

IMPROVEMENT OF THE NICARAUGUAN DAIRY VALUE CHAIN

CAMOAPA, NICARAGUA

APRIL 26, TO MAY 8, 2009

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Introduction:

This baseline study provides information and analysis developed from two Partners of the America questionnaires to identify current production, processing and marketing data available from its host organizations; Cooperative San Francisco, Cooperative Masiguito and Eskimo a privately held Nicaraguan company. The milk production questionnaire will collect data on current production levels in the wet and dry seasons, dual purpose cattle levels, nutritional roughages and supplements available to livestock, reproductive health issues, birth and death rates of calves, lactation and birthing cycles. The second questionnaire focuses on the collection centers, processing plants, transportation cycles, marketing and export activities of two cooperatives and Eskimo.

The findings were collected by the two authors of the document between April 26-May 8, 2009 who visited Nicaragua and spoke to personnel at the two cooperatives and Eskimo. Additional research was conducted by the authors via the internet. The documents listed below were utilized in this report as acquisition to background information in country was limited.

- Strategies for Developing Domestic and International Markets For Nicaragua Dairy Products, W.D. Dobson, Ph.D, 2003
- A Review of Milk Production In Pakistan With Particular Emphasis on Small-Scale Producers, Otto Garcia, Khalid Mahmud, and Torsten Hemme, 2003
- Estudio Cadena de Valor Sector Lacteo Nicaragua, PEMCE, DFID and UNOPS, August 2008

Nicaragua's dairy industry faces both opportunities and challenges as it seeks to expand its dairy products including pasteurized milk, cheese and butter over the next 4.5 years (2009-2013) Nicaragua is well positioned to produce and expand dairy products for local and export markets because it has over three million head of cattle, 3.1 million blocks of pasture and processing capability. Between January through May 2008 dairy products grew 75% over the same annual period in 2006. The export of

meat, livestock, and dairy products generated a total of \$260 million in revenues in 2007 with dairy products producing the largest revenues of \$94.5 million and the export of cheese generating \$53 million. Yet stiff competition by other countries with lower processing costs, newer and more efficient processing plants, and stiffer milk handling and dairy processing regulations may keep Nicaragua from expanding its export trade over the next 5 years.

Many market participants including small to medium size cooperatives and privately held processors believe that the challenge facing the Nicaraguan dairy industry are mainly marketing problems associated with expanding export markets. The challenge lies in the inability to expand the volume of milk at the farm level and improve its quality which would provide the processors with the resources to expand their processing capabilities and introduce new product lines especially gouda and cheddar cheese.

This paper will present the value chains for Coop de San Francisco, Masiquito and Eskimo and identify where technical assistance can be provided by Partners of the Americas, Farmer-to-Farmer volunteers over the next four and one-half years. Eight farms have been identified who are members of the two host cooperatives will be the designated sites for hands-on training of care taker farmers, farm owners and cooperative technicians who work with the farmers and University of Managua Animal Science Department students.

Traits of Nicaragua's Dairy Industry that Influence Its Capability To Expand Domestic Sales and Export Profitability

1. Milk Production Practices and Trends:

The object of this part of the project is to find the opportunities that can be addressed to improve the quality and quantity of milk being produced by the selected producers in the areas served by the Cooperative San Fransisco de Assisi and the Cooperative Masiquito. The project should also define the baseline problems describing the dairy industry at the producer level including transportation and collection situations.

Some background information about the farms and the farm owners.

