaboration between Brazil and Dutch dairy sectors

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Samenvatting NL Tijdens een missie van een week werden twee onderzoekers van Wageningen University and Research gevraagd om de mogelijkheden voor samenwerking tussen de Braziliaanse staat Parana en de Nederlandse zuivelsector te verkennen. De samenwerking was gericht op onderzoek en ontwikkeling die de verdere ontwikkeling van de Braziliaanse zuivelsector in het algemeen en het zuivelcluster in het Castro-gebied in het bijzonder zou vergemakkelijken. Ook verkenden ze de belangen van de Nederlandse bedrijven om samen te werken met stakeholders in de Braziliaanse zuivelsector. De eindresultaten van de missie van één week waren een inventarisatie van de sterke en zwakke punten, kansen en bedreigingen (SWOT) van de zuivelsector in de regio Castro en een concept onderzoek agenda.

Summary UK During a one week mission two researchers from Wageningen University and Research were asked to explore the potential for collaboration between the Brazilian state of Parana and the Dutch dairy sector. The collaboration focused on research and development that would facilitate the further development of the Brazilian dairy sector in general and the dairy cluster in the Castro area in particular. They also explored the interests of Dutch companies to collaborate with stakeholders in the Brazilian dairy sector. The final results of the one week mission were an assessment of the strengths, weaknesses, opportunities and threats (SWOT) of the dairy sector in the Castro region and a draft research agenda.

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Foreword

When it comes to agriculture, agricultural research and agribusiness the Netherlands and Brazil have longstanding good relations and we are historical trading partners. We also have a common ambition. And that is to continue feeding the world through sustainable production while respecting people, nature, and our environment. Currently the Netherlands is taking sustainability to the next level with a vision to achieve circular agriculture by 2030 and promote it on the global stage.

For several reasons the dairy sector in Brazil is very interesting for cooperation and partnerships with the Netherlands. Especially in the southern states the sector has shown steady and high growth figures in the past decades. But despite this growth the country is not yet self-sufficient and still imports significant amounts of milk powder. Therefore, and as in most agriculture areas, the dairy sector as a whole is hungry for innovation, new technology and knowledge in all stages of the value chain to increase sustainable production. This includes genetics, feed, housing, animal health and welfare, monitoring, storage, logistics, quality, milking technology, processing and chain management. And, also, Brazilian dairy farmers are bound to strict environment rules concerning nature preservation and emission of greenhouse gasses and manure management.

The Netherlands, as the second largest exporter of agricultural goods in the world has abundant knowledge, expertise and technology in all these areas; with a highly regarded agricultural university and where farmers achieve the highest agricultural production per unit area in the world. Brazil offers many agribusiness opportunities, although new technologies and innovations have to be tailored to local Brazilian circumstances.

The objective of this mission/study is to give a brief impression of the dairy sector in Brazil and specifically to identify areas of possible cooperation in dairy research between Wageningen University and the (private) "Fundação ABC" research center in Parana state. The latter is a well renowned center for applied research in the south of the country. This is a starting point for possible future cooperation but ultimately it is up to these (or other knowledge) institutes themselves to give follow-up; we are keen on new initiatives which we will then continue to facilitate.

Finally it is our expectation that, as a result of this mission, existing and new Dutch companies related to the dairy sector may be encouraged to explore and or expand their business in Brazil. From our side we are there to assist and facilitate these Dutch companies to realize their international ambitions to the benefit of both countries.

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Summary

The Dutch Embassy in Brasilia took the initiative to organise a one week Dairy Mission to the Brazilian state of Parana to explore the potential for collaboration between Brazil and Dutch dairy sectors. Collaboration on research and development that would facilitate the further development of the Brazilian dairy sector in general and the dairy cluster in the Castro area in particular was the main objective of this mission. This is why two researchers from Wageningen University and Research were asked to execute the mission. They visited dairy farmers, dairy extension workers and board members of the cooperatives in Castrolanda, Carambei and Arapoti. Next to that visits were made to the umbrella organisation of cooperatives in Parana (OCEPAR) and the State Ministry of Agriculture of Parana to get informed about the present state and the foreseen developments of the dairy sector in this state. They also explored the interests of Dutch companies to collaborate with stakeholders in the Brazilian dairy sector. The final results of the one week mission were an assessment of the strengths, weaknesses, opportunities and threats (SWOT) of the dairy sector in the Castro region and a draft research agenda. Next to that it was agreed that the cooperatives would take a decision about collaboration interests in the course of 2020. In 2020 they decided – for the time being - to refrain on further steps on the path towards joint dairy research.

Various Dutch companies have shown interest to collaborate on the development and execution of future research agendas for the Brazil dairy sector. All stakeholders concluded that the involvement and participation of the companies in a dairy research programme would enhance the success of the programme in Brazil.

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1 Brief introduction of dairy sector Brazil

1.1. Developments in national and regional milk production

Table 1 Comparison of Brazil and Dutch dairy sectors.

	Brazil	The Netherlands
Population	209 mill.	17 mill.
Surface country	8,511,000 km ²	42,000 km ²
Milk cows	19.2 mill.	1.6 mill.
Milk production (mill.t.)	35,08	14,50
Self sufficiency	97%	192%
% milk processed	70%	99%
Dairy farms	1,015,000	17,000
Milk cows per farm	21	100
Kg milk per farm	38,000	870,000
Milk per cow per year	1,830	8,700

Source: Based on many different most recent data sources



Figure 1.1 Development of Brazil milk production 1990-2019.

Source: <https://www.milkpoint.com.br/estatisticas/> ; data originate from Brazilian Institute of Geography and Statistics (IBGE)

The total Brazilian cow milk production in recent years fluctuated between 33 and 35 million tons (figure 1.1). This is about 240% of the Dutch national milk production (Table 1). The long term trend in the national milk production is a gradual increase in this total production. The national production fluctuates; mainly because of the impact of fluctuations in feed and milk prices and weather conditions. Fluctuations in feed and milk prices influence decisions of dairy farmers to increase or decrease the amount of concentrates and more expensive ingredients in the ration, resulting in fluctuations in milk output of the farms. The slight decline in the volume of the milk production in the period from 2015 to 2017 also reflect an economic crisis going on in these years in Brazil.

Through the years the share of the southern states (Parana, Rio Grande do Sul and Santa Catharina) in the national milk production is increasing. Based on figure 1.2 their share is 37% of the national milk production. This is the region that contributes most to the national milk production. These are also the states with the highest milk production growth rates. The next region in size are the south-eastern states (Minas Gerais, Sao Paulo, Rio de Janeiro and Espirito Santo) with a share in the national production of 34%. These two regions are home to many efficient dairy farms that produce high quality milk.

