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Quality in smallholder dairy farming in Minas Gerais, Brazil.

July 2008



ANIMAL SCIENCES GROUP
WAGENINGEN UR

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Abstract

This report presents the results and impressions of a project on 'Quality in smallholder dairy farming in Minas Gerais, Brazil'. The following topics are discussed: quality of product & process, the position of the smallholder farms, and the problems and future opportunities for these farmers.

Keywords

product quality, process quality, dairy, smallholder, family farms, Brazil, Minas Gerais

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Disclaimer

This report is based on observations from field visits, meetings, seminar and workshop. An extensive literature study was not conducted in this project. Therefore the report does not pretend to be complete on all aspects of the variable dairy scene in Minas Gerais. Indeed, much more can be done, but detailed work is beyond this assignment. Comments and suggestions are very welcome.

Preface

This report describes the results of a study on '*small farmers in the Brazilian dairy sector (especially Minas Gerais) and the development of dairy quality chains*' which was initiated by the Agricultural Counselor of the Dutch Embassy in Brazil. The project was sponsored by the Dutch Ministry of Agriculture, Nature and Food Quality (project no BO-10-006-112). This report presents the results and impressions of our two missions to Minas Gerais. In these missions we looked at the quality of product & process, the position of the small [family] dairy farms, and the problems and opportunities for these farmers. The issues and challenges for the smallholder dairy farms were discussed with relevant stakeholders.

The project started with focus on quality in dairy chains, but during the project we also focused on the position of the smallholder farms in the dairy chain. The first priority of the smallholder farms is to stay in business, because they hardly have an alternative. Therefore improving product quality is needed, but they also need recognition of the importance of their role for the countryside and environment (process quality).

We would like to thank all our friendly hosts and hostesses for their hospitality and interesting meetings, visits and discussions. We especially would like to mention (at the risk of forgetting some people) Fabio Homero Diniz, Rodolpho de Almeida Torres, Claudio Napolis Costa, Pedro Braga Arcuri with their research staff from Embrapa Gado de Leite; Fabio Freire Lopes, Feliciano Nogueira de Oliveira, Marcos Meokarem with their staff from Emater; Aparecida das Graças Monteiro (LAC); Guus Laeven (Lagoa); Jan Ubel van der Vinne (Batavo); Roger van der Vinne (Intervet); Vidal Pedroso de Faria, Wilson Mattos and Paulo Fernando Machado from University of Sao Paolo; Jos van de Vooren and Peter Zuurbier (WUR Latin America Office); and Frederica Heering from the Dutch Consulate for arranging all appointments.

During our first mission the people from Embrapa and Emater spent some days with us and they arranged very good trips to dairy farms and industry, many thanks for that! The seminar and workshop have been a great success, and a special thanks to Fabio Homero Diniz (Embrapa) for the perfect organization. A final thanks to all stakeholders for the good discussions and participation.

We hope that this report triggers useful discussions, we look forward to receive comments and suggestions, and we hope for some collaborative work between Brazil and the Netherlands.

The Netherlands, June 2008

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Executive summary

The project

This mission on “Quality in smallholder dairy farming in Minas Gerais” was initiated by the Agricultural Counselor of the Dutch Embassy in Brazil. Important goal was to study opportunities for collaboration between the Netherlands and Brazil.

Two visits were made (July and October 2007) to meet and discuss with stakeholders along the dairy chain (from farm input to dairy product) in the Minas Gerais state, by two experts from Wageningen University (Judith Poelarends on product quality and farm management and Hans Schiere on farming system development). Minas Gerais is a traditional and strong state in terms of [smallholder] dairy production. It also represents various agro-ecological regions of south, north, east and western Brazil.

The main approach of the visit was the use of a chain approach (from farm-inputs to dairy product), with a distinction between short term product quality issues (e.g. bacterial counts, antibiotic residues and milk composition), and long term process quality issues in view of global changes such as climate change, energy prices, emerging diseases (e.g. good agricultural practices concerning environmental aspects like erosion, community life, farmers skills, biodiversity, etc.).

Dairy in Minas Gerais

- Much milk is produced by smallholder dairy farms. The dairy sector has to adjust due to changing rules for food safety, changing market conditions (increased export-opportunities) and growing concerns about the biophysical, socio-economic and ecological environment. Brazil is known for destruction of rainforest, but it is also strong in NGO-movements that counteract these processes.
- Most milk in Minas Gerais appears to be produced by small family dairy farms, with milk yields of approx 1500 kg/cow/yr; some 80% of farms use hand milking and 75% of the farms are able to cool their milk (either on farm or in communal milk tanks).
- Product quality of milk is becoming more important, and in 2011 the quality standards will be the same as nowadays in Europe. Many farms do not even meet present Brazilian quality standards (bacterial counts, somatic cell count etc). These farms face a challenge to improve their milk quality on short term.

Main observations & possible actions

- The two missions had to look especially at current problems and future possibilities for the family farms. The first visit was mainly to get acquainted, the second was to organize a seminar and workshop for the stakeholders in the dairy chain, together with Embrapa Gado de Leite (dairy) in Juiz de Fora in Minas Gerais.
- The first central observation is that the milk market is undergoing strong changes, a) due to increasing world market prices; b) due to shifting production locations away from more profitable crops such as for bio-fuel; and c) due to public pressure for more higher quality products. All dairy farms also have to submit to more stringent quality standards. However, one may wonder whether the sector in Minas Gerais should focus on production of one standard milk, or on different brand-qualities like organic, “green-hill-milk”, fair-trade-milk, export quality, etc. (see last comment).
- The second central observation is that much knowledge and practical experience exists in terms of both product and process quality; and also in both traditional and modern approaches of research (on station trials vs. participatory approaches). We were impressed with community-milk collection schemes, with the role of universities (Piracicaba) in quality control and with industry initiatives. For example Intervet organizes dairy quality trainings at village level, and Lagoa da Serra is actively involved in production of locally adapted semen (Nelore, etc). It is probably largely a matter of private initiative to do the up-scaling, but the risk would then be that smaller family farms will eventually be marginalized.
- Third: a) more work is still needed, also by the public sector, to improve milk product quality for the short term, however, most of that work consists of up-scaling present activities and models, and/or by updating public sector staff on aspects like HACCP, Pareto analysis; b) milk quality control is a matter of farmer organization and mindset, but also of mindsets at higher company level (e.g. the state level milk scandal when we just visited there in October); c) commercial companies have the know-how, skills and infrastructure to produce [added value] products of good standards.
- Fourth, opportunities exist for synergy in collaborative work on new concepts for process quality and Good Agricultural Practices, referring to aspects as resource use efficiency, conservation of resources, community life, farmer skills, biodiversity, erosion, planning [of] multifunctional agriculture, etc.
- Fifth, much work is done by Embrapa on [future] production systems & techniques (e.g. agro-forestry, new fodder, breeding for heat- and disease tolerance, farm- and sector economics). Animal Sciences Group /

Wageningen UR can provide recent concepts and methodologies, it can help to review and summarize this work through workshops and exchange of staff, thus setting a path for future collaboration between Brazil and The Netherlands. Particularly work on inclusion of constantly evolving and changing farming systems deserves attention in this respect. Some of that work is already going on, e.g. in the WUR-Embrapa work on 'competing claims', but more can be done and linking up is suggested.

- Sixth, much private sector developments are in the hands of large companies that have their own know-how. General know-how in that sense is not needed, but specific consultancies might be useful, e.g. on specific feed mixes, R&D on reproductive work and breeding, vaccine production techniques etc. WUR and the Embassy could facilitate such exchange.
- Seventh, training and workshops with respect to popularization and implementation of participatory work and use of modern system approaches could be initiated, again with good possibilities for synergy between The Netherlands and Brazil (industry as well as public sector). Particularly the work on system approaches, scenario studies and workshops as during the second visit appears to be useful for the Brazilian partners (an opportunity for Animal Sciences Group, Wageningen International and other Dutch training centers).
- Eighth, sustainability implies attention for local and [inter]national production contexts, as well as for the core competence of [different dairy] production systems. In some places close to cities and infrastructure the sector may benefit from industrial production systems based on high input use (also of agro-industrial by-products). In other places such as in the hilly and more remote conditions of Minas Gerais one might decide to focus on sustainable [dairy] development with aspects of environmental services, resilient countryside, etc. In other words, there may not only be a need for market segmentation but also for production system segmentation. The product quality may differ between those systems (except for basic standards such as on bacterial counts and residues), but process quality should be advertised and marketed with specific attention for the needs and opportunities of the region. Workshops and exchange in that field is a last but not least opportunity.

Main conclusion

- The dairy sector in Minas Gerais is undergoing rapid change and family farms can play a potentially large role, provided they manage to get 'good product quality'. The process quality of these systems and regions may, however, imply other criteria than the standard ones.



Contents

Preface

Executive summary

1	Introduction	1
2	The stakeholders	2
3	Quality and smallholder farms – results of the first mission	3
	3.1 Milk production in Minas Gerais (MG)	3
	3.2 Milk quality.....	4
	3.2.1 Milk quality - the rules	4
	3.2.2 Milk quality – some results	5
	3.2.3 Milk quality – residues	5
	3.2.4 Milk quality – strategies and payment schemes of the dairy plants.....	5
	3.3 Milk recording	6
	3.4 Small dairy farmers – some specific notes.....	7
	3.5 Communities of farmers – one example.....	8
	3.6 Projects by stakeholders – concerning small farms or milk quality	8
	3.7 First conclusions concerning milk quality on farms in MG	9
4	Issues and challenges for the dairy sector	10
	4.1 Resources	10
	4.2 The market and production sites.....	10
	4.3 The structure of the sector, problems or opportunities?	11
5	First mission; concluding comments and suggested actions.	13
6	Seminar and workshop.....	14
	6.1 Seminar 30 th October	14
	6.2 Workshop 31 st October	14
	6.2.1 Types of small holder dairy farms in MG, including some characteristics	15
	6.2.2 Scenario's for the future	15
	6.2.3 Actions for the future.....	15
7	Conclusions	17
	7.1 Suggestions for joint work.....	17
	7.2 The family farm	17
	7.3 Final conclusions and suggested activities	18
	Appendix 1 – Itinerary first mission to Minas Gerais	21
	Appendix 2 - Terms of Reference	22
	Appendix 3 – Participants of Seminar 30th October 2007	23
	Appendix 4 – Participants of Workshop 31st October 2007	24
	Appendix 5 - Presentations during the seminar	25

1 Introduction

This report presents the results and impressions of our two missions to Minas Gerais in the framework of the project “Small farmers in the Brazilian dairy sector and the development of dairy quality chains”.

The goal of our first mission to Minas Gerais (8-20 July 2007) was to meet major stakeholders along the dairy chain in Minas Gerais (research, extension, local [small] dairy producers, dairy industry, etc.) and to identify main problems and opportunities in the dairy chain. The first mission focused on the quality of product & process, the position of the small [family] dairy farms, and the problems and opportunities for these farmers. We visited the most important stakeholders in the region and different kind of farms which represent the farms present in MG, but the mission was only for ten days, which is insufficient for complete description of the situation. The description that we made is based on the meetings and discussions with the stakeholders. An extensive literature study was not conducted. The results and impressions of our first mission in July are described in this report, starting with a description of the stakeholders (chapter 2) proceeding with an outline of the dairy sector and quality in Minas Gerais (chapter 3), towards issues and challenges for the dairy sector (chapter 4 and 5).

As a follow-up of the first mission we planned a seminar and workshop in October 2007 with all relevant stakeholders (chapter 6). Goal was to discuss the quality of product and process in the dairy chain in Minas Gerais and the position of the smallholders.

Final conclusions and suggestions are described in chapter 7.

2 The stakeholders

The first visit in July helped to meet the stakeholders across the entire chain; from input supply and producer via collection point people to processors and marketing people (see itinerary in appendix 1). The visits also included representatives of the private and public sector (farmers, business, farmers unions, researchers). On the one hand, the visit was too brief to come up with a detailed list of possible actions and priorities per stakeholder. On the other hand, there is too much information gained during the discussions and from the literature and reports received. The relevant documents are available on request.

All in all, the impression is that almost all relevant aspects of dairy development are known in Brazil, that the present market is recovering from a bad period, and that there are opportunities such as:

- further work on quality, incl. greater coverage of the producers (still large informal market), and expanding on aspects of 'social inclusion' (with special attention for small farmers) and process quality (with attention for aspects of environment, resource use efficiency etc.).
- the producers and processors tend to consist of smaller / traditional bulk producers on the one hand, and more specialized hi-tech ones (not necessarily larger) on the other hand. The concern would be to exploit the variation rather than to standardize everything.
- the industry (incl. farmer groups) plays a large role in aspects of quality control, e.g. at the collection points and during processing, but also for example in campaigns for better udder health (Intervet). We did not get a good picture on the role of feed and breed¹ companies in general, but we were impressed by the direction and new developments such as in breeding (Lagoa da Serra ²), e.g. including work on breeds for more marginal conditions.
- the formal research and extension systems are generally up to date and well aware of the issues in the sector. The notions of farmer-led R&D are well known, as well as notions and methodology on basic issues of efficiency and environment (physical and social).



Crossbred cows seeking shade under a tree.

¹ 'Feed-and breed' companies also include other input suppliers (seed, equipment, housing systems etc.)

² Lagoa da Serra, AI centre, is a daughter company of CRV, a cooperative of forty thousand Dutch and Belgian breeders

3 Quality and smallholder farms – results of the first mission

3.1 Milk production in Minas Gerais (MG)

Minas Gerais is a part of Brazil that actually reflects various environments. In that way a good understanding of dairy in MG can help to understand dairy elsewhere in Brazil. The north of MG is like the north of Brazil. South of MG is like the state of Sao Paulo and the western part of MG is like the neighboring states. So it reflects three types of climate. MG is a big state and therefore one of the bigger producers concerning the total amount of produced milk (28% (=7 billion) liters of the total production in Brazil). Concerning milk density per square kilometer, MG does not differ from the other states. The total milk production in MG is not increasing so much as in the North, relatively seen there is a growth in milk production in MG, but it is not as big as in other states. Most milk is produced by small family farms. For the term “small family farms” or “smallholder farms” we noticed that these term might be interpreted in different ways. We may see it as farms, run by the families, that produce no more than a few hundred kilograms of milk per day with low production per cow.

- In MG the milk production per cow approximates 1500 kg/cow/year (2005). On well managed herds it is possible to have a production of more than 4000 kg/cow/lactation.¹
- Most of the farms (80%) in MG milk by hand.¹
- 75% of the farms cool their milk (on farm or in communal tanks), 25% don't cool their milk and they get a lower milk price from the dairy plant (\$0,30 vs \$0,50).¹
- The biggest dairy company in MG, Itambe, had 8700 milk producers in 2006 with an average daily production of 274 kg/day. The year before, 2005, they had less producers, 7325, but with a higher production per farm, 367 kg/day. So, Itambe got more producers, but with a lower production per farm on average. This probably means that more smaller farms delivered to Itambe. What may influence these figures are the increasing number of communal milk tanks (represents a group of farmers) and people buying their own milk cooling tank to be able to deliver cooled milk.¹

¹ *Availability and reliability of data is limited, i.e. data given here can only reflect approximate ranges rather than accurate values. Large differences occur between regions and companies, as well as between productivity parameters such as lactation length and milk actually marketed through official channels.*



Materials for hand milking, cleaning and storage on one farm

Increasing milk production

The milk production (per farm and in total) is increasing and this may be for several reasons.

- Farmers tend to breed more crossbreeds with higher milk production and some farms switch from beef to milk production. Former beef producers did not have the chance to get their milk to the dairy plant, but with the introduction of cooling tanks it became possible. The beef producers did not milk before, but they began to “extract milk” from cows and started to crossbreed with Holandes. Increasing milk prices stimulate this.
- More milk is delivered at the plants instead of sold at home or in the village. More farmers want to deliver their milk to the plant because of the increasing milk price and the opportunities they see in milk production. This also means that more milk goes into the ‘official circuit’ and is registered. Nowadays it is estimated that 30-50% of all produced milk is ‘unofficial’ (not registered) and does not go into official dairy plants. This is especially true for the North and West of Brazil. So, the figures that are known only reflect half the reality. In the past, the same (uncooled) milk was sold on the market, but with the cooling (communal) tanks farmers can join the dairy plant. This affects the number of kilograms of milk which is ‘on paper’ and registered.
- The dairy sector is becoming more efficient, more focus on quality, and some pay bonuses for quality which is stimulating. After 1996 there is a better collection of the milk, milk is cooled on the farm (not on all) and truck drivers collect the milk. Still, there is a long way to go.

In summary Brazil presents a large production potential concerning the number of dairy cows in the country (20 million). The production can grow very fast with small investments. The milk price started to increase some years ago, but in 2007 the milk price is better than ever. So farmers are more interested in producing milk and even farmers that had stopped, have started to milk again. Logistics for export are also getting better (milk powder industry). Even if export may still suffer due to commercial (taxes from EU/USA), technical (milk quality) and ambiental problems (certification of industry and farms in the future).



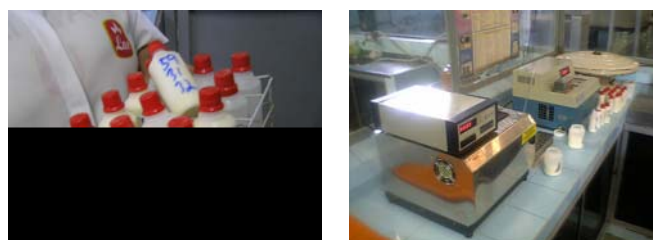
Machine milking with calves suckling. Milk is put in the tank by hand.

3.2 Milk quality

3.2.1 Milk quality - the rules

There are national standards for milk quality, but it differs how these rules are handled. In the near future the rules will become more strict. Awareness of the importance of quality is increasing.