The farms which the authors visited ranged in size from 50 to 200 manzanas and had dairy herds of 20 to 110 cows, along with young-stock and bulls. Farm owners live in Camoapa and travel daily to the farms to oversee the operations. These farms were located in the same area that POA volunteers worked in from 1998 to 2003. The situation today is very much as it was in 1998. Since the farmers do very little record keeping, it was necessary to utilize information from an article entitled; Estudio Cadena

de Valor Sector Lacteo Nicaragua, prepared by PEMCE, DFID and UNOPS in August 2008. This information is general for Nicaragua and was very close to the information the farm owners verbally relayed to us. Although diseases such as mastitis were acknowledged, the exact level was not possible to determine. Information such as somatic cell count (SCC) reports are not available since the processors do not test for this. At present the processors are *not* testing for butter-fat, solids not fat, or sediments. This information would be invaluable in determining the final results of the project. The farmers interviewed agreed with the Milk Study Report that production averaged 4 liters morning milk per cow shipped daily (I use this term because it is not known how much evening milk is fed to calves and kept for home use) in the summer and 6.5 liters in the winter. Dual purpose cattle are the rule with Pardo and Brahmin being the main breeds, there has been some cross-breeding with Swiss and Friesian but due to the 'high cost' of semen, many of the farmers have reverted to using bulls.

Observations:

Cleansing of the udders and quarters is still accomplished by using a calf to stimulate milk 'let down' and cleaning the quarters. Milkers do not wash their hands between cows or use towels to dry the cows teats before milking. No consideration is given to the control of the spread of mastitis from cow to cow.



Teat cleaning. Luckily, it is the dry season.



And after a little licking and stimulation, we are ready for milking,

Improved nutrition is the most requested assistance and could be greatly improved by the farmers themselves if they would consider preparing roughages to be fed during the dry season. The Camoapa area does not have any grain processing plants or brewers that could supply raw ingredients to produce nutrient supplements for livestock.

Transporting raw materials to Camoapa causes the prices to escalate and makes supplement feeding prohibitive. To improve the nutrition of the dairy ration, it will be necessary to begin raising grains and oil seeds that could be processed and the waste used for the manufacture of livestock feeds. Water quality varied greatly from farm to farm and at this time, the quantity was not sufficient for livestock and proper sanitation at many of the farms. Although there were many complaints about the price of milk that the farmers were receiving, no one could tell us what the cost of production was, except for one producer. This lack of information existed in every aspect of the farm. Including breeding, ("I know which bull the calf is from because it is white or red!") production, health issues or mortality rates.

UNA, the agricultural university informed us that they would be willing to assist in training technicians and key farmers by allowing FTF instructors use of their facilities. This would also enable livestock students to obtain additional training.

Because of low milk production, only one of four Coop San Fransisco de Assis milk collection systems was operating. Milk delivered to this CC was tested for freshness,

but no samples were taken for further testing at the plant. Coop Masiquito has three remote receiving stations that also produce cheese. Milk is delivered to these CC's in several ways. The majority is by contract haulers that start pickup at 6:30 am and usually return to the CC by 10:30. Making as many as 35 stops with the furthest farm being 20km's from the plant or CC. Farmers with independent forms of transportation deliver milk by horse-back, motorcycle or pick-up truck.

Recommendations:

In order to improve the value chain of the dairy milk system at the producer level, it will be necessary to provide technical assistance in the following fields:

- Pasture management.
- Silage preparation or dry hay conservation
- Crop diversification. Agronomist?
- Sanitation.
- Nutrition—using locally available ingredients and identifying legumes which could be grown during the rainy season, dried or ensiled and fed during the dry season
- Farm record keeping/breeding records
- Cost analysis, Farm economics.
- Location of wells.
- Improving water quality.
- Advanced training for veterinarians on dairy diseases.
- Refrigeration specialist for evaluating the cooling capacity in the processing plants
- Lab technician to train techs to test for B.F., SCC, SNF, etc.
- Establish milk price index using quality tests.

Training could be coordinated with UNA and provided to technicians, extension workers, 4th and 5th year livestock students and key farmers. These students would then act as trainers for other farmers, and the key farmers would eventually become model farms which other farmers could emulate.