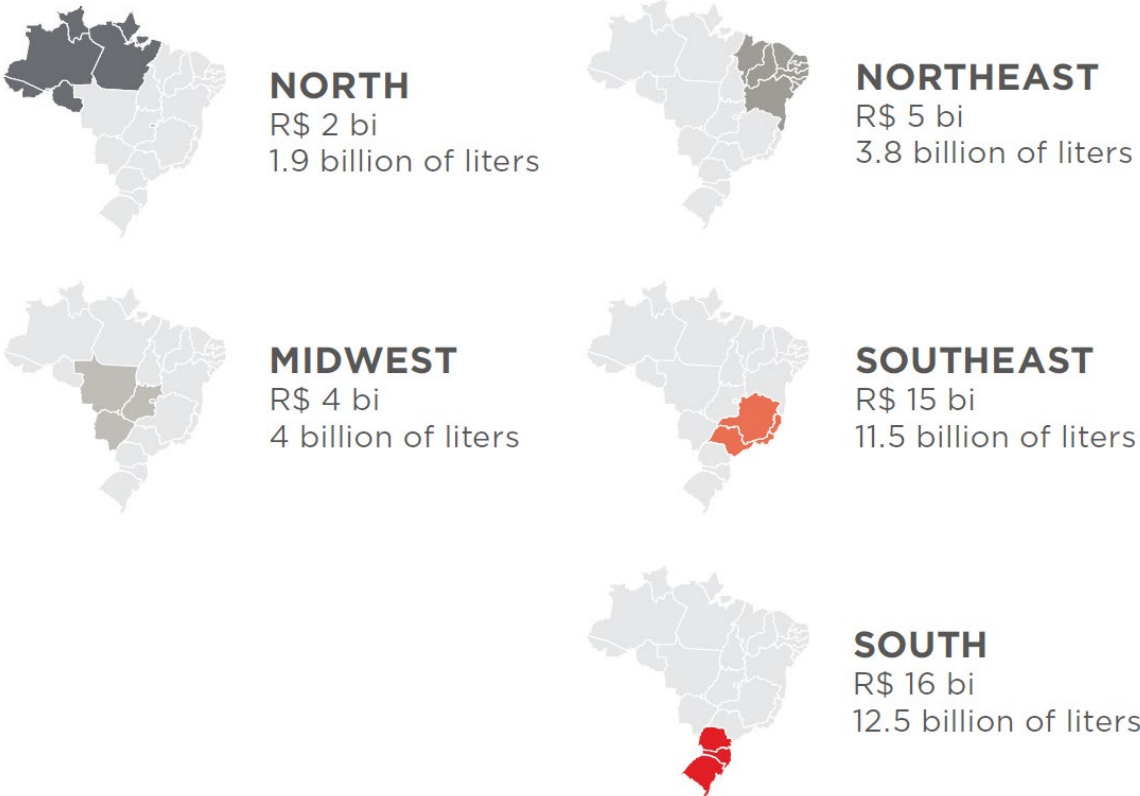


Figure 1.2 Value of production and volume of milk produced in 2016 in the Brazilian regions.

Source: Published by FGV Europe Projetos in "The Brazilian dairy sector and their interactions with international trade" (2019), based on data from PPM and IBGE (2018)

Table 2 shows the results annually reported by research organisation Embrapa in its annual Brazilian L report about the milk volumes collected by the biggest processors. The table comprises the milk volumes delivered to the 13 listed companies. These companies all together process 7.9 billion liters; this is about 31% of the milk processed in Brazil. This Empraba survey does however not include the data of all dairy processors in Brazil. Missing companies are a.o. Lactalis, Itambé, Goiasminas and Tirol who collect about 9.7 billion liters, equaling 40% of the milk processed in the country. Lactalis is the biggest processor in Brazil with an estimated processing of 2.3 billion liters per year in 2020; about 9 percent of the country's formal milk production. In July 2019 Lactalis has acquired the large processor Itambé from cooperative

CCPR. Goiasminas is expected to be the second or third company in the country in processed milk volume.

Table 2 Milk collected by Brazilian dairy industries per year.

Milk collection (in thousand liters) 2019			
Company	From producers	From third parties(**)	Total processed
1 Nestlé	780.434	701.841	1.482.275
2 Laticínios Bela Vista	1.111.858	345.679	1.457.537
3 Unium (*)	791.007	460.150	1.251.157
4 Embaré	335.112	214.797	549.909
5 Aurora	510.865	19.635	530.500
6 Ccgl	477.889	0	477.889
7 Cativa	298.897	126.901	425.798
8 Jussara	265.018	142.696	407.714
9 Vigor	256.909	91.817	348.726
10 Danone	167.197	126.437	293.634
11 Dpa Brasil	54.964	202.229	257.193
12 Frimesa	182.375	44.815	227.190
13 Centroleite	221.984	0	221.984
Total	5.454.509	2.416.991	7.871.500

(*) Dairy Intercooperation of cooperatives Frisia, Castrolanda and Capal

(**) Third parties milk is milk sourced on the open milk market by trade between milk processors

Source: <https://www.milkpoint.com.br/noticias-e-mercado/giro-noticias/ranking-leite-brasil-2019-captacao-das-maiores-empresas-cresceu-41-219474/>

1.2. Outlook development dairy sector in Brazil

1.2.1. General outlook dairy sector Brazil

The Brazilian dairy sector is in a process to increase quantity and quality of milk. The size of the dairy farms (in number of dairy cows) is increasing and so is the quality of the milk and the portfolio of dairy products. The country has a self-sufficiency rate for dairy product between 95 and 100% and many industry stakeholders hope that the country will become a net exporter in the next decade.

The southern states Parana, Rio Grande do Sul and Santa Catharina are the region with a share of 37% in the national production and this share is expected to grow. This is a dairy region with a lot of potential. Climate conditions to grow fodder crops and the availability of fodder and feed are excellent. Together with the emerging professionalism of the farmers as well as the processors, this region has excellent conditions to increase milk production further and this process is also supported by the regional state governments. At the same time research and development, training in farm management skills and marketing of milk and dairy products are areas that need further development to convert the strong conditions into an overall international competitive industry.

