



**Dairy Alternative
Development
Colombia Program
(LOL/DADCP)**



USAID CA#514-A-00-03-00211-00

FINAL REPORT

Submitted by

**Land O'Lakes, Inc.
P.O. Box 64281
St. Paul, MN 55164-0281
USA**

Submitted to

**Camilo Sanchez
Alternative Development Program
USAID/Colombia
Bogota, Colombia**

April 2006

Final Report
Dairy Alternative Development Program
Table of Contents

1. Executive Summary.....	2
2. Background.....	5
3. Detailed Description of Activities.....	10
3.1 Technical Activities	10
3.1.1 Illicit Crop Elimination	10
3.1.2 Licit Crop Establishment.....	12
3.1.3 Association Creation and/or Strengthening	14
3.1.4 Milk Collection Center Establishment.....	15
3.1.5 Agro-Processor Creation and/or Strengthening	17
3.1.6 Market Development Activities	20
3.2 Support Activities	22
3.2.1 Monitoring and Evaluation (M&E)	22
3.2.2 Project Management	24
4. Program Results	27
5. Program Impact.....	30
5.1 Qualitative Impacts	31
5.2 Quantitative Impacts.....	32
5.3 Impact from Simulation Model.....	34
5.3.1 Assumptions	35
5.3.2 Results.....	37
6. Lessons Learned	40

1. Executive Summary

Land O'Lakes, Inc. signed a Cooperative Agreement with the United States Agency for International Development (USAID) on March 6, 2003 for a three year program to implement the Dairy Alternative Development Colombia Program. The program has three basic objectives: (1) organize and equip milk collection centers; (2) increase dairy production and improve dairy processing and marketing in targeted areas; and, (3) increase the area planted in pastures and forage.

The program was implemented in the two focus Departments of Antioquia and Nariño with field activities being initiated in August 2003. The program focused its efforts on six major activities: (1) elimination of illicit crops; (2) establishment of pastures and forage; (3) creation and strengthening of producer associations; (4) installation of milk collections centers; (5) improving processing plant operations; and, (6) expanding market linkages. Target output indicators were established at the beginning of the program for each of these activities and were adjusted at the beginning of the third year to more closely reflect the field and budgetary realities faced by the program.

Land O'Lakes presented USAID with an unsolicited proposal to expand the program, and the Mission approved additional funding at the end of the program for consolidating the dairy chain in Nariño with program-established producer associations for the installation of additional milk collection centers.

With the assistance of two Colombian sub-contractors (CORPOICA and CIPEC), the Land O'Lakes staff succeeded in meeting or surpassing all of the adjusted three-year output targets for the program. The third year of implementation was the most productive due to the field experience gained during the first two years, the positive demonstration effect of program successes in rural areas, the desire of increasing numbers of farmers to participate in the program, the inclusion of prevention activities in Antioquia, the expanded participation of the private dairy processing sector, and the dedication of program staff to achieve the desired results under dangerous field conditions.

The impact of the program has been recorded by personal testimonies and opinion surveys with program beneficiaries (farmers, producer associations and agro-processors) as well as by the quantity and value of milk sold during the third year, which was 7.4 million liters for \$1.7 million, through program-supported milk collection centers. This amounts to revenues of \$294 per family per month, equal to one and three-quarters minimum wage salaries. Additional program impacts are the following:

- Each dollar of USAID direct investment with participants generated one additional dollar of participant milk sales during the program;
- USAID direct investment with participants generated \$2.4 million of milk sales annually;
- Price per liter of milk received by participants increased by 65 percent during the program due to better quality of milk;

- Dairy income for participants will be three times higher than the minimum daily wage in the second year after the termination of the program; and,
- The program obtained \$4.8 million from counterpart contributions, 127 percent more than required under its contract with USAID.

In addition, a farm development model based on levels of technology with and without the program was created using program data to determine the returns to the dairy business over a period of six years. This model is based on the assumption that dairying is a medium-term business and that changes in technology adopted today will only come to fruition after a few years when the farm reaches an equilibrium state. Calculations were made for various Net Present Values and the Internal Rate of Return. The conclusions reached by this simulation model are the following:

- On-farm technological improvements at lower technological levels are readily attainable with initial program intervention, but become progressively more difficult to achieve at higher technological levels, since these require improvements in cattle breeds, culling or purchasing of improved dairy cows;
- Income levels of the average farm without this program intervention are not sustainable in the long run because there are no clear animal selection parameters nor good practices to maintain pastures, thus the emphasis of the program on technical assistance in pastures and herd management;
- USAID investment per farm through the program in dairy activities in Antioquia is profitable due to the possibility of expansion of dairy herds and improved pastures;
- USAID investment per farm through the program is not recoverable in Nariño since the small farm size in this state limits potential growth in herd size and amount of improved pastures;
- In Nariño, the return to one dollar of USAID investment per farm through the program is only \$1.42, while in Antioquia it is \$5.17, the difference again arising from the farm size limitation in Nariño;
- The internal rate of return analysis shows that small dairy farmers in Nariño cannot earn enough income from dairying to repay a commercial bank loan that might be used to expand or improve their business. Therefore, the farmers in Nariño were very enthusiastic to participate in the program, which helped them capitalize and technologically improve their operations, with little or no financial cost to them; and,

- Dairy activities in Nariño provide the small farmer and his/her family with at least 50 percent greater income than harvesting illicit crops, working as a rural day laborer, or being employed as an urban laborer with a minimum wage.

In summary, this analysis strongly indicates the close-to-subsistence level of Nariño dairy farmers due to their very small plots of land on which to develop a profitable dairy enterprise. However, if the social costs of not investing in the small farmer and permitting him/her to continue poppy production are taken into account, USAID's economic return on investment is not as important as the elimination of illicit crops. Given the farm size constraint in Nariño, a possible alternative is to keep cows in stables and feed them cut forage (feed concentrates are presently too expensive) rather than having them graze in very limited pastures. In contrast to Nariño, USAID investment per farm through the program in dairy activities in Antioquia is profitable due to the possibility of expansion of dairy herds and improved pastures.

A summary of lessons learned from this 36-month program are listed as follows:

- When an alternative development project is based on illicit crop eradication, other supporting activities (licit crop establishment, creation of producer associations, and establishment of milk collection centers) necessarily take place in subsequent stages with their speed of implementation depending on the rhythm of eradication. On the other hand, when the basis of the project is prevention, implementation is not constrained by eradication and can take place more rapidly.
- Convincing farmers to replace their principal source of income and participate in the benefits of an alternative development project is time consuming, labor intensive and costly.
- Farmers are willing to eradicate their illicit crops if they perceive a good possibility of income substitution with licit alternatives and if supporting institutions promptly fulfill their commitments.
- Adequate all-weather roads and strong government presence in violence-prone illicit crop producing areas are keys to attracting private productive investment (e.g., milk collection centers) and sustaining milk sheds in these areas. These conditions facilitate private sector market linkages for licit substitution crops that are important to ensure long-run sustainability of the alternative enterprise.
- Farmers in the highlands of Nariño are faced with few, if any, other viable income earning opportunities other than illicit poppy production. Without the support of the Colombian government and international donors, they will be hard pressed to voluntarily eliminate their illicit crops based solely on economic reasons. However, subsidized and/or donated resources can help these farmers capitalize and improve their operations while eliminating their illicit crops, thus preserving their licit family dairy operation.

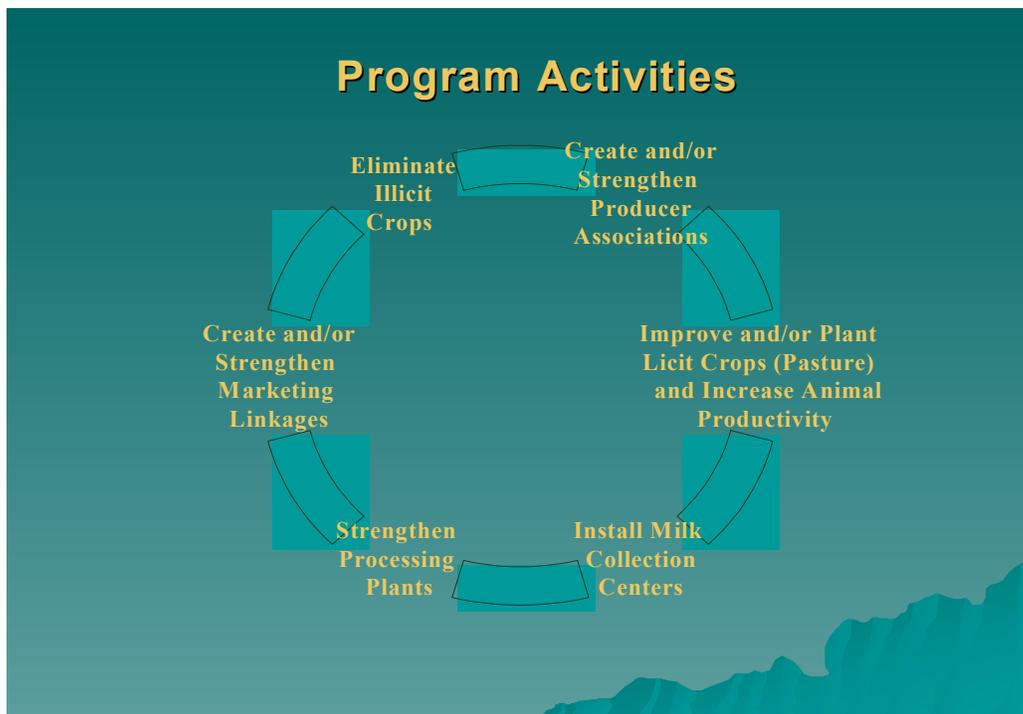
2. Background

In response to the publication of USAID/Colombia's Annual Program Statement for FY 2002, Land O'Lakes, Inc. prepared and presented to the Mission an unsolicited proposal for implementing dairy activities with small farmers as an income alternative for cultivating illicit crops. USAID approved the proposal and signed a Cooperative Agreement for three years with Land O'Lakes on March 6, 2003.

The goals and objectives of the Land O'Lakes Dairy Alternative Development Colombia Program follow the directives of Plan Colombia and conform to the USAID/Colombia Strategic Objective to promote social and economic alternatives to illicit crop production through a practical, business and market-oriented dairy development approach in the targeted Departments of Antioquia and Nariño.

As stated in the Cooperative Agreement, the program has three basic objectives: (1) organize and equip milk collection centers; (2) increase dairy production and improve dairy processing and marketing in targeted areas; and, (3) increase the area planted in pasture and forage crops.

Land O'Lakes developed a model for the implementation of its dairy development program as seen in the figure below.



The model permits the program to implement activities on various fronts simultaneously since the implementation of one activity does not necessarily depend on first achieving

another (e.g., the program can strengthen processing plants before, during, or after the elimination of illicit crops and vice versa).