- Milk must be refrigerated. However, this is not done everywhere, there are still some small plants that buy uncooled milk for lower prices. This is still 'allowed' under the condition that the uncooled milk must be at the plant before 10.00 am (this is not always the case).
- At present the maximum for bulk milk somatic cell count (BMSCC) is 1.000.000 cells/ml. For total bacterial count (TBC) the maximum is 1.000.000 cfu/ml.
- From 2008 till 2011 the maximum will be 750.000 for BMSCC as well as TBC.
- The rules will become more strict in 2011, then the BMSCC maximum is 400.000 cells/ml and the TBC maximum is 100.000 cfu/ml (according to EU standards). For communal tanks the rules for TBC will be less strict, the maximum TBC in 2011 for communal tanks is 300.000 cfu/ml instead of 100.000 cfu/ml.
- No standard procedures are implemented to prevent antibiotic residues and dairy plants only test for residues to prevent problems at the plant. However, this differs between plants, some take a random sample for analysis, some analyze all. Rules for antibiotics will become more strict.
- There is a rule that says that uncooled milk must be at the dairy plant before 10:00 am. This is not always the case. Milk is sometimes long underway before it arrives at the plant. Some farmers bring the milk themselves and others deliver to a pick-up truck that collects the milk cans. In both cases milk arrives sometimes too late at the plant. This is even worse in the wet season when roads are bad.
- Uncooled milk results in a lower milk price, \$0,30 vs \$0,50 for cooled milk.
- In some parts of Brazil monthly analysis of quality of milk is compulsory; in the north from July 2007 onwards and in the south from 2005. There are eight labs that do the milk quality analyses, one of them is Embrapa in Juiz de Fora.



Milk samples and equipment for quality control at the factory

3.2.2 Milk quality – some results

Embrapa analyzed 30.000 samples from individual farms (monthly) from MG en SP on BMSCC, TBC and fat and protein. The results were:

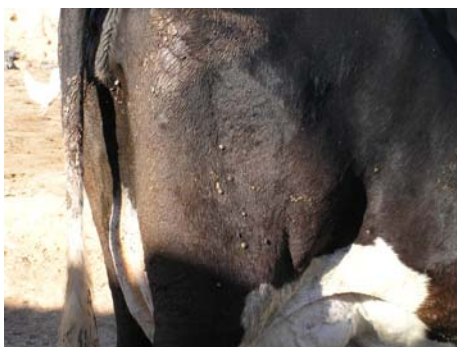
- BMSCC: 10% > 1 million cells/ml and 50% < 400.000 cells/ml
- BMSCC on average 450.000 cells/ml in June 2007
- TBC 45% > 1 million and 10% <100.000 cfu/ml
- TBC on average 1.2 million in June 2007

The main problem for the TBC is 1) the milk is not cooled immediately if the farmers have to bring it to the communal tank; 2) the cooling on the farm is not done well enough; 3) hygiene of the milking equipment.

3.2.3 Milk quality – residues

It is hard to get any official data about antibiotic residues in milk. Some say it is a problem, especially in milk from bigger herds, others say there is no problem. Without indicative numbers it is hard to put it into perspective. Below some interesting facts:

- Farmers can buy medicines in shops without advice from a veterinarian about application, use or withdrawal times for the milk.
- Well organized dairy companies offer the possibility to test cow milk on residues. Some farmers do this if they have doubts about whether the cow's milk is free of residues.
- In North Brazil an inspection body analyzed dairy products (in 2007) from the supermarkets on presence of bacteria and residues. In some products they found residues and too high TBC. These examples stimulate that the regulation will be more strict in the future. This is necessary, because some (small) dairy plants don't take the residue problems serious. For export products are guaranteed free, but for the internal national market (local) some do not always care.
- Ticks are a big problem for dairy cows. Prevention is done by using chemicals in baths, sprays or pour-ons. However, these chemicals have withdrawal periods for meat and milk, but farmers don't take these into account, which results in residues in milk. No regular tests are used to detect these residues in milk, so this may be a future (big) problem. The withdrawal period of the different chemicals varies between 3 and 45 days. Some ticks are resistant to some chemicals, so there is not always a choice.



Ticks are a big problem. On this photograph already 15 ticks can be seen.

3.2.4 Milk quality – strategies and payment schemes of the dairy plants

During the first mission we visited LAC, Florida, Itambe and Batavo. Details of these visits are available on request. Below are some interesting notes concerning the plants.

- The payment schemes differ between the dairy companies. Some payment schemes are based on a base line price for the milk and the rest of the price is comprised of bonuses for all kind of quality characteristics like temperature, fat, protein, TBC, BMSCC. Some even pay for logistics and volume capacity. Others only take into account the volume and don't pay for quality.
- Uncooled milk results in a lower milk price, approximately \$0,30 vs \$0,50 for cooled milk.

Antibiotics

- The processing plants have different strategies concerning antibiotics in milk. One plant has a shop at the plant that sells antibiotics for farmers, but they also have a veterinarian that supports the farmer in how to use it. This way they know which farmer has bought antibiotics and they can pay extra attention to the milk of this farm.
- Concerning the communal tanks, the plants have different strategies. One plant has milk samples from all individual farmers to be able to trace back the source of antibiotics. Another plant only analyses the milk of the communal tank. In case of quality problems it cannot be traced back to the responsible farmer and it is the problem of the whole community, requiring and employing social pressure for securing milk quality.
- Antibiotics residues are more often found in milk from the bigger farms.
- It is not a standard procedure that every delivery of milk is analyzed for antibiotic residues. If residues are found, not every dairy plant gives a penalty, some only give a warning and advice.
- Very small plants (we didn't visit) are said to have no control strategies to prevent antibiotic residues or poor quality to get into the product chain. They are believed to mix all kinds of poor quality milk into mozzarella and parmesan cheese. The medium sized and larger dairy plants have rules for quality and are better organized. Small plants are believed to buy all kinds of milk, also all uncooled milk. During our visit it became clear that quality problems also occur at management level.

TBC and cell counts

- Once or twice a month the milk samples are analyzed for TBC and BMSCC.
- Basic farm tests for quality like CMT, phenolphthalein and alcohol test are available and applied (CMT on small scale not on regular basis, the others often done by truck drivers collecting milk).
- In summer more problems occur with higher TBC, because of poor hygiene (rain), higher temperature and longer driving times to the plant. The trucks are insulated but after many hours of driving (the bad roads) the temperature of the milk has often risen to 7 / 8 degrees C.
- Some people expect that when the limits for TBC and BMSCC get lower, the smaller farms may get in trouble if they don't invest in better quality milking.

3.3 Milk recording

Individual cow milk recording is not common in Brazil. It is done mostly by bigger farms, however, they have sometimes troubles reading the results and act according to it. Farmers need support in using the results to improve their management. There are technicians from Pfizer and Intervet that help farmers to interpret the results of the milk recording. These men are trained by the Milk Quality lab from the University of Sao Paolo. In terms of milk quality, the udder health (SCC) of individual cows can be monitored and improved by joining the milk recording.

For breeding organizations it is important to be able to estimate good breeding values. Bulls, from which semen is imported e.g. from Europe or Canada may have other results in Brazil, because of the different environment / climate. Therefore it is important to estimate the breeding values under the Brazilian circumstances. For that, accurate data is needed from the milk production of the daughters of the bulls (including contents). Besides, these companies can use the milk recording data for better management advice for their client farmers.



Cows grazing elephant grass.

3.4 Small dairy farmers – some specific notes

There are several reasons to keep the small family farmers in business:

- Social considerations: what is their alternative?
- Small farmers represent a large potential for milk production.
- Small farmers can operate well in variable landscapes.

Education

- Rural people are believed to be un-educated, especially by the top-down R&D tradition. In that sense it is easy to underestimate the skills of the farmers, but there is a general opinion that farmers need education about milk quality and hygienic working. Training programs exist for these farmers, but it is sometimes difficult to convince farmers to take a day off and go to a course (Intervet organizes successful half day courses on milking hygiene). Farmers often -wrongly- believe that what they do is good enough, but official R&D tends to underestimate what farmers can do. The trainers of Embrapa and Emater are well aware of this tension and participatory approaches are increasingly applied.

Farming

- Small farms that milk by hand sometimes do have their own cooling tank. This is often first priority above machine milking.
- Some small farms still have problems in getting good water, long distances. Besides, many farms lack electricity, good infrastructure and good water control.
- In the dry season milk production declines because of lower quality and quantity of the feed, also, fertility of the cows suffers. So the feeding in the dry season is sometimes a problem, to which the crossbreeds are better resistant.
- Sometimes farmers lack motivation to improve quality or the process of milking, because of the low price they get (especially for uncooled milk), resulting in a vicious circle. To get out of this circle, farmers need to increase the milk production, to raise their income. To increase the production, farmers need training in how to do it, they are often unaware of the effects of certain management measures on their farms.
- A way to increase production is to start milking twice a day instead of once. However, milk must be cooled in any way or brought to the communal tank. Another way is to select for longer lactations and try to wean earlier. However farmers don't think that weaning calves can be done, they want to keep the calves near the cows, because they say the cows won't let the milk down without the calves nearby them. Traditions and attitude play a role.

Support

- The government has a special tax rule for family farms: 3% tax instead of 7%. A family farm is defined as less than 30 hectares and all the income should be from the farm.
- The fact that communal tanks are allowed to have a lower quality/higher TBC (in 2011) than individual tanks is a short term help for the small farmers.



Some farmers have their own cooling tank or share one with a neighbor.

3.5 Communities of farmers – one example

Associação dos Produtores de Silveirinia (MG) – Antonio Grossi

- A dairy association with seven communal tanks, six of 3000 kg and one of 4000 kg. The number of liters per farm varies roughly from five to 200 liters per day. The milk from the tanks is collected by milk truck every two days. The association has employees that are present at the tanks location when the milk is delivered by the farmers. They record the amount of milk and do a first quality check (alcohol test).
- Once a month the association has a meeting for the members to discuss things and sometimes they have a technician for some education. For example on one meeting it was explained how to handle milk with antibiotics and how to feed this milk to the calves.
- This association also has a feed cooperative, where the members can buy feed and medicines / antibiotics. The biggest problem with milk quality they encounter is residues of antibiotics. That's why the association buys medicines for the members with short withdrawal periods to prevent use of medicines with long withdrawal periods and thereby more risks of residues in milk.
- The farmers that participate in the association are proud of being a member, they have higher self esteem. Without this opportunity they might have stopped already. They now earn three times the minimum wage. The association also contributes to the future retirements of these people.
- In MG there are more associations like this, but not all are organized as well as this one.

In general

- Farmers that cooperate in a community tank scheme should deliver their milk twice a day, but they don't always do. This is a risk for the total milk quality of the bulk tank.
- Some community tank cooperatives go some steps further, they also buy feed, medicines and semen together and share e.g. the storage for the semen (liquid N).
- A side effect of the large number of community tanks is the large number of small cooperatives in e.g. one municipality. They do not (want to) cooperate together and do everything on their own.



Milk is collected by truck or brought to the communal tank by the farmer. At the milk collection site the milk is sieved and the number of liters is measured and administrated. Milk cans are cleaned and farmers can take clean cans home.

3.6 Projects by stakeholders – concerning small farms or milk quality

During our mission we met some important stakeholders in the dairy sector. Below are the most interesting notes of these meetings, concerning work related to dairy farmers.

- Embrapa did some work on milk quality in communal tanks. It appeared to be possible to produce reasonably good quality milk when sharing a communal tank. They also produced a leaflet with instructions for good hygienic hand milking (Kit Embrapa de Ordenha Manual).
- Emater is the information service of the government and they provide advice to farmers for free. Emater is also funded by the municipalities. Trainings by Emater often have a participatory set up, training farmers in groups. Example of such a program is "Minas Gerais sem fome" (Minas without hunger). And "Credito Rural" to improve the circumstances for small farmers. Emater also has a project about cheese making for small dairy farmers to sell in the village.
- Intervet offers a milkers' course, which is a training of half a day for farmers and employees. They organize it together with cooperatives, agricultural stores and rural societies. The participation is high, about 50% of the invited people come to the course. The course is for free. Topics in the course are (the basics of) milk quality, udder anatomy/physiology/health, treatment and prevention of mastitis.

- University of Sao Paulo – Departamento de Zootecnia - Clinica do Leite (milk quality lab) organizes a course on management of dairy herds. At the moment the course runs for 10 years now and 500 farmers have participated. It is a 180 hours program in which farmers come together once a month for three days, for eight to 10 months. They are obliged to write a business plan for their farms, make operational procedures and collect milk samples from the cows. In MG there are now 25 farmers that participate, with daily productions on their farms between 2000-5000 kg/day.



Another [smaller] communal milk collection point, with two tanks where milk is sieved and the amount is measured and administrated. Cleaning water is available. Material for alcohol test.

3.7 First conclusions concerning milk quality on farms in MG

Some basic conclusions on milk quality issues are given below, more conclusions about the complete project are in chapter 7.

- Basic aspects of HACCP and GAP are known and sometimes applied in parts of the chain, although a specific GAP protocol for dairy is not implemented yet (possible future action).
- Bulk tanks for cooling are used, also as communal tanks, sometimes even without having milking machines. Uncooled milk however, is still collected.
- The stakeholders' awareness on process quality and environmental impact assessments is increasing.
- Farmers that are not organized and still have no opportunity to deliver cooled milk, should get organized and start cooperatives.
- Milk quality may be improved by use of bonuses and/or penalties. For the poor small farmers first priority might be to improve production and to deliver cooled milk. There is free advice for farmers, so they can get the help.



Example of cooperative; feed and medicine shop.

4 Issues and challenges for the dairy sector

The dairy sector in Brazil is quite variable, in terms of economic, social and bio-physical conditions (distance to the city, location in North or South), and in terms of structure (small mixed, large specialized). It is thus unwise and misleading to generalize and to suggest blanket-action, but some trends can be suggested, to be elaborated and prioritized for different systems at a later stage (as done in the workshop in October, chapter 6).

4.1 Resources

Several trends in terms of resource use need to be taken into account for the short and long term. All has to do with quality, but in the more indirect sense of process quality. For example:

- climate change on local scale will affect the sector in terms of uncertain production conditions (freak weather), e.g. implying a need for flexible [fodder] production systems. Climate change at global level will certainly affect the sector but at this moment a bit beyond imagination. Discussions could focus on issues of erratic climate such as prolonged droughts in Australia with their effect on Brazilian dairy, but such issues are beyond this assignment. They do offer, however, a good opportunity for Brazilian-Dutch collaboration on scenario-setting.
- environmental services offer an opportunity for at least part of the sector, e.g. in CO₂ sequestration programs and/or conservation of biodiversity in fragile areas; examples are around also in Latin America. Public pressure on conservation of forest and nature areas offers opportunities for the design of new dairy (and/or dual purpose systems that conserve rather than degrade the natural resources).
- resource crunches such as availability of energy and/or clean water may affect Brazilian dairy in an unexpected and perhaps positive way. For example, increased production of alcohol is likely to change the agricultural map of Brazil (e.g. dairy moving from Sao Paolo to Minas), it will also affect the feed base (prices of carbohydrates increase and 'waste' products become available). Water may be a problem in many other countries that base their production mainly on irrigation, but Brazil may have an edge in this respect (not considering freak weather), also because it has so much land.



Girolando bull of Lagoa da Serra

4.2 The market and production sites

The development of the local and international market is uncertain, but that is no news. We suggest attention to factors such as:

- the national demand for fresh and processed products in local markets may catch up as particularly urban elites get higher incomes. Aspects such as the age structure of consumers, consumption habits and the like are beyond our reach at this stage.
- the international arena has China [and perhaps India] that may not be able to produce enough for their internal demand. Freak weather over the past few years in Australia also has put pressure on the international market.

- dairy seems to move around the country, but Minas continues to be a strong producer with a strong family sector. It may actually benefit from the pressure on good cropland to produce alcohol, soybeans etc. This leaves the more variable agro-ecological regions of Minas for dairy and livestock (if not reforestation!).
- dairy seems to do well (only very recently!), but its development has to be seen in relation with other sectors. We have no good idea of the developments in those sectors, also because we focussed on dairy. The relation between these different sectors might be an issue to consider in future work, e.g. in terms of [competing] health claims of the different products (issues of obesity, functional foods), aspects of process quality (effect on environment and resource use as well as social impact), use of feeds etc.



4.3 The structure of the sector, problems or opportunities?

The structure of the dairy sector varies widely between regions and socio-economic conditions. The biggest decision to take for future development is perhaps whether to use the variation or to standardise. In that respect we noted, as opportunities:

- Brazilian dairy is inherently variable. Apart from the obvious climatic and topographic differences it is noteworthy that, in the years from 2002 to 2005 the average collection of milk per farmer by DPA ranged from 509 to 574 litres per day, and by Elege it ranged from 67 to 84 (based on unofficial data). And table 1 further illustrates the variation in the structure of the sector in Brazil.
- remarkable awareness and conceptualisation among researchers (Embrapa) on the differences between production conditions, especially on social differences.
- a surprisingly strong³ emphasis on social organisation and support for small farmers, e.g. tax relief, special subsidies, some special research on technologies such as communal milk tanks.
- well developed hi-tech and large scale specialised farms, as well as processing modes (local and national). Also, there appear to be different initiatives on production of green and/or socially 'fair' milk. This implies that the basic know how and concepts of these approaches is available, and the workshop in October was used to translate this into specific actions for the stakeholders

³ Compared with many other countries!

Table 1. The approximate structure of the Brazilian Dairy Sector (based on Golçalves de Assis et al., 2006)

Specifics		Milk production		Number of farms		Prod / farm	Cows in milk		Prod/cow	Cows / farm
l/farm/day	l/cow/yr	(1000t)	%	Number (1000x)	%	l/day	1000x	%	l/year	number
< 100	<1200	7.709	33	1.157	90	18	12.365	62	623	11
100-400	1200-2000	8.848	38	15	9	210	5.440	27	1626	47
401-2000	2001-4500	5.833	25	20	2	791	2.013	10	2898	100
>2000	>4500	1.084	5	.7	.1	3.986	205	1	5297	275
total		23.475		1.294			20.023			



Sugarcane is brought to the barn and chopped in pieces as feed for the cows if not used for production of juice.

5 First mission; concluding comments and suggested actions.

This rather brief visit to the dairy sector of small farmers in Minas Gerais was well organized and very comprehensive considering the time available. It covered a range of production and processing systems (from small to large and from traditional to modern), a range of agro-ecological conditions, and visits to stakeholders at different levels (farmers, farmer leaders, industry people and researchers).

The visit helped to get a good impression of issues at stake, aspects of marketing, concerns on the environment, opportunities for processing and production in a part of the country that is influenced by world market prices (looks promising for Brazil), changing climate and input prices to name a few.