1.2.2. Impact of free trade between Mercosur and EU

The EU and Mercosur countries have been in an ongoing process of negotiations to come to a free trade arrangement for the last 20 years. They have reached an agreement in principle¹ in 2019 but this agreement still has to be approved by the EU Council and the European Parliament (in that order), as well as by the national parliaments of the Mercosur partners. A number of EU Member States have already expressed severe reservations about the agreement (France, Ireland, Poland and Belgium). Therefore the risk of Member States voting the deal down cannot be ruled out. Concerns about beef market access to the EU and lack of climate action by Brazil are considered to be the main hurdles, but there will be many smaller ones as well.

The main positive aspects of free trade arrangements for the dairy industry sectors in Europe would be the reduction of tariffs for dairy products as well as for industrial goods for dairy farms and dairy processing plants. Brazil would be a very interesting market to increase the import of European high quality dairy products (e.g. cheeses and infant formula) and all kinds of supplies for dairy farms, ranging from feed additives and pharma to robotic equipment for milking, feeding and manure management. Next to the reduction of tariffs also the abolishment of non-tariff barriers can be an advantage to give free access to European exports and to arrange plant registration, labelling and the protection of high quality European cheeses with granted Protected Geographical Indication (PGI) or Protected Designation of Origin (PDO). Imitation of these product categories is expected to be prohibited after agreeing on the free trade arrangement.

1.2.3. Opportunities for Dutch dairy equipment suppliers

The Netherlands have a strong dairy sector that is based on: entrepreneurship skills of the dairy farmers, international competitive dairy processors, high quality suppliers and specialised education and advisory services. The ambitions of the Brazilian to continue growth in quantity and quality of milk offer excellent opportunities to the Dutch high quality suppliers to export their products and services to Brazil. The Dutch have a positive image, partly also based on the high performance of farmers in the originally Dutch colonies in the state of Parana. These colonies and their dairy infrastructure (a.o. distributors) provide a springboard to contribute to the further development of the Brazilian dairy sector. Before, during and after our visit to the dairy sector in Parana we have invited Dutch companies who are already present in Brazil with subsidiaries and Dutch companies who are interested to export products and services to Brazil, to share company data with us. The names and additional data of these companies are listed in Chapter 4. This list was added to give an impression of the Dutch suppliers and the products they can supply to improve the development of the Brazilian dairy sector. This list may be useful in future activities to promote export of Dutch dairy supplies or to come to research collaboration between dairy related organisations in the two countries.

¹http://trade.ec.europa.eu/doclib/docs/2019/june/tradoc_157964.pdf?utm_source=POLITICO.EU&utm_campaign=246e97d315-EMAIL_CAMPAIGN_2019_07_01_03_49&utm_medium=email&utm_term=0_10959edeb5-246e97d315-190004365

2. Programme of the mission

2.1. Objectives of the mission

1. Identify and understand the main challenges of the Brazil (BR) dairy sector and the needs for support by Dutch (NL) by research organisations and private sector
2. Explore potential for partnership(s) between NL and BR, aiming at the future development of the Brazil dairy sector in general, dairy related trade between the two countries and collaboration with the research organisation Fundação ABC² on dairy research in particular.
3. List critical success factors for developing future collaboration and partnership(s) with knowledge institutes and private sector

2.2. Deliverables

1. Overview of perceived strengths, weaknesses, opportunities and threats of the Brazil dairy sector
2. Joint agenda for collaboration between BR and NL, based on the needs of Brazil dairy stakeholders: identify themes, initiatives, partners, sources for finance and critical success factors (long term)
3. Plan for follow up activities (short term)
4. List of NL and BR companies that are interested in more extensive exchange between BR and NL dairy chain partners

2.3. Programme during the mission week

See next page for the programme of the dairy mission week.

² Fundação ABC Fundação ABC is a research institute that conducts applied research, located in Castro in the Brazilian state of Parana

Table 3 Programme dairy mission Brazil

Date	Organisation/person to visit	Key themes	Details/ comments	Participants
Monday Nov. 18	Fundação ABC and cooperatives			
Morning	Dairy farm visits and group discussion with farmers Carambei	Discuss research opportunities	<ul style="list-style-type: none"> • Farm visits to the farms of Janus Katsman and Bouke Dijkstra • Strategy of dairy sector ABC cooperatives • Research opportunities • Support of farmers to research and added value of research for them 	<ul style="list-style-type: none"> • Janus Katsman, dairy farmer and dairy committee Frisia • Katsman senior, retired consultant • Bouke Dijkstra, dairy farmer • Jacob Zijlstra, dairy farmer
Afternoon	Fundação ABC and extension workers of the three cooperatives	Organisation of the week programme with stakeholders of the ABC cooperatives	<ul style="list-style-type: none"> • Organisation of week programme in collaboration with the three dairy extension coordinators of the ABC cooperatives and staff of Fundação ABC • Extensive explanation of the dairy sector in the Capal area, by Roberto Caldeira 	<ul style="list-style-type: none"> • Huibert Pieter Janssen (coordinator dairy extension Castrolanda) • Jefferson Tramantion Pagno (coordinator dairy extension Frisia) • Roberto Caldeira (coordinator dairy extension Capal) • Claudio Kapp Junior, Fundação ABC •
	Unium	History and opportunities of the ABC Cooperatives	<ul style="list-style-type: none"> • Strategy of the cooperatives • Research needs and considerations to invest in R&D • Finance of research and support of dairy farmers to finance research 	<ul style="list-style-type: none"> • Frans Bor, president of Unium and president of Castrolanda Cooperative • Huibert Pieter Janssen (coordinator dairy extension Castrolanda)
Tuesday Nov. 19	Cooperative Castrolanda			
Morning	Cooperative Castrolanda		<ul style="list-style-type: none"> • Short introduction by Huibert Pieter Janssen • Farm visit to Groenwold dairy farm 	<ul style="list-style-type: none"> • Huibert Pieter Janssen • Hans Jan Groenwold, dairy farmer and president of Brazil Holstein Association (accompanied by his son and son in law, also involved in the management of the family dairy farm)
Afternoon	Feed centre Nobre Nutricao Animal		<ul style="list-style-type: none"> • Guided tour at feed centre, providing customized feed for cattle and horses • www.nutricaoanimal.com.br 	<ul style="list-style-type: none"> • Pablo Borg, owner
Wednesday Nov. 20	Fundação ABC and Cooperative Frisia			
Morning	Fundação ABC		<ul style="list-style-type: none"> • Organisation of Fundação ABC • Research opportunities for collaboration 	<ul style="list-style-type: none"> • Claudio Kapp Junior, economist • Gabriel Barth, manager crop production • Luis Henrique Peckowski, technical research manager • Rodrigo Yoity Tsukahara, coordinator IT and smart agriculture
Afternoon	Cooperative Frisia		<ul style="list-style-type: none"> • Introduction to cooperative • Dairy farm benchmarking model • Farm visit to small dairy farm 	<ul style="list-style-type: none"> • Raphael Cornelis Hoogerheide, dairy farmer, president dairy committee • Wilant van den Boogaard, Vice-president dairy committee • Jefferson Tramantion Pagno, coordinator dairy extension Frisia • Francis Bavoso, Nutrition consultant and data analyst
Thursday Nov. 21	Stakeholders in Curitiba			