The elimination of illicit crops involves identifying small farmers who are growing coca or poppy, convincing them to voluntarily eliminate these crops with the understanding that through the Land O'Lakes program they can increase their income from dairy production. Elimination agreements are signed by farmers with the program's own field technicians using GPS equipment and digital photos to verify that the elimination has taken place.

The establishment of pasture and forage involves program technicians preparing farm development plans; instructing farmers on where, when and how to plant and manage improved pastures and forage; providing good pasture seed and fertilizers; and training farmers in animal health, nutrition, milk hygiene and genetic improvement.

The creation and strengthening of producer associations involves identifying and analyzing existing associations; selecting those that can participate in the program; organizing new associations where necessary and assisting in their legal incorporation; providing organizational development training to association members; and instructing associations on how to manage their own milk collection centers.

The installation of milk collection centers involves demonstrating to the association the benefits of a center; obtaining a commitment from the association to provide materials and labor for the construction of the center; instructing the association members on how to manage their own center, especially quality control of milk; providing a program grant to the association for the milk tank and supporting equipment; and assisting the association in securing a contract with a dairy processor for the sale of its milk.

The strengthening of processing plants involves identifying processing plants within the two Departmental dairy chains; undertaking technical and administrative analyses of the firms to determine what improvements should be undertaken; preparing investment plans for funding; preparing marketing plans to expand or access new markets; and providing small seed grants to processors based on investment and marketing plans.

The creation and/or strengthening of market linkages involves undertaking marketing studies on demand for dairy products; identifying niche markets for new and unique dairy products; designing new packaging for dairy products; participating in industrial fairs; and promoting consumption of dairy products through school feeding programs.

In order to implement these activities, the program established productive working relationships with ten public entities, ten private entities, ten agro-processors, and 48 producer associations during the life of the program.

The program was challenged to work in two different agro-ecological and human organizational settings as seen in the following chart.

Types of Dairy Systems

Specialized

Nariño Highlands

(municipalities in southern Nariño)

- ◆ Existence of poppy
- ◆ Very small indigenous and campesino farms (average of 2 hectares)
- ◆ Specialized Hostein dairy cows
- ◆ Intensive cow pasturing with cut forage
- ◆ Average productivity per cow of 7 liters of milk per day
- ◆ Medium cost of production due to limited pastures and forage (\$350-\$550/liter)
- ◆ Dairy farms close to milk consumption centers for liquid milk sales
- ◆ Cool/cold climate facilitates holding time for milk

Dual Purpose

Low Tropics in Antioquia

(municipalities in northern Antioquia)

- ◆ Existence of coca
- ◆ Medium and large farms (average of 35 hectares)
- ◆ Dual purpose (beef and milk) Cebu cattle
- ◆ Extensive pasturing with few animals, no fertilization
- ◆ Low productivity per cow of 4 liters of milk per day
- ◆ Low cost of production due to extensive pastures (\$150-\$350/liter)
- ◆ Farms far from milk consumption centers requires processing (cheese, dehydrated milk)
- ◆ Hot climate requires cooling raw milk

This difference is important when analyzing and presenting the information on program impact and lessons learned. The geographic focus of the program can be observed in the following maps.

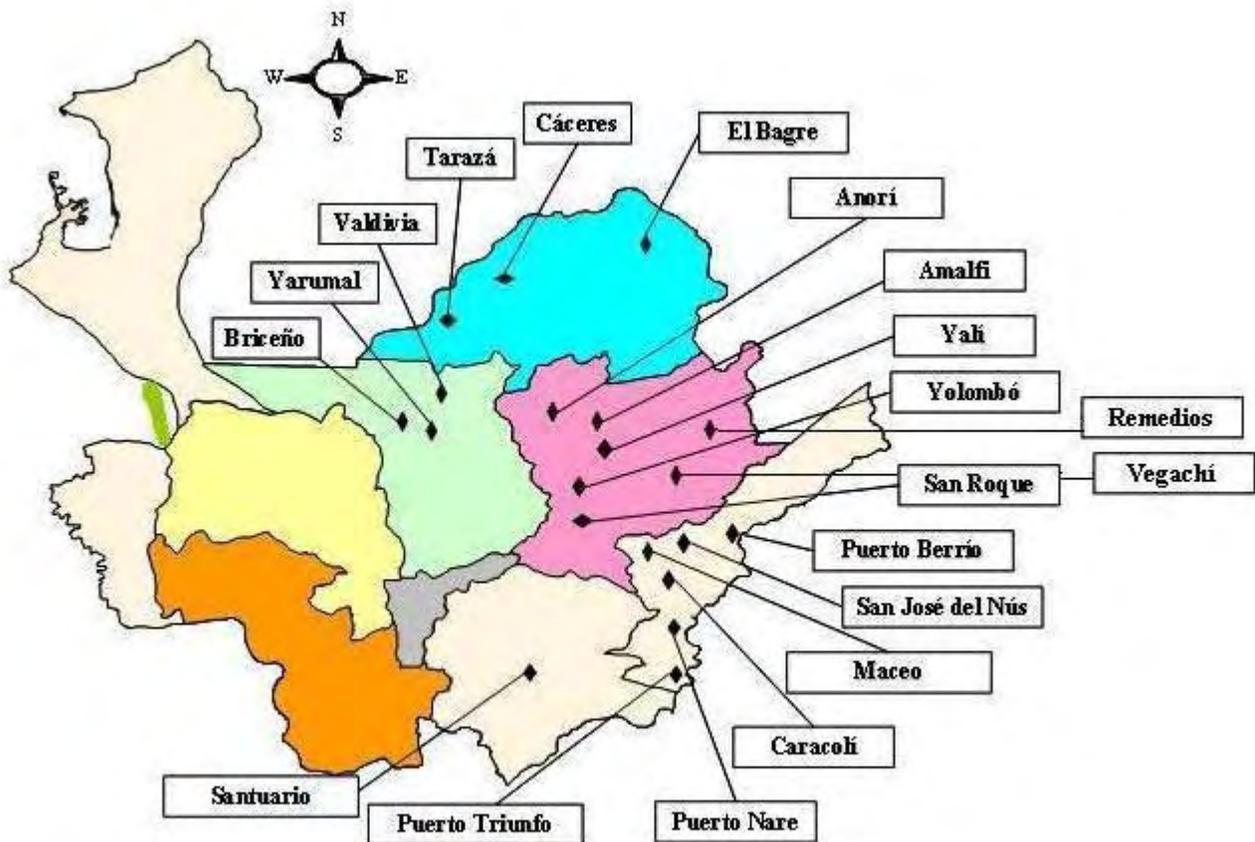
Municipalities in Antioquia

Number of Municipalities: 20

Number of Milk Collection Centers Established: 55

Hectares of Pastures Improved: 5,444

Families Benefited: 1,931



Municipalities in Nariño

Number of Municipalities: 8

Number of Milk Collection Centers Established: 17

Hectares of Pastures Improved: 711

Families Benefited: 918



3. Detailed Description of Activities

The Land O'Lakes program was structured around two major areas of program management, each with its responsible director and staff. Staff members based out of the Medellin office are pictured at right along with Tom Verdoorn, Vice-president of the Land O'Lakes International Development Division, and Rodrigo Brenes, Regional Director. The following description is presented according to these two distinct areas of responsibility—Technical and Administrative—both of which were extremely important to the success of the program.



3.1 Technical Activities

The Technical Team was responsible for designing and implementing the six major activities of the implementation model as described in the previous Background section of this report. This includes: elimination of illicit crops, establishment of pasture and forage, creation and strengthening of producer associations, installation of milk collection centers, strengthening of processing plants, and creation of market linkages.

3.1.1 Illicit Crop Elimination

The USAID rationale for approving dairy development activities within the Alternative Development Program (ADP) was to reduce the amount of coca and poppy produced in the country through voluntary eradication by small producers of these crops by offering them licit income alternatives.

Year One (March – December 2003)

The thrust of field activities initiated in August 2003 was directed towards illicit crop elimination. A concerted effort was devoted to the identification of areas with illicit crops and dairy—or potential dairy activities—as a prior condition to undertaking investments and activities under other program components. Although this short Year 1 elimination period coincided with municipal elections and unseasonably heavy rains, 65 percent of the elimination target for this year was accomplished.

The Land O'Lakes Dairy Development Program initiated the elimination process by participating in frequent coordination meetings with local governments, municipal offices of agricultural technical assistance (UMATAs), and the Secretaries of Agriculture of Antioquia and Nariño to facilitate access to and visits with potential beneficiary communities. Program staff visited 12 rural communities in Antioquia and Nariño,

meeting with 770 potential participants to explain the objectives of the program and better understand the rural setting in which the program would be working.

Intervention areas were evaluated according to illicit crop presence, dairy potential, access routes, and security concerns. The program initiated work with participants during the fourth quarter in the municipalities of Vegachi, Taraza, Remedios, and Caceres in Antioquia, and Cumbal and Carlosama (Cuaspud) in Nariño. From an additional 30 rural communities evaluated by the Land O'Lakes team for program expansion, four municipalities were selected in Antioquia (Valdivia, Segovia, Nechi, and Yali) and one in Nariño (Ipiales). However, due to public disorder it was decided that initiation of activities in Ipiales would be postponed until a later date.

Nine field technicians were responsible for beneficiary mobilization and elimination activities in Nariño and Antioquia. They registered participants and collected individual baseline information on each farm, facilitated the completion of Elimination Agreements, Producer Registration Forms, and Verification of Elimination Forms designed by the program's Monitoring and Evaluation Unit. Information collected at the farm level was then entered into the program's database.

During 2003, 1,266 elimination agreements were signed with farmer participants, 198 in-depth farm surveys were completed by field staff, and 203 verification acts were completed, which registered the elimination of 70 hectares of illicit crops.

Year Two (January – December 2004)

By the end of 2004, the Land O'Lakes program had worked in 15 municipalities (seven in Antioquia and eight in Nariño). Illicit crop elimination had been completed in five of the seven municipalities of Antioquia (Vegachi, Remedios, Caceres, El Bagre and Yali) and all eight municipalities in Nariño (Aldana, Carlosama/Cuaspud, Cordoba, Cumbal, Guaitarilla, Potosi, Puerres, and Tuquerres).

During 2004, 1,362 elimination agreements were signed with farmer participants, 1,145 in-depth farm surveys were completed by field staff, and 1,328 verification acts were completed, which registered the elimination of 865 hectares of illicit crops.

Year Three (January 2005 – February 2006)

Due to time and budgetary constraints, the program completed illicit crop elimination during the first quarter of 2005 with the elimination of 76 hectares. The Work Plan for 2005, approved by USAID in April, reduced the performance indicator targets for illicit crop elimination and shifted program emphasis from elimination to prevention of illicit crops in high-risk areas.

Even though the Land O'Lakes program completed its crop elimination activities in early 2005, program staff continued to make field visits during the remainder of 2005 to verify that farmer participants had maintained their farms free from illicit crops. Land O'Lakes

found beneficiaries to be adamant about maintaining their farms illicit-free in order to focus their efforts on developing sustainable income from dairy.