Many, if not all aspects of modern production and processing are well known in Brazil, including issues of social inclusion. The type of activities on milk quality for small farmers that this project could offer (our mandate) has two main areas of attention:

- more work on refining of milk product quality (bacterial counts, somatic cells, residues, composition, physical parameters, etc).
- exploration and application of modern concepts for process quality, referring to aspects such as resource use efficiency, good agricultural practice, conservation of resources (community life, farmers skills, biodiversity, erosion, etc.)

In each of those areas it is necessary to define the role of individual stakeholders (farmers, processing companies, R&D from public and private sector, the input suppliers from feed, breed etc.). Discussions were held to further specify specific problems and opportunities for each of those stakeholders, and basic materials are available but they could not be elaborated within the given time frame.

The conclusions of this visit were that a workshop planned for October was to cover issues raised during the first visit, to further specify what could be done at which level. The results of the workshop are described in chapter 6.

6 Seminar and workshop

Together with Embrapa we organized a seminar and workshop in October for the stakeholders in the dairy chain.

6.1 Seminar 30th October

For the seminar on “Quality of product and process of small holder dairy farms in Minas Gerais” several stakeholders were invited to attend the meeting and to give presentations.

The goal of the seminar was to discuss the views of the different stakeholders in the dairy chain about the quality of product and process concerning the small holder dairy farms in Minas Gerais. All stakeholders presented the state of the art and the future trends / scenarios as they see it. The following topics were covered during the seminar:

- Overview of ‘what is the chain and stakeholders’, how much milk is and will be produced, present and future trends / scenarios.
- Quality of product in the past, present and future; what do consumers want / what should they want / how should they change their mind.
- What can be done by large and small industry, for example international dairy companies vs. small local co-operatives and local produce.
- What can small producers do, what kind of small producers are there, what is their niche and what should they do to perpetuate the niche.
- New approaches of R&D by public and private.

The PowerPoint presentations are added in appendix 5. The list of participants is in appendix 3.

6.2 Workshop 31st October

A part of the seminar participants were invited for a workshop on “scenarios for the future”. The workshop was set up as a pilot effort to define the several farming systems and to suggest future scenarios and actions that are needed.

The set-up of the workshop was as follows:

- presentation on scenarios and mode changes at different levels (by Hans Schiere)
- participants suggest on trends and scenarios
- small groups work according to different parts and levels of the chain
- plenary reporting and rephrasing
- second group session on different aspects and systems levels
- plenary proposals and discussions

Below is a short report of the first ideas of the workshop. These are suggestions of the group and not the formal conclusions, because more work needs to be done as a follow up in this area, a promising line for future collaboration. The list of participants is in appendix 4.



People at work during the workshop, characterizing farmers in groups

6.2.1 *Types of small holder dairy farms in MG, including some characteristics*

The following types of dairy farming systems were described by the participants:

- Traditional - far from town, isolated, resistant of technology, no credits, low level of production
- Entrepreneur – more receptive for technology, organic/green milk, more educated, earn more money, higher production, higher cultural level, think smart, look for new things, crossbreeding (AI)
- Agro ecologist – farming with nature, environmental concerns
- Asentados – settled by agricultural reform programs
- Home producers (quesana's) – make fresh products on their farms, more like entrepreneurs, must have inspection

The group chose to focus on the traditional farmers, entrepreneurs and home-producers in this workshop, mainly because those are expected to be the three main farming systems in 2020.

6.2.2 *Scenario's for the future*

The following scenario's were described by the group:

- Export
- Social programs, strong rural extension services (ATER)
- Formalization of products “artesananas”
- Empty country side (farmers and people)
- Sustainable production
- Strong inspection quality, sanction system
- Higher press of the industry / market

Some of the scenario's might be the result of another scenario. E.g. pressure of the industry or market, may result in stronger inspection on quality of products/milk. This may result in an empty country side if farmers need to stop farming/milking because they cannot produce the required quality. On the other hand, strong social programs like ATER may prevent the country side to become empty if the social support leads to better (quality) farming. Not all scenario's are applicable to all types of farmers and for some types of farmers more than one scenario may be applicable.

For this session three scenario's combined with three types of farmers are chosen to be worked out in this session.

- Traditional farmers x social programs
- Entrepreneurs x sustainable production
- Home producers x formalization of “artesananal” products

6.2.3 *Actions for the future*

For these three scenario's the group discussed the type of actions that are needed by R&D, government and farmers to improve quality of product and process.

The main discussion items were as follows:

- Traditional farmers x social programs
 - There is support of federal government of the states. In the North-East e.g. there is a program that regulates the price of milk. This is a good example of what might help the traditional small holder farmer.
 - Social programs are getting more and more important or else the farmers may stop and leave an empty country side.
- Entrepreneurs x Sustainable production
 - For process quality it is necessary to certify the sustainable process (economics, soil, water, social, environment, family welfare, etc). There is no protocol yet developed.
 - Technicians do not know the indicators for sustainability. They often only give standard advice and do not look at what the farmer wants or what is best suitable for the region. Technicians often believe that small scale production is not economic and therefore they give standard recommendations only to improve production. They do not care about welfare of the farmer, but

- only scientific knowledge. They should learn to have a holistic view, not only look at milk production.
- Therefore a tool with sustainability indicators might be of help. This tool needs to be developed.
- Home producers x formalization of “artesanal” products
 - For these producers only the regional market is of interest, no export.
 - The law needs to be changed, because nowadays these producers need to have a “plant” and that is often too expensive for them. That’s why most producers do not have inspection of their products, because it is not produced in such a plant.
 - As said, not all home producers are inspected, only about 25%. This does not mean that 75% delivers bad quality, on the contrary, many products are fine, but the producers lack money to pay for the inspection and to build a plant. Inspection is on request and farmers have to pay for it. This % of inspection must be higher, the producers need to have formalization of their products by inspection. So that they can prove their products are okay. If not, in the future they might not be able to sell their products in the shops anymore.

In the end we concluded what other work needs to be done, e.g.:

- Work on definitions of sustainability
- Work on certification systems
- Changing paradigms for extension workers and R&D (better understanding of family farmers)
- Need for social assistance
- Environmental impact analysis
- Methodologies for technology transfer
- Participatory technology development
- Differentiated policies
- Protocols for Good Agricultural Practices on-farm (already for other sectors in Brazil, but not yet for dairy)

7 Conclusions

7.1 Suggestions for joint work

The missions' focus was on 'quality management and small farmers', and the visits clearly showed the different nature of programs with smaller and with larger farmers. We were impressed with the work in both these sectors, with clear differences between involvement in the smaller sector (balance public - private) and larger farmers (balance private - public).

Suggestions for collaborative activities between Brazil and Dutch parties in family farm development might include (general for the long term):

- further work on quality payment schemes based on social control and internal farmers organisation, good examples of that are around in Brazil.
- up scaling of existing work on producer communities for farmers that still deliver un-cooled milk. Much of that work will include issues of learning and capacity building, together with more participatory R&D for better tailor made work.
- work with smaller / community milk collection centres to also boost activities such as the establishment of other cooperative work, e.g. selling points on feedstuff, semen and medicines.
- work on niche products like locally processed milk ('Minas Milk', 'Green Milk', local cheese; dried meats, etc.)
- more ecological forms of fodder production and dairy management, including agro-forestry, issues of biodiversity, dual purpose breeds, academic work on multifunctional-farming, etc.
- joint organisation of training programs (R&D) for improvement of production systems (e.g. at regional levels), also to cope with expected large changes due to climate change, increased fuel prices / bio fuel production, need for biodiversity etc.

More collaboration with the commercial and larger sector belongs mainly to the commercial sector (e.g. Lagoa da Serra; Intervet). Collaboration in this area could be by commercial exchange of consultants on specific subjects (feed formulation, nutrient management, joint review of existing HACCP-protocols, design of GAP). Much of this is, however, already underway and special exchanges / missions in this field are recommended, e.g. via trade missions, also because this particular mission had no mandate to focus on large enterprises.

Many of the ideas around product- and process quality are already known and applied in Brazil, and up scaling is the next priority. Joint work between Brazilian and foreign [Dutch] partners in this respect will, however:

- serve to update the Brazilian R&D system on international developments. One example is the work on 'competing claims' between Embrapa and WUR; another example is the Embrapa interest for scenario work during this mission. More thorough and applied work is possible in this respect and has expected short term results.
- serve to generate further synergy in R&D and commercial links between the Brazilian and foreign [Dutch] partners. For example, it would serve to jointly develop work on novel systems that might be replicated elsewhere in the world, especially to face the challenge of global change (novel nutrient management and crop-species as well as cropping patterns, management of biodiversity and animal genetic resources, design of new distribution chains for niche products, aspects of animal health and emerging diseases, regeneration of soils and hills, work on urban agriculture, organic farming etc). The work by the Animal Sciences Group and Wageningen International in Western Europe and the Far East might add strength to this kind of synergy.

7.2 The family farm

We conclude that much is known, especially about the more traditional forms of dairy production. The potential for dairy in Brazil is large and growing, with magnificent cases of change in both the large commercial sector and the family farm sector. This mission had to focus on opportunities in the family farm sector. The role of that sector is disputed but [in our view] very relevant. Attention to this type of farming is justified:

- for social reasons, unless other, better and more sustainable alternatives can be offered to this part of the population.

- for reasons of sustainable and resilient rural development in less favourable areas that need more attention for ecology and environmental regeneration⁴. Family farms can adapt more quickly to local conditions, they also have a competitive edge in the use of variable landscapes and topographies such as in Minas Gerais [provided they do not produce standard milk for the market].
- because the family sector produces a large proportion of the total milk supply, and with updated management systems it can do so at little cost to the environment and society.
- the pressure on good land for production of sugar cane and commercial crops may push dairy into less favourable areas (even if some large scale dairy units in for example the North may take part of that).

This mission found exiting activities on smallholder / family farm development in terms of work on for example communal milk tanks, also with an important role of large companies (Intervet, Lagoa da Serra, Nestle, Itambe). Also the public sector has examples of 'commercial work' that can be developed further, e.g. at the university of Sao Paulo by the Milk Quality lab (courses and projects combined), conceptualisation and implementation of environmental programs, and design of GAP for several agricultural sectors (different Embrapa-centres). Specific requests were made for preparation of GAP-protocols for dairy, with a unique opportunity for GAP-protocols that are tailor made to suit specific agro-ecological and socio-economic conditions and academic work on [dynamic] criteria for sustainability.

The family farm sector is inherently diverse, with specific challenges in terms of logistics of the supply chain. However, convincing examples show that milk quality at farm level can be guaranteed, sometimes undone by adulteration scandals at level of state and company (as happened in October 2007). We feel that diversity is an opportunity for Brazil rather than a problem, but its proper implementation will require some more work(shops) by R&D from private and public sector. A good session on these problems and opportunities is suggested as a top priority to ensure that the potential of the family sector is not unnecessarily lost. The role of education and formal research cannot be underestimated, together with the need for those institutions to take a more participatory approach. The fact that the definition of small and large farmers differs per state is a case in point, showing that proper use of diversity requires novel approaches (different criteria are used, like income, land-size, production per animal; herd size etc.). Even the government acknowledges the importance of this sector with special programs, and strategic thinking may help to ensure that the potential is fully used.

Overall, and specific to product quality, it is clear that regulations concerning quality of raw milk will become more strict, starting in 2008. In a few years the quality must be on the same level as in Europe, requiring a lot of work (by farmers and extension) to improve the quality of the raw milk on many farms. If product quality is considered most important, than some small farmers will get in trouble if they cannot improve the quality of their raw milk. Loss of this family sector would cause a social and ecological problem, if:

- these farmers hardly have an alternative (social inclusion).
- these farmers are to fulfil their potential role in taking care of the environment, nature, and vibrant countryside.

7.3 Final conclusions and suggested activities

- The family farm is important in terms of present and future market share, for social reasons, and potentially for ecological reasons. The family farm sector has to adjust due to changing rules for food safety, changing market conditions (increased export-opportunities) and growing concerns about the biophysical, socio-economic and ecological environment. One should investigate the possibility of small-holder Minas-milk as niche product, and re-consider the notion that family farms of Minas should compete with their larger scale and more commercial specialised farms on the world market. A set of workshops on that issue is strongly suggested [along the lines of the October workshop held in Juiz da Fora].
- Present R&D on product- and process quality is well geared to face current challenges. There is considerable scope, however, for collaborative work between Brazil and the Netherlands on development of methodology and technology for challenges that are around the corner, e.g. on effects of climate change, use of bio-fuel, need for resilient country sides, with special attention to development of tailor made solutions and niche markets (with regards to family farm development).

⁴ The regions closer to large cities in higher potential areas such as Sao Paulo also need other and more sustainable forms of farming, but they require attention to more intensive recycling and management of high resource flows (irrigation, feed, manure management, etc.)

- Work on improved product- and process quality for the short term is a matter of up-scaling the present activities. For the long term it is a matter of work to introduce new notions for the future. Such notions refer especially to challenges (as mentioned above) which are due to expected large changes due to climate change, fuel-prices, concerns on biodiversity, resilient country-sides, need for tailor-made approaches etc.
- Opportunities exist for synergy in collaborative work between Brazil and the Netherlands on new concepts for process quality and Good Agricultural Practices, referring to aspects as resource use efficiency, conservation of resources, community life, farmers skills, biodiversity, erosion, (strengthening of) participatory approaches to rural development, multifunctional agriculture, etc. Much of such work might serve joint interests of Brazilian and Dutch partners, and indeed, the search should be for synergy and co-generation of new methodology, technologies and management approaches.
- A similar visit is recommended for the more commercial and specialized sector. Their priorities in terms of technology and management are different, but they also manage their know-how in a different way. General know-how for them is probably not needed, specific consultancies might be more useful, e.g. on feed mixes, on reproductive work and breeding, vaccine production techniques etc. WUR and the Embassy could facilitate such exchange to jointly exploit their knowledge and expert networks.

It is clear that the dairy sector is undergoing rapid change and family farms can play a large role, provided they manage to get 'good product quality'. However, not only product quality is important, but also process quality (i.e., the way in which milk is produced with respect to the environment and resource utilisation). Creating and/or keeping niches for local products (even at upscale markets) are an opportunity for some of the family farmers to stay in business. Another part of the family farmers may be able to latch on to the export market, provided they will be able to deliver milk to the large plants, and provided also the top management of large companies takes quality management serious. The use of concepts such as community milk tanks is a great stepping stone, also for subsequent development of input supply and processing.

Appendix 1 – Itinerary first mission to Minas Gerais

July 9th

EMBRAPA - Gado de leite
Juiz de Fora

July 10th

EMBRAPA – Gado de Leite - Núcleo de Treinamento em Bovinocultura Leiteira Tropical
Dairy Association (Antonio Grossi) of milk producers with 7 communal tanks
Dairy farm (Fernando Scarleteli) - approximately 25 dairy cows
Dairy farm (Horácio Dias) - 400 dairy cows.
Juiz de Fora

July 11th

Dairy association with three communal tanks
Dairy cooperation LAC
Two small dairy farms – 1st quality milk delivery to LAC
Dairy plant FLORIDA
Juiz de Fora

July 12th

EMATER
Belo Horizonte

July 13th

ITAMBE
Two dairy farms in projects of EMATER, one with 100 dairy cows and one with 8 dairy cows
Belo Horizonte

July 14th

LAGOA
Ribeirao Preto

July 16th

BATAVO
Two dairy farms delivering to BATAVO
Carambei

July 17th

University of Sao Paolo - Animal Sciences (Piracicaba)
Fundação de Estudos Agrarios Luiz de Queiroz
Departamento de Zootecnia - Clinica do Leite (milk quality lab)
INTERVET
Sao Paolo

July 18th

Associação Brasileira dos Produtores de Leite
Sao Paolo

Appendix 2 - Terms of Reference

Project: Small farmers in the Brazilian dairy sector and the development of dairy quality chains.

Project duration and location: 2007, Brazil, especially Minas Gerais.

Project Management team:

Judith Poelarends, Msc.

Researcher in Farm Management en Chain Systems

Animal Sciences Group, Wageningen UR, Lelystad, The Netherlands

Hans Schiere, Msc, PhD.

Livestock & Crop Production Systems

Consultant for Wageningen International, The Netherlands

La Ventana

The approach of the members for the **first mission** was:

- prepare for the first mission by contacts with relevant key-informants and recent literature / project reports / industry documents.
- identify and meet major stakeholders along the dairy chain in the respective region. Identification of these stakeholders will be done in consultation with the Dutch Embassy Brasilia (J.v.d.Vooren) and with Wageningen UR Office (P. Zuurbier). E.g. Embrapa, Emater, local (small) dairy producers, dairy industry.
- to identify and rank the changes in the main problems and opportunities in the dairy chain, as they occurred in the past decade and as they are likely to occur in the near future. In consultation with the Dutch Embassy, the focus will be on possibilities for development of quality assurance within the dairy sector.
- to suggest a tentative plan of action for the short and long term in Brazilian dairy.
- to prepare a draft report, to be discussed with the local stakeholders, and to be finalized within one month after return, taking into account these Terms of Reference and the original project document, while clearly stating and justifying where changes have taken place.

The approach of the **second mission** was:

- to organize a seminar and workshop together with Embrapa for the different stakeholders in the dairy chain.
- the focus of the seminar was to discuss the views of the different stakeholders in the dairy chain about the quality of product and process concerning the small holder dairy farms in Minas Gerais.
- the workshop was set up as a pilot effort to define the several farming systems and to suggest future scenarios and actions that are needed.

Appendix 3 – Participants of Seminar 30th October 2007

Quality of product and process of small holder dairy farms in Minas Gerais.

Participants

Pedro Braga Arcuri	Embrapa Gado de Leite
José Renaldi F. Brito	Embrapa Gado de Leite
Rosângela Zoccal	Embrapa Gado de Leite
Alziro Carneiro	Embrapa Gado de Leite
Rodolfo José da Silva Morais	Embrapa Gado de Leite
Emílio Pereira de Brito Neto	Embrapa Gado de Leite
Marta F. M. Guimarães	Embrapa Gado de Leite
Sarita Gonçalves Carmo	Embrapa Gado de Leite
Maria Aparecida V. Paiva Brito	Embrapa Gado de Leite
Heloísa Carneiro	Embrapa Gado de Leite
Anna Carolynne A. Duque	Embrapa Gado de Leite
Michele Munk Pereira	Embrapa Gado de Leite
Rodolpho Torres	Embrapa Gado de Leite
Fábio Homero Diniz	Embrapa Gado de Leite
Feliciano Nogueira de Oliveira	Emater MG
Lea Maria Burnier Ganimi Costa	Procon/JF
Guilherme Gonçalves Teixeira	Fetaemg
André Luiz da Piedade Moura	Itambé
Fernando Pinheiro	Itambé
Francisco Ferreira	Itambé
Aparecida das Graças Monteiro	Lac
Karla Mendes	Lac
Adriana Prado Bicalho	DFDA/MG – MDA
Andre Oliveira	OuroFino
Guus Laeven	Lagoa da Serra
Jonatas Felipe Barbosa Cold	UNIPAC - ILCT
Hans Schiere	Wageningen UR - Wageningen International
Judith Poelarends	Wageningen UR - Animal Sciences Group

Appendix 4 – Participants of Workshop 31st October 2007

Workshop - Quality of product and process of small holder dairy farms in Minas Gerais.