Date	Organisation/person to visit	Key themes	Details/comments	Participants
	Sistema OCEPAR	Potential for partnerships in dairy chain	<ul style="list-style-type: none"> • Future of dairy chain • Potential for future collaborations (themes and organisations) 	<ul style="list-style-type: none"> • Mr. José Roberto Ricken, president • Alexandre Amorim Monteiro, technical assistant, dairy specialist • Nelson Costa, supervisor • Maiko Zanella, technical analyst • Maria Emilia Pereira Lima, Human development manager
	Parana State Agricultural Secretary of	Potential for partnerships in dairy chain	<ul style="list-style-type: none"> • Future of dairy chain • Potential for future collaborations (themes and organisations) 	<ul style="list-style-type: none"> • Otamir Cesar Martins, Director President (replacing secretary of state Mr. Norberto Anacleto Ortigara) • Rubens Ernesto Niederheitmann, Technical Director
Friday Nov. 22	Final meeting			
Afternoon	Cooperatives Frisia, Castrolanda and Capal (dairy extension officers and dairy committee members) and Fundação ABC (researchers)	<ul style="list-style-type: none"> • Preliminary conclusions on options for collaboration • Discussion • Final conclusions dairy mission • Additional activities in next months 	<ul style="list-style-type: none"> • SWOT BR dairy • Main themes for collaboration • Attitudes towards collaboration • Identified options to collaborate (incl. partnerships): themes, initiatives, partners, sources for finance and critical success factors (long term) • Follow up activities (short term) • Still to do: additional activities of parties to elaborate results, solve issues or answer questions in next two months 	<ul style="list-style-type: none"> • See minutes meeting Dairy Mission on Friday 22nd November 2019 at Fundação in Castro

3 Towards R&D collaboration options and conclusions

3.1 Introduction

During the mission week we explored the options for collaboration between the Brazil and Dutch dairy sectors with focus on two options:

- Collaboration on dairy research with research organisation Fundação ABC in Castro and the three farmer cooperatives who own this research institute.
- Collaboration with Dutch companies who are already supplying the Brazilian dairy sector and Dutch companies who showed interest in exploring the potential to supply this sector.

About Fundação ABC

Fundação ABC is a private, non-profit research institute that conducts applied research to develop and adapt new technologies, with the aim of promoting technological solutions for agribusiness to the more than 5,000 rural producers affiliated with the farmer cooperatives Frisia, Castrolanda and Capal, in addition to contributing farmers, such as Coopagricola (Ponta Grossa-PR) and the group and BWJ (Formosa-GO). Through the participating cooperatives the institute is connected to an area of 467,235 hectares, in addition to a milkshed of 678 million liters per year. The institute has a strong focus on plant science research and also conducts research projects with private companies, through technical cooperation contracts. It also maintains links with public research companies such as IAPAR, EMBRAPA and important universities in Brazil. The headquarters and laboratories are located in Castro in the state of Parana. In addition, it has five demonstration and research fields covering an area of 143 hectares.

We visited Fundação ABC and met with farmers, board members and staff of the three cooperatives Frisia, Castrolanda and Capal to understand the present status and the outlooks for the dairy sector in the work area of the cooperatives and in the rest of Parana. Visits to the state Ministry of Agriculture and the overarching organisation of cooperatives in Parana Sistema Ocepar provided additional information about the dairy sector in the state of Parana. The state of Parana collaborates with other states in the south (see figure 2.1 for the states that are part of South Brazil) in promoting the further development of agriculture in the south. All these visits were focusing on options for research collaboration on dairy topics. Until today Fundação ABC is not involved in dairy cattle research and since the organisation was considering the options to extend to this research field we joined forces to explore the opportunities and willingness to extend their research area to dairy research. During the week we made an inventory of potential research topics, strongly based on a SWOT (strengths, weaknesses, opportunities and threats) for the dairy sector in Parana in general and the Castro area in particular. All these findings were presented on the last day of the visit. The minutes of this meeting are described in the next chapter (chapter 4).

We contacted a selected group of Dutch suppliers to the dairy industry who are already present in Brazil about their interest in joined research in Brazil and invited Dutch companies in the Netherlands who are

participating in Dutch Dairy Centre³ to show their interest in extending their business to the dairy sector in Brazil. The result was the list of companies presented in chapter 5.

3.2 Results of SWOT of dairy sector Parana

The results of the SWOT analysis were presented in a PowerPoint document that is attached in annex 2. This paragraph explains the SWOT results presented in table 4. These results are strongly focusing on the dairy sector in the working areas of the three cooperatives Frisia, Castrolanda and Capal. The results distinguish between the characteristics of the cooperatives and the dairy farms. These results were based on the observations and the discussions with all visited stakeholders during the mission week. Since the time to collect information was limited the results should also be considered as general and preliminary results. The main role of these results was to come to the definition of research themes.

Strengths

The overall impression is that cooperatives and farms have a very strong position and a very good performance. Mainly caused by efficient and market oriented businesses, a very favourable climate, very good soil conditions to grow crops and highly developed cultivation equipment and cultivation skills of the farmers.

Weaknesses

The items listed speak for themselves. In general: R&D and market orientation could be improved to produce more demand driven and to better benefit from the high quality of the produced milk.

Opportunities

Most of the opportunities mentioned have to do with dairy market opportunities, expansion of farms and scaling up of cooperatives. We - as Dutch assessors - expect that improvements towards more sustainable production on the dairy farm are in interesting opportunity. The Brazil partners have doubts about the real market potential of more sustainable milk.

Threats

The threats deal with Brazilian and international competitors of the three cooperatives that will gradually meet higher quality standards, introduction of additional environmental regulations and labour shortages.