3.1.2 Licit Crop Establishment

The Land O'Lakes program facilitates licit crop establishment or enhancement on individual farms once the program has verified with photographs and GPS coordinates that illicit crops do not exist on the farm. After participating farmers eradicate their illicit crops, they are guided by the sub-contractors in preparation of land for planting improved pastures, installation of fences around their pastures, and training at the farm level on improved pasture and dairy cow management.

Year One (March – December 2003)

Farm investment plans were developed by program field technicians for 12 participants who had eliminated their coca in Antioquia. They received program inputs and initiated establishment of new pastures under the Land O'Lakes' program guidance.

The program signed a Collaborative Agreement with CORANTIOQUIA in November to ensure that the program was implementing environmentally sound agricultural and livestock management practices in the Northeast region of Antioquia.

During the fourth quarter, Environmental Reviews for field activities in Antioquia and Nariño were submitted to and approved by the USAID/Colombia Environmental Officer. In addition, program Pesticide Reviews for the minimal use of pesticides for pasture development received USAID approval. This was an important program milestone that allowed the program to initiate licit crop establishment.

Through a local consultant, nine local institutions were identified and evaluated in Antioquia and Nariño with experience in providing seminars and field training in the key topics of animal nutrition, animal health, artificial insemination, herd evaluation, and milk quality. The program selected the sub-contractors in 2004.

Year Two (January – December 2004)

Pasture establishment increased considerably during the last quarter of 2004 due to greater program emphasis on licit crop establishment than on eradication. This was also the result of strong support in Antioquia from the program sub-contractor CIPEC (*Corporación para el Desarrollo Integral del Sector Agropecuario*), who was contracted in May for 22 months to plant and/or enhance pasture and provide technical farm training to farmer participants.

Land O'Lakes also sub-contracted *Corporación Colombiana de Investigación Agropecuaria* (CORPOICA) in May for six months to undertake similar activities in Nariño. A follow-on sub-contract was signed with them in October for an additional ten months to expand their efforts in Nariño.

Of the 1,088 hectares of pastures planted in Antioquia during 2004 by CIPEC, 1,055 hectares germinated on 200 farms with an average germination rate of 97 percent. Germination rates in Nariño were considerably lower (64 percent) due principally to poorer quality seed.

Under a separate sub-contract, CORPOICA-Antioquia initiated farm-level productivity enhancement training for illicit-free participating farmers in February 2004 in its well-equipped training site in San Jose del Nus located in northeastern Antioquia. This training included animal nutrition, silage preparation, hygienic milking, pasture establishment and management, preventive animal health, mastitis control, and raising replacement calves. Similar training was initiated by CORPOICA-Nariño in May, while CORPOICA-Cordoba initiated its farmer training activities in July for participating farmers from the Bajo Cauca region of Antioquia. In total during 2004, 215 seminars were provided to participating farmers.

Year Three (January 2005 – February 2006)

During the first semester of 2005, the program focused on planting improved pastures with those farmers who had eliminated their illicit crops in Antioquia and Nariño as originally planned. With the shifting program emphasis from elimination to prevention approved in the Work Plan for 2005, the focus during the second semester was placed on planting and/or improving pastures of those participants in high-risk areas who had never planted illicit crops on their land.

Technical assistance packages for participant farmers eliminating illicit crops and those never having cultivated these crops were markedly different. Participants having eradicated illicit crops in Antioquia were provided with three hectares of *Brachiaria* grass and 0.5 hectare of a protein bank, whereas participants never having grown illicit crops were provided with 0.5 hectare of a protein bank with their commitment to improve a mutually agreed upon number of hectares of existing pastures. In Nariño, all participants had eradicated their illicit crops and, depending on the size of their farm, were provided with up to one hectare of new pasture, as well as a protein bank of 0.25 hectares.

In April, Land O'Lakes and the Secretary of Agriculture of Antioquia initiated a collaborative effort in the Magdalena Medio region of Antioquia with milk producers committed to keeping their farms free of illicit crops through improving milk quality of farmers grouped in associations in six municipalities. The program contributed one hectare of a protein bank per farmer for improving cattle nutrition on 300 farms, as well as providing instruction to farmer associations in the operation of milk collection centers donated by the Secretary of Agriculture. In September, the Secretary of Agriculture contributed \$4,500 of its own budgetary resources to assist the program in providing farm-level inputs to these 300 participants.

In October, CORPOICA-Nariño finished the implementation of its second sub-contract with the program, completing the planting of 426 hectares of new pastures with 438 farmer participants in the six municipalities of Potosi, Puerres, Cordoba, Aldana, Carlosama, and Cumbal, as well as the technical training of 525 program beneficiaries in

eight municipalities. The field staff provided follow-up training and technical assistance visits to participants on their farms during the last quarter of 2005 to ensure that pastures were properly maintained.

During 2005, a concerted effort was made to provide training to participants, particularly through on-farm technical assistance visits, resulting in 500 practical seminars in animal nutrition, preventive health, milk hygiene, and silage preparation. As part of the technical support package provided to farmer participants who eliminated their illicit crops in Antioquia, the program provided fencing materials to improve pasture management and grazing for an equivalent of 2,781 kilometers during the 29 months of program field activity.

The field staff and its sub-contractors frequently worked side-by-side to provide the needed technical assistance during the short planting seasons and in providing joint training to take advantage of in-house expertise. This was particularly true in Antioquia where, rather than training new field personnel, Land O'Lakes technicians assisted CIPEC in carrying out technical assistance visits and training of farmers who had never planted illicit crops.

3.1.3 Association Creation and/or Strengthening

Strong producer associations are important for appropriate use of inputs and management of milk collection centers. However, their formation and strengthening is slow due to the need to sensitize producers as to the needs and benefits of associating. This is especially difficult in the indigenous areas of southern Nariño where there is an inherent distrust of government-sponsored programs. An added factor is the process of legalizing the associations with the Colombian government, which is very lengthy.

Year One (March – December 2003)

During 2003, the program identified and evaluated 25 existing producer or community associations, 21 in Nariño and 4 in Antioquia. During the fourth quarter, the program signed agreements with two producer associations in the Department of Antioquia: *Asociación de Leche de Vegachi* (ASOLEVE) and PROLACOOOP.

PROLACOOOP is an association comprised of 750 dairy farmers and 18 processors in the region of Santa Rosa de Osos. According to the agreement, PROLACOOOP was to transport milk from other beneficiary associations located coca-producing areas of Antioquia to their processors in Santa Rosa de Osos. These processors were to receive technical assistance in business planning, market analysis, and overall strategic business decision-making in order to capture a competitive market and pay a fair market price for beneficiaries' milk.

The program initiated work with an informal association in Remedios, Antioquia, during 2003, but due to public disorder and disorganization on the part of the association, the legalization process was postponed until 2004.

Year Two (January – December 2004)

The process of establishing and/or strengthening producer associations during 2004 was constrained by the rhythm of illicit crop eradication since the focus of working with farmers who eradicate usually implies establishing new associations with producers that have the eradication factor in common. During 2004, this process was carried out by CIPEC and CORPOICA who have specialized staff responsible for the organization, legalization and training of these associations. As planned, this activity was carried out concurrently with the establishment of licit crops, resulting in the establishment of ten producer associations in 2004.

Originally, the program assumed that there would be one association for each milk collection center established. However, under the program's agreement with Colanta in Antioquia signed in the fourth quarter, small farmers who group around a milk cooling tank would be able to join the Colanta cooperative and receive the benefits of milk sales and production assistance from that processor. This new approach considerably reduced the number of associations necessary under the program, while achieving the same results, such as good quality milk with a sustainable market.

Year Three (January 2005 – February 2006)

During 2005, the Land O'Lakes program strengthened the 36 newly established associations in Antioquia and Nariño as well as the 12 associations that had been established by the program in 2004. During 2005, the program staff and its sub-contractors provided 210 seminars in organizational development to these 36 farmer associations, as well as assistance in the preparation of business plans for each, which included basic information of the productive activities (e.g., milk collection, silage, inputs) of the association, basic financial analysis, and a projected marketing plan.

During 2005, staff provided 73 training sessions in milk reception and milk collection center administration to producer associations in Antioquia and Nariño. Training for the remaining six new associations in Nariño that have decided to transform their milk into cheese was provided under an agreement with Lacteos Andinos, a dairy processing partner in Pasto.

Through continued assistance, 16 farmer associations in seven municipalities of Nariño finally became legally incorporated under Colombian law during the third quarter. With incorporation papers in hand, they initiated construction of milk collection centers.

3.1.4 Milk Collection Center Establishment

The basis of sustainable commercial activities for small milk producers is the establishment and operation of milk collection centers owned by these same producers who control the quality and volume of the product, share in the profits of the enterprise, and ensure stable markets through association contracts with dairy processors.

Year One (March – December 2003)

The program met with three companies, Steel Mark, Willgo and Dismatec, who specialize in the manufacture and/or supply of milk cooling tanks and services, including tank delivery, equipment installation, and training in tank operation, maintenance, and hygiene. After careful analysis, the Medellin-based Steel Mark equipment manufacturer was selected to provide the program with cooling tanks.

Late in 2003, the first program milk collection center was installed in Vegachi. The Secretary of Agriculture of Antioquia donated the milk cooling tank, ASOLEVE donated the building and materials, and the program donated the laboratory, generator, and milk cans necessary for preparing the center to receive raw milk.

Year Two (January – December 2004)

Land O'Lakes entered into an agreement with the Secretary of Agriculture of Antioquia during the first quarter of 2004 to: (1) assist in the establishment of milk collection centers based on milk cooling tanks that the Secretary had donated to communities; and, (2) enhance the performance of fledgling milk collection centers already in operation that were deficient in administration and milk handling. This effort resulted in the establishment of seven milk collection centers in the municipalities of Amalfi, Anori, Puerto Valdivia, Yali, Caceres, Yolombo, and Remedios, using the successful model of joint collaboration in Vegachi in 2003.

In early 2004, Land O'Lakes held conversations with the three major milk collection and processing firms in Nariño (Lacteos Andinos, Lacteos Purace/Friesland, and Colacteos) as to their interest, capacity, and conditions for collecting and transporting cooled raw milk from the program's milk collection centers to their processing plants. After much analysis and discussion, Lacteos Purace/Friesland was selected because of its more favorable conditions for the program. Land O'Lakes signed a management agreement with this processor to provide operational oversight for the program's centers in Nariño, which included the purchase of all collection center milk at bonus prices for good quality, which would be controlled by the program, Lacteos Purace/Friesland and producer participants. Training and technical support to the producer associations in how to run the centers properly and eventually assume that responsibility was also provided. This agreement considerably accelerated efforts to establish milk collection centers in Nariño.