Participants:

Adriana Prado Bicalho	MDA – DFDA/MG Agrarian Development Ministry
José Renaldi F. Brito	Embrapa Gado de Leite
Rodolpho de Almeida Torres	Embrapa Gado de Leite
Fábio Homero Diniz	Embrapa Gado de Leite
Guilherme Gonçalves Teixeira	Fetaemg
Adauto de Matos Lemos	Epamig – Cândido Tostes
Vanessa Aglaê Martins Teodoro	Epamig – Cândido Tostes
Daniel Arantes Pereira	Epamig – Cândido Tostes
Vânia Maria de Oliveira	Embrapa Gado de Leite
Aparecida das Graças Monteiro	Lac
Hans Schiere	Wageningen UR - Wageningen International
Judith Poelarends	Wageningen UR - Animal Sciences Group

Appendix 5 - Presentations during the seminar

Seminário

A qualidade dos produtos e processos na cadeia produtiva do leite para produtores de base familiar no Estado de Minas Gerais

1.	Pedro Braga Arcuri – Chefe-geral em exercício – Embrapa Gado de Leite The Brazilian dairy chain and R&D in tropical milk production	27
2.	José Renaldi Feitosa Brito – Embrapa Gado de Leite A qualidade do leite em Minas Gerais	39
3.	Lea Ganimi – Superintendente Procon/Juiz de Fora Código de proteção e defesa do consumidor, o trabalho do Procon em Juiz de Fora e a qualidade dos produtos	43
4.	Guilherme Gonçalves Teixeira – Fetaemg Qualidade e processos: Desafios para os produtores de leite de base familiar	47
5.	Feliciano Nogueira de Oliveira – Emater-MG A percepção da assistência técnica e extensão rural em relação à qualidade dos produtos e processos da cadeia do leite	53
6.	Adriana Bicalho – MDA/Belo Horizonte A percepção do Ministério do Desenvolvimento Agrário em relação à qualidade dos produtos e processos da cadeia do leite	not available
7.	Aparecida das Graças Monteiro Amadeu – LAC..... Qualidade dos produtos e processos na cadeia produtiva do leite para produtores de base familiar do Estado de Minas Gerais	59
8.	Fernando Ferreira Pinheiro & André Luiz da Piedade Moura – Itambé A Itambé e a Qualidade do Leite	67
9.	André Bruzzi Correa – OuroFino A qualidade dos produtos e processos na cadeia produtiva do leite para produtores de base familiar no Estado de Minas Gerais	71
10.	Judith Poelarends – Wageningen University, Animal Sciences Group A qualidade do produto e dos processos na produção de leite na Holanda	77
11.	Hans Schiere – Wageningen University, Wageningen International and La Ventana..... Calidad de proceso en ganadería lechera de pequeños productores (familiares) en Minas Gerais Cambios, Scenarios, estratégias	91

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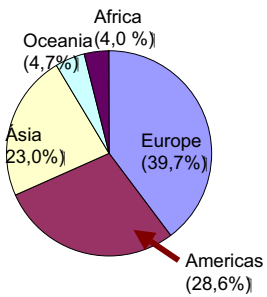


The Brazilian Dairy Chain and R&D in Tropical Milk Production

Pedro B. Arcuri, PhD, R&D Associate Director
Paulo C. Martins, D.Sc., Head
 Embrapa Dairy Cattle



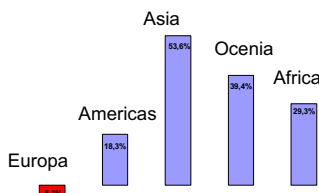
Global Milk Production (2005)



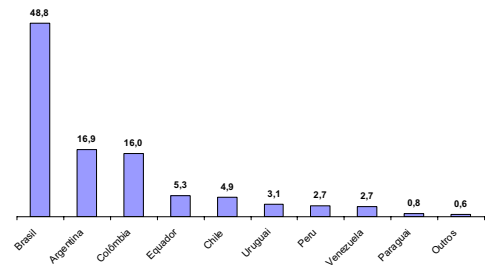
Source: FAO (2006)



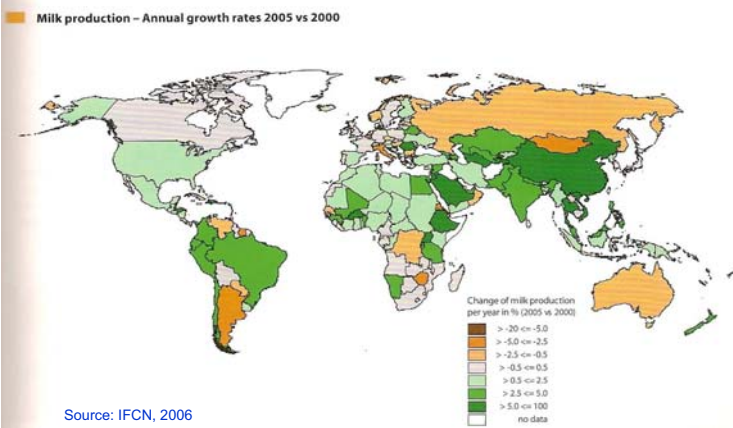
Production Growth (2005/1995)



South America has 16 countries of which, 6 produce 95,2% of milk

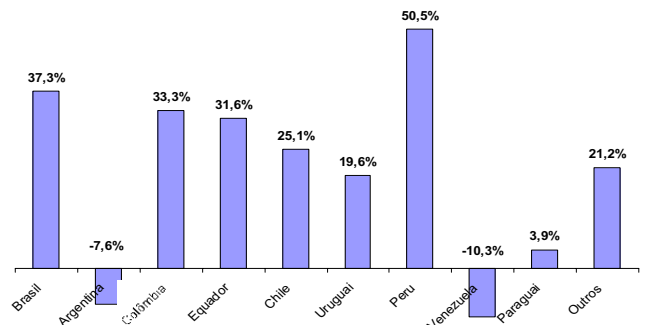


South American countries among the highest milk production annual growth rates



Source: IFCN, 2006

From 1995 to 2005 milk production increased 18,3%.



South American Milk Production keep growing for the next ten years

Assumptions

- Income growth
 - Milk and dairy consumption stimulated
 - Currently 118.9 equivalent liters per capita.year
- Increases in farm productivity
 - Still low in most South American countries
 - Animal performance
 - Economic efficiencies
 - Exceptions
 - » Argentina
 - » Uruguay
- Some obstacles, depending on each country



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Internal consumption will keep production growing

Selected countries socio-economical indexes - 2006

	Population (mil)	Population Growth Rate (%)	GDP Per Capita (US\$)	GDP Real Growth (%)
Argentina	40,302	0.9	15,200	8.5
Brazil	190,011	1.0	8,800	3.7
Chile	16,285	0.9	12,700	4.2
Colombia	44,370	1.4	8,600	6.8
Equador	13,756	1.6	4,500	4.1
Paraguay	6,669	2.4	4,800	4.0
Peru	28,675	1.3	6,600	8.0
Uruguay	3,461	0.5	10,900	7.0
Venezuela	26,024	1.5	7,200	10.3



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Countries obstacles for higher growth rates

- Uruguay, Chile and Equador
 - Relatively small countries
 - Territory
 - Population



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Countries obstacles for higher growth rates

- Argentina
 - Suffered frequent floods and droughts lately
 - Energy deficit
- Colombia
 - Still must solve serious institutional questions



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Brazil

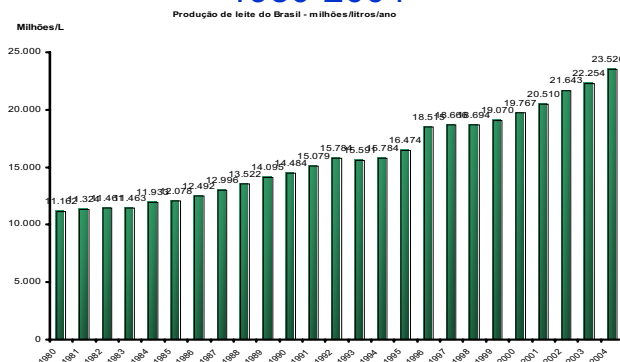
- Milk production steadily grows by 4.6% annually from 2000 to 2005
 - Increases in productivity
 - Incorporation of land
 - Cerrados (savannas) region
- Production costs
 - Among the world lowests
 - **NO** price-supporting policies



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Brazilian Milk Production 1980-2004



Brazilian Agricultural Research Corporation
Ministry of Agriculture, Livestock and Food Supply

In 2006 Brazil produced 25,7 billion liters
15.4% global milk
primary sector enrolled ~ 5 million people, of which
ca. 1.3 million were milk producers

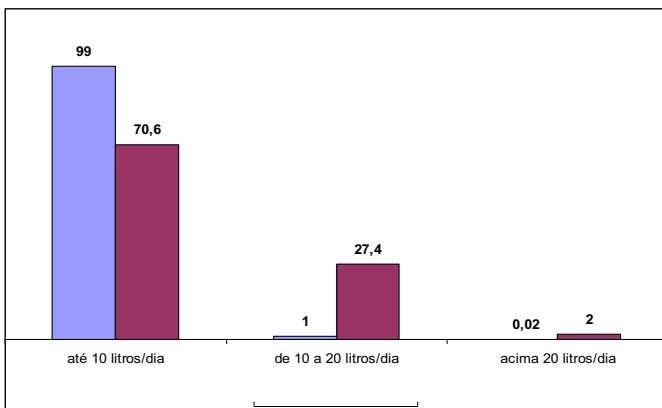


Brazilian Dairy Farmers

- Estimated 1,3 million
 - 60% up to 50 liters/day, 20 % production
 - 30% up to 200 liters/day, 20% production
 - 10% > 200 liters/day, 60% production
- Several different production systems
 - Different biomes
 - Different breeds
 - Holstein
 - Zebu
 - Gyr
 - Mean Low productivity
 - Different technology
 - Capital
- Market organization, still an issue



Milk Production / Cow / Day (%) % Milk Production



Land incorporated for milk production

- Cerrado (Savanna) areas
 - Geographical expansion
 - Follows grain production
 - UHT technology for milk processing
 - Distant from Consuming urban centres
- Government policy for land distribution
 - Unproductive farms
 - >5000 ha, usually
 - Ministry of Agricultural Development
 - Settlements, “assentados”
 - >100.000 families / year
 - Milk as first and main income activity
 - Community cooling tanks
 - Technical assistance

Brazilian milk production growth

- Cerrados (savannas), cheap yet less-explored territories
 - 127 million arable hectares
 - ~ 80 million ha unexplored
- No deforestation for milking purposes, as immediate purpose
- No competition for land against bio-fuel projects

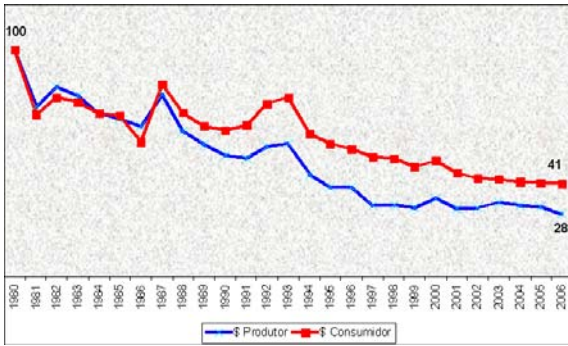


World Briefing | Americas
Brazil: Amazon Deforestation Slows
By MERY GALANTERNICK
Published: August 14, 2007
Deforestation of the Amazon rainforest from August 2005 to July 2006 decreased by 25 percent since the previous 12 months, the Environmental Ministry said. It said that 8,774 square miles, almost the size of New Hampshire, were cut down, significantly less than the 11,745 square miles a year earlier. It was the second year in a row that deforestation fell.
(www.NYT.com/2007/08/14)

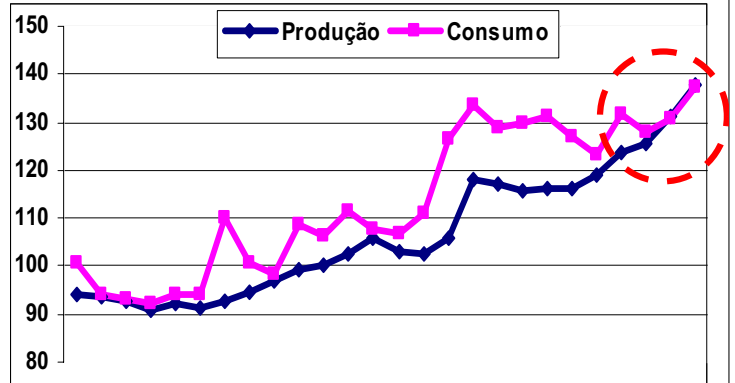
Brazilian milk production growth

- Steady decrease in prices paid to farmers, consumers

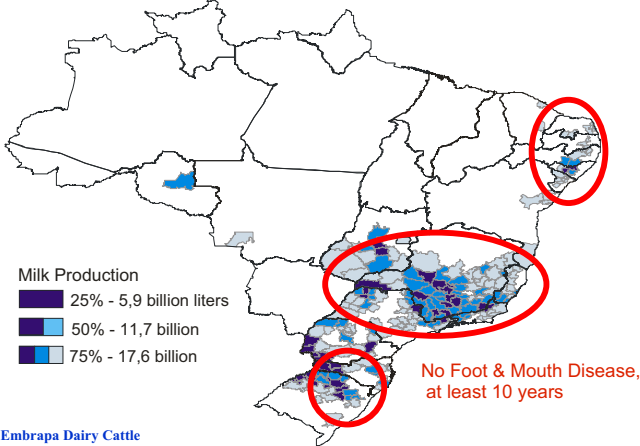
Milk Prices to Farmers (raw) and consumers (pasteurized), 1980- 2006 (1980 = Index 100)



Brazilian Per capita milk production and consumption, 1980 - 2005



Geographical distribution for 75% of Brazilian milk production



Source: Embrapa Dairy Cattle

Reasons for Brazilian growing milk production

- Milk and dairy consumption
 - growing 1.4% per year
- Brazilian population
 - 190 million people
 - Demographic rate 1,2%
 - Young population
 - Mean 26 years-old
- Least income class
 - 9% annual income growth

Source: Brazilian Geographic and Statistical Institute, 2005

A look at The Brazilian Dairy Industry

- Flexible
 - Family-run (thousands)
 - Cooperatives (hundreds)
 - International
 - Nestlé
 - Parmalat
 - Plants with 500 – 1.000.000 l/day
 - Spread throughout the country
- Agile
 - Expanding
- Increased quality standards
 - Exports scenario

Brazilian Dairy Industry

Number of suppliers, thousand
Source: Embrapa Dairy Cattle (2006)

Ordem (1)	Empresa	1996	2005
1	DPA/Nestlé	39,2	6,1
2	Itambé	19,9	7,3
3	Elege	4,4	25,2
4	Parmalat	35,8	4,4
5	CCL/SP (2)	25,4	4,4
6	Embaré	n. d.	2,4
7	Morrinhos	n. d.	3,2
8	Centroleite	n. d.	5,1
9	Sudcoop	n. d.	6
10	Confepar	n. d.	6,2
11	Batavia	11,8	4
12	Leite Lider	n. d.	5,2
13	Danone	2,1	0,6
14	Vigo	n. d.	n. d.

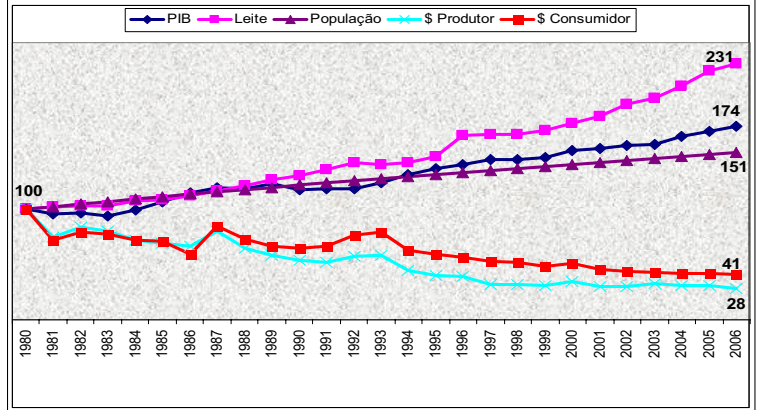
Brazilian Dairy Industry Mean production, liters/farm/day

Source: Embrapa Dairy Cattle (2006)

Ordem (1)	Empresa	1996	2005
1	DPA/Nestlé	100	557
2	Itambé	98	366
3	Elege	35	81
4	Parmalat	61	241
5	CCL/SP (2)	72	158
6	Embaré	n.d.	288
7	Morrinhos	n.d.	199
8	Centroleite	n.d.	140
9	Sudcoop	n.d.	107
10	Confepar	n.d.	94
11	Batavia	62	153
12	Leite Lider	n.d.	96
13	Danone	225	608
14	Vigor	100	400

Fonte: Banco de Dados Embrapa Gado de Leite (2006)

Milk Chain Competitiveness Selected Brazilian Indexes 1980-2006



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Embrapa Dairy Cattle (Headquarters)

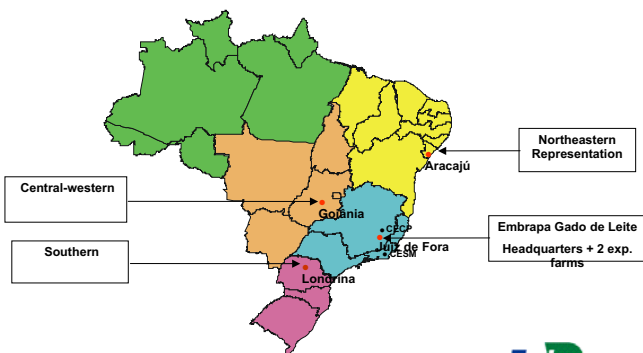
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Embrapa Dairy Cattle

- 262 employees
 - Researchers
- Headquarters
 - Labs
 - Library
 - Internet server
 - Administration
 - 2 experimental farms
 - ~2,000 hectares
 - 2,200 heads
- Regional representations
 - Main dairy basins
 - Northeastern
 - Central-western
 - Southern

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Embrapa Dairy Cattle structure



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Brazilian Tropical milk production Technologies

- Animal Breeding
 - 25 years of Gyr breeding program
 - Elite animals > 8000kg
 - Guzerat, Sindhi
 - Holstein heat-tolerant
- Plant Breeding
 - Several tropical grasses, legumes
 - Pasture management
 - Agroforestry
 - Methane emissions mitigation, next step
- Husbandry, facilities

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Innovative, cheap, easy-to-built plant
mechanical F1s milking
 (calves at their side)

Plant Breeding / Physiology

- 4 Researchers
- Species
 - *Pennisetum purpureum* germplasm bank
 - Pasture-prone
 - Seed-planted
 - Drought tolerant
 - Biomass production (charcoal? biofuel?)
 - *Brachiaria ruziziensis*
 - Biomass production
 - Integrated crop-livestock systems
 - *Cratylia argentea*
 - Increased palatability
 - *Arachis pinto*
 - Higher biomass production
- Participation in other breeding programs



Plant breeding

Pasture management

- 4 Researchers
- Animals, plants, soil, water relationships
 - Use of chemical fertilizers
 - Land intensification usage
 - High productivity / ha
- Integrated crop-livestock systems
 - Corn / Brachiaria annual production systems



Ruminant Nutrition

- 3 Researchers
- Feeding strategies using tropical forages
- Silages
 - Corn, sorghum, grasses, sugarcane, etc.
- Feedstuffs for dry periods
 - Sugar cane + urea
 - Tropical legumes
 - Protein conc. + minerals mixture
- Rumen microbiology
- Digestion, fermentation modelling
 - Feeding strategies for improved fiber degradation
 - Link feed conversion with CH4 mitigation?