³ <https://dutchdairycentre.com/>

The Dutch Dairy Centre (DDC) is a network of companies based in the Netherlands who supply a wide range of products and services to the international dairy industry for farmers, farmer co-operatives and milk factories.

Table 4 Results of the SWOT for the Parana dairy sector in the wider Castro area.

Cooperatives	Dairy farms
Strengths	
<ul style="list-style-type: none"> • Climate: temperature and rainfall enable high crop yields • Top raw milk quality from farms, compared to the rest of Brazil. Low in cell count and bacterial count. • Crop rotation: climate enables two or more high yielding crops during one year • Research, extension and training organized by cooperatives, Fundação ABC (crops and feeds) and partnering universities (cow feeding) • Strong competitive position in Brazil dairy chain • Entrepreneurship skills of cooperatives 	<ul style="list-style-type: none"> • Highly efficient farms (compared with Parana average yields) with high crop yields per ha land and high milk production per cow • Mixed farms (animal/crop) enables own feed production • Entrepreneurship skills of dairy farmers • Expansion of dairy farms exploits economies of scale • Zero tillage, has great advantages for soil health and structure and avoids erosion
Weaknesses	
<ul style="list-style-type: none"> • Vision and R&D on new consumer trends is left to multinationals in the Brazil dairy chain. Limited production for and investment in own brands. • No own research (through Fundação) in dairy farming (animal research) 	<ul style="list-style-type: none"> • Milk quality of small farms • Land price in the region is high and will hinder further expansion • Collaboration dairy and crop farmers • Awareness of market opportunities • Price volatility, partly influenced by currency fluctuations of Brazil real
Opportunities	
<ul style="list-style-type: none"> • Added value dairy products, such as cheese, deserts, infant nutrition, etc. • More emphasize on sustainability aspects of dairy production • Sell Dutch quality experience connected to the Castro region • More own brand products • Increase in domestic milk consumption • High quality demand of small high end consumer segments • Collaboration with other cooperatives in Brazil 	<ul style="list-style-type: none"> • Improved sustainability practices in animal welfare, greenhouse gasses, soil, water, biodiversity, etc. Will be future quality specs. • Expansion to other regions in Brazil • More efficient use of manure nutrients on crops • Sustainable best practices • Implementation of high tech solutions on dairy farms • Optimize collaboration between dairy and crop farmers
Threats	
<ul style="list-style-type: none"> • Improved milk quality nationwide, that decreases the competitive edge • Dependency on big (multinational) players and their brands • Stronger market position of cooperatives in others BR regions • Competition from foreign dairy suppliers, maybe facilitated by free trade arrangement • Increase of Brazil formal milk 	<ul style="list-style-type: none"> • Intensification, that may damage image of dairy products from this region • Environmental regulations • Labour shortages and or lack of necessary skills of workers

3.3 Potential R&D themes and follow up

In a joined meeting with representatives from the three cooperatives and Fundação ABC we discussed a list of R&D themes. This list was the result of the needs and opportunities discussed during the meetings that were held in the mission week. During the meeting all participants shared their R&D priorities and this led to this overall priority order of the research themes:

1. Dairy cow research facilities (feeding, health, welfare and calf raising)
2. Independent evaluation of feed ingredients and others supplies for dairy farms
3. Environment/Sustainability (energy, biodiversity, pesticides, awareness based on facts and figures)
4. Decision support systems (IT, Apps, and algorithms)
5. Education and training of farm workers
6. Future dairy farm systems (confined, semiconfined, grazing)
7. Dead cow removal and destruction
8. Compost bedding farm

3.4 Conclusions about follow up

After having agreed on the priority list in paragraph 3.3 Fundação ABC and the farmer representatives decided that they would consider the option of collaboration with Wageningen University & Research and Dutch private sector partners to extend the research program of Fundação ABC with a dairy program. In the course of 2020 the farmer cooperatives decided – for the time being - to refrain on further steps on the path towards dairy research.

We have documented the activities, the SWOT and the R&D priorities in this report to save these findings and experiences. There may be a follow up some time in the future, that will build on many joint initiatives in the past.

The initial objective of listing critical success factors factors for developing future collaboration and partnership(s) with knowledge institutes and private sector has received little attention during the mission. The main focus was understanding the present status and the needs of the dairy sector. The three cooperatives in the Castro area in Parana have built a strong and independent milk production and trade organisation that is in the forefront of the development of the dairy sector in Brazil. Next to that they have an open mind on the global development of the dairy sector. The Netherlands is part of their global scope and given their Dutch roots they still have many connections with Dutch business partners, but these are not in a preferred supplier position.

3 Minutes of the final meeting to discuss results and follow up activities

This meeting was held on Friday 22nd November 2019 at Fundação ABC in Castro.

Participants:

- *From Cooperative Castrolanda: Frans Borg and Armando Rabbers*
- *From Cooperative Frisia: Janus Katsman and Jefferson Tramontini Pagno*
- *From Cooperative Arapoti: Roberto Caldeira*
- *From Fundação ABC: Andreas Los, Luis Enríques Penckowski, Gabriel Barth and Claudio Kapp Junior*
- *From Dutch Embassy: Bert Rikken*
- *From Wageningen University & Research: Adolfo Alvarez Aranguiz and Jelle Zijlstra*

Minutes of the meeting

The presentation and discussion on “**Potential collaboration between Brazil (BR) and the Netherlands (NL) in the Dairy Sector**” were based on the power point made by Jelle and Adolfo (see Annex 2):

- 1. Main topics mentioned by the BR dairy farmers:** expansion, intensification, manure use and management, land price (crop and animal production and urbanization), soil nutrient management, applied animal research, logistics, feed costs and animal comfort.
- 2. Main topics mentioned by industry, institutions and organizations:** dairy sector reorganization (intensification/expansion, small farmers grow or change activity), BR milk production in the south will grow (subtropical climate), future export markets, land competition with other activities, mainly cash crops (soy, citrus, sugar cane, coffee), milk quality (legislation, but no enforcement?), milk powder.
- 3. Strengths:**
 - a. ABC Coops:** ideal climate, top milk quality, crop rotation, research, extension and training, strong position in BR dairy chain, entrepreneurship and expansion, cooperatives focus on farmers (add by participants), high dairy farms concentration in small area (add by participants).
 - b. ABC Dairy Farms:** highly efficient farms, mixed farm (combine animals and crops), entrepreneurship and expansion, zero tillage.
- 4. Weaknesses:**
 - a. ABC Coops:** vision and R&D on new consumer products, involvement in animal research in dairy farming, logistics, future increase in competition (add by participants)
 - b. ABC Dairy Farms:** Milk quality of small farms, land price, awareness of market opportunities, price volatility (participants comment that the cooperatives give a very stable price through the year, they believe that limited price volatility for cooperative members associated is a strength).
- 5. Opportunities:**
 - a. ABC Coops:** Sustainability = Next level in quality (participants comment the necessity of facts and figures to show this), added value dairy products, sell Dutch quality experience, more own brand products, increase in milk consumption, high quality demand, collaboration with other cooperatives, stable milk production throughout the year (added by participants).
 - b. ABC Dairy Farms:** Expansion to other regions, manure use on crops, sustainability, high tech.