Conclusions:

The unwillingness of the majority of the farmers to prepare for the dry season by making silage or storing dry hay (of good quality and quantity) is a major reason for the low production of milk in the area visited. It has been shown that cows fed good quality roughages are capable of producing 40 liters of milk per day.



Cows kept in a 'scoring condition' of 1.5 to 2 are not capable of increasing milk production. Imported supplements are not economically feasible to feed at a rate

sufficient to balance the quality of roughage. An appreciable increase in milk production will require a change in roughage production to be economical. Feeding a calf program that weans calves at an earlier age, i.e., 5 to 15 days instead of 6 to 10 months and selling the evening milk will boost total milk sales by approximately 40%. To accomplish this it is necessary to develop a system of maintaining the quality of the evening milk on the farm. With the increase in rural electrification, it will make refrigerating milk more accessible. (some farmers are paying \$70.00 US/per month for cable tv.)

Overall, little has changed in the dairy sector in the past 10 years. A more sustainable method of training must be used to change the traditional way of dairy farming. A few farmers that have had the opportunity to visit the US and witness the system used by US dairy farmers have changed their milking habits and increased milk production considerably.

The government of Japan is providing to Coop Masiguito technical assistance with improving milk production and sanitation on the farm. More information about PROGANIC, can be obtained on their website. An attachment is found with printed information attached to this report

2. Structure of Nicaragua's Dairy Processing:

The milk is produced by farmers who own dual purpose cattle which are raised for meat and milk. The milk cows are genetically crossed exotic and tropical breeds that can tolerate the climate conditions and produce larger volumes of milk with good nutrition practices.

Traditionally only the morning milk enters the collection center due to the lack of cooling capabilities at the farm level. Transportation of the raw milk is by horse or through an informal system of milk haulers that are paid by the farmers or the cooperative. The milk hauler transports the milk in cans to the collection centers. Due to the poor road conditions and distance of the farm from the collection center the milk may be in transport from one to four hours in hot weather before entering the collection center.

In 2005 156.8 million gallons of milk were produced with 84% being processed in artisanal processing plants with no health registry of the dairy product. Only 15% of the milk was processed by plants which pasteurized the milk and are licensed by the Nicaraguan department of health. Much of the artisanal dairy products especially cheese enters domestic and international markets which damages the image of dairy products produced under licensed sanitary conditions. All Nicaragua dairy products then come into question and create marketing problems for licensed processors in the international market place.

A majority of processors do not have laboratory capabilities and are unable to test the milk for quality control before entering the processing plant. This contributes to the health risks to the consumer. The processor cannot separate the poor quality milk from the grade A milk which compromises the quality of the product being produced.

The milk entering many collection centers cannot be chilled to 4 degrees centigrade, stored before processing and must be processed into cheese using a coagulant and then pressed into blocks. A majority of the processing plants do not have electricity and cannot cool and store the cooled milk in refrigerated tanks or pasteurize the milk to eliminate the bacteria which lowers the health risks to the consumer. These dairy practices would improve the overall quality of the dairy product. The cheese is packaged and either sold directly to a retail facility, or transported to a cold storage facility where it may be cut and repackaged and sold in international markets.

Waste management is a critical issue in the processing cycle. A majority of processors do not assess, control or monitor waste generated throughout the processing cycle. Some processors capture the whey and give it to the farmers who then feed it to livestock especially pigs. Much of the waste water from the processing facility is either reused for cleaning purposes or is dumped into local streams or on to nearby fields which later enters and pollutes local water systems. Some processors have waste water treatment plants but many of these treatment plants are either too small for the processing plants' output or become inoperable over time. The environmental impact of these products and processes is significant and needs to be addressed by all processors within the country.

Nicaraguan dairy industry faces problems associated with pronounced seasonal variations in production that create large price swings that are objectionable to farmers and produce inefficiencies in plant operations. Processors report that milk production during the rainy season increases by two-thirds as compared to the dry season. The processors do not have the capability to store the product (cheese) in a chilled facility until it can be sold locally or exported.