In late 2004, the program signed an agreement with Colanta to install up to 100 milk cooling tanks in the high-risk municipality of Yarumal and surrounding areas in Antioquia. This was necessary to decrease the risk of delivery of canteen bombs by insurgents to company-owned large milk collection centers. The first phase of the agreement, calling for the installation of 25 centers, considerably accelerated efforts to establish centers in Antioquia under the program's illicit crop prevention approach.

In the Colanta agreement, the Land O'Lakes program agreed to finance 20 percent of the cost of the equipment and facilities, Colanta would provide a milk purchase guarantee to the banking system, the bank would lend the remaining 80 percent to farmer participants,

and Finagro would provide the loan guarantee to the bank. In this manner, the program leveraged significant private sector resources and committed Colanta to purchase milk from program milk collection centers and producer associations, thereby consolidating the dairy chain in Antioquia.

During the fourth quarter, the program installed two demonstration milk collection centers in Nariño, one in the municipality of Cumbal and the other in the municipality of Potosi, where the program assisted the existing local processor Agrolacteos in installing the milk collection and making it run as a viable business. The total number of centers established by the program during 2004 was 18.

Year Three (January 2005 – February 2006)

The signing of agreements in 2004 with the Secretary of Agriculture of Antioquia, and dairy processors Colanta in Antioquia and Lacteos Purace/Friesland in Nariño considerably accelerated the establishment of milk collection centers in 2005, reaching 53 during Year Three. Lacteos Purace/Friesland collected cooled milk from all centers in Nariño established by the program in 2004 and 2005, thereby guaranteeing a market for quality milk.

3.1.5 Agro-Processor Creation and/or Strengthening

Strengthening dairy processors was an important aspect of the Land O'Lakes program since it committed the private sector to the program's objectives, increased the leveraging of private sector resources, facilitated market expansion for program dairy products, and ensured the sustainability of the dairy chain.

The Land O'Lakes Marketing Team initiated this process by designing various formats for assisting dairy processors, beginning with a letter of intention with the processor agreeing that both parties desired to work together. This was followed with a visit to the firm to complete a thorough business plan that included detailed production as well as marketing strategies in order to optimize processor efficiency and performance.

The business plan was then accompanied by an investment plan, which is a document signed between the program and the processor detailing the financial assistance that the program would contribute to the processor's marketing goals, as well as the matching resources that the processor would contribute. The investment plan was then followed by two visits, one a financial review with the Land O'Lakes accountant to look at financial documents and complete cash flow projections that support the new marketing plan, and the other from the program's technical team in good manufacturing practices.

Year One (March – December 2003)

During 2003, the program technical team identified six agro-processors as potential program participants, four in Antioquia and two in Nariño. The program completed technical and administrative assessments for Colacteos in Nariño, with the next step being the signing of collaborative agreements and preparation of an agro-processor

development plan, including training in administration and more effective plant management standards.

Year Two (January – December 2004)

Early in 2004, the program contracted Actuar, a local non-profit organization that provides assistance to micro and small businesses, to complete an administrative, technical and marketing assessment of dairy processor Bufaladas (also known as Colemma) in Puerto Berrio, Antioquia. A subsequent agreement between the program and Bufaladas resulted in program assistance to establish sales and distribution channels, as well as the provision of a six-month subsidy to help pay a sales manager as the firm consolidated its market channels. With a new sales strategy, the reorganization of milk routes, the hiring of five new operational staff, and a small investment in plant and transportation improvement, sales rose by 154 percent during 2004 and the firm reached a breakeven point in its financial operations, versus a large loss in 2003.

During the second quarter of 2004, Land O'Lakes contracted a short-term international expert in dairy processing plants to undertake a technical analysis of nine processing firms in Antioquia and Nariño that had been previously identified by program staff as potential industry participants. The companion administrative analyses were subsequently completed by staff, which resulted in the selection of four dairy processing firms (Colemma, Prolinco, Lacteos Andinos, and Colacteos) to participate in the program. Criteria used to select the processors was: (1) willingness to sign agreements to buy cooled milk from program milk collection centers, (2) adequate facilities to process quality dairy products, (3) appropriate location to service program milk collection centers, (4) commitment to apply good manufacturing practices (GMP), (5) willingness to report all internal information required to measure program performance indicators, (6) willingness to share experiences with other processing facilities, and (8) potential as a sustainable business operation.

The Marketing Team worked closely during the latter part of 2004 with the dairy processor Prolinco in Santa Rosa de Osos, Antioquia, on technical and microbiological specifications and export strategies for white cheese. After the implementation of improved processing techniques and export strategies, Prolinco succeeded in exporting approximately 3,000 pounds per week of this cheese to the U.S. Due to a 100 percent increase in milk reception and processing and the support of the PROGRAM in marketing strategies, Prolinco was producing pasteurized milk, *quesito* and *arequipe* for a major Colombian retailer (El Exito), as well as selling its own products in El Exito supermarkets throughout the country.

The Marketing Team supported a small milk processor, Lacteos La Leticia, located in Santa Rosa de Osos, Antioquia, in promotion and sale strategies, which resulted in an increase in milk reception of 50 percent. The processor was working at full capacity by the end of 2004 producing *quesito* and *cuajada*, and its standardized three new products: yogurt, *arequipe* and *panelitas*.

By the end of 2004, the Land O'Lakes program had developed working agreements with five dairy processors (Colanta, Lacteos Purace/Friesland, Bufaladas, Prolinco and Lacteos La Leticia), as well as with Colacteos in Nariño (for agricultural inputs for the program at discounted prices) and with Dios El Amor in El Bagre, Antioquia (for cheese).

Year Three (January 2005 – February 2006)

Overall activities with the agro-processors included technical, administrative, and financial evaluation and strengthening; legal incorporation of those requiring it; development of business and investment plans; and the provision of small investments for key plant equipment. Training in GMP and administrative controls were provided as part of the technical assistance package.

With Land O'Lakes assistance in business and financial planning, Dios Es Amor finalized the process of becoming an incorporated enterprise in Antioquia, as well as obtaining a \$6,500 loan from the *Banco Agrario de Colombia* to be repaid over three years and to be used for renovating a new, more efficient and hygienic processing facility. In order to secure the credit, the owner had to demonstrate his ability to repay the loan. The program's technical team provided support to the owner to project sales for the repayment time period, which included developing a 2005 marketing plan in order to increase the processor's total sales by 100 percent. To achieve this, it was necessary to increase the amount of milk processed into cheese. In April, the local farmers association (ASOGABA), which is a program beneficiary organization, began selling 800 liters of milk to Dios Es Amor on a daily basis. This would provide ASOGABA with a needed buyer for its cooled milk, as well as the necessary raw material that Dios Es Amor needs to meet its 2005 projected sales targets.

The program's technical team also assisted in enhancing technology within the processing facility, including training in GMP, updating equipment for hygienic purposes, and instituting formal accounting practices. As a result of this technical support, Dios Es Amor will be growing its business by 100 percent, providing a more hygienic product to the area, expanding to clients in Medellin, and providing a sustainable outlet for ASOGABA's cooled milk.

During the second quarter, the Land O'Lakes accountant provided assistance to processor Lacteos La Leticia in the preparation of basic financial reports, including its balance sheet and profit-and-loss statement. According to Lacteos La Leticia's administrator, the agro-processor had sales of \$19,658 per month, with a net profit of \$384 (or two percent of sales). The accountant estimated that the processor's net income should be around 5 percent, or an equivalent of \$1,025. With this information, the administrator received follow-up instructions that led to the detection of two frauds, one in milk reception and one in sales. This situation was resolved and the firm is now making the expected 5 percent net profit.

With direct program assistance, Lacteos La Leticia successfully completed a business plan, including financial documentation that enabled it to register as a formal business in the Chamber of Commerce in Yarumal. It also completed physical plant modifications as part of the collaborative investment plan. The processor completed INVIMA (*Instituto Nacional de Vigilancia de Medicamentos y Alimentos*) certification with the assistance of PROGRAM technical team support in documenting maintenance and residual waste removal. The INVIMA certification allows Lacteos La Leticia to access new national and local markets; the processor projects an increase of 20 percent in sales by the end of 2005 as a result of this technical assistance.

During the second quarter of 2005, the program's technical team completed technical and administrative assessments for an additional seven agro-processors, four in Antioquia and three in Nariño. Business, marketing and investment plans were also prepared for five of these processors.

During the fourth quarter, the Land O'Lakes technical team provided training for all six participating dairy processors in Antioquia and six processors (three participating and three non-participating) in Nariño in the production of various milk derivatives, including *quesito*, white cheese, yogurt, *arequipe*, *panelitas*, and mozzarella cheese. Specific training on the incorporation of cheese whey into dairy products, including the typical *quequeson*, was provided by the Dairy Department of the National University in Antioquia and the University of Nariño in Nariño. This training should allow these processors to diversify their product offerings and increase future sales volumes.

3.1.6 Market Development Activities

The purpose of this activity is to identify new and expanded market opportunities and encourage increased per capita consumption of program-supported dairy products.

Year One (March – December 2003)

Since the thrust of program's activities in 2003 was directed towards dairy production and elimination of illicit crops in order to build a sufficient milk production base that would support interventions at the processing and marketing levels, most work at the market level was focused on the identification of partners that could accompany the program in this activity and on understanding the market forces at work in Antioquia and Nariño.

The program's Marketing Team held meetings with various groups in Medellin, Bogota, and Pasto regarding the development of practical dairy industry bulletins during 2003. It also held discussions with TETRAPAK, Colanta, Mejoramiento Alimentario y Nutricional de Antioquia (MANA), and Instituto Colombiano de Bienestar Familiar (ICBF) regarding the establishment of school breakfast programs in the municipalities where program participants are located.

Land O'Lakes contracted a market research firm to undertake a detailed market study on leading dairy brands by city, their market shares by districts within cities and by

distribution channels, and approximate volumes at each market level. The study should allow dairy processors to evaluate their distribution strategy against that of competitors.

Participation in industry fairs is essential to exposing dairy processors and participant farmers to new marketing and processing techniques. During the fourth quarter, the Land O'Lakes marketing specialist attended one of these in Cartagena accompanied by a representative of Colacteos. As a result, Colacteos made contacts with ten possible distributors of its products in Colombia to increase its market coverage.

Year Two (January – December 2004)

During 2004, the Marketing Team worked on packaging design for various participating agro-processors, researched the feasibility of financing and disseminating a periodic dairy industry bulletin, and financed the research and publication of the Nielson Distribution Study on the Colombian market for UHT milk.

The Marketing Team designed a pilot school feeding activity in Santa Rosa de Osos in Antioquia during the second quarter of 2004. A collaborative agreement was signed by the program with the Government of Antioquia, specifically the Department of Health of Antioquia, Mejoramiento Alimentario y Nutricional de Antioquia (MANA), and the municipality of Santa Rosa de Osos. The activity provided a snack consisting of a 50-gram portion of fresh cheese purchased by the PROGRAM from local program participant processor Prolinco, a 70-gram local *arepa*, and a nutritious chocolate drink provided by the municipality, to 300 malnourished children in the town's public elementary school every morning for six months starting in July 2004. MANA agreed to measure growth and weight gain of each individual participant child over the complete six-month period.