6. Threats:

- a. **ABC Coops:** Improved milk quality nationwide, dependency on big players and their brands, stronger Coops in others BR regions, competition from foreign dairy suppliers, increased of BR formal milk (discussion: impact will be very small, because many small farmers will leave dairy sector).
- b. **ABC Dairy Farms:** Intensification, environment regulations, labour in the future (quality and quantity).

3 List of Dutch companies interested in collaboration BR and NL dairy

Before, during and after our mission to the dairy sector in Parana we have invited Dutch companies who are already present in Brazil with subsidiaries as well as Dutch companies who are interested to export products and services to Brazil, to share their company data with us. The names and additional data of these companies are listed in the table below. The table gives an overview of Dutch expertise that might become available to support the development of the Brazil dairy sector. One of the initial goals of this list was also to get an overview of companies that might be interested to participate in research and implementation projects in Brazil. Some of the companies in the list below have shown interest to collaborate on R&D initiatives for the dairy and/or beef cattle sectors.

Company	Contact BR	Contact NL	Products and/or services
Agrifirm S.A. Brasil	Mr. John Dortmans Director Agrifirm LATAM Curitiba - PR Mobile: +55 41 99136 2864 E-mail: j.dortmans@agrifirm.com		Animal nutrition, Young animal nutrition & additives
Alta Genetics	Mr. Heverardo Rezende de Carvalho Director Uberaba – MG Mobile: E-mail: comunicacao@altagenetics.com.br		Animal breeding material - artificial insemination
Banco Rabobank International Brasil S.A.	Mr. Renato A. Perroni Relationship Manager Head International Desk Brazil São Paulo - SP Mobile: 11 98635 5778 E-mail: renato.perroni@rabobank.com	Mr. Bart IJntema Mobile: +3165126784 E-mail: Bart.IJntema@rabobank.com	Financial services
CRV Lagoa	Mr. Rudi den Hartog Director President Sertãozinho – SP Mobile: 16 99762-5533/99625-4560 E-mail: rudi.den.hartog@crv4all.com		Animal breeding material - artificial insemination
De Heus Ind. E Com. Nutrição Animal Ltda	Mr. Rinus Donkers Director President Campinas- SP Mobile: 19 98458 1187 Email: rdonkers@deheus.com		Animal Nutrition – Animal feed, concentrates, premixes and calf milk replacers
DSM Produtos Nutricionais Brasil S.A.	Mrs. Veronica Lopes-Schvartzaid Marketing Dairy Category São Paulo - SP		Animal feed

Company	Contact BR	Contact NL	Products and/or services
	Mobile: +55974243671 Email: Veronica.Lopes-Schvartzaid@dsm.com		
Trouw Nutrition Brasil - Campinas	Mr. Fabio Escher Director Marketing Campinas - SP Mobile: 19 99889 2604 Email: fabio.escher@trouwnutrition.com		Innovative feed specialities, premixes and nutritional services for the animal nutrition industry
Mueller	Janio Terra Regional Sales Manager - Dairy Farm Equipment São Paulo - SP Phone: (+55)35-99873-2018 e-mail: jterra@paulmueller.com	Jos ten Horn International New Business Manager Noordgang 14, 7141 JP Groenlo Mobile: +31621553516 Email: jtenhorn@paulmueller.com en.paulmueller.com	Milk cooling equipment Pre-owned milk cooling tanks
Van Dinther		Willie van Dinther Infanteriestraat 1, 5363 VW Velp (NB) Phone: +31 486473068 Email: willie@vandinthervelp.nl www.vandinthervelp.nl	Milking parlour and backing gates
CowSignals@ Training Company		Rik Neeleman Managing Director Hoekgraaf 17a, 6617 AX Bergharen Phone: +31487745041 Email: rik.neeleman@cowsignals.com www.cowsignals.com	Training and education on animal health.
Noldus Information Technology	André Kraaijkamp Office Manager and Research Specialist Santiago de Chile +56 953963573 (WhatsApp) andre.kraaijkamp@noldus.com www.noldus.com	Dr. Lucas Noldus CEO Nieuwe Kanaal 5, 6709 PA Wageningen Mobile: +31 6 53425199 Email: Lucas.Noldus@noldus.nl https://www.noldus.com/applications/animal-behavior-welfare-health-tracking	Solutions for the monitoring of behaviour, health and welfare of animals

3 Acknowledgement

The authors like to thank for the hospitality we received from all the hosts we visited. We really appreciated sharing and exchanging visions and opinions about the future of the Brazilian dairy sector. With special thanks to Mr. Alexandre Amorim Monteiro From SistemaOcepar in Curitiba for sharing, explaining and discussing data about the Brazilian dairy sector.

Annex 1 Terms of Reference “Potential Collaboration Fundação ABC-WUR

1. Introduction

a. Brazil Dairy Sector:

Brazil is well known as a strong exporter of grains, beef, poultry and pigs, but its dairy export position is still weak. The southern regions of Brazil are home to dairy farms that are highly efficient and produce high-quality milk, many of them associated to the Agro industrial 3 Cooperative (of former Dutch colonies) with its technical arm: Fundação ABC, and with a huge potential to export dairy products to other countries. The Brazilian government seems to move forward in supporting the Brazilian dairy farmers. New standards for production have come into force in May and the minister of agriculture wants to develop a plan to promote dairy sector modernisation.

b. The Netherlands, WUR:

The dairy tradition and evolution of the dairy sector in The Netherlands is well known worldwide, and Wageningen University and Research are, in part, responsible to keep the Dutch dairy sector in permanent development according to new challenges (climate change, productivity, sustainable intensification, efficiency).

Development of production systems (dairy, beef, pig), precision farming adapted to specific conditions, the development of high technology for the agricultural sector and the adaptation to a circular agriculture perspective is one of the main focuses of WUR. The customisation and application of this new progresses in different countries and conditions have been part of WUR in the last years.