Some processors are interested in targeting new emerging markets in Costa Rica, but cannot do so without the cold storage capabilities that would allow them to produce cheddar and gouda which needs to be aged. Small and medium size producers are beginning to develop partnerships that will address the need to combine resources to build a large cold storage facility in Camoapa. Seven cooperatives have developed a partnership which addresses the issues

surrounding the need for a cold storage facility that will be utilized by all the partners,

Many cooperatives which process dairy products are under-capitalized. It makes it difficult for such processors to borrow money to acquire equipment and technology to upgrade and modernize their collection centers, acquire needed rural electrification for collection centers and processing plants, acquire new refrigerated trucks for transportation of milk and build new cold storage facilities. Commercial credit is not available for certain processors operating in Nicaragua, and those banks that do make credit available have high interest rates of 30% or more. Loans secured by international agencies maybe as high as 15-20%. Many cooperative based processors do not have the resources and technical expertise to investigate grant opportunities which may provided the needed capital to upgrade and modernize old and inefficient processing facilities.

3. Export Dairy Markets for Nicaragua

In order for Nicaraguan Dairy industry to shape and expand its domestic and export sales it must be low cost producers of commodities to be profitable in both strong and weak economies. Differentiated products need not be low cost but must have a clearly defined target market to be profitable. Producers who are neither low cost producers nor producers of differentiated products often end up as being “stuck in the middle” and find it difficult to remain profitable over the long run.

The benefits of being a low cost producer and producer of differentiated products is they are able to be formable international competitors. Companies as Parmalat and Eskimo have strong product identification and customer loyalty. Their products lines stand for quality, flavor and promote good health.

The dairy industry in Nicaragua needs to develop local and national markets as demanding domestic customers help make a dairy processor more competitive in the international market place. Cluster industries in Nicaragua are important sources of strength for processors hoping to expand their export capabilities.

The Nicaraguan government assistance can be provided by improving dairy standards for all producers of dairy products, foster strong domestic competition and improve education opportunities for the workforce close to where they live and work through advanced technology and distance education. The government can also make important contributions by improving infrastructure through improved road, bridges and ports. Electricity capacity in remote rural areas help

to promote the improvement in milk quality on the farms and at the processing plants.

As dairy processing companies begin to expand their export capabilities they will need to invest time and money into research and development efforts as well as start marketing departments in house. Strong dairy processing companies as Eskimo and Parmalat have strong in-house marketing departments which research new market segments and target markets and develop and test new product lines for new emerging markets.

Risk management strategies are used by successful exporters around the world. All successful exporters use the following steps to manage risks when entering new markets.

- Work with a broker who can sell the product in a new foreign market
- If the new market proves promising then the company and the broker can enter into a joint venture to expand sales in that market
- As sales expand in that market, the dairy company can confirm the profitability of that market.
- When the company products are firmly established in the new market the dairy company can buy out the joint venture partner and develop a subsidiary through which more export sales can be channeled.
- If other players in this market are weak it may provide the opportunity for the dairy company to establish a processing plant in country.

When identifying export possibilities or expanding new export markets, it is important to benchmark against the best company in the industry within Nicaragua. Know your competitor and learn from him. What are his goals and objectives? What are his processing capabilities? How does he develop infrastructure to support his business activities? How does he attract and hire the best technicians and employees? How does he finance his business activities? What is his management style? Who does he buy his raw products from? What quality procedures does he practice? What are his risk management procedures? What new product lines is he planning on promoting in the next 5 years? How does he handle risk both in the local and international market place? How does he provide technical training for his employees? In general what makes this a strong company? If possible hire employees away from the company that you are benchmarking against. Learn what they know about their past employer. Become a smart competitor!