Partial Results: Chemical composition, ingested material (extrusate) from three grass forages, rotational grazing, 30 days rest

Grass	DM (%)	CP (%)	NDF (%)
<i>P. maximum</i>	13,8	15,2	68,7
<i>Cynodon sp.</i>	14,0	14,4	65,0
<i>Brachiaria briz.</i>	13,5	12,7	64,4



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Silvopastoral systems

- 4 Researchers
- 10 + years research
 - 3 different experiments
 - Mature trees
- Parameters evaluated
 - Animal
 - Pasture
 - Planted trees
 - Interaction
- Need to evaluate
 - Environmental services
 - Carbon cycle
- Need tools
 - Modelling



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Soil Fertility under different shading levels

Shading level (%)	Ca	Mg	K	P	OM
		cmol _c /dm ³		mg/dm ³	%
12	0.45	0.15	0.11	2.89	2.48
22	0.92	0.47	0.31	4.15	3.24

Alvim et al. (2005)



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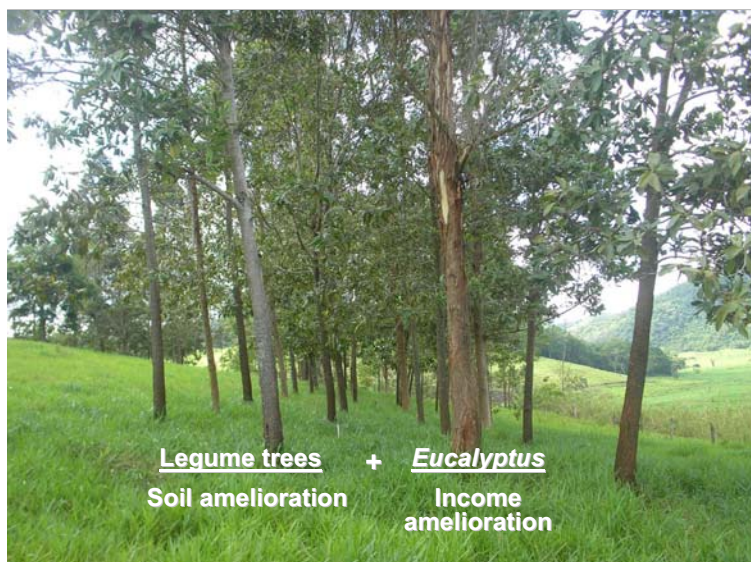
Brachiaria decumbens Characteristics under different shading levels

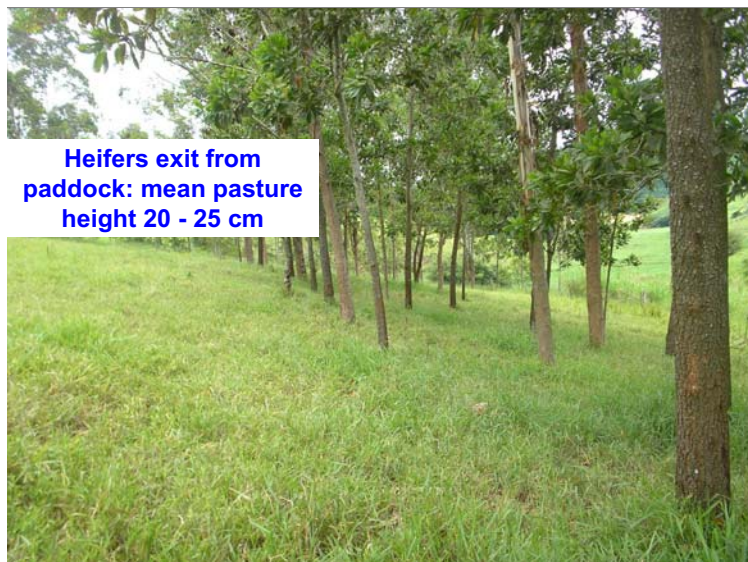
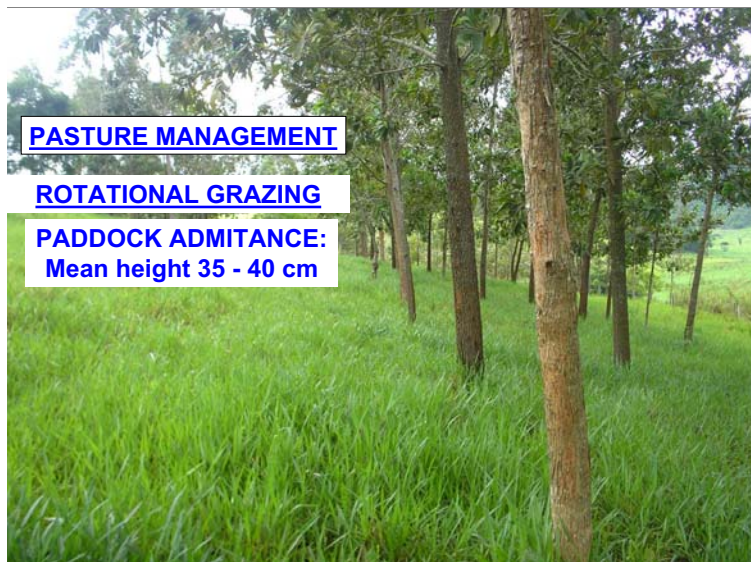
Shading level (%)	<i>B. dec</i> height (cm)	Forage biomass (kg/ha)	Soil cover (%)		
			Live forage	Dead Material	Nude Soil
12	41,4 b	1692 b	52,8 b	44,4 a	2,93 a
22	58,8 a	3616 a	67,5 a	32,5 b	0,07 b

Alvim et al. (2005)



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Shading effect upon *Brachiaria decumbens* Dry Matter digestibility, 2 year means

Tree Species	Treatment	Rain	Drought
<i>A. angustissima</i>	Sun	42,2	35,6
	Shadow	42,1	45,1
<i>A. auriculiformes</i>	Sun	43,9	40,0
	Shadow	43,6	50,9

Carvalho et al. 1999

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Crossbred heifers weight gain (g/day), area accumulated weight gain (kg/ha/180 days)

Treatment	Drought		Rain	
	g/heifer/d	Kg/ha/180d	g/heifer/d	Kg/ha/180d
Shaded	276 a	62,3 a	647 a	221,3 a
Treeless	252 a	59,1 a	563 b	182,4 b

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- Animal Reproduction**
- 4 researchers
 - F2 population for molecular markers study
 - Zebu (Gyr) *in vitro* protocols optimization
 - *In vitro* fertilization
 - *In vitro* embryo production
 - Embryo freezing
 - Brazil holds highest number of bovine embryo transfers
 - ~280.000/year
-
- Brazilian Agricultural Research Corporation
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Animal Breeding

- 6 researchers
 - Quantitative genetics
 - Breeding strategies
 - Progeny trials
 - Genetic markers
- Breeds
 - Gyr
 - Progeny trials for 20 years
 - Elite animals >8000 Kg milk
 - Semen best seller among dairy breeds
 - » (> 600.000/yr)
 - Guzerat
 - Multiple Ovulation and Embryo Transfer nucleus
 - Double purpose animal, size
 - Holstein



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Recorded Characteristics

- Production
 - Milk
 - Fat
 - Protein
 - Lactose
 - Total Solids
- Physical Conformation
- Management conditions



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Technological Achievements
Cross-bred, environmentally
adjusted holstein-gyr dairy cattle



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ÉDIPO DE ALAGOINHA
PTA 348 kg

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Ministério da Agricultura, Pecuária e Abastecimento **Embrapa**



HUMAITÁ TE TABOQUINHA

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TESTE DE PROGENIE
ANÁLISE GENÉTICA DE OVINOS, BOVINOS, EQUINOS, CANÍDEOS, FELINOS, MURCILOS E AVES

asbia
Associação Brasileira de Insseminação Artificial

SEMBRA

ABS
Associação Brasileira de Sêmen de Bovinos

Molecular Genetics

- 3 researchers
 - Support to animal breeding program
 - > 400 F2 Holstein x Gyr individuals
 - Genotypic
 - Phenotypic
 - Heat stress
 - Tick, worm tolerance
 - + commercial herds
 - QTLs
 - Gene expression
 - Mastitis
 - Phenotypic characteristics
 - Candidate genes
 - BOLA
 - Kappa Casein
 - Bovine growth hormone

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Parasitology

- ✓ 2 researchers
- ✓ Susceptibility of the Cattle tick populations to acaricides
- ✓ Phytoterapics as alternative control
 - Eucaliptus
 - Neen
- ✓ Biological control of *Boophilus microplus*
 - Entomopathogenic nematodes

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Cattle tick susceptibility to acaricides

Composição	Produto	Total	Média EF	EF 2006	N 2006	Persist (%)
Alphamethrin (T03)	Ultimate	589	17,7	(15,1)	(12)	-3,1
Deltamethrin	Butox	1363	15,3	12,0	176	-1,6
Cypermethrin (I06)	Beltoc C			9,1	42	
Cypermethrin + Piperonil Butoxido	Cythal	821	50,8	41,4	140	-3,5
Amitraz	Triatox	1517	44,0	41,2	266	-1,8
Amitraz + Chlorpyrifos (I06)	Amiphos			93,3	241	
Coumaphos (T01)	Asuntol	425	48,0	(45,2)	(83)	-2,3
Coumaphos + Flumethrin (I01) (T05)	Bovinal	426	47,4	(46,4)	(80)	0,2
Chlorfenvinphos + Dichlorvos	Carbeson	1382	88,0	90,3	281	-0,7
Chlorpyrifos + Dichlorvos (I00)	Ectofos	1088	76,7	63,5	200	-4,8
Cypermethrin + Chlorpyrifos (I01)	Aspersin	1053	66,1	53,8	237	-7,4
Cypermethrin + Chlorpyrifos (I05)	Flytion	407	98,6	98,9	282	1,0
Cypermethrin + Chlorpyrifos + Pip. (I03)(T05)	M3Ecto	344	39,8	(36,2)	(152)	-6,2
Cypermethrin + Chlorpyrifos+Cit.(I02)	Colosso	896	74,1	71,6	254	-3,4
Cypermethrin + Chlorpyrifos+Cit. +Pip. (06)	Cyperclor			99,8	231	
Cypermethrin + Chlorfenvinphos	Supocade	990	41,2	28,2	71	-4,7
Cypermethrin + Dichlorvos	Cypermil	1059	36,1	24,3	183	-5,7
Cypermethrin + Dichlorvos (T02)	Ectoplus	388	43,8	(29,2)	(34)	-4,6
Cypermethrin + Ethion (I01)	Cypermithion	692	38,6	33,3	204	-5,0
Cypermethrin + Thiazolin	Ektoban	1213	61,2	44,6	229	-5,6
Fipronil (I01)	Top Line	723	88,5	87,2	259	-1,8

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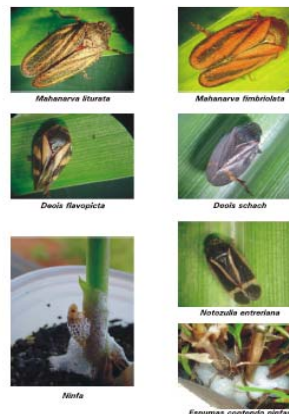
EDC's Entomology Lab

- Three years running
- One PhD researcher
- Main goal
 - Help plant breeding program to develop insect-tolerant / resistant forages
 - Work with Elephant grass (*Pennisetum purpureum*)



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"SPITTLEBUGS" - Species found in Brazil



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Adult



Mahanarva spectabilis



Nymph in elephant grass



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Socio-Economics

- 4 Researchers
- Markets monitoring
 - Supplies, prices to producers, Dairy products
- Publications
 - Bulletins for dairy sector
 - Critical analyses
 - www.cileite.com.br
- Participate with IFCN (Germany)
- Diagnostics, geo-referenced infos



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Milk Quality

- Milk Quality National Network
 - Participating lab, service (\$)
 - ~50.000 analyses / month
 - Physico-Chemical (30 - 35.000)
 - Total Bacterial Counts (15.000)
 - Automatized equipments
- Milk Microbiology Lab
 - 4 researchers
 - Mastitis epidemiology, microbiology
 - Culture collection > 3.000 isolates
 - Human pathogens in milk
 - Listeria, S. Aureus, E. coli, etc



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Technology Transfer

- Organized information
- Different media
 - Printed
 - Electronic
 - paper
 - Radio
 - TV, DVD
- Hygienic, low water consumption Manual milking Kit
- Training courses
 - Artificial insemination
 - Management
 - Embryo transfer, etc



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Thank you for your attention

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Qualidade do leite em Minas Gerais

José Renaldi Feitosa Brito



Ministério da Agricultura,
Pecuária e Abastecimento



LEITE DE QUALIDADE: DEMANDAS DO CONSUMIDOR / SAÚDE PÚBLICA

Atuais

- alto valor nutritivo
- propriedades organolépticas (sensoriais)
- alta qualidade higiênica

Atuais / futuras

- riscos ao ambiente: uso de químicos na preservação de silagens, uso de esterco, produção de metano pelo gado, produção orgânica.
- riscos éticos: uso de hormônios, conforto animal, transgênicos, mão-de-obra, respeito aos direitos da criança e do adolescente, respeito à legislação trabalhista.



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LEITE DE QUALIDADE: DEMANDAS DA INDÚSTRIA

- Qualidade higiênica (patógenos / toxinas, microrganismos deterioradores, baixa CCS, ausência de contaminantes químicos, água, etc.)
- Propriedades ótimas para processamento (estabilidade ao calor, coagulabilidade)
- Pouca variação sazonal na composição (gordura, lactose, proteína)

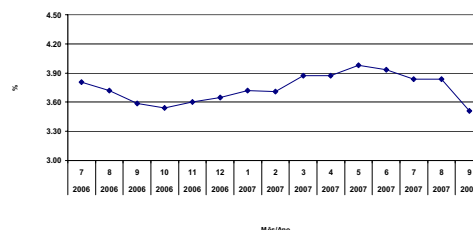


Ministério da Agricultura,
Pecuária e Abastecimento



Dados de gordura de rebanhos de Minas Gerais: 15 meses

Gordura (%)	n	%
< 3,0	9.020	7,6
≥ 3	109.225	92,4
Total	118.245	100,0

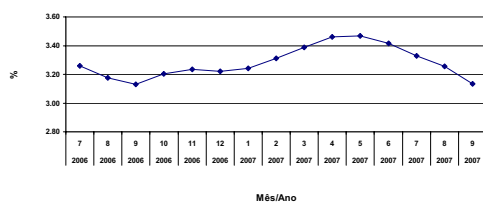


Ministério da Agricultura,
Pecuária e Abastecimento



Dados de proteína de rebanhos de MG: 15 meses

proteína (%)	n	%	% acumulado
< 2,9	4.890	4,1	4,1
≥ 2,9	113.355	95,9	100,0
Total	118.245	100,0	

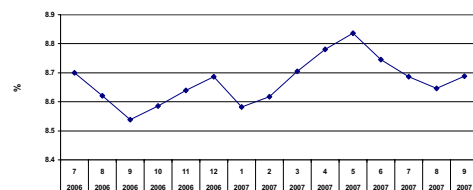


Ministério da Agricultura,
Pecuária e Abastecimento



Dados de ESD de rebanhos de MG: 15 meses

ESD (%)	n	%	% acumulado
< 8,4	16.883	14,3	14,3
≥ 8,4	101.355	85,7	100,0
Total	118.238	100,0	



Ministério da Agricultura,
Pecuária e Abastecimento



Dados de CCS de rebanhos de MG: 15 meses

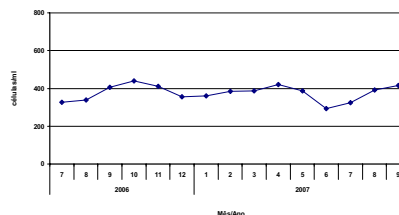
Categoria CCS (x1000)	n	%	% acumulado
< 400	58.453	49,4	49,4
400 – 750	35.164	29,7	79,2
750 – 1000	10.528	8,9	88,1
≥ 1000	14.100	11,9	100,0
Total	118.245	100,0	