2. Summary of proposed action

Brazil is a priority country for Wageningen UR in Latin America and within the country, there is a focus on “Circular economy (agriculture)”, “Climate Change & sustainable intensification” and “Animal Husbandry (beef, dairy, poultry and pigs)”, not leaving unattended opportunities in the other domains of Wageningen UR (Agro Big-Data use, genomic-genetic, crop high-technology).

The goal for the agriculture team of the Dutch embassy in Brazil is to mediate and facilitate the contribution of Dutch companies and knowledge institutions to the challenge of sustainable intensification of Brazilian agriculture, contribution to the recovery of degraded land avoiding unnecessary further deforestation.

In this concern, the proposed action for this mission are twofold:

- Identifying what the main challenges faced by the Dairy stakeholders; the associates and board members of the 3 cooperative FRISIA and especially the technical staff of Fundação ABC as key players in the dairy sector in Parana area, and ii) define a joint agenda for collaboration (Fundação ABC, Cooperatives, Wageningen UR and potential other partners, including private sector)
- Identifying potential additional (local) institution and private companies for future collaborations in the dairy sector (State authorities, Universities, EMBRAPA, DSM, De Heus Feed, Nutreco, Trouw Nutrition, Rabobank, CRV, Alta Genetic, Hendrix Genetics, Lely, etc.).

3. Purpose and overview of the mission

The purpose of this mission is to scan the current situation in the high potential dairy area of Brazil, have thorough exchange with the stakeholders involved in the dairy chain, especially in dairy farmers, cooperatives and service providers to obtain the first-hand the main challenges in the sector.

These insights will then be used to develop potential scenarios for the development of the proposition of collaboration, in relation to the growing dairy sectors including identification of key leverage points for influencing them.

This proposed study will do:

- Screening of challenges and opportunities in Brazil Dairy sector,

-
- Develop a joint agenda for collaboration (with Fundação ABC, cooperatives mainly) and potentially; draw the outline of a (joint) Center of Excellence for Dairy.
 - Define the follow up activities and elaborate a first general scheme (including potential funders) for future activities.

4. Overview of planning

This proposal is expected to be conducted during October-December 2019 with a final report January-February 2020.

- **Stage 1-** Visit to Brazil: To be decided 7 to 10 days (WUR Availability: Between October 15 and November 2) . Contact Dairy sector stakeholders (Farms, cooperative, feed companies, dairy industry, etc.)
- **Stage 2-** Preparation of reports and a project proposal for future collaboration

5. Coordination

- Embassy of the Kingdom of the Netherlands, Brasilia

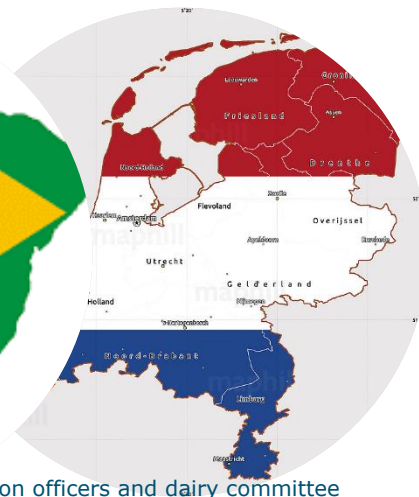
6. Finalize outputs

- Dairy (short report and first outline of project proposal)
- Midterm presentation in Brazil (at the end of the trip) before NL Embassy and other partners

Annex 2 PPT presented at meeting
November 22, 2019, including
results discussion

Colaboração Brasil e Holanda na área de laticínios

Parana, Brazil, November 22, 2019



Collaboration between the Brazil and Dutch dairy sectors. Presentation held on November 22, 2019 for a group of dairy extension officers and dairy committee members of Cooperatives Frisia, Castrolanda and Capal and researchers of Fundacao ABC. The purposes of this meeting were (1) to present the experiences and the vision on the development of the dairy sector in Parana as perceived by the Wageningen experts and (2) to discuss opportunities for research collaboration between Fundacao ABC and cooperatives on Brazil side and Wageningen



Picture on Groenwold family dairy farm, with on the left agricultural counselor Bert Rikken (Netherlands Embassy in Barsilia), fourth from the left dairy nutrition expert Adolfo Alvarez Aranquiz and sixth from the left dairy economist Jelle Zijlstra (both from Wageningen Livestock Research, the Netherlands). The other persons are part of the Groenwold family.



Impression of the Groenwold farm: big farm with modern feeding equipment to make total mixed ration (TMR)



Farmer in Carambei, who is specialized in producing milk with Jersey cows

Findings from Dairy Farmers:

- Expansion
- Intensification
- Manure use and management
- Land price (crop/animal production/urbanization)
- Soil nutrient management
- Animal applied research
- Logistic
- Feed cost (55%)
- Animal comfort



These were the most frequently discussed topics during our talk with farmers about dairy farming in Parana. We perceive these topics as development pathways and issues.

Findings from Industry, Institutions, Organizations:

- Dairy sector reorganization:
 - Intensification/expansion
 - Small farmers grow (or change activity)
- Brazil milk production in the south will grow (Subtropical climate)
- Future Export markets
- Land competition with other activities, mainly cash crops (soy, citrus, sugar cane, coffee)
- Milk quality (legislation, but no enforcement?)
- Milk powder

These were the topics that were frequently discussed in visits to Ministry of Agriculture of Parana, OCEPAR and farm advisors

Strengths

- ABC Coops:
 - Climate
 - Top milk quality
 - Crop rotation
 - Research, extension and training
 - Strong position in BR dairy chain
 - Entrepreneurship and expansion
- ABC Dairy Farms:
 - Highly efficient farms
 - Mixed farm (animal/crop)
 - Entrepreneurship and expansion
 - Zero tillage

This sheet and the next four are the results of the SWOT assessment (Strengths, Weaknesses, Opportunities and Threats) that we (Adolfo Alvarez and Jelle Zijlstra) made of the dairy sector in Parana. This sheet is about the strengths, where we distinguish between the three cooperatives in Castrolanda, Carambei and Arapoti and the dairy farms in the milk sheds of the three cooperatives. The overall impression is that cooperatives and farms have a very strong position and a very good performance. Mainly caused by efficient and market oriented businesses, a very favourable climate and very good soil conditions to grow crops and highly developed cultivation equipment and cropping skills of farmers



Weaknesses

■ ABC Coops:

- Vision and R&D on new consumer products
- Involvement in research in dairy farming (animal)
- Logistics

■ ABC Dairy Farms:

- Milk quality of small farms
- Land price
- Collaboration dairy and crop farmers
- Awareness of market opportunities
- Price volatility



These items are the weaknesses we perceived for the cooperatives and the farms. Most items hardly need any further explanation; they speak for themselves. R&D and market orientation could be improved to produce more demand driven.