2.Host Organizations Participating in Farmer-to Farmer Grant(2008-2013)

The Eskimo and the Natural Agricultural University, Department of Animal Science will participate in the Farmer-to-Farmer grant. Partners of the Americas will provide volunteers with technical backgrounds in agribusiness to the host organizations over the next 4.5 years. Approximately two volunteers per month will travel to Nicaragua and will provide training to technicians employed by the cooperatives, technicians who work in the Eskimo processing plant, animal science students and extensions agents and cooperative members who provide milk to the cooperative. All participants in the grant will provide in-kind contributions and services to support the volunteers while they are in Nicaragua.

The authors met with the processors and plant manager of Eskimo on April 27, 2009 at their offices in Managua. The questionnaire was sent to them on April 28, 2009 with a request they send the form to the volunteer by email by May 4, 2009. As of May 8, 2009 no response has been obtained. Therefore, the authors are unable at this time to give detailed information about the privately held company. The questionnaire arrived on Friday, May 8, 2009 and is included in the attachments to this report, but is not translated and does not have financial information requested.

The Agriculture University of Nicaragua's (UNA) School of Animal Science will participate in the Farmer-to-Farmer program. The dairy facilities at the school will provide the back drop for training junior and senior animal science students and extension agents by agricultural specialists (volunteers) provided by Partners of the Americas. The hands-on training in dairy production and processing will be an extension of their classroom activities during the regular semester. It is felt that this will provide the student with practical experience not currently available at the University.

The managers of San Francisco cooperative and Masiguito Cooperative and the dean of the school of animal science, Dr. Elmer Gullen and Dr. Siles, president of the National Agricultural University have stated in conversations with the authors of this document that they would like to capture the information presented by the volunteers in the training workshops both at UNA and at the 10 designated farms in Camoapa which will be used as training sites. It had been suggested that a digital video camera be purchased and a video tape be made of each training session. The university's AV department could assist with the taping and burning of the CD's. The video tapes could be burned on to a CD and saved for future training sessions. The CD's could be duplicated and store in libraries at Coop San Francisco, Masiguito Cooperative and the school of animal science.

San Francisco Cooperative located in Camoapa was started in 1991 by 25 farmers who were interested in finding a market for their milk. At the same time the Masiguito

cooperative started with 23 members who gave \$23,000 to begin the cooperative and purchase needed equipment. Each cooperative has about 75 employees with Masiguito cooperative also paying 80 contract milk haulers about 25 C\$ per can per day for picking up milk. The San Francisco cooperative does not pay its milk haulers, the farmers are responsible for that cost.

The government provided assistance to San Francisco cooperative through donation of a administration building and Techno-serve provided assistance in the form of dairy equipment and water treatment plant. Ms. Bernabela Orezco, director of the dairy/food testing service for Nicaragua stated at a meeting with the authors that the water treatment plant is too small for the amount of waste water moving through it everyday.

Today the Masiguito cooperative has 150 members and produces and processes 48,000 liters of milk a day at 4 processing plants. It produces traditional white cheese that is pasteurized and some is not pasteurized. In 2009 it bought 4.5 million gallons of milk and produced 4.2 million pounds of cheese. Approximately 3-5% of its production is sold in Nicaragua and 95% is sold through a broker to El Salvador under its own logo or cut and repackaged and then sold abroad. In the United States the cheese is sold primarily in Miami and Texas to Hispanic populations. In 2008 it had revenues of \$6 million and saw a profit of 8-12%. When there is a low demand for the cheese the cooperative will sell its milk to CENTROLAC and then it is exported to South America.

Cooperative San Francisco has 400 members which produce 50,000 liters of milk per day and process it into various types of dairy products including cheese, butter, cream and pasteurized milk. It sells 200,000 lbs of cheese to the United States per month and 138,000 pounds of cheese to El Salvador per month. A portion of its revenue comes from the sale of dairy products within the country. It sells 50,972 pounds of cheese to Managua, Camoapa, region 4 and region 5 per month. In Nicaragua the cooperative sells directly to super markets and through a store in Managua which sells to customers for home use and to retailers. In the international market the cooperative uses a broker to sell its product to El Salvador and the United States.

