B. MALAWI DAIRY BUSINESS DEVELOPMENT PROGRAM (MDBDP)

1. Funding Levels and Project Objectives

The Malawi Private Dairy Business Development Program cooperative agreement no. 690-A-00-99-00148 was first obligated by USAID at US$ 1.5 million for Phase I, and US$2.1 million for Phase II. The program is managed by Land O'Lakes, Inc. (LOL), with Phase I lasting from March 26, 1999 to March 25, 2001 and Phase II scheduled for March 26 2001 to March 25, 2003.

Project Goal: To stimulate the development of a viable commercial dairy sector that will result in significant increases in rural incomes, employment opportunities, and overall performance of businesses that will contribute to Malawi's GNP.

Project Purpose:

To facilitate improvements in the dairy sector resulting in efficient milk production, processing and distribution, such that producers, processors, and distributors increase their incomes and deliver lower cost, better quality dairy products to meet consumer demand.

Project Objectives:

- To continue technology transfer to producers and processors focusing on improving cost efficiencies, commercialization, and environmentally sustainable farm-to-market dairy systems;
- To strengthen private dairy industry associations capacities to provide milk consumption promotional and educational activities, policy reform dialogue with government officials, market information services; and,
- To leverage government, international donor assistance, project cost sharing to extend assistance to a broad base of dairy stakeholders, and thereby, generate significant cost-benefit to USAID's funding contribution.

Specific objectives included:

- Development of efficient milk producer organizations – 3 milk producer groups registered and functioning as cooperatives;
- Innovative dairy processing and marketing – 2 dairy operating businesses improved their operating and management procedures, increasing profit margins by 10 percent; and,
- Expansion of industry support services – establish 5 in-house extension services for dairy production and 5 in-house artificial insemination units.

2. Findings

a. Overview

Malawi's livestock population in 1999 was estimated at 712,000 cattle, 1,427,000 goats, 413,000 pigs, and 103,000 sheep. About 90 percent of the cattle in the country are Malawian Zebu. Only about 5.2 percent of the population of Malawi own cattle; however, smallholders own about 96

percent of all cattle in the country. The predominant dairy breeds in order of importance are Friesian-Zebu crosses and Friesians (Holstein). Apart from a small number of dairy estates, smallholder dairy production is concentrated in three milk sheds: Blantyre, Lilongwe, and Mzuzu; these farmers have about 6000 Friesian-Zebu crosses of various grades.

Dairy development dates back to the 1950s when Government began a program of producing Friesian-Zebu heifer crosses to distribute to smallholders with the goal of national self-sufficiency in milk production. Other efforts continued, including one with Canadian support which provided imported heifers and semen to parastatal dairy farms.

The results of past programs have been disappointing. By 1991, the national dairy herd was supplying only 17 percent of domestic milk consumption, milk consumption per capita was variously reported at 4 and 7 kg/year (in either case the lowest in the region) and livestock products contributed only 8.7 percent of the total protein supply in Malawi. In recent years, however, a number of positive developments have taken place, which set the stage for the development of a dairy industry. The parastatal processing company Malawi Dairy Industries has been privatized. Most parastatal dairy farms were allowed to fall idle and to go out of business. Despite their weaknesses and problems, a significant number of milk bulking groups (MBGs) exist and form the basis upon which a dairy development program could be established. There is some understanding of artificial insemination and of the role it could play. On the other hand, public extension services for dairy are minimal and have yet to be replaced by private sector providers. Value-added technology in the processing industry is also inadequate.

It is against this backdrop that USAID and its partner Land O'Lakes agreed to start the Malawi Dairy Business Development Program (MDBDP) to support producers, processors, and service providers and to develop a strong private dairy industry providing for the needs of consumers, raising income for farmers, and contributing to the national economic growth.

The project has three components:

1. The Development of Efficient Milk Producer Organizations to:

- Increase quality and quantity of milk production on dairy operations;
- Improve profitability and management of dairy businesses;
- Free-market primary society/cooperative development;
- Development of "umbrella" cooperative societies; and,
- Improve household food security and increased household purchasing power through intensification and diversification of production.