During the second quarter of 2004, the program financed the printing of a CORPOICA technical publication entitled *Ganaderia de Leche Sostenible*, placed an advertisement and a short article on the program in the El Colombiano newspaper in June, and helped sponsor a workshop for small dairy producers undertaken by the Secretary of Agriculture of Antioquia as part of the collaborative agreement between the two entities.

In support of the renowned "Competitiveness and Quality" seminar held by Colanta every two years, the program financed a keynote speaker for the sessions on trade. As an international advisor to the Peruvian Free Trade Agreement negotiating team on agriculture and an expert on the Central American Free Trade Agreement (CAFTA) negotiations, he spoke of his experience and recommendations on strategies for the ongoing Colombian free trade negotiations with the United States concerning dairy and other agricultural commodities.

Year Three (January 2005 – February 2006)

Early in 2005 the results of the pilot school feeding activity that the program had undertaken with MANA were made available. Even over such a short period, the impact on the nutritional level of primary school participants was positive as measured by

MANA. However, due to program funding constraints, resources for this program were redirected toward activities that directly impacted program indicators.

During the first quarter of 2005, the program financed a study in Medellin to locate potential buyers for *queso costeño* (white cheese) for Dios Es Amor and other processors interested in marketing this product. The study, which identified 55 clients in Medellin who buy this product on a daily basis, was used to assist processors in locating new clients for their products in Medellin. The study was completed and distributed during this quarter.

During the second quarter, the Marketing Team completed the design of the Barrancabermeja marketing study in collaboration with the Chamber of Commerce of that city, SENA, and the Bufaladas processing firm. The study was completed during the fourth quarter and appropriately distributed.

During the third quarter, the Marketing Team collaborated with the Cadena Lactea of Nariño in collecting and analyzing information on overall consumption of milk and dairy products in Pasto. As an extension of this effort, the program undertook a survey in Cali to evaluate the fresh cheese market, including prices, intermediaries, and product specifications. These two studies should be useful for the three participating processors in Nariño for identifying and accessing markets for their dairy products in Pasto and Cali.

During 2005, Land O'Lakes collaborated with the Community Development Secretariat of Antioquia and the MANA program in the design and printing of 1,500 posters to promote milk consumption in elementary schools and area hospitals located in program municipalities in Antioquia. The promotion campaign is aimed at increasing milk consumption as a means of improving children's nutritional intake.

3.2 Support Activities

In order for technical activities to be effectively and efficiently implemented, three very important support functions were critical to successful completion of the program. These responsibilities were managed by the Administrative Unit of the Land O'Lakes program.

3.2.1 Monitoring and Evaluation (M&E)

Year One (March – December 2003)

During 2003, the M&E Unit coordinated closely with USAID to ensure that the program's monitoring and evaluation system was in compliance with USAID M&E requirements. The program installed, tested and applied the Microsoft Access Application provided by USAID to provide timely quarterly information.

The M&E Unit designed the following formats to collect evaluation information:

- On Illicit Crops
 - Elimination Agreements
 - Verification Acts
 - Farm Surveys

- On Licit Crops
 - Input Inventory Control
 - Farm Production Resources

The Performance Management Plan (PMP), used to guide the M&E process for the first year, was prepared in mid-2003 by the program and approved by USAID. GIS and GPS tools and software were installed and tested to ensure compliance with the program's M&E process. GPS devices were purchased and tested and a GPS Operational Manual in Spanish was prepared.

During the fourth quarter of 2003, the M& E Unit provided extensive training to nine program field technicians in Antioquia and Nariño on the proper use of formats for collecting general farm data, digital photography with clearly identifiable reference points, and proper registration of GPS coordinates for field plots.

Year Two (January – December 2004)

During the first quarter of 2004, the M&E Unit prepared a reporting process for sub-contractors CORPOICA and CIPEC, including the following formats: Activities Report; Farm Visit Report; Environmental Checklist; Match Contribution Report; Financial Report; and Attendance Lists for training and meetings. Subsequently, the Unit designed and implemented the following new formats, which assisted the program technical team in making strategic programmatic decisions: Farm Cost of Production Survey; MCC Site Visit Report; MCC Milk Cost of Production Survey; Processor Technical Evaluation; and Processor Administrative Evaluation.

In early 2004 the M&E Unit installed and began using the Microsoft Access software with Arcview components to provide more accurate and timely maps of PROGRAM field activities to USAID.

Year Three (January 2005 – February 2006)

With the suspension of the use of GPS equipment in the field in early 2005 due to security concerns, the M&E Unit and technical field staff continued to successfully document elimination and licit crop activities with manually prepared maps signed by farmer participants and field staff.

During the first quarter of 2005, the M&E Unit completed a verification check of CIPEC's work for the program in Antioquia during 2004 in the municipalities of Caceres

and Taraza. A 10 percent sample of the work reported as complete by CIPEC was checked and clearly showed that CIPEC in fact had completed the work as reported.

The M&E Unit and field staff completed the collection of elimination data by the end of the first quarter. Documentation for a total of 1,011 hectares of illicit crops eliminated is stored in the M&E files. Approximately 98 percent of hectares recorded have GPS coordinates, while the remaining two percent has maps.

In order to assess the program's impact, the M&E Unit worked closely during the last half of 2005 with the Technical Unit in the design and application of a simulation program to evaluate economic performance of farms participating in the program. Baseline and follow-up surveys of farms participating in the program were carried out in a continuous fashion throughout 2005 in order to improve the data quality and validate the simulation program's results.

An important activity for the M&E Unit during 2005 was the organization of support documentation for every beneficiary. New data formats that better facilitated filing and organization of documentation, as well as input into the database, were designed and completed for all 2,849 beneficiaries, 72 milk collection centers and 48 producer associations.

Perhaps the most important responsibility of the M&E Unit was providing the follow-up and coordination for data collection with sub-contractors and independent consultants delivering training and technical assistance to the large number of beneficiaries, both individually and through their associations. A great deal of effort was spent to ensure that data quality was appropriate and that it was available on a timely basis for the Technical Unit to measure progress and provide follow-up for field activities.

During 2005 the M&E Unit continually undertook spot verification checks in 11 municipalities in Antioquia and Nariño on pastures and protein banks planted by program participants. These checks also involved verification of participants' compliance with not replanting illicit crops on their farms.

3.2.2 Project Management

Year One (March – December 2003)

In August, the Land O'Lakes program opened its satellite office in Pasto, Nariño in addition to its main office in Medellín. In the same month, Land O'Lakes contracted Omnitempus Ltda., a Colombian security firm, to prepare a Security Plan and Manual for the program in order to ensure that appropriate measures would be taken to protect Land O'Lakes personnel, especially in the frequently dangerous illicit crop field settings where the program was working. The manual was completed and included the following: (1) Vulnerability Study; (2) Emergency Action Plan (EAP); (3) Standard Security Procedures; (4) Crisis Management Plan (CMP); and (5) Risk Scenarios and Best Security Practices.

During the fourth quarter of 2003, the Administrative Unit completed the Sub-Contracts and Grants Manual in preparation for sub-contracting third party organizations to assist the program in implementing the licit crop portion of the transition from illicit crops to dairy production. The manual included the process for sub-contracting, as well as the process to monitor sub-contractor progress.

The Administrative Unit created a bi-weekly newsletter, called Flash News, which communicated updated highlights and occurrences to USAID, as well as to other program collaborators and interested parties.

Year Two (January – December 2004)

Staff size for 2004 increased during the second quarter due to an acceleration in activities, especially in milk collection center establishment and the number of grants to and purchases for participating producer associations.

Land O'Lakes contracted technical assistance from a Bogota web design firm to assist in preparing the Land O' Lakes website for Colombia. It was posted in October, but had to be suspended in early 2005 due to the delicate security situation that arose in December 2004. After some security adjustments in the program, it was again posted in October 2005. Other salient achievements during 2004 included the efficient implementation of a GIS system, completion of the beneficiary database, and improved accuracy in the GPS coordinates and illustrative photographs.

During the fourth quarter of 2004, the Administrative Unit applied the Internal Control Evaluation process to the first CORPOICA sub-contract. This included a review of accounting, procurement, and monitoring and evaluation documents, as well as visits to beneficiary sites where deliverables were completed. The evaluation was satisfactory as established results were fully achieved by the sub-contractor. On this basis, the PROGRAM negotiated a second sub-contract with CORPOICA for expanded activities in Nariño.

Year Three (January 2005 – February 2006)

On the basis of a careful financial analysis of the program at the end of 2004, the Administrative Unit prepared and presented to USAID its Work Plan for 2005 that proposed reduced life-of-program targets for most of the original indicators to be achieved with the remaining budget. The Mission approved this Work Plan and its reduced targets in April, which are the ones presented in Table 1 and used to calculate final program achievements.

During the second half of 2005, provisions were taken by the program to ensure that termination of field activities with participants and their associations permitted sustainability of program efforts. A careful assessment of each association was made by

the Technical Unit and sub-contractors, with measures taken to ensure that those organizations were provided the technical assistance to reach the required level. Sub-contractors willingly responded to this need and doubled their efforts on this front.

With the exception of the 11 milk collection centers in Nariño built and placed into operation in 2006, all field activities were completed during the fourth quarter of 2005. Contracts of field personnel and many of the support staff in the main office in Medellin were terminated in December, thereby reducing program staff from 28 to ten. An additional five contracts were terminated at the end of January and the remainder at the end of February 2006.

In order to accommodate a reduced staff during closeout, the program moved its Medellin office to a smaller facility in the same building. The field office in Nariño was closed at the end of December, with one field technician working from his home in Pasto during January 2006 to ensure that the 11 milk collection centers were successfully installed.

During the fourth quarter of 2005, Land O'Lakes headquarters used its own resources to contract the preparation of a 20-minute video in English and Spanish describing the objectives, activities and results of the Dairy Alternative Development program. The video forms part of the program's final report to USAID and will be incorporated into the final program files.

The preparation, testing and application of the simulation model to program dairy farmers' incomes by herd size and geographic location as a result of the program was successfully undertaken during the second semester of 2005. The model and its results are presented in this final report.

During November and December, the Administrative Unit closed out all eight program grant agreements in accordance with USAID and Land O'Lakes corporate policies. During this quarter, five of the six sub-contracts were also closed out, with the CIPEC sub-contract closed out in early 2006 after approval of its final report.

4. Program Results

The following are the important highlights and results of the three-year Dairy Alternative Development Program effort in dairy development, as presented in Table 1.