Ministério da Agricultura, Pecuária e Abastecimento



Dados de CCS de rebanhos de MG: 15 meses



Ministério da Agricultura, Pecuária e Abastecimento



Dados de CTB de rebanhos de MG: 15 meses

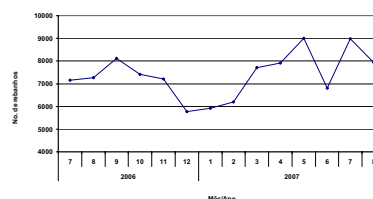
CTB (x1000)	n	%	% acumulado
< 100	11.425	10,2	10,2
100 a 750	43.312	38,8	49,1
750 a 1000	7.450	6,7	55,8
> 1000	49.336	44,2	100,0
Total	111523	100,0	



Ministério da Agricultura, Pecuária e Abastecimento



Dados de CTB de rebanhos de MG: 15 meses



Ministério da Agricultura, Pecuária e Abastecimento



TANQUES COMUNITÁRIOS DE SANTOS DUMONT

Tanque	N	Gordura	Proteína	Lactose	ST	ESD
		Média	Média	Média	Média	Média
1	146	3,72	3,25	4,38	12,36	8,64
2	90	3,76	3,28	4,38	12,43	8,67
3	59	3,78	3,31	4,45	12,57	8,79
4	59	3,75	3,19	4,34	12,29	8,54
5	85	3,64	3,24	4,36	12,23	8,59
6	155	3,65	3,24	4,39	12,28	8,63
Total	594	3,71	3,25	4,38	12,35	8,64



Ministério da Agricultura, Pecuária e Abastecimento



TANQUES COMUNITÁRIOS DE SANTOS DUMONT
CCS x 1.000 células/ml

TANQ UE	N	Média Arit	DP	Média Geom	Media na	Min.	Máx.
1	146	392	410	234	277	3	2595
2	90	473	540	295	342	13	3508
3	59	332	271	243	241	10	1408
4	59	672	626	466	445	66	2747
5	85	456	444	316	344	51	2561
6	155	689	571	491	541	24	3192
Total	594	513	511	330	371	3	3508



Ministério da Agricultura, Pecuária e Abastecimento



TANQUES COMUNITÁRIOS DE SANTOS DUMONT CTB x 1.000 ufc/ml

TANQUE	N	Média Arit	DP	Méd Geo	Media-na	Mín.	Máx.
1	146	828	1461	290	256	3	7129
2	90	349	531	173	143	10	2769
3	61	439	733	0	190	1	4057
4	60	805	1027	341	345	17	4078
5	82	511	950	200	159	17	5422
6	160	1238	1526	0	477	1	5665
Total	599	780	1251	0	273	1	7129



Ministério da Agricultura,
Pecuária e Abastecimento



TANQUES COMUNITÁRIOS DE SANTOS DUMONT Dados de crioscopia

Adição de água (%)	n	%
0 a 3*	537	90,7
3,1 a 10	33	5,6
> 10	22	3,7
Total	592	100,0



Ministério da Agricultura,
Pecuária e Abastecimento



TANQUES COMUNITÁRIOS DE SANTOS DUMONT Resíduos de antibióticos

Presença de inibidores*	n	%
Negativo	549	91,3
Suspeito	32	5,3
Positivo	20	3,4
Total	601	100,0



Ministério da Agricultura,
Pecuária e Abastecimento



Segurança dos alimentos

- **DTA:** problema de saúde pública e econômico
- **Nos EUA (por ano):** 76 milhões de casos; 325.000 hospitalizações; 5.000 mortes.
- **No Brasil (1999-2004):** 3.064 surtos; 57.353 pessoas; 37 mortes; 70% dos casos - o alimento foi identificado.
- **No mundo (por ano):** 2,1 milhões de pessoas morrem com diarreia.



Ministério da Agricultura,
Pecuária e Abastecimento



Patógenos veiculados pelo leite e derivados

- *Escherichia coli* O157:H7
- *Staphylococcus aureus*
- *Listeria monocytogenes*
- *Salmonella*
- *Enterobacter sakazakii*
- Outros



Ministério da Agricultura,
Pecuária e Abastecimento



Futuras demandas / exigências

- Segurança do alimento:
- Análise de risco microbiológico
- Patógenos emergentes / re-emergentes
- Novas abordagens sobre o manejo dos perigos
- APPCC
- Boas Práticas
- Mudanças dos sistemas de vigilância oficiais, certificação, auto-controle
- Papel do consumidor
- Comunicação de risco



Ministério da Agricultura,
Pecuária e Abastecimento



Obrigado!



Ministério da Agricultura,
Pecuária e Abastecimento





“O Código de Proteção e Defesa do Consumidor, o trabalho do Procon em Juiz de Fora e a qualidade dos produtos ”

A Agência Procon Juiz de Fora

- *Única do país a funcionar como autarquia especial: pode agir como reguladora, educadora e fiscalizadora;*
- *O Procon de Juiz de Fora está entre os mais atuantes de Minas, está no SINDEC, é membro do conselho de consumidores da CEMIG.*
- *Dá suporte a vários Procons do país no projeto de educação para o consumo nas escolas com palestra e teatro.*
- *Fundado em 1986, o Procon completou, no dia 30 de abril, 21 anos de história;*

Atendimento

- *Cerca de 1700 consumidores por mês, no atendimento presencial. Aproximadamente 1200/mês no atendimento telefônico, via 156;*
- *Cerca de 90% dos casos são atendidos, sendo a maioria solucionada num primeiro contato;*
- *Atendimento humanizado, infra-estrutura renovada, aumento do número de atendentes. Atendimento nos Centros Regionais;*

O Código de Defesa do Consumidor

- *Considerada uma das legislações mais modernas do mundo, o CDC apresenta avanços como o reconhecimento da vulnerabilidade do consumidor, o princípio da boa fé objetiva-responsabilidade objetiva e a inversão do ônus da prova.*
- *O CDC busca dignidade, saúde, segurança, proteção dos interesses econômicos e à melhoria da qualidade de vida do consumidor;*

RELAÇÃO JURÍDICA DE CONSUMO

- **CONSUMIDOR** - *pessoa física ou jurídica que adquire ou utiliza produto ou serviço como destinatário final*
- **FORNECEDOR** - *pessoa física ou jurídica, pública ou privada, nacional ou estrangeira, entes despersonalizados, que desenvolvem atividade de produção, montagem, criação, construção, transformação, importação, exportação, distribuição ou comercialização de produtos ou prestação de serviços*

RELAÇÃO JURÍDICA DE CONSUMO

- **PRODUTO** - *qualquer bem móvel ou imóvel, material ou imaterial;*
- **SERVIÇO** - *qualquer atividade fornecida no mercado de consumo, mediante remuneração, inclusive as de natureza bancária, financeira, de crédito e securitária, salvo as decorrentes das relações de caráter trabalhista*

PRINCÍPIOS E DIREITOS BÁSICOS:

- *Reconhecimento da vulnerabilidade do consumidor;*
- *Harmonização e equilíbrio das relação de consumo;*
- *Educação e informação para fornecedores e consumidores;*
- *Incentivo à criação, pelos fornecedores, de meios eficientes de controle de qualidade e segurança de produtos e serviços;*
- *Proteção à vida, saúde e segurança contra riscos provocados por práticas no fornecimento de produtos e serviços considerados perigosos ou nocivos;*

- *Divulgação sobre o consumo adequado dos produtos e serviços, assegurada a liberdade de escolha e igualdade nas contratações;*
- *A efetiva prevenção e reparação de danos patrimoniais e morais;*
- *proteção contra publicidade enganosa e abusiva;*
- *modificação de cláusulas contratuais que estabeleçam prestações desproporcionais ou a sua revisão em razão de fatos supervenientes que as tornem excessivamente onerosas;*
- *facilitação da defesa do consumidor que o juiz entende hipossuficiente com inversão do ônus da prova a seu favor;*

CLASSIFICAÇÃO DOS PRODUTOS IMPRÓPRIOS

- **DEFEITUOSO:** É AQUELE QUE NÃO CUMPRE COM SUA FUNÇÃO, NÃO OFERECE SEGURANÇA QUE DELE SE ESPERA;
- **DETERIORADO:** DANIFICADO, ESTRAGADO, DEGENERADO, ALTERADO, ADULTERADO, CORROMPIDO;
- **FALSIFICADO:** CONTRÁRIO À REALIDADE, IMITAÇÃO DO VERDADEIRO;
- **FRAUDADO:** ENGANOSO, ILUSÓRIO;
- **NOCIVO:** É O QUE PREJUDICA, CAUSA DANO;
- **PERECÍVEL:** SUJEITO A PERECER, A EXTINGUIR-SE;
- **PERIGOSO:** ARRISCADO, QUE CAUSA OU AMEAÇA PERIGO; QUE APRESENTA PERICULOSIDADE;

- **ADULTERADO:** ALTERADO COM FRAUDE, FALSIFICADO, MODIFICADO, DETURPADO OU DEFORMADO;
- **AVARIADO:** ESTRAGADO OU DANIFICADO;
- **CLANDESTINO:** SÃO OS QUE NÃO TRAZEM INFORMAÇÕES CLARAS SOBRE ORIGEM, FABRICANTES, E OS QUE NÃO CONTÉM CARIMBOS OU REGISTROS DAS INSTITUIÇÕES RESPONSÁVEIS;
- **CONGELADO (CUIDADOS):** OBSERVAR VALIDADE, CONDIÇÃO DA REFRIGERAÇÃO (ACÚMULO DE ÁGUA SIGNIFICA TEMPERATURA INCORRETA);
- **CORROMPIDO:** PODRE, ESTRAGADO, DECOMPOSTO;

PRODUTO VICIADO

É o produto impróprio ou inadequado ao consumo a que se destina ou lhe diminuem o valor, os decorrentes da disparidade com as indicações constantes do recipiente, da embalagem, rotulagem ou mensagem publicitária.

RESPONSABILIDADE POR VICIO DO PRODUTO

ART. 18 - VÍCIO DE QUALIDADE A RESPONSABILIDADE SOLIDÁRIA- TODOS OS FORNECEDORES.

(alimentícios)

§ 3º - troca imediata do produto

ART. 19 - VÍCIO DE QUANTIDADE A RESPONSABILIDADE É DO FORNECEDOR IMEDIATO QUE FIZER A PESAGEM.

RESPONSABILIDADE POR DANOS CAUSADOS AO CONSUMIDOR (art. 12)

O fabricante, o produtor e o comerciante respondem solidariamente perante aos consumidores, **independente da existência de culpa**, pela reparação dos danos causados por defeitos decorrentes de projetos, fabricação, construção, montagem, manipulação, apresentação, acondicionamento de seus produtos bem como por informações insuficientes ou inadequadas sobre sua utilização e risco.

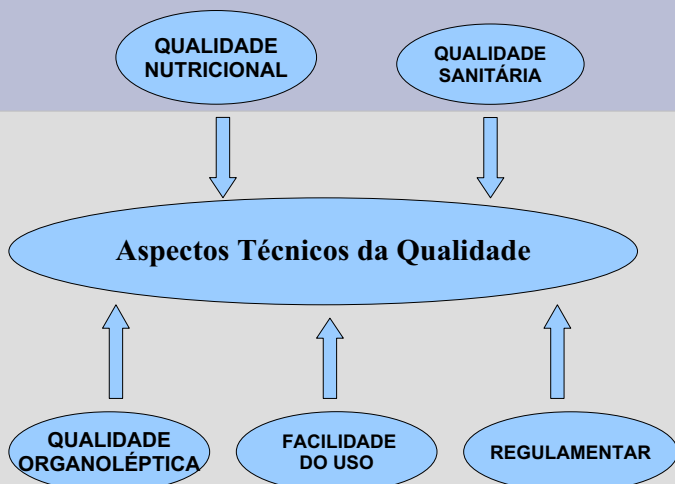
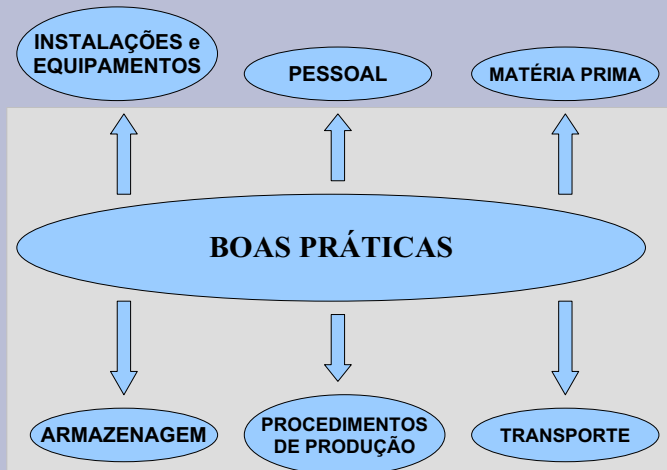
SEGURANÇA ALIMENTAR lei 11.346/06

O QUE É ALIMENTO?

- ser assimilável pelo organismo
- fornecer uma ou mais substâncias nutritivas
- estar isento de qualquer ação prejudicial ou tóxica ao organismo

O ALIMENTO

- deve estar em perfeito estado de conservação
- estar isento de nocividade à saúde
- estar de acordo com as disposições da legislação federal, estadual e municipal



PADRÕES DE ROTULAGEM

- identificação do produto
- data de fabricação e validade
- número e registro no órgão competente
- composição, quantidade
- identificação do produtor, importador, empacotador.
- condições de armazenamento e exposição
- endereço de produção, beneficiamento, empacotamento ou envase.

> **Todas as indicações de forma legível**

SANSÕES ADMINISTRATIVAS

- I- Multa
- II - Apreensão do produto
- III -Inutilização do produto
- IV - Cassação do registro do produto
- V - Proibição da fabricação do produto
- VI - Suspensão temporária da atividade
- VII - Revogação da concessão ou permissão de uso
- VIII - Cassação da Licença
- IX - Interdição, total ou parcial, do estabelecimento ou atividade

LEI Nº 8.137/90

Art. 7º – Constitui crimes contra as relações de consumo:

(...)

II - vender ou expor à venda mercadoria cuja embalagem, tipo, especificação, peso ou composição esteja em desacordo com as prescrições legais, ou que não corresponda à respectiva classificação oficial;

III - misturar gêneros e mercadorias de espécies diferentes, para vendê-los ou expô-los à venda como puros; misturar gêneros e mercadorias de qualidades desiguais para vendê-los ou expô-los à venda por preço estabelecido para os demais mais alto custo;

Pena – detenção de 2 (dois) a 5 (cinco) anos ou multa

MENSAGEM FINAL

“Promover o equilíbrio entre as partes é um dos grandes objetivos da Agência Procon e do prefeito Alberto Bejani.

A saúde e a qualidade do alimento depende do planejamento, do preparo, do manejo e da forma de servi-lo, bem como da consciência sanitária de todos.”

Léa Ganimi

Superintendente da Agência Procon/JF

AGÊNCIA PROCON JUIZ DE FORA

**Avenida Independência, 992, Centro
3690-7610 / 3690-7611**

lea.procon@pjf.mg.gov.br

www.procon.pjf.mg.gov.br

**Mais informações
LIGUE 156**





QUALIDADE E PROCESSOS: “Desafios para os produtores de leite de base familiar”

Local: EMBRAPA CNPGL – Centro Nacional de Pesquisa em Gado de Leite

FETAEMG

Guilherme Gonçalves Teixeira - Assessor Técnico/FETAEMG


Juiz de Fora/MG – 30 de Outubro de 2007



FETAEMG – Federação dos Trabalhadores na Agricultura do Estado de Minas Gerais

- Orgão de Representação de Classe
- Sistema **CONTAG – FETAGs - STTRs**
- Completará no próximo ano 40 anos
- Início 6 STTRs
- Hoje são mais de 450 STTRs filiados
- Prédio Sede – Belo Horizonte
- 12 pólos regionais

FETAEMG



Pela Lei Nº 11.326, de 24 de Julho de 2006 **Lei da Agricultura familiar** Agricultor (a) Familiar

É aquele que:

1. Não detém, a qualquer título, área maior do que 4(quatro) módulos fiscais;
2. Utiliza predominantemente mão-de-obra da própria família nas atividades econômicas do seu estabelecimento ou empreendimento;

- Tenha renda familiar predominantemente originada de atividades econômicas vinculadas ao próprio estabelecimento ou empreendimento.


FETAEMG



PERFIL DA AGRICULTURA FAMILIAR

- OCUPA 84 % DOS IMÓVEIS RURAIS DO PAÍS;
- ❖ USA APENAS 21% DAS TERRAS CULTIVADAS NO PAÍS;
- ❖ DETEM 4,1 MILHÕES DE ESTABELECIMENTOS FAMILIARES;
- ❖ EMPREGA 13 MILHÕES DE TRABALHADORES/AS RURAIS;
- ❖ DETÉM 78 % DE EMPREGOS GERADOS NO CAMPO;

FETAEMG



- PRODUZ 60 % DOS ALIMENTOS CONSUMIDOS PELOS BRASILEIROS;
- ❖ APENAS 21% DOS RECURSOS SÃO DESTINADOS PARA AG. FAMILIAR;
- ❖ MOVIMENTA R\$ 160 BILHÕES POR ANO.
- ❖ PARTICIPAÇÃO DE 40% DO VBP DA AGROPECUÁRIA NACIONAL

FETAEMG



Cadeia do leite em Minas Gerais

- 7 bilhões de litros ³a;
- 1,2 milhão de empregos;
- Movimenta 14,5 bilhões por ano;
- 70% produção (até 100 litros/dia);

Tab. 1 - Demanda de produção de leite no Brasil

Faixas de idade	Recomendação litros/dia	Produção	Demanda (milhões de litros)
Crianças (até 10 anos)	146	32.918.055	4.806
Adolescentes (10 a 19 anos)	256	35287.882	9.034
Adultos (20 a 60 anos)	219	95239239	20.857
Idosos (maiores de 70 anos)	219	6353994	1.392
Total		169.799170	35.658

Fonte: Ministério da Saúde e IBGE
Elaboração: R.ZOCCAL - Embrapa Gado de Leite (2003).