2. Innovative Dairy Processing and Marketing that provides for:

- Business and market plan development;
- Self-financing of business start-up or expansion;
- New product and packaging development; cottage industry, and medium-scale processing;
- Marketing and promotion;
- Quality control;
- Financial management and accounting practices; and,

- Operational efficiencies and human resource development.

3. The Expansion of Industry Support Services to provide for:

- Development of private artificial insemination services;
- Availability of private dairy production services and inputs leading to improved technology transfer;
- Increased economic and leadership opportunities for women;
- Active dairy associations in dairy policy, promotion, and industry support;
- Increased numbers of young dairy farmers in the agricultural sector; and,
- Improved environmental management in production and processing.

To achieve these objectives, Land O'Lakes worked with milk bulking groups, processors, and service providers. It also did advocacy work on behalf of farmers and processors. The project worked in the three major milk sheds: Northern (Mzuzu region) with the Mzuzu Dairy Farmers Association (MDFA), Central (Lilongwe region) with the Central Region Milk Producers Association (CREMPA), and, to a lesser extent, in the south with the Shire Highlands Milk Producers Association (SHMPA). Given the biological parameters of milk cows, time is a major component in the development of the dairy industry. Many of the efforts of the project and of individual dairy farmers will only bear fruit long after the project has finished.
By the end of the first phase, Land O'Lakes noted in its Phase II proposal that it had worked with:

- Twelve milk bulking groups to strengthen the organizations composed of nearly 4,000 dairy farmers;
- Four large processors and six mini-dairies in business skills training to increase profitability;
- Private artificial insemination services that had been launched with the support of World-Wide Sires (WWS);
- The financial sector for loans to the industry; and,
- A national dairy industry association, Malawi Dairy Stakeholders Association (MDSA), was formed and work was in progress on improving the legal and organizational status of the national processors association.

After the first phase of the project, Millennium Consulting Group did a survey for Land O'Lakes in July 2001, which provided the following findings:

- Purebred milk cows were found only on large-scale dairy farms and on a very few small farms;
- Small farmers who had succeeded in obtaining pure or nearly purebred cows, had suffered losses due to mortality resulting from poor management;
- On average farmers had only two cows that they were milking;
- Artificial insemination (AI) services provided by LOL were preferred to those of other providers;
- Thirty-two calves had been born at the time of the survey and none had died; low calf mortality (compared to a national average over 30 percent mortality) is an indication that farmers take care in rearing calves produced by AI; and,

- All Milk Bulking groups surveyed (except one) experienced significant growth in their membership during the time that the project was operating; the one exception is a group where members dropped out because they found side-selling of raw milk outside the MBG (called "vending") to be more lucrative. There was a 51 percent increase in membership for all groups (and a115 percent increase, if the group where vending became important is excluded).

A number of problems were noted in the survey. There was considerable dissatisfaction with milk prices paid by the processor, and with his discounts for transportation, and payment delays. Other problems identified were: a lack of cows and a lack of a loan scheme to purchase them, low milk yield, lack of security (cattle theft), loss of milk from souring due to an inability to cool (lack of diesel fuel), and the high cost of veterinary drugs.

b. Production Increases

Land O'Lakes has assisted farmers with improving their pasture, provided them with better designs appropriate to their resources for the housing of cattle, assistance in improving security to minimize theft; it provided artificial insemination services through its partnership with World Wide Sires to improve the dairy herd in the long term, taught local farmers how to provide AI services, provided assistance to improve veterinary care, and partnered with Citizens Network for Foreign Affairs through an inventory credit guarantee of 50 percent, in order to improve the availability of veterinary medicine, feed and, other dairy supplies.

The project has increased the availability of purebred cattle through imports. It is working with the Irish NGO Bothar, the Heifer Project International (HPI) and with the Small Scale Livestock Promotion Program (SSLPP) to import pure bred in-calf heifers from Ireland donated by Irish farmers. Three plane loads of animals have been imported; two of the three have been enormously successful, although there were problems with one plane load, due to the failure of pressurization equipment on the aircraft the cattle were traveling in, and the suffocation of most of the heifers. The EU, Oxfam, and DANIDA, all have provided additional funding for heifer loan programs for women and for the poorest rural households.