Opportunities

■ ABC Coops:

- Sustainability = Next level quality
- Added value dairy products
- Sell Dutch quality experience
- More own brand products
- Increase in milk consumption
- High quality demand
- Collaboration with other cooperatives

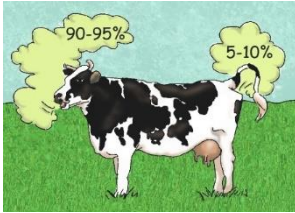
Most of the opportunities mentioned have to do with dairy market opportunities, expansion of farms and scaling up of cooperatives. We as Dutch assessors expect that improvements towards more sustainable production on the dairy farm are in interesting opportunity; the Brazil partners have doubts about the real market potential of more sustainable milk.

■ ABC Dairy Farms:

- Expansion to other regions
- Manure use on crops
- Sustainability
- High tech



Global sustainability issues dairy farms



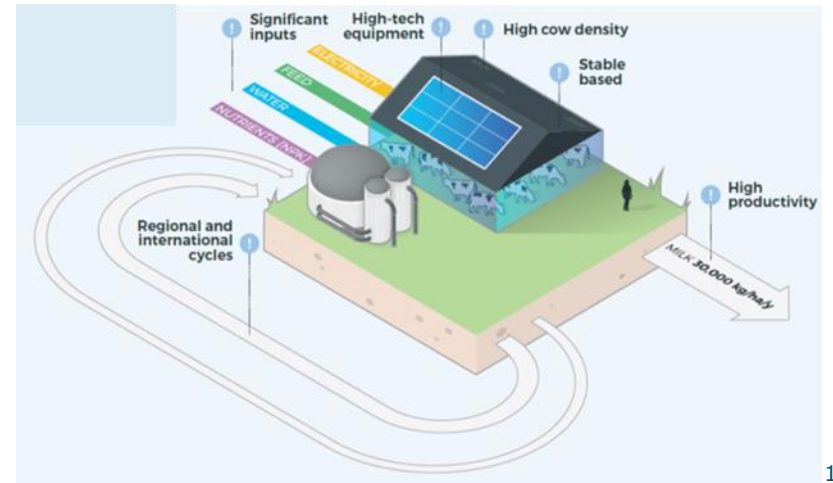
These pictures show the many faces of sustainability as defined by the global organisation Dairy Sustainability Framework: greenhouse gases, soil fertility and soil life, circular agriculture e.g. by more efficient use of nutrients in manure, improvement of water quality and saving on water use, biodiversity, sustainable profitability, healthy and prosperous working conditions, healthy food and animal welfare.

Threats

- ABC Coops:
 - Improved milk quality nationwide
 - Dependency on big players and their brands
 - Stronger Coops in others BR regions
 - Competition from foreign dairy suppliers
 - Increase of BR formal milk

The threats deal with Brazilian and international competitors of the three cooperatives that will catch up, environmental regulation and labour shortages

- ABC Dairy Farms:
 - Intensification
 - Environment regulations
 - Labour



Research and development themes (dairy farm level)

1. Dairy cow research facilities (feeding, health, welfare, calf raising)
2. Independent evaluation of feed ingredients and others supplies for dairy farms
3. Environment/Sustainability (energy, biodiversity, pesticides, awareness based on facts and figures)
4. Decision support systems (IT, Apps, and algorithms)
5. Education and training
6. Future dairy farm systems (confined, semiconfined, grazing)
7. Dead cow removal and destruction
8. Compost farm (bedding)

This is the prioritized list of research opportunities for the Parana dairy sector. This list was compiled in close collaboration with the Brazil representatives in the meeting. The priority sequence in the above list was decided by these Brazil participants.

Potential future partners in research

Dutch in BR

- DSM
- De Heus
- CRV

■

Institutions

- EMBRAPA
- IAPAR
- Universities
- Others coops
- Secretary of Agr. , OCEPAR ...

Finance options:
- 50% Coops CFC and members
- 50% potential partners

Dutch in NL

- Genetics
- Cow signals (training)
- Uniform Agri (software)
- Dairy processing
- Mueller cooling tanks
- Van Dinther barn equipment
- Noldus (IT animal behaviour)
- GD Animal Health
- ...

Together we assessed public and private partners from Brazil and the Netherlands that might be interested to undertake research with Fundacao ABC and the cooperatives. We brainstormed about Brazil and Dutch partners to collaborate on R&D.

Other potential partners?

Next Steps

This meeting was held to generate ideas about R&D topics and initiatives, potential partners in R&D, collaboration between Fundacao ABC, farmer members of cooperatives and Wageningen Livestock Research. Next to that to think about private and public partners with research and innovation needs and funds. In the end we agreed about a road map to come to decisions about the research topics and the collaboration. Fundacao ABC is in the lead to discuss this with the three cooperatives.

1. Define Pesquisa e Desenvolvimento agenda
2. Approval of 3 farmer committees: Go / No go
3. If go: Further elaboration of the Programme
Support/facilitate/review from Embassy NL and WUR ?
4. Search for potential partners
 - a. Invite
 - b. Align joint research agenda
5. Finance
 - a. Who contributes?
 - b. Which share?
6. Organisational setup
 - a. Lead party
 - b. Design of organisation (Research Farm or Centre of Excellence Dairy or)
 - c. Management, Ownership results, Communication....

Time Line:

March

April

May

June

To explore
the potential
of nature to
improve the
quality of life



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Wageningen Livestock Research creates science based solutions for a sustainable and profitable livestock sector. Together with our clients, we integrate scientific knowledge and practical experience to develop livestock concepts for future generations.

Wageningen Livestock Research is part of Wageningen University & Research. Together we work on the mission: 'To explore the potential of nature to improve the quality of life'. A staff of 6,500 and 10,000 students from over 100 countries are working worldwide in the domain of healthy food and living environment for governments and the business community-at-large. The strength of Wageningen University & Research lies in its ability to join the forces of specialised research institutes and the university. It also lies in the combined efforts of the various fields of natural and social sciences. This union of expertise leads to scientific breakthroughs that can quickly be put into practice and be incorporated into education. This is the Wageningen Approach.