Both cooperatives sell in local markets in Nicaragua as well as exporting to El Salvador and indirectly into the United States.

Due to their close proximity within the Boaco region they have begun to work informally and are looking at starting a partnership that will address their need for a cold storage facility in Camoapa. The cooperatives face similar problems with excess milk in the rainy season, producing more cheese than they can sell at that time, and the need to store more than 250,000 lbs of cheese which can later be exported. Therefore, the two cooperatives would like to develop a partnership with would include 5 other cooperatives in the region to finance the building of a cold storage facility that would

benefit all partners. Financing this project has proven difficult to date and they would like to obtain a volunteer who could write a grant to fund the cold storage facility as well as acquiring new processing equipment for their ageing processing plants. If they could obtain both the cold storage facility and processing equipment it would give them the competitive advantage they need in the growing and rapidly evolving export market.

The processing plants for the San Francisco and Masiguito cooperatives is relatively old and needs to be refitted with new processing equipment that would give them a competitive advantage and allow them to develop new products requested by customers who are tourists to Costa Rica. Without the processing equipment they will not be able to compete. Cooperative San Francisco would like to request a cheese maker who has significant experience working in small cheese plants and has the expertise in making both gouda and cheddar cheese. Cooperative San Francisco see this as a growing market and would like to be able compete with other companies eyeing the Costa Rica market.

Over the past 10 years since Partners provided dairy and agribusinesses specialists to Cooperative San Francisco the cooperative has evolved into an organization that has grown its product line and markets. It now realizes that it needs a marketing department which can create and expand new product lines and markets. A partnership between San Francisco and Masiguito cooperatives is underway. Both cooperatives would provide resources to develop a marketing department that would support and grow both cooperatives export markets. The managers have begun the informal partnership by developing a series of printed color advertisements which have appeared in a number of Nicaraguan magazines over the past year. Samples of these advertisements in hard copy have been attached to this report.

The managers of the cooperatives would like to develop with the assistance of Partners of the Americas a marketing department that can conduct research and development activities, create new product lines, create new logos and packaging, identify new emerging markets and work with FDA to improve existing products and develop a seal of quality.

The directors of the two cooperatives as well as Daniel Prato, director for production for Eskimo have indicated that the focus should be on improving the quality and quantity of milk entering their processing plants. Without the improvements in milk handling practices on the farm, the improvement of transportation between the farm and the collection centers, lowering the time needed to transport the milk to the collection centers and ability to cool the milk at the collection centers with plate coolers and bulk

coolers, these cooperatives and Eskimo will not be able to grow their businesses. They will remain at the production levels they experience today.

Therefore they have requested assistance from Partners of the Americas and the Farmer-to-Farmer program in providing technical assistance in the following areas”

- Computer training in Micro-soft office for Accounting departments of cooperatives
- Training for food and dairy inspectors (12) for the National Agricultural inspection department in Managua
- Marketing training and assistance in:
 1. Research and Development techniques
 2. Development of a marketing dept. for the two cooperatives
 3. Logos and new packaging
 4. New product development
 5. Grant writing training
- Grant Writer to apply for grant money to finance processing equipment and cold storage Facilities
- Feasibility study on cold storage unit and capacity
- Cheese maker who can train local processors in cheddar and gouda cheese making techniques
- Specialists, maybe an engineer to evaluate the current condition of the processing machinery and electric wiring and its capacity—both cooperatives
- Engineer which can teach maintenance of processing equipment
- Refrigeration specialist who can train them in upkeep of refrigeration machinery
- Waste water treatment specialist which can evaluate the current waste water treatment plant in Camoapa used by cooperatives and make recommendations
- FDA and USDA specialist who can advise them on current milk handling and processing standards
- Dairy processing specialist who can work with processing technicians on product development especially for export.