Land O'Lakes is also working with the Malawi Social Action Fund (MASAF) that is proposing to form 25 groups to help orphans and other disadvantaged and vulnerable people enter the dairy production field. Most of the members of these groups are women. Each group receives between MK500,000 and 700,000. This is a relatively new program and its success has yet to be proven. As the Malawi Dairy Business Development Program (MDBDP) noted, the design of the program is deficient and it is not likely to succeed. In view of this problem and of past problems encountered by other Malawi Social Action Fund (MASAF) projects, such as its food-for-work program in Balaka district -- this collaborative effort needs to be monitored closely.
There is also a cooperation agreement between MDBDP and the Southern Africa Regional Crops Research Network (SARRNET) on cassava silage. About 80 percent of the mass of the silo is constructed from leaves of closely planted cassava (30 cm spacing) that is harvested four times a year. Roots are sliced mechanically (using a manual or motorized slicer) and added in a one to four proportion. Given the increased price of cassava (which closely follows the price of maize), there is a need for careful cost analysis in the use of cassava as animal feed, rather than for direct human consumption.

As a result of the support received from Land O'Lakes, milk yield, which is based on the 1999 national average of 4.5 liters per cow per day, increased by twenty percent to 5.4 liters. Some individual farmers reported spectacular increases, attributable to better management practices learned through their interaction with the project, and also attributable to the acquisition of a better quality of animals.

Dairy is potentially a highly profitable activity, as evidenced by the fact that in recent years, with the decline in the price of tobacco, some of NASFAM's farmers have approached the Dairy Development project in order for them to be able to convert or expand into dairy production. By increasing the number of farmers involved in dairy production, the Malawi Dairy Business Development Program (MDBDP) is helping these farmers increase their incomes, which increases family food security by their ability to buy food when they need it. Also, based on reports, dairy farmers' families consume about 12 percent of the milk they produce, equivalent to about 1 liter per family per day. Therefore, as a direct contribution to family nutrition, milk is important. The implication of this analysis is that the quickest way to increase income and nutrition/food security would be to purchase cows for families that do not have them -- which is one of the strategies being proposed by the project.

c. Producer Groups, their Legal Status, and Other Group Issues

Groups have been re-formed around cooling centers established by government in the past. These centers were supposed to be within 8 kilometers of all dairy farmers. Many of the cooling centers had fallen into disrepair and the groups associated with them were inoperative. This equipment has been repaired and the groups have again been formed with the help of LOL. Two of the groups in the Northern region now have legal status, after having registered as cooperatives. The others are not legally recognized yet. Work is continuing with the Milk Bulking Groups, as well as with the three regional associations, which work closely with the project.

Governance issues have surfaced in a number of groups where elected officials were not transparent in their running of the MBGs and failed to properly account for funds. The project works with groups to improve both transparency and accountability. In some cases, where leaders were not adequately representing the groups, these leaders have been able to convince members to have new elections. Both MBGs and associations are assisted to develop their own strategic plans. Considerable assistance also is being provided in basic accounting and record-keeping skills.

A number of volunteers from the Volunteer Service Organization (VSO), Canada, and other organizations have been working with the project. For the most part, their work has contributed to project success. Their presence acts as a catalyst for obtaining external funding for the groups that they are working with. They work most closely on issues related to improving the management of the MBGs and the associations. Milk quality is also improving where equipment at cooling centers has been repaired; as a result of better organization of the MBGs, this equipment remains operational for a higher percentage of time, leading to less milk spoilage.

The MBGs, with support from the program, have been lending maize bran, as dairy feed, to members, as well as medicines and semen. Initially problems developed due to the lack of a loan contract, an unclear loan recovery system, and the failure to specify applicable interest rates.

These problems have been overcome and loan repayment is now made through deductions from the milk payment; however, even this approach has had its problems, which have not been limited to the periods of the year when farmers' cows are dry. There is no loan program for the purchase of cows (except for the HPI in-kind heifer loans).