Table 1. Comparative Results of the Dairy Alternative Development Program

	Adjusted 3-Year Program Targets	CY 2003 Results	CY 2004 Results	CY 2005 Results	Cumulative 3-Year Results	Percent Achieved of 3-Year Targets
Hectares of Illicit Crops Eliminated	1,002	70	865	76	1,011	101
Hectares of Licit Crops Planted and/or Enhanced	3,983	---	2,321	3,834	6,155	155
Producer Associations Established and/or Strengthened	25	2	10	36	48	192
Milk Collection Centers Established	56	1	18	42	72	129
Processing Facilities Established and/or Strengthened	8	---	1	10	11	138
Jobs Created	3,692	34	1,518	2,913	4,465	121
Families Benefiting from the Program	2,926	203	1,333	1,313	2,849	97

Year One (March – December 2003)

Of the 131 hectares of illicit crops that farmers reported having eliminated during 2003, 70 hectares were verified by the M&E team (30 hectares of coca in Antioquia and 40 hectares of poppy in Nariño), with 61 hectares yet to be verified and reported by M&E personnel in 2004.

Although no hectares of pastures were fully established by the end of 2003, 34 jobs were created in the transition phase from illicit to licit crops, 20 in land preparation and fertilization and 14 in expanded dairy activities (milking, herding, and related farm activities).

A total of 203 families were benefited during 2003 through participation in land preparation for pastures and training in livestock and dairy techniques. The Land O'Lakes program did not undertake the strengthening of any processors during the

year, but did strengthen two producer associations and establish one milk collection center in Antioquia during 2003.

Year Two (January – December 2004)

All 865 hectares of illicit crops that farmers reported having eliminating during 2004 (588 hectares of coca in Antioquia and 277 hectares of poppy in Nariño) were verified as eliminated by the M&E Unit. The eradication figure for 2004 was lower than planned due principally to the program concentration on difficult eradication in isolated geographic areas and the extended time, human effort and cost involved in convincing farmers to replace their principal source of income in order to participate in the benefits.

One of the key indicators is the number of families directly benefiting from the program. Originally, a one-to-one relationship was assumed between the number of hectares eradicated and the number of families benefited, since families were required to eradicate their illicit crops to receive full program benefits. In fact, the program found that the average size of family poppy plot in Nariño was only about 0.2 hectares, instead of one hectare as originally assumed. This resulted in fewer hectares of poppy being eradicated but more families participating in the program.

The program considered the alternative of incorporating into the program farmers in focus areas of Nariño who have never had illicit crops, thereby increasing the number of family beneficiaries without increasing the number of hectares of illicit crops eliminated. Even though this approach was never implemented in Nariño during the life of the program, the program reached 1,333 families during 2004, or 46 percent of the adjusted three-year target of 2,926.

On the basis of 1,154 farm investment plans elaborated by field teams and sub-contractors during 2004, 2,321 hectares of improved pastures were planted, or 58 percent of the adjusted three-year target of 3,983. This corresponded to 2,203 hectares of coca in Antioquia and 118 hectares of poppy in Nariño.

Originally, the program considered that three jobs per farm of six hectares would be created in Antioquia (two in pasture/herd management and one in milk handling), while two jobs per farm of one hectare would be created in Nariño (one in pasture/herd management and one in milk handling). In fact, because of smaller-than-expected size of plots being planted to improved pastures in target areas (three hectares instead of six in Antioquia and less than one hectare in Nariño), only two jobs per farm were being created in Antioquia and one job per farm in Nariño.

Because of smaller-than-expected size of plots being planted to improved pastures in target areas (three hectares instead of six in Antioquia and less than one hectare in Nariño), creation of jobs during 2004 was considerably lower than planned—1,518 of the 3,692 jobs targeted for the program, or 41 percent of the adjusted three-year target.

During 2004, 10 producer associations were established, or 40 percent of the three-year adjusted target for this indicator. During the year, the program also installed 18 milk collection centers, or 32 percent of the adjusted three-year target, principally during the last two months of 2004. It strengthened only one processor (Bufaladas).

As of the end of December 2004, the program staff had been implementing field activities for 17 months and had completed 47 percent of the program's total life of project (36 months). Four of the seven key performance indicators had approximated or surpassed 47 percent of their planned cumulative results by the end of 2004.

Year Three (January 2005 – February 2006) and Total Program

In April USAID/Colombia approved Work Plan 2005 for Year 3 of the program. This included a revision of program indicators to more accurately reflect possible achievements given budgetary and time limitations.

The third year of the Dairy Alternative Development Program was the most productive due to the experience gained in the field during Years 1 and 2, the positive demonstration effect of program successes in rural areas, the desire of increasing numbers of farmers to participate in the program, the inclusion of prevention activities in Antioquia, the expanded participation of the private dairy processing sector, and the dedication of personnel to achieve the desired results under frequently dangerous field conditions.

As part of the periodic budget review process in August, technical staff undertook a review of field progress and pending actions to be completed before the end of 2005 in order to consolidate the program and leave in place a sustainable dairy network for Nariño. Of the 22 producer associations that Land O'Lakes had organized and legalized to date, six had fully equipped milk collection centers built with program support grants and leveraged counterpart funds. They have received expected benefits of guaranteed market outlets and quality-induced higher milk prices.

The 76 hectares of coca eliminated in Antioquia during the first quarter of 2005 brought the **total of illicit crops eliminated** by the program between December 2003 and March 2005 to 1,011 hectares (714 hectares of coca in 10 municipalities in Antioquia and 297 hectares of poppy in 8 municipalities in Nariño), or **101 percent of the target**.

The emphasis on working in prevention resulted in the planting of 2,513 hectares of new pastures in Antioquia and Nariño and the improvement of 1,321 hectares of existing pastures in Antioquia during 2005. This effort raised the **total of pastures planted and/or improved** by the program between April 2004 and December 2005 to 6,155 hectares, or **155 percent of the target**.

As a result of increased planting and improvement of pastures, 2,913 additional jobs were generated during 2005, far surpassing the original projections for that year. New jobs were also created with the establishment of additional milk collection centers in milk

transportation, reception, and handling. **Total jobs created** during the life of the program reached 4,465, or **121 percent of the target**.

Sub-contractors worked with 1,313 families during 2005 to ensure appropriate planting and management of new pastures. The large number of beneficiaries served during 2005 resulted from close coordination between field staff and its sub-contractors in Antioquia and Nariño. **Total families benefited** during the life of the program reached 2,849, or **97 percent of the target**.

The process of establishing producer associations was accelerated in Year 3. During 2005, Land O'Lakes signed agreements with 36 farmer associations (19 in Nariño and 17 in Antioquia), or 75 percent of the total number of associations established and/or strengthened during the life of the program. **Total producer associations established** during the life of the program reached 48, or **192 percent of the target**.

During 2005, the program established 42 milk collection centers, four in Nariño and the remainder in Antioquia primarily with Colanta (24 milk collection centers) and the Secretary of Agriculture (14 milk collection centers). Eleven more centers (five milk collection centers and six artisan cheese-making centers), serving 16 producer associations and 561 families, were installed in Nariño in January and February 2006, raising to 72 the **total number of MCCs established** by the program between January 2004 and February 2006, or **129 percent of the target**.

During 2005, the technical team identified and strengthened 10 new agro-processors, bringing the **total agro-processors strengthened** over the life of the program to 11 (8 in Antioquia and 3 in Nariño), of **138 percent of the target**.

Over the 32 months of program field activities, Land O'Lakes surpassed all but one of the performance indicators approved in the 2005 work plan and presented in Table 1. Of significance are the indicators referring to area of pastures and forage planted and new jobs created, which are the most important factors in determining increased incomes of program participants.

5. Program Impact

The Land O'Lakes Dairy Alternative Development Program had a great impact on all aspects of its beneficiaries' life and livelihoods and other collaborators' operations, such as governments and private businesses. Qualitative and quantitative measures along with modeled estimates can be used to describe the program's success. Qualitative measurements are based on opinions of program beneficiaries as well as outside observations and happenings that cannot be put easily into numerical terms. Quantitative measurements usually arise from systematic data gathering and analysis that demonstrate the changes in the situation of beneficiaries due to program interventions, such as

changes in sales, employment and herd-size. In addition, models of future returns can be utilized to measure the program's impact in the coming years.

5.1 Qualitative Impacts

In addition to the beneficiary testimonials that the Quarterly and Annual Reports provided, additional examples of this type of measurement are provided below.

Months after the termination of the elimination activities, illicit crop producers in program target areas in Antioquia and Nariño continued to request that the program continue. This would appear to be a clear indication of the positive demonstration effect of the program on illicit crop elimination.

During the second quarter of 2005, staff assisted four farmer associations in Nariño gain access to the Finagro loan guarantee mechanism and the Banco Agrario credit system, through which they purchased 100 dairy cows for their association members. This demonstrated participating farmer interest in expanding their herd size, delivering more milk to the collection centers, and solidifying their licit farm economy based on dairy activities.

During the fourth quarter of 2005, 27 producer associations working with the program were interviewed by field technicians in order to record the opinions of beneficiaries concerning the overall impact of the program. The associations were requested to indicate the areas where they thought program assistance had made major impacts on the overall operations of the association and on long-term sustainability. Three-quarters of the respondents indicated that the greatest perceived impact was in improving administrative policies and procedures that included a more active participation of the association's membership. Almost one-half (47 percent) responded that the next most important area of impact was on the technical aspects of their business—milk production. The associations recognized the increase in volumes of milk delivered and improved milk quality that resulted in better prices paid and increased total revenues, as well as a better attitude towards the dairy business by its members.

Future plans of the associations were to increase milk collection volumes (74 percent of respondents) and the sale of production inputs to members (11 percent of respondents). Businesses into which the associations hoped to diversify in the future include processing of surplus milk, purchase of cattle, and new pasture establishment.

During this same quarter of 2005, eight agro-processors benefited by the program were also requested to provide their perceptions about the program, indicating the areas where they thought program assistance had provided major impact regarding their overall operations. Results of the interviews show that the major areas of impact are:

- Improvements in incoming milk control and training of producers who supply the plants;
- Improvements in process standardization and development of new products;

- Implementation of GMPs, resulting in better quality products;
- Entrance into new markets through technical assistance provided by the Land O'Lakes Marketing Unit;
- Higher prices for their final products due to better quality; and
- Better understanding and management of accounting systems.

5.2 Quantitative Impacts

Milk sales by program milk collection centers have been determined to be a good proxy variable for increases in incomes among farmer participants. The increase in value of milk sales, as recorded by the program for the fourth quarter of each year in the graph on the following page, demonstrates this result.