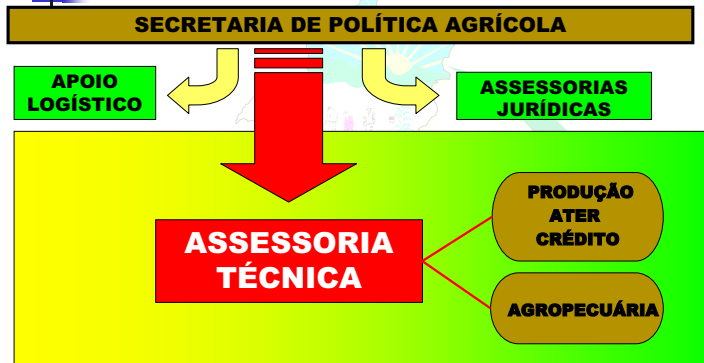
O COOPERATIVISMO COMO FERRAMENTA PARA O DRS

- Cerca de 360 Cooperativas de Leite/ OCB – UNICAFES
- 222 Coop. mais de 70% de Agricultores Familiares;
- Mecanismo para a socialização de interesses: sociais, ambientais, culturais e econômicos no meio rural;
- Escala de produção, ATER, qualidade da matéria prima.
- Captação de leite: redução de 60% anos 90 para 40%.



METAS PROPOSTAS PARA 2006-08

2. NÚCLEO DE APOIO ESTADUAL (FETAEMG)



Ações da FETAEMG para o fortalecimento da Cadeia do leite na Agricultura Familiar

- Representação dos Agricultores Familiares na Câmara técnica de Bovinocultura de Leite do CEPA;
- Membro do Comitê Gestor do Pólo Tecnológico do Leite;
- Assessoria Técnica no Fomento do PRONAF, elaboração de cartilhas, folhetos explicativos etc.;
- PAA – CONAB;
- Consórcio Social da Juventude Rural – Rita Quadros;
- Assessoria Técnica/ Apoio ao cooperativismo de crédito, produção etc.
- Assessoria Técnica Específica para a Cadeia do leite.
- Participação de foruns de discussão em nível nacional e estadual.
- Seminário Estadual da Cadeia do leite na Agricultura Familiar – Desafios, e Perspectivas (2008);



Participe e faça bons negócios

Dias 27 a 30 de setembro de 2007
Serraria Souza Pinto
Belo Horizonte - MG

AgriMinas
II FEIRA DE AGRICULTURA FAMILIAR DE MINAS GERAIS

Visite o campo sem sair da cidade!

PARA OUTRAS INFORMAÇÕES:
Site: www.fetaemg.org.br
e-mail: fetaemg@fetaemg.org.br
tel: (51) 3023-3000 - fax: (51) 3023-0022
www.emater.mg.gov.br

PRODUÇÃO DE LEITE COM QUALIDADE NA AGRICULTURA FAMILIAR

30 ANOS DE AÇÃO FETAEMG

Ações estratégicas para o fortalecimento da cadeia

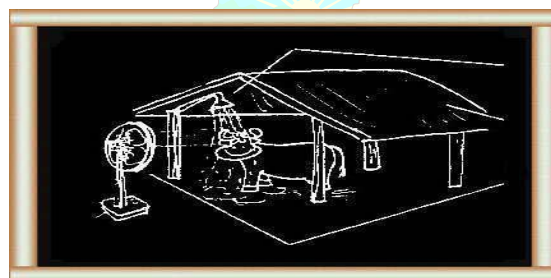


Desafios para o fortalecimento da Cadeia:

- ATER (Gestão, Genética, Qualidade, Nutrição, Pastagem etc.).



Desenvolvimento de Tecnologias adequadas.



Profissionalismo e comprometimento:



Diagram illustrating the relationship between milk production and energy balance over 44 weeks post-partum. The Y-axis represents energy balance (kcal/kg) from -10 to 40. The X-axis represents weeks post-partum from 0 to 44. The legend indicates: Produção de leite (lactação) (Milk production), Energia concentrada (Concentrated energy), and Energia balanceada (Balanced energy).

Semanas pós parto	Produção de leite (lactação)	Energia concentrada	Energia balanceada
0	~25	~0	~25
4	~25	~0	~25
8	~25	~0	~25
12	~25	~0	~25
16	~25	~0	~25
20	~25	~0	~25
24	~25	~0	~25
28	~25	~0	~25
32	~25	~0	~25
36	~25	~0	~25
40	~25	~0	~25
44	~25	~0	~25

Eficiência na utilização de forragens:

Fornagem deve proporcionar alta taxa de lotação animal e baixo uso de alimentos concentrados por litro de leite produzido: Requer alta produção de matéria seca por hectare e baixa porcentagem de fibra (FDN) na matéria Seca.

Não adianta apenas ter alta produção de massa verde por hectare!!!

Planilhas de Custo de produção?



Desenvolver o "espírito" cooperativista na Agricultura Familiar

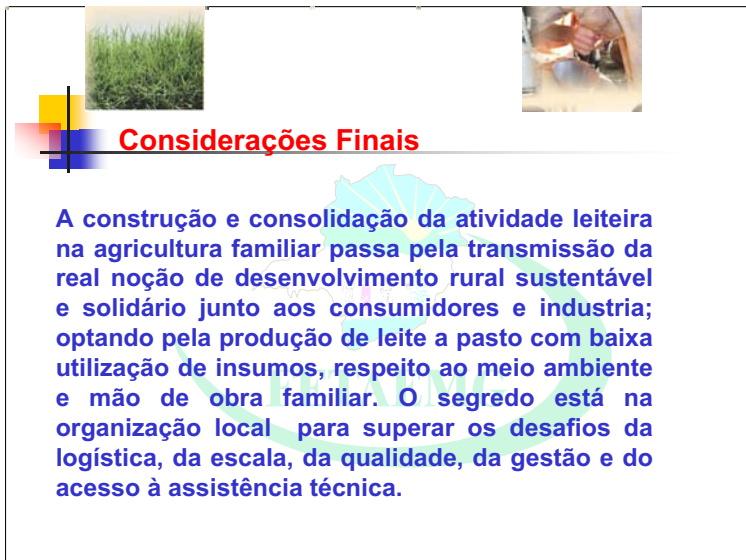


Comercialização e Mercado



programa minas artesanal
valorizando a agricultura familiar








EMATER-MG
GOVERNO DE MINAS

A Percepção da Assistência Técnica e Extensão Rural em relação à Qualidade dos Produtos e Processos da Cadeia do Leite

Embrapa / Gado de Leite
Juiz de Fora - 30.10.07

www.emater.mg.gov.br



QUALIDADE

- “s. f. Propriedade, atributo ou condição das coisas ou das pessoas capaz de distingui-las das outras e de lhes determinar a natureza.”
 - Novo Dicionário da Língua Portuguesa, 2ª Ed. 1986

www.emater.mg.gov.br




Qualidade “das coisas” → Produtos Leite e Derivados



- Visual
- Sanitária
- Organoléptica
- Nutricional
- Praticidade culinária

www.emater.mg.gov.br

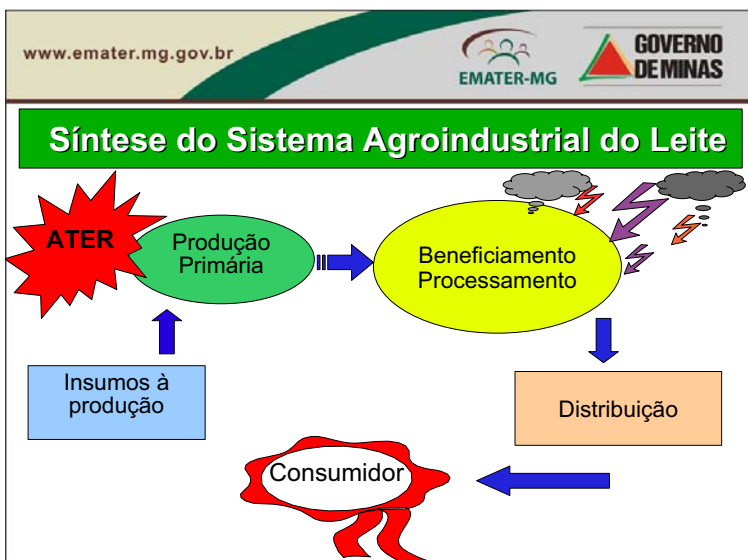


Qualidade “das coisas” → Produtos Leite e Derivados

Operação da PF e Procuradoria prende 26 acusados de adulterar leite em MG

Publicidade
da **Folha Online** - 22.10.07

A Polícia Federal, a Procuradoria da República e o Ministério Público Estadual de Minas Gerais realizam nesta segunda-feira a operação “Ouro Branco” em duas cooperativas de laticínios acusadas de adulterar leite longa vida em Minas. Segundo a Procuradoria, 27 mandados de prisão foram expedidos e 26 **pessoas** já foram presas.



www.emater.mg.gov.br



Qualidade das pessoas → Processos Assistência Técnica e Extensão Rural

Processo educativo não formal que tem como propósito contribuir, à partir do diálogo, para a construção participativa dos saberes e para o exercício da cidadania.



www.emater.mg.gov.br

EMATER-MG GOVERNO DE MINAS

A Qualidade do PROCESSO

Metodologia Participativa de Extensão Rural para o Desenvolvimento Sustentável




www.emater.mg.gov.br

EMATER-MG GOVERNO DE MINAS

Características das Técnicas

- Consideram o saber existente;
- Permitem e estimulam o diálogo e a participação;
- Associam teoria e prática;
- Asseguram a apropriação de novos saberes;
- Privilegiam a qualidade do processo.

www.emater.mg.gov.br

EMATER-MG GOVERNO DE MINAS

O Processo para se chegar à adoção de tecnologia pelo pecuarista familiar

- Sensibilidade do pecuarista ao problema;
- Identificação e caracterização do problema ou interesse de forma conjunta (pecuarista e extensionista);
- Diálogo e estudo de viabilidade das alternativas de solução;
- Adequação da tecnologia (alternativa viável) ao sistema de produção a ser incorporada;
- Informações disponibilizadas para a tomada de decisão do pecuarista familiar.

www.emater.mg.gov.br

EMATER-MG GOVERNO DE MINAS

A Ação Extensionista em Programas e Projetos na Atividade Leiteira

- Minas Leite: Programa de Qualificação Gerencial e Técnica dos Sistemas Produtivos de Pecuária Leiteira de Minas Gerais.
- Programa Minas Sem Fome: Tanques de Expansão
- Programa de Organização e Gestão da Pecuária Bovina Bovina de Minas Gerais - PROPEC
- Programa de Aprimoramento da Pecuária Leiteira do Norte de Minas e Vale do Jequitinhonha - PROCRIAR
- Programa Queijo Minas Artesanal

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EMATER-MG GOVERNO DE MINAS

MINAS LEITE: Qualificação Gerencial e Técnica dos Sistemas Produtivos de Pecuária Leiteira de Minas Gerais.



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www.emater.mg.gov.br

EMATER-MG GOVERNO DE MINAS

MINAS LEITE: Qualificação Gerencial e Técnica dos Sistemas Produtivos de Pecuária Leiteira de Minas Gerais.



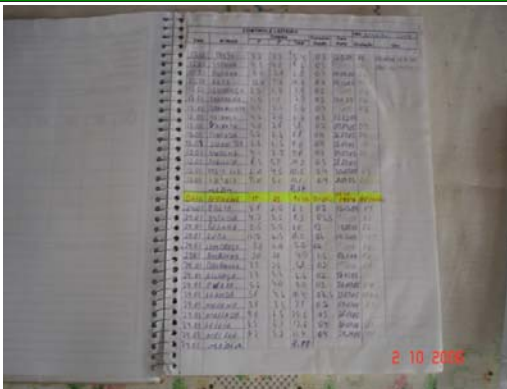
MINAS LEITE: Qualificação Gerencial e Técnica dos Sistemas Produtivos de Pecuária Leiteira de Minas Gerais.



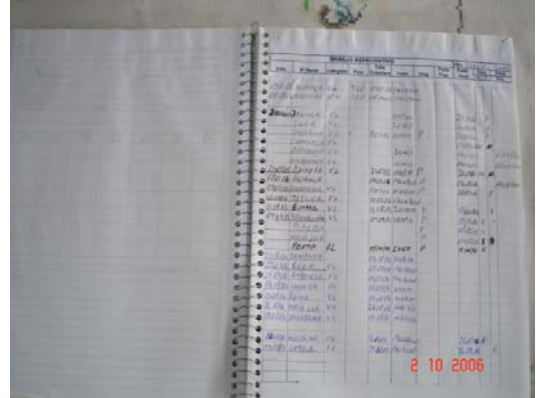
MINAS LEITE: Qualificação Gerencial e Técnica dos Sistemas Produtivos de Pecuária Leiteira de Minas Gerais.



MINAS LEITE: Qualificação Gerencial e Técnica dos Sistemas Produtivos de Pecuária Leiteira de Minas Gerais.



MINAS LEITE: Qualificação Gerencial e Técnica dos Sistemas Produtivos de Pecuária Leiteira de Minas Gerais.

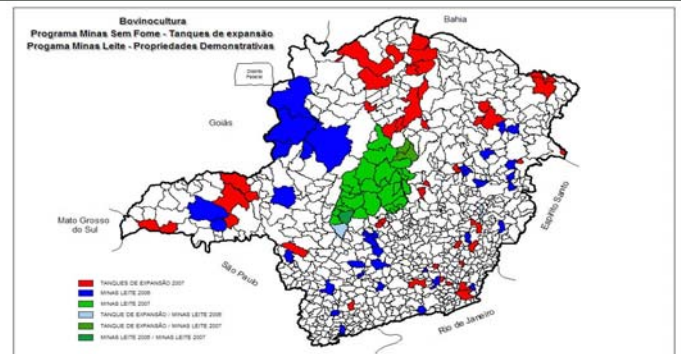


MINAS SEM FOME / Tanques de Expansão - 2007

- Investimento: **R\$ 750.000,00**
- Fonte de recursos: **Estado**
- Tanques a serem instalados: **48**
- Produtores atendidos: **aproximadamente 500**



MINAS LEITE e MINAS SEM FOME / Tanques de Expansão



O Programa Queijo Minas Artesanal



O Programa Queijo Minas Artesanal



O Programa Queijo Minas Artesanal



O Programa Queijo Minas Artesanal em Números

- Cursos de qualificação para os produtores: 102
- Produtores com qualificação para o processamento do produto: 1.428
- Técnicos qualificados (Emater MG e IMA): 70
- Queijarias cadastradas junto ao IMA: 55
- Concursos de Qualidade do Queijo Artesanal já realizados:
 - Municipal - 30
 - Regiona - 8
 - Estadual - 1

O Programa Queijo Minas Artesanal A qualidade é incorporada ao produto



Considerações Finais...

Produto: Objeto da ação
Sujeito da ação: Pessoas

Precisamos investir nos processos de **qualificação das pessoas** para elas façam bom uso da **tecnologia disponível** e gerem **produtos confiáveis**.



Seminário

Tema: Qualidade dos produtos e processos na cadeia produtiva do leite para produtores de base familiar do Estado de Minas Gerais

EMBRAPA

Aparecida das Graças Monteiro Amadeu

Juiz de Fora , MG

30 de outubro de 2007



CNEC

Lac 1943



- Grupo de produtores
- Funcionava no centro da cidade.
- Companhia de Leite de Leopoldina.



CNEC

Lac 1982



- Inauguração das novas instalações
- Rodovia BR 116, KM 773.
- Capacidade 280 mil/dia



CNEC

Lac 1985 – 1988



- Ponto Máximo da produção de leite empacotado.
- RJ e MG maiores consumidores.



CNEC

Lac 1995 – 1996



- Terceirização do leite UHT.
- Inauguração da Planta UHT.



CNEC

Lac 1998



- Iniciou a granelização.
- Pagamento por qualidade.



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Evolução da Granelização na Lac

- 1.998 – INSTALAÇÃO DOS PRIMEIROS TANQUES - 2,0 %
- 1.999 – 53,74 % DO LEITE FOI RECEBIDO GELADO
- 2.000 – 85,33 % DO LEITE FOI RECEBIDO GELADO
- 2.001 – 95,68 % DO LEITE FOI RECEBIDO GELADO
- 2.002 – FOI ATINGIDO O PATAMAR EM OUTUBRO DE 100,00 %



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Histórico da Granelização Fatos Marcantes

- 1.998 – INSTALAÇÃO DOS PRIMEIROS TANQUES - 2,0 %
- 1.999 – 53,74 % DO LEITE FOI RECEBIDO GELADO
- 2.000 – 85,33 % DO LEITE FOI RECEBIDO GELADO
- 2.001 – 95,68 % DO LEITE FOI RECEBIDO GELADO
- 2.002 – FOI ATINGIDO O PATAMAR EM OUTUBRO DE 100,00 %



CNEC

Comparativo

- | | |
|--------------------------------------|-------------|
| GRANELIZAÇÃO NO BRASIL
(EM 2.005) | APROX. 70 % |
| EM MINAS GERAIS
(EM 2.005) | APROX. 88 % |



CNEC

Vantagens da Granelização

1- Para a Indústria

- REDUÇÃO DAS PERDAS NO PROCESSO
- CONSEGUE MANTER RÍGIDO CONTROLE DE QUALIDADE DURANTE TODO O PROCESSO
- REDUÇÃO DOS CUSTOS OPERACIONAIS
- FIDELIZA SEUS CONSUMIDORES PELO ALTO PADRÃO DE QUALIDADE



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Vantagens da Granelização

2- Para o produtor de leite

PERMITE AO PRODUTOR MAIOR FLEXIBILIDADE NOS HORÁRIOS DE ORDENHA, COM MELHOR APROVEITAMENTO DA MÃO DE OBRA, CONSEGUE MELHOR REMUNERAÇÃO PARA SUA PRODUÇÃO, PELA MELHORIA DA QUALIDADE DO LEITE, AUMENTO NO VOLUME PRODUZIDO, SENSÍVEL ECONOMIA COM O FRETE, EVITA PERDAS POR ACIDEZ ELEVADA E CONDENAÇÃO POR INSTABILIDADE AO ALIZAROL.



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Vantagens da Granelização

3- Para o consumidor

ESTE IMPORTANTE ELO NA CADEIA PASSA A TER A CERTEZA DE ESTAR CONSUMINDO PRODUTOS FABRICADOS COM MATÉRIA PRIMA DE ÓTIMA QUALIDADE.