With the help of the project, farmers have also formed livestock associations to prevent theft, usually chaired by the village headman. In order to transit with animals in an area, people need a permit from the association signed by the village headman. Theft, which used to be rampant in the Lower Shire and west of Lilongwe, has been much reduced. Most stolen cattle are sold to small-scale butchers. Animals are not branded in Malawi; ear tags (like so many other dairy supplies) are also not available in the market.

Milk production in Blantyre is facilitated by the high percentage of enterprises that are using agro-industrial by-products for feed, such as molasses and brewers' grain and not grazing. A good data base system that tracks production and other variables has been established with the assistance of the MDBDP monitoring and evaluation (M&E) staff. There was considerable farmer satisfaction with the AI program and the quality of the calves resulting from it.

The gender breakdown of membership in the groups averages about two thirds male, one third female. The project received a copy of a recent Master's thesis in Animal Science (Revesai, December 2002) whose major conclusions are: 1) that gender was a determining factor on income -- with women farmers earning more than men; 2) that dairy farmers growing tobacco had significantly lower incomes from their dairy operations than those who did not; and, 3) that the optimal genotype cattle for smallholder dairy farming is the 50 percent Friesian, 50 percent Zebu (the cross resulting from AI practiced on local cattle). In other words, women do better at dairying than men; farmers concentrating on dairying as their main activity do better than those who do not, and the best cross of cattle for smallholder dairy farming is achieved by artificially inseminating local cattle.

Discussions have already been held with the Malawi Union of Savings and Credit Cooperatives (MUSCCO) concerning the possibility of establishing exclusively dairy farmer common bond savings and credit cooperative societies (SACCOs) in the Northern and the Central regions. Minimum requirements would be 500 members and a minimum total share capital of MK 1 million ($12,500).

d. Innovative Dairy Processing and Marketing

The Mzuzu plant was inspected by LOL consultants who concluded that most of its equipment was beyond repair and needed to be replaced. Equipment needing to be replaced included the separator, the homogenizer, and the pasteurizer. The plant owner is gradually replacing these items as funds become available. Most replacements are in the form of used equipment in good repair from other countries. (At one point, financing was found with INDEFUND for farmers to purchase the plant; however, their organization was not ready for such an ambitious step at this stage in its development.)

A mini-plant ("Juda Dairy") was established, but at the time of field work (early December 2002) was not operating, due to lack of financing for equipment, vehicles, and working capital. Financing was sought from INDEFUND, but no response was given to the owner's loan

application. Thus, there is still only one processor buying milk in Mzuzu, despite demand that exceeds supply from both the local market and from the export market serving Tanzania and eastern Mozambique.

Overall, processing capacity is underutilized in the industry. This situation makes it difficult to find investors interested in making investments in new plant and equipment. One partnership involving the Electoral Commission, which invested MK 2.0 million, broke down.

Volunteer experts have been brought in by LOL to analyze business accounting and management information systems at dairies in Mzuzu and Lilongwe; these experts concluded that there was a correlation between the use of raw (as opposed to powdered) milk and profitability, and that systems could be developed to pay producers better prices (thus discouraging vending).

The MDBDP has also brought in dairy equipment suppliers from overseas and helped to broker deals with local dairies, including one in Blantyre with an equipment supplier from Holland. Hygiene audits at MBGs and at dairies are conducted periodically to improve milk quality and the care with which the product is handled. These are part of an overall strategy to improve the quality of processed milk.

e. Expansion of Industry Support Services

For artificial insemination purposes, Land O'Lakes is in partnership with World Wide Sires. After training 32 farmers in AI techniques (despite skepticism from the Government), technicians have basic knowledge on improved genetics; they now know how to detect heat, and how to inseminate. Farmers are achieving conception rates on the order of 70 percent, and they prefer the World Wide Sires service to other AI services, which are provided at low cost (MK 25) compared to WWS' price which is ten times that figure, or more (depending on the quality of the sire); the WWS service is preferred because of a known quality of animal and better conception rates with frozen semen. (Other programs work with non-frozen semen, and results are correspondingly poorer.) Initial problems with getting liquid nitrogen to keep the semen frozen have apparently been overcome. Over 500 calves have been born as a result of the AI program, and the overall mortality is only eight percent (well below the national average, which is in excess of 30 percent).