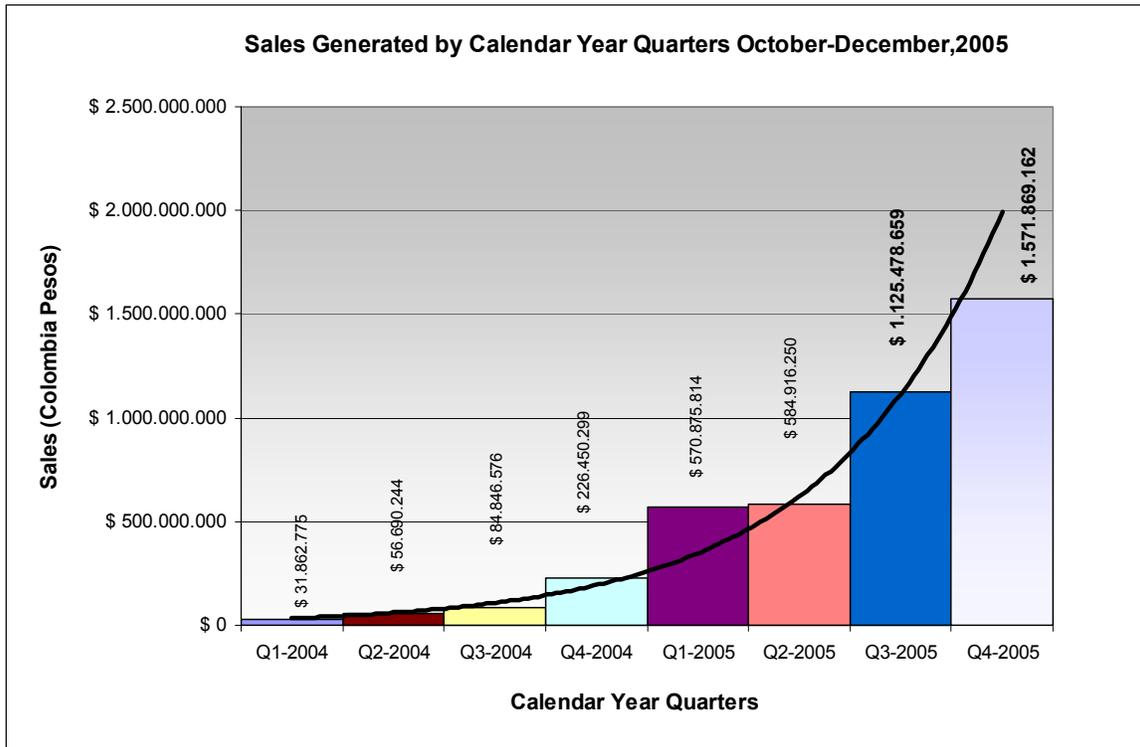


Table 2 on the following page indicates the distribution of milk sales by milk collection center and dairy processor for the fourth quarter of 2005.

Table 2. Milk Collection Center Milk Sales in Fourth Quarter of 2005

Milk Collection Center	Number of Participants	Liters of Milk Sold	Total Sales (Colombia Pesos)	Buyer
AGROCAS (Cáceres)	13	12,200	5,897,512	Parmalat
ASOLEVE *	-	-	-	-
COGANORI (Anorí)	30	222,977	148,374,533	Parmalat
ASOGABA (El Bagre)	10	33,483	21,364,850	Local
38 MCCs (Yarumal) **	79	836,527	337,882,070	Colanta
COLEPA (Briceño)	30	168,403	70,763,296	Colanta
COLEBRI (Briceño)	28	400,339	181,405,375	Parmalat
ASOLESANFER (Valdivia)	4	26,979	16,654,981	Colanta
AGROGANADERA YALÍ *	-	-	-	-
ASOGAMUY (Yolombó)	15	22,666	14,175,001	Colanta
COLEMA (Pto Berrio) *	-	-	-	-
COOLAMALFI (Amalfi)	128	610,274	315,981,505	Colanta
ASOPROGAT (Tarazá)	13	26,611	15,995,408	Colanta
COOLESAR (San Roque)	10	18,826	10,239,719	Colanta
ASOLEMA (Maceo)	20	34,157	17,782,155	Colanta
PRECOMAN (San José del Nus)	16	67,720	59,736,112	Colanta
ASOLENEV (Valdivia)	30	110,350	59,474,960	Parmalat
ASPROLESA (El Santuario)	144	108,245	62,848,400	Parmalat
TOTAL ANTIOQUIA	570	2,699,757	1,338,575,877	
NUEVA VIDA 2000 (Potosí)	20	101,678	54,104,850	Friesland
LOS LAURELES (Cumbal)	39	90,095	45,716,133	Friesland
GUAN (Cumbal)	36	66,338	33,779,754	Friesland
CUASPUD GRANDE (Cumbal)	41	67,831	35,239,725	Friesland
BOYERA (Cumbal)	44	65,986	34,096,541	Friesland
CUETIAL (Cumbal)	25	58,225	30,356,282	Friesland
TOTAL NARIÑO	205	450,153	233,293,285	
COMBINED TOTAL	775	3,149,910	1,571,869,162	

* Did not collect milk during the quarter

** Estimated final milk receipts not yet received at LOL/DACP office

Value of milk sales per participant as follows also indicates the impact of the program:

- Total value of sales in 2003 of \$1,520, or \$152 per farmer
- Total value of sales in 2004 of \$82,998, or \$954 per farmer
- Total value of sales in 2005 of \$714,550, or \$922 per farmer

Income reported at the program's milk collection centers is equivalent to CP 676,020 (or US\$ 294) per month per family, equal to one and three-quarters minimum wage salaries (CP 381,000) per family per month. As farmers continue to enhance their milk hygiene at the farm level, the milk collection center will receive a quality-induced higher price from processors, with income to farmers increasing even more over time. As of the end of 2005, 7.4 million liters of refrigerated milk at the milk collection centers have earned a premium of up to 100 pesos per liter (65 percent greater than the local market price), with total sales during 2005 amounting to CP 3.85 billion (US\$ 1.7 million).

A "back-of-the-envelope" analysis of the benefits of the Land O'Lakes program undertaken at the end of August 2005 indicated the following for participating farmers in Antioquia after one year in the program: yields per cow increased by 17 percent due to more nutritious grasses and better pasture rotation, price per liter of milk paid to farmers by the milk collection centers was 66 percent greater than that received from intermediaries, and the resulting total monthly income increased by 26 percent.

Overall, the impact of the Land O'Lakes Dairy Alternative Development Program has been the following:

- Each dollar of USAID direct investment with program participants generated one additional dollar of participant milk sales during the program
- USAID direct investment with program participants generates \$2.4 million of milk sales annually
- Price per liter of milk received by program participants increased by 65 percent during the program
- Dairy income for program participants will be three times higher than the minimum daily wage in the second year after the termination of the program
- The program obtained \$4.8 million of counterpart contributions, 127 percent more than required under its contract with USAID

5.3 Impact from Simulation Model

An even more important means of measuring the impact of the program is projecting into the future the growing increase in value of dairy products and then discounting that value back to the present. This is the basis for the simulation model that has been developed by the program to demonstrate program impact over time. A complementary document to this final report entitled, *Assessment of Program Results on Dairy Productivity and Incomes*, explains in detail the methodology and findings of the simulation model but a summary is provided below.

5.3.1 Assumptions

In order to determine the impact of activities on participating farmers' incomes, a farm development model was created. It follows the assumption that dairying is a medium-term business and that changes in technology adopted today only come to fruit after a certain period of time. A still longer period is needed for the farm to reach an equilibrium or "steady" state as a result of the technological change applied a few years earlier. The model assumes that changes due to improved pastures and grazing, training in herd management, sanitation and animal health will result in a farm reaching its maximum potential after around six years and continue at the same production and productivity rates thereafter.

The changes effected by the Dairy Alternative Development Program in the production and productivity parameters should result in an improved income stream from dairy activities at the farm. Therefore, the model begins by identifying the initial production, productivity and resource base parameters at the farm level and measures how those parameters start to change after one year. This allows the classification of the farm into one of four technology levels, each having different productivity parameters as shown in Table 3.

Table 3. Characteristics of Technology Levels

	Start-up		Development	Expansion	Sustainable	
Technology Level (TL)	1.0		2.0	3.0	4.0	
VARIABLES						
TL qualification according to Hectares	Less than 3	From 3,1 to 5	From 5,1 to 9,9	From 10 to 14	From 14,1 to 19,9	More than 20
Load capacity (animals/Ha)	Less than 0,3	From 0,4 to 0,6	From 0,7 to 1,0	From 1,1 to 1,5	From 1,6 to 2,4	More than 2,5
Liters/cow/day	0,00	1,00	4,00	8,00	12,00	15,00
Total cattle at the farm	Less than 1	From 2 to 5	From 6 to 12	From 13 to 16	From 17 to 22	More than 23
Type of Labor	Non	Sporadic visits	Relatives (Does not live on farm)	Relatives (Lives on farm)	Relatives and temporal jobs	Contracted
Fence condition (posts)	Non	Fallen fences	Live fences	Wired, posts and live fence	Wired fence and electric fence	Electric fence
Animal management installations	0,00	In pasture lot	Bad condition	In corral	Shedder	Barn
Technical assistance	0,00	Non	Traditional	Sporadic technical inquiry	Sporadic technical inquiry	Contracted technical assistance
Type of Pasture	Non	Native grass	Improved native grass	Native grass and native legume	Improved grass	Improved grass and legumes
% Established pasture	Less than 30%	From 30% to 50%	From 50% to 70%	From 80% to 90%	From 91% to 95%	More than 96%
% weed growth	More than 26%	From 21% to 25%	From 13% to 20%	From 8% to 12%	From 1% to 7%	Less than 1%
Type of animals (breeds)	Rejected	Native	Improved native	2 to 3 cross breedings	Improved cross breeding	Pure and Specialized cross breeding
Technical training and level	Non	Traditional	Sporadic	With knowledge	Attend regular training	Trained
Milkings per day	Non	Sporadic	1 with calf	1,00	2,00	2 or more
Milking hygiene and disinfection	Unknown	Non	Shakes udder and washes teats	Washes equipment washes and disinfects teats	Washes and disinfects hand equipment and teats	Washing routine, disinfection, test teats
Number of pasture	0,00	One, without definition	One, defined	From 2 to 3	From 3 to 4	More than 5
Nutritional supplement	0,00	Sea salt, sporadic	Sea salt	Sea salt, sporadic	Mineralized salt, freely	Mineralized salt and concentrates
Pasture lot management (fertilizers and weeds)	0,00	Urea, sporadic	Only urea	Urea, correctives sporadically	Regularly	According to chemical analysis
Animal groups (Lots)	In disorder	Disperse	1,00	2,00	2 and heifers	3 or more
Animal health (% clinical mastitis)	More than 3%	0,03	0,02	0,02	0,01	0,00

In order to obtain data for the model, 100 farms were surveyed after one year of participation in the program and their data compared with that of an initial farm survey carried out with the same 100 farms. Additionally, data on milk production costs was collected in both periods. Data collected was used to categorize the farms into the technological levels as described in Table 3.

In Year 0, all of the 100 participants appeared in the second and third technology levels, indicating that all were applying at least improved technology, but none at an advanced level. All but one of the 78 participants in the second level moved to the third level after one year, with the other jumping to the fourth level. All but one of the 22 participants in the third level stayed in the third level after one year, with the other moving up to the fourth level.