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Desvantagens da Granelização

UMA DAS PRINCIPAIS DESVANTAGENS DA GRANELIZAÇÃO NOTADA NESTE PERÍODO DE IMPLANTAÇÃO DO SISTEMA, É O AUMENTO DA FLORA MICROBIANA DO GÊNERO DAS PSICOTRÓFICAS, PRINCIPALMENTE NO PERÍODO DAS CHUVAS (ENTRE OUTUBRO E MARÇO)



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Desvantagens da Granelização

NOS CASOS DAS INDÚSTRIAS CENTRALIZADORAS QUE RECEBEM LEITE DE TERCEIROS, SUPOMOS QUE, EXISTEM COM ATÉ 96 HORAS DE VIDA, O QUE CAUSA ALGUNS PROBLEMAS PARA A INDÚSTRIA, COMO POR EXEMPLO A PERDA DE RENDIMENTO NAS INDÚSTRIAS DE QUEIJO, GELIFICAÇÃO EM PRODUTOS UHT, DIFICULDADE NO DESNATE OU PADRONIZAÇÃO DO LEITE, (MANTEIGA).



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Desvantagens da Granelização

UM MOTIVO DE GRANDE PREOCUPÇÃO DA EQUIPE TÉCNICA DA LAC, COM O SISTEMA DE RESFRIAMENTO DO LEITE EM TANQUES DE EXPANSÃO, NO INÍCIO DO PROCESSO, FOI O DE ALGUNS PRODUTORES RURAIS, SE DESCUIDAREM DO PROGRAMA DE BOAS PRÁTICAS DE PRODUÇÃO. AQUELES CUIDADOS BÁSICOS DE MANEJO, PARA UMA PRODUÇÃO HIGIÊNICA DO LEITE.



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Custo do Frete com a Granelização

(PREÇOS MÉDIOS)

EM 1.999 - R\$ 0,0184 POR LITRO

EM 2.002 – R\$ 0,0204 POR LITRO

AUMENTO DE 10,87 %



CNEC

Pagamento por Qualidade

COM A GRANELIZAÇÃO A COOPERATIVA INICIOU TAMBÉM O PAGAMENTO DO LEITE POR QUALIDADE – PROGRAMA DE INCENTIVO À QUALIDADE E PRODUTIVIDADE (PIPQ).

EM 1.999 – INCENTIVO MÉDIO DE R\$ 0,0172 POR LITRO

EM 2.002 – INCENTIVO MÉDIO DE R\$ 0,0625 POR LITRO

AUMENTO DE 263,38 %



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Principais objetivos da granelização

- * ASSEGURAR A QUALIDADE DO LEITE PRODUZIDO NAS PROPRIEDADES RURAIS (FUNDAMENTAL)
- * REDUZIR O CUSTO DO FRETE
- * COMO CONSEQUÊNCIA, COLOCAR À DISPOSIÇÃO DOS CONSUMIDORES PRODUTOS SEGUROS E CONFIÁVEIS E A PREÇOS MAIS BARATOS.



CNEC

P.I.P.Q. Lac - 1ª Fase – Implantação

1 REDUTASE:

DE 00:00 À 03:00 horas	- 0 pontos
DE 03:00 À 04:00 horas	- 106 pontos
DE 04:00 À 05:00 horas	- 176 pontos
ACIMA DE 05:00 horas	- 247 pontos



CNEC

P.I.P.Q. Lac - 1ª Fase – Implantação

1 GORDURA:

Abaixo de 3,0 %	- perde 50 pontos
De 3,0 a 3,2 %	- perde 20 pontos
De 3,3 a 3,5 %	- não perde e nem ganha pontos
De 3,6 a 3,8 %	- ganha 30 pontos
Acima de 3,8 %	- ganha 50 pontos



CNEC

P.I.P.Q. Lac - 1ª Fase – Implantação

PRODUÇÃO POR FAIXA:

01. até 1.500 litros/mês	- 0 pontos
02. de 1.501 a 3.000	- 53 pontos
03. de 3.001 a 4.500	- 106 pontos
04. de 4.501 a 7.500	- 176 pontos
05. de 7.501 a 15.000	- 247 pontos
06. acima de 15.001	- 317 pontos



CNEC

P.I.P.Q. Lac - 1ª Fase – Implantação

PONTUAÇÃO:

ATÉ 260 pontos	- recebe o preço básico
De 261 à 332 pontos	- preço básico + 05%
De 333 à 402 pontos	- preço básico + 10%
De 403 à 473 pontos	- preço básico + 15%
De 474 à 543 pontos	- preço básico + 20%
De 544 à 614 pontos	- preço básico + 25%



CNEC

P. I.P.Q. Lac 2ª FASE

REDUTASE PARA LONGA VIDA

Até 01 hora - leite péssimo	- 0 ponto
De 01:01 a 02:00 horas	- leite ruim - 0 ponto
De 02:01 à 03:29 horas	- leite regular - 0 ponto
De 03:30 à 04:00 horas	- leite bom - 106 pontos
De 04:01 à 05:00 horas	- leite ótimo - 176 pontos
Acima de 05 horas	- leite excelente - 247 pontos



CNEC

P. I.P.Q. Lac 2ª FASE

TEMPERATURA DO LEITE:

Leite quente	- 0 ponto
Leite gelado	- 245 pontos (LEITE GELADO EM TANQUES DE EXPANSÃO DIRETA)



CNEC

P. I.P.Q. Lac 2ª FASE

INDICE CRIOSCÓPICO:

Ponto criosc. **Máximo** $-0,530^{\circ}\text{H} / -0,512^{\circ}\text{C}$ -
O leite será **DECLASSIFICADO**



CNEC

P. I.P.Q. Lac 2ª FASE

TEOR DE GORDURA:

Abaixo de 3,0 % - perde 50 pontos
De 3,1 a 3,2 % - perde 20 pontos
De 3,3 a 3,5 % - 0 pontos
De 3,6 a 3,8 % - ganha 30 pontos
De 3,9 % acima - ganha 50 pontos



CNEC

P. I.P.Q. Lac 2ª FASE

PRODUÇÃO POR FAIXA: (TOTAL DE LITROS/MÊS)

1 -	De	001	a	600	l/ mês -	0 pontos
2 -	De	601	a	1.500	l/ mês -	0 pontos
3 -	De	1.501	a	3.000	l/ mês -	87 pontos
4 -	De	3.001	a	4.500	l/ mês -	140 pontos
5 -	De	4.501	a	6.000	l/ mês -	192 pontos
6 -	De	6.001	a	7.500	l/ mês -	243 pontos
7 -	De	7.501	a	12.000	l/ mês -	295 pontos
8 -	De	12.001	a	15.000	l/ mês -	346 pontos
9 -	De	15.001	a	22.500	l/ mês -	422 pontos
10 -	De	22.501	a	30.000	l/ mês -	499 pontos
11 -	De	30.001	a	99.999	l/ mês -	576 pontos



CNEC

P. I.P.Q. Lac 2ª FASE

PONTUAÇÃO:

ATÉ	400 PONTOS	-	PREÇO BASE
DE	401 A 467 PONTOS	-	PREÇO BÁSICO + 5%
DE	468 A 520 PONTOS	-	PREÇO BÁSICO + 8%
DE	521 A 572 PONTOS	-	PREÇO BÁSICO + 11%
DE	573 A 693 PONTOS	-	PREÇO BÁSICO + 14%
DE	694 A 892 PONTOS	-	PREÇO BÁSICO + 17%
DE	893 A 1.044 PONTOS	-	PREÇO BÁSICO + 21%
ACIMA DE	1.045 PONTOS	-	PREÇO BÁSICO + 25%



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P. I.P.Q. Lac 3ª FASE

A TERCEIRA FASE DO PROGRAMA DE PAGAMENTO POR QUALIDADE DA **LAC** ESTÁ PRONTA, OBEDECENDO A IN 51, A **LAC** JÁ ESTÁ PARA REALIZAR A IMPLATAÇÃO DESTA NOVA FASE, QUE ESPERAMOS SER REALIDADE A PARTIR DE **JANEIRO/08**.



CNEC

Considerações

1ª FASE – BASTANTE “LIGHT” – APENAS PARA OS PRODUTORES TOMAREM CONHECIMENTO – 1.998/1.999.

2ª FASE – EVOLUÇÃO NATURAL DA 1ª FASE. NESTA FASE A QUALIDADE DO LEITE TEM UM PESO APROXIMADO NO PREÇO FINAL DO LEITE DE 40 % E A QUANTIDADE TEM UM PESO DE 60%. – DE 1.999 ATÉ HOJE.



CNEC

Considerações

3ª FASE – COM A **IN 51**, JÁ EM VIGOR A **LAC** IMPLANTARÁ A 3ª FASE. NESTA FASE A QUALIDADE TERÁ UM PESO APROXIMADO DE 70% E O VOLUME PRODUZIDO DE 30%. PARÂMETROS COMO CCS, CBI, AUSÊNCIA DE RESÍDUOS, FIDELIDADE, TEOR DE PROTEÍNAS, SANIDADE DO REBANHO, TERÃO UM PESO MUITO FORTE, NO PREÇO FINAL DO LEITE.



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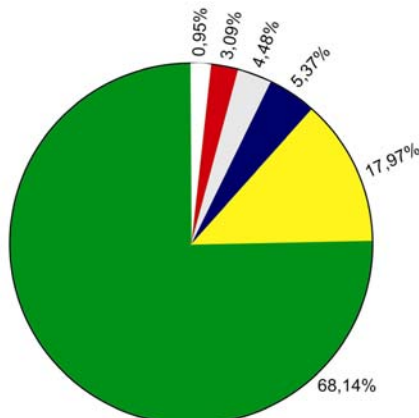


DESTINAÇÃO DO LEITE

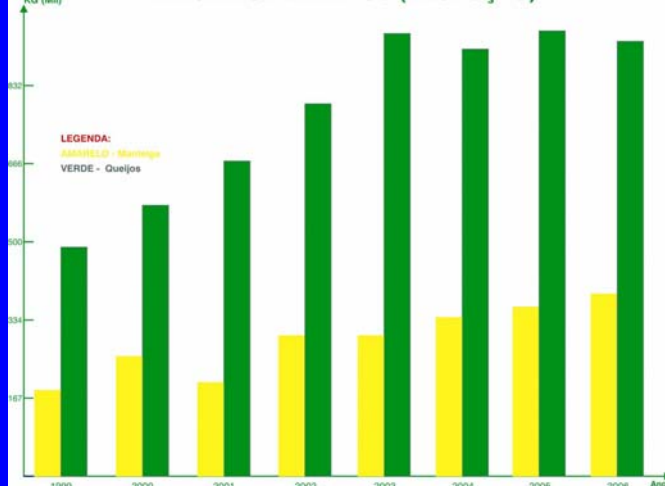
LEGENDA:

VARIAÇÃO 2005/2006

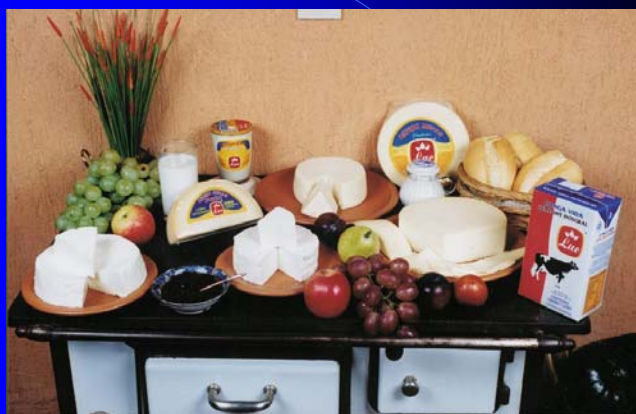
Leite Longa Vida - 68,14 %	- 8,98%
Indústria - 17,97 %	+ 4,96%
Leite em Pó - 5,37 %	+ 1,17%
Leite "C" - 4,48 %	+ 0,84%
"In Natura" - 3,09 %	+ 1,48%
Outros - 0,95 %	+ 0,23 %



PRINCIPAIS DERIVADOS (PRODUÇÃO)



O Melhor do leite



Conclusão

Atuação da Lac

A **LAC** POR ACREDITAR QUE A SAÍDA É PRODUZIR COM QUALIDADE E PROCURANDO ADEQUAR-SE ÀS EXIGÊNCIAS DA **IN 51** VEM TRABALHANDO JUNTO AOS SEUS PRODUTORES, PROMOVEDO PALESTRAS EM COMUNIDADES RURAIS, PARTICIPANDO ATIVAMENTE EM DIAS DE CAMPO, DIVULGANDO SISTEMATICAMENTE MATÉRIAS SOBRE O ASSUNTO EM SEU INFORMATIVO LACOMUNICAÇÃO.



CNEC

Agradecimentos

A Deus

Cooperativa dos Produtores de Leite de Leopoldina

CNEC

Lab Caseus



CNEC

**OBRIGADA PELA
ATENÇÃO !!**





A Itambé e a Qualidade do Leite

Fernando Ferreira Pinheiro
Médico Veterinário

Histórico

- A CCPR-ITAMBÉ é uma cooperativa de 2º grau contando com 29 cooperativas associadas.
- Foi constituída em novembro de 1948 e iniciou suas operações em maio de 1949, assumindo a Usina de Leite que abastecia Belo Horizonte, de propriedade do Governo do Estado, numa experiência pioneira de privatização.
- Próxima de completar 60 anos de atividades a ITAMBÉ é a 2ª maior indústria de laticínios do país, sendo a maior de capital nacional. Atuando em todo o mercado nacional e em alguns países do exterior.

A Itambé e a Qualidade do Leite

- Coleta a Granel
- Programa de Pagamento Por Qualidade.
- Desenvolvimento de ações de orientação, para a melhoria da qualidade do leite.



Programa de Pagamento Por Qualidade

- Laboratórios das Fábricas
- Laboratório Central
- Laboratório Oficial pertencente à Rede Brasileira de Laboratórios de Controle da Qualidade do Leite



Programa de Pagamento Por Qualidade

- Parâmetros de qualidade:
 - ESD
 - Proteína
 - Gordura
 - Temperatura
 - Crioscopia
 - Resíduos de antibióticos
 - Conservantes
 - CCS
 - CBT
- Para efeito de pagamento por qualidade serão considerados: Gordura, Proteína, CCS e CBT

Programa de Pagamento Por Qualidade

Contagem Bacteriana Total (UFC/mL)	R\$/litro	Contagem de Células Somáticas (CCS/mL)	R\$/litro	Gordura (%)	R\$/litro	Proteína (%)	R\$/litro
<= 25.000	0,0300	<= 100.000	0,0200	<= 3,20	0,0000	<= 3,00	0,0000
50.000	0,0266	125.000	0,0192	3,30	0,0048	3,01	0,0022
75.000	0,0232	150.000	0,0163	3,40	0,0095	3,06	0,0045
100.000	0,0200	175.000	0,0135	3,50	0,0143	3,09	0,0067
125.000	0,0167	200.000	0,0107	3,60	0,0192	3,12	0,0090
150.000	0,0135	225.000	0,0078	3,70	0,0240	3,15	0,0113
175.000	0,0103	250.000	0,0050	3,80	0,0289	3,18	0,0135
200.000	0,0071	275.000	0,0021	3,90	0,0337	3,20	0,0158
225.000	0,0039	300.000	0,0000	4,00	0,0386	3,22	0,0180
250.000	0,0007	325.000	0,0000	4,10	0,0435	3,24	0,0180
275.000	0,0000	350.000	0,0000	4,20	0,0484	3,26	0,0180
300.000	0,0000	375.000	0,0000	4,30	0,0533	3,28	0,0210
325.000	0,0000	400.000	0,0000	4,40	0,0582	3,30	0,0225
350.000	0,0000	425.000	0,0000	4,50	0,0631	3,32	0,0240
375.000	0,0000	450.000	0,0000	4,60	0,0680	3,34	0,0255
400.000	0,0000	475.000	0,0000	4,70	0,0729	3,36	0,0270
425.000	0,0000	500.000	0,0000	4,80	0,0778	3,37	0,0275
450.000	0,0000			4,90	0,0827	3,38	0,0285
475.000	0,0000			5,00	0,0876	3,39	0,0290
500.000	0,0000			5,10	0,0925	3,40	0,0295

A orientação para a melhoria da qualidade do leite

- o Distribuição de Material Impresso:
- o Boletim da Qualidade
- o Manuais
- o Informativo da Qualidade
- o Agropecuário
- o Revista Leite Integral



A orientação para a melhoria da qualidade do leite

- o Promoção de Palestras Técnicas:
- o Qualidade do Leite
- o Qualidade da Água
- o Irrigação
- o Visitas aos Produtores
- o Parcerias
- o Projeto UNILEITE
- o EDUCAMPO



A orientação para a melhoria da qualidade do leite

- o Informações via Internet



ITAMBÉ INDÚSTRIA

ANDRÉ LUIZ DA PIEDADE MOURA
Coordenador Qualidade

CONTROLE DE QUALIDADE

- o RECEPÇÃO DE LEITE:
 - o LEITE.
- o LEGISLAÇÕES.
- o PADRÕES ITAMBÉ (PAP: Procedimento Analítico Padrão - Físico-Químico e Microbiológico).

LABORATÓRIO CONTROLE DE QUALIDADE

CONTROLE DE QUALIDADE

o PROCESSO:

- POR PRODUTO / LINHA DE PRODUÇÃO;
- PADRÕES ITAMBÉ (PAP: Procedimento Analítico Padrão – Físico-Químico e Microbiológico).

CONTROLE DE QUALIDADE

o PRODUTO ACABADO:

- LEGISLAÇÕES;
- PADRÕES ITAMBÉ (PAP: Procedimento Analítico Padrão – Físico-Químico e Microbiológico).

CONTROLE ITAMBÉ PARA MELHORIA DE PROCESSO

- o COMITÊ DA QUALIDADE;
- o MANUAL ITAMBÉ PARA QUALIDADE;
- o BOAS PRÁTICAS DE FABRICAÇÃO;
- o APPCC (Análise de Perigos e Pontos Críticos de Controle);
- o QSMA (Programa Itambé para Qualidade, Segurança e Meio Ambiente)= ISO9001:2000.

PROBLEMAS NOS PRODUTOS

o SE OCORRER:

- PROCEDIMENTO RECALL;
- RASTREABILIDADE.



OBRIGADO !

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Gado de Leite

A qualidade dos produtos e processos na cadeia produtiva do leite para produtores de base familiar no Estado de Minas Gerais

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A Ouro Fino

Empresa 100% Brasileira!
(National Company)

Exporta: 32 países 4 continentes
(Exports to 32 countries)

20 anos de mercado
(20 years old)

Conhece, atende necessidades do produtor
(Knows clients, & brasilian necessities)



Planta Industrial



Grupo Ouro Fino (Holding)