Various types of supplies are needed by the dairy industry, and a good part of these are unavailable. For example, no amino or salt blocks are sold anywhere in Malawi. Competition in veterinary medicines is limited, and in many parts of the country these supplies are not available. Veterinary medicines have to be imported only to a licensed veterinarian, thereby limiting the ability of non-veterinarians (evenly properly advised ones) to import products. At present, two veterinary health models are being followed in the country: the model developed by German Technical Assistance (GTZ) in the North, and that of the EU/SADC working with veterinary assistants in the center and south. Support has also been obtained from the Japanese International Cooperation Agency (JICA) for expanding the breeding of dairy animals at Katete farm, which was formerly owned by the Government and is now privatized.

f. Project Issues Requiring Further Attention

As an industry wide dairy development program, the Malawi Dairy Business Development Program (MDBDP) has a number of internal contradictions that remain unresolved. The first is the price of milk paid by the processors to the farmers. There is a long history going back to the time when all processing was controlled by the parastatal Malawi Dairy Industries (MDI) by keeping milk prices fixed over long periods of time and only adjusting them late, reluctantly, and by as little as possible. With most of the population located in rural areas and with many dairy farms located in close proximity to urban areas or trading centers, farmers often have the option of "vending," that is selling raw milk at higher profit and lower cost directly to consumers. Under Malawian law, this is illegal. Still from the farmer's point of view, this is the most reasonable option for the sale of part or all of their milk during the entire year, or at least part of it. (There is considerable seasonal variation in milk production, providing farmers a strong incentive to vend their milk to bicycle traders and directly to consumers at times of the year when supplies are short).

If the only focus of the program were on raising producer incomes and getting milk cheaply to consumers -- supporting milk vending by farmers would be an option worth investigating. However, since the focus of the program is also promoting the dairy industry and increased milk production (most of which will have to be marketed through MBGs to the processing industry), MDBDP is forced to discourage vending. Furthermore, project personnel are unable to obtain accurate assessments of the volume of milk sold through vending, because members are reluctant to report outside milk sales, for fear of expulsion from the MBGs. (Most MBG by-laws prohibit members from vending milk.) Production is seasonal and the months of lowest production are between February and April. Part of the reduction in milk production may be due to the failure to report milk vended outside the MBG -- since these are the lean months for the family budget and daily sales for quick cash may seem more appealing than waiting a month for the milk payment from the processor.

Distributional issues also arise. The most efficient producers are likely to be the larger ones, whose income levels may be significantly higher than poorer members, especially those who do not have genetically improved dairy animals. These producers also are more likely to have crossbred cows that can easily produce on average over 10 liters of milk per day (compared to 2 liters at best for local Zebu cows). Therefore, the quickest way to increase the volumes of production is to work with these producers rather than with the smaller ones.

Also, if the volume of milk is of interest, the fastest way to raise production is by importing purebred in-calf heifers. This is being done with the support of Bothar, Heifer Project International (HPI), and the Small Scale Livestock Promotion Program (SSLPP) in a pass-it-on livestock loan scheme. If these heifers are to survive and to give birth to calves, the best candidates for receiving them are the larger farmers whose management tends to be better. If this is done, then income distribution within the community becomes even more skewed. If, on the other hand, the heifers are passed on to people without cows (and thus most probably without experience in managing them), there is a good chance that they will die; heifers are worth $1000 in Ireland or in neighboring Zimbabwe, not counting transportation costs (air fare in the case of the Bothar/HPI program).

Moreover, in-kind animal loan schemes are also problematic because of the biological delay in payment, compared to the short lifespan of most projects. An in-calf heifer will give birth approximately 5 or 6 months after arrival; if the calf is female, it is turned over to the next participant when it is one year old. If it is male, the first turnover is after the next calf is born, the following year, assuming that this calf is female. Since normally half the calves are male and the other half female, the average delay in turnover is two years, equal to the lifespan of Phase II of the project. (In Mzuzu, the association has encouraged farmers to replace in-kind with cash repayments when a sequence of male calves is born.) The in-kind animal loan scheme can, in theory, continue without the project, but only if the group is solid, well organized, and cohesive. Given simple transparency and governance issues which have already emerged in a number of groups, it is apparent that at the present stage of their development, most groups have not achieved the level of maturity necessary to operate the in-kind loan schemes, without outside monitoring from the project.

g. Monitoring and Evaluation

Subcontracting out the monitoring and evaluation component of the project during Phase I to a local company proved unsatisfactory, and in Phase II a monitoring and evaluation staff has been hired by LOL to carry out that function in-house. The quality of reporting and problem analysis is much improved as a result.