This demonstrates that technological jumps at the lower technological levels are readily attainable with initial intervention, but become progressively more difficult to achieve at higher technological levels, since these require improvements in cattle breeds, culling or purchasing of improved dairy cows, which usually takes a larger investment and longer time (3-5 years) to produce results.

All changes due to program intervention are expected to take place through the third year, with the farm expecting to reach its full and sustainable development after six years. The model has been corrected with real data after Year One, and the results have been projected for the remaining five years.

In order to measure impact, income from dairy production (including sale of cull cows, heifers and calves as well as milk) as a result of program intervention is compared to that of the same farm without intervention. The Net Present Value of this stream of differences is then calculated and ascribed as the benefit resulting from the program. The principal determinants of net dairy income are:

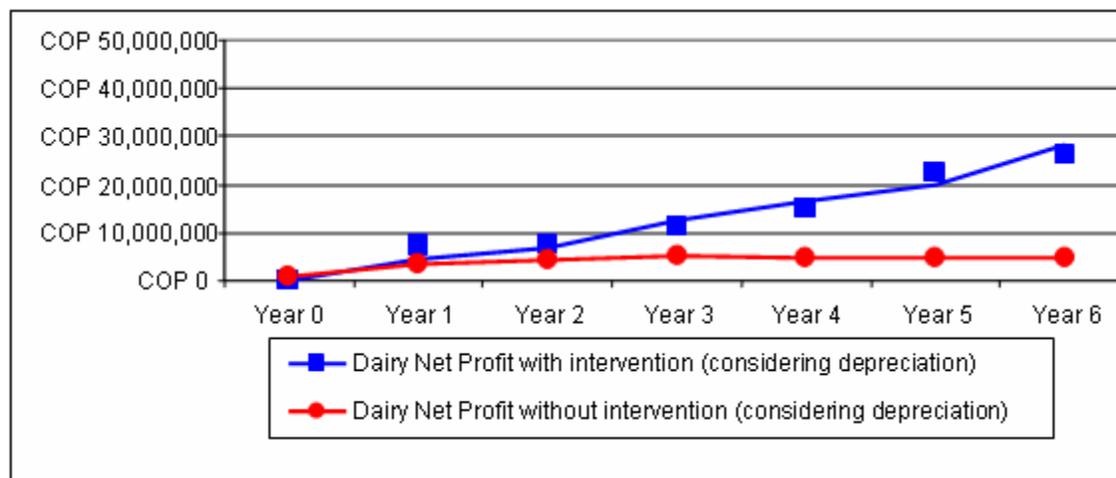
- Number of lactating cows on the farm, which is determined principally by farm size and area in pastures;
- Milk yields, which is determined principally by breed of cattle, animal health and nutrition; and,
- Cost per liter of milk.

Two additional measures of program benefits are also calculated: (1) the increase in herd value resulting mainly from improved reproductive parameters and (2) the increase in terminal value of the business resulting from the business continuing at the same level of production and productivity after the sixth year.

The Dairy Alternative Development Program worked in two regions, each with different agro-ecological and livestock characteristics. Each region was treated separately when running the model and evaluating the results.

5.3.2 Results

The graph below shows that the income of the average farm without program intervention decreases slightly over time due to the assumption that farms, even those with the highest technologies, are not sustainable in the long-run because there are no clear animal selection parameters nor good practices to maintain pastures. Thus, productivity decreases slightly. This was an initial finding and the reason why so much emphasis was placed on technical assistance in pastures and herd management.



The averages of the Net Present Value of dairy incomes for farms over the six years of the simulation model in the two regions with and without intervention is presented in Table 4. The income stream was discounted at 13 percent, which was the prevailing farm loan interest rate at the beginning of the program.

Table 4. Net Present Value (NPV) of Income Stream (US\$)

	Antioquia	Nariño
NPV with LOL Intervention	14,502	6,456
NPV without LOL Intervention	5,468	2,754
NPV of Income Increase Due to Intervention	9,034	3,702

This difference in income streams was then compared with the USAID investment through the PROGRAM, as indicated in Table 5. In Antioquia, this investment per farm amounted to \$5,000 and \$5,870 in Nariño.

Table 5. Net Present Value (NPV) with Program Investment (US\$)

	Antioquia	Nariño
NPV of Income Increase	9,034	3,702
USAID Investment per Farm	5,000	5,870
Difference	4,034	(2,168)

From the figures in Table 5, it is clear that in Antioquia program investments are clearly recovered, but in Nariño they are not. The basic difference is the size of farm operation in Antioquia, which is much larger than that in Nariño. Potential for growth in herd size and amount of improved pastures in Antioquia is not limited as it is in Nariño, where operations larger than five dairy animals are severely constrained by farm size.

There are other benefits for the farmer who joins the program and applies the recommended technological package, including the increase in the size of the herd as a result of better animal productivity parameters at the end of six years, and the value of the difference in profits accruing to the farmer if the business remains operational after the sixth year (known as the Terminal Value). Table 6 presents this analysis for herd size.

Table 6. Net Present Value (NPV) with Program Investment and Herd Value (US\$)

	Antioquia	Nariño
NPV of Income Increase	9,034	3,702
NPV of Herd Value Increase	2,467	322
USAID Investment per Farm	5,000	5,870
Difference	6,501	(1,846)

Although some improvements can be made by improved genetics through selection and breeding with better bulls in Nariño, farmers cannot increase their herd size sufficiently to significantly increase the return to program investment due to the farm size constraint.

The concept of the Terminal Value of the business is based on the assumption that the business will continue beyond the period of time when all improvements are fully incorporated. This is a well-founded assumption for Nariño, where participants will remain in the small family dairy business due to tradition and lack of other viable alternatives, and for Antioquia, where participants will remain in the business due to having developed and annexed new areas to the existing milk sheds and having established sustainable market linkages for their dairy products. Using this approach, the stream of benefits considering the terminal value is presented in Table 7.

Table 7. Net Present Value (NPV) with Program Investment and Terminal Value (US\$)

	Antioquia	Nariño
NPV of Income Increase	9,034	3,702
Increase in Terminal Value of Business	16,814	4,612
Program Investment per Farm	5,000	5,870
Difference	20,848	2,444

When considering the Terminal Value of the business, it is clear that the investments made by USAID through the Dairy Alternative Development Program are clearly profitable beyond six years in Antioquia and marginally profitable in Nariño. The issue of benefits to eliminating illicit crops notwithstanding, the USAID investment in the dairy business over the long run appears to be a sound decision economically.

The increase in return from dairy activities for each dollar of resources invested by USAID through the program can be seen in Table 8. In Nariño there is less than one dollar generated per USAID dollar invested when only considering herd value and just \$1.42 generated per dollar when considering the terminal value of the business. In Antioquia, the returns are very respectable for the dairy business.

Table 8. Return on USAID Dollars Invested

	Antioquia	Nariño
Considering NPV of Income Increase Plus Herd Value Increase	2.30	0.69
Considering NPV of Income Increase and Terminal Value of Business	5.17	1.42

In order to compare different investment alternatives, the Internal Rate of Return of the program by region is presented in Table 9.

Table 9. Internal Rate of Return (%)

	Antioquia	Nariño
Minus USAID Investment	24.8	3.1
Plus Increase in Herd Value Minus USAID Investment	29.4	4.9
Plus Terminal Value Minus USAID Investment	52.2	23.6

Based on this analysis, it is clear that small dairy farmers in Nariño are unwilling to take bank loans at commercial interest rates of 13 percent to improve their dairy business, since they could not earn enough to repay the loans. But this is not the case for Antioquia.

It is obvious that farmers in Nariño participated in the program due to USAID investment, which helped them technologically improve their dairy operations, whereas they eliminated their illicit crops at little financial cost to themselves, complying with the social pressures in their communities.

When comparing hourly dairy net profits in Year One with other employment opportunities in Nariño, one can see in Table 10 that dairy provides at least 50 percent higher income than harvesting illicit crops, working as a rural day laborer, or employed as an urban laborer with a minimum wage.

Table 10. Comparable Income Alternatives in Nariño

Alternatives	%
(Hourly Dairy Net Profits w/Program)/(Hourly Rural Workday)	179.3
(Hourly Dairy Net Profits w/Program)/(Hourly Minimum Wage)	176.8
(Hourly Dairy Net Profits w/Program)/(Hourly Illicit Crop Harvesting)	161.3

In summary, this analysis strongly indicates the close-to-subsistence level of Nariño dairy farmers due to their very small plots of land on which to develop a profitable dairy enterprise. However, if the social costs of not investing in the small farmer and letting them continue poppy production are taken into account, USAID's economic return on investment is not as important as the elimination of illicit crops.

These farmers are also faced with few, if any, other viable income earning opportunities other than illicit crop production. Without the support of the Colombian government and international donors, they will be hard pressed to voluntarily eliminate their illicit crops in Nariño for purely economic reasons. The bottom line is that with larger farms and larger dairy herds, returns on investment will be greater, thereby ensuring the economic viability of dairy operations, as is the case in Antioquia but not in Nariño.

6. Lessons Learned

Based on 36 months of implementation of this Dairy Alternative Development Program by Land O'Lakes, the following are the principal lessons learned that can be applied to future activities:

- When an alternative development project is based on illicit crop eradication, other supporting activities (licit crop establishment, creation of producer associations, and establishment of milk collection centers) necessarily take place in subsequent stages with their speed of implementation depending on the rhythm of eradication. Alternatively, when the basis of the project is prevention, implementation is not constrained by eradication and can take place more rapidly.
- Convincing farmers to replace their principal source of income and participate in the benefits of an alternative development project is time consuming, labor intensive, and costly.
- Farmers are willing to eradicate their illicit crops if they perceive a good possibility of income substitution with licit alternatives and if supporting institutions promptly fulfill their commitments.
- Given the large quantity of risk capital and technical effort required to establish new dairy processing facilities and the difficulty of sustaining these enterprises in isolated illicit crop producing areas, it is more cost effective to focus efforts on strengthening existing dairy processing firms that have linkages to the target areas. This provides the following benefits:

- Sustainable sales contracts between established processors and program milk producers;
 - Increased opportunities for marketing and exports of program participant products by processors who are already in the market; and
 - Technical assistance and training of program beneficiaries by existing “partner” dairy processing firms.
- Adequate all-weather roads and strong government presence in violence-prone illicit crop producing areas are keys to attracting private productive investment (e.g., milk collection centers) and sustaining milk sheds in these areas. These conditions facilitate private sector market linkages for licit substitution crops that are important to ensure long-run sustainability of the alternative enterprise.
 - A solid monitoring and evaluation system that facilitates collection, analysis and presentation of reliable field information is key to responding in a timely manner to continual requests for information and demonstrating progress and results.
 - Farmers in the highlands of Nariño are faced with few, if any, other viable income earning opportunities other than illicit poppy production. Without the support of the Colombian government and international donors, they will be hard pressed to voluntarily eliminate their illicit crops based just on economic reasons. However, subsidized and/or donated resources can help these farmers capitalize and improve their operations while eliminating their illicit crops, thus preserving their family dairy operation.