The indicators for the results expected of the project do not coincide with those that would quantify a well-running dairy development program. For example, artificial insemination is the cheapest way to increase the average quality of a dairy herd. Therefore, the number of crossbred calves produced by artificial insemination should be a major indicator of program success. Half of the calves will become relatively high-yielding dairy cows adapted to the Malawian dairy environment and are the real product of the program. The mortality rate of the calves is also an important indicator. Also, where purebred cows are being imported, one would want some indicator of the survival rate; management capacity of most farmers is not highly developed and therefore, one would expect some losses of these expensive assets due to this situation. Many of the indicators selected for monitoring program results are short-term in nature, and have little to do with measuring the real development of a viable dairy industry development program.

The presentation in some of the monthly and quarterly reports could be improved. For example, in many cases, totals are absent in the monthly reports. In the quarterly report, total amounts of raw milk going for processing are being provided; percent utilization of capacity is not. Some reports provide time-series data on milk prices in nominal terms; these need to be deflated for inflation in order to find out if farmers are winning or losing over time.

3. Conclusions

The program has been successful in increasing milk production and sales through MBGs and in stimulating interest in dairy production. Potential interest is increased by falling prices for tobacco. The program has also stimulated a high degree of interest in dairy farming. However, a long-term effort will be required to meet the expectations that have been created.

The artificial insemination program has achieved a high rate of pregnancy and has given farmers calves that are adapted to the environment and to the prevailing level of management. These

calves are surviving at a very high rate (compared with the national average). Fifty-two percent of the cows in the Lilongwe region are zebu, making the AI program the best choice; in Mzuzu, the percentage of such cows is only 7 percent.

Assisting potential members who are interested in dairy production but own no cows can best be stimulated by a combination of purchasing local Zebu cattle and by artificially inseminating them to produce crosses which combine vigor with reasonably high levels of milk production; this is the best way for a long-term development program to reach large numbers of participants at reasonable costs.

Women tend to have fewer outside interests (such as tobacco and other cash crops) and do a generally better job in managing milk cows. Women constitute a high percentage of potential members and are willing to take the time and effort necessary to start up dairy production based on local cows and artificial insemination.

The lack of competition in the dairy processing industry gives processors an unfair edge in setting milk prices at low levels and in failing to raise producer prices to MBGs for extended periods of time, despite increases in retail prices to consumers. Thus far, program efforts have not succeeded in fully addressing this issue and in offsetting farmers' natural tendency to sell all or part of their milk in raw form without processing (except for dilution with water) to bicycle traders for sale to final consumers, with the attendant health risks. Until competition is increased in the dairy processing industry, the program needs to accept this situation and to deal with it more forthrightly in its promotion efforts with members -- which at present consist of coercive measures applied to those engaged in vending. Where dairy farms are located in close proximity to urban areas and where rural demand among neighboring families and in the trading centers is significant, vending will continue to occur and needs to be analyzed and dealt with as part of the development of the dairy industry.

Through the advocacy work of the project, the 20 percent surtax on dairy products was successfully removed and is a major accomplishment early in the program.

Through its imports of cows, the Malawi Social Action Fund (MASAF) is becoming a major player affecting the development of the dairy sector. Its approach is heavily flawed and MDBDP needs to assess how best to collaborate with the MASAF scheme, without compromising its own integrity and its methodology of supporting individual dairy farmers through milk bulking groups. The MDBDP approach has a far greater probability of success and should not be tied in with the MASAF scheme that has a high probability of failure.

A number of donors (not USAID) are supporting the importation of purebred dairy cows and MDBDP is collaborating with these programs, providing cows to members with experience in dairy farming and in caring for dairy cows. Such programs are expensive and therefore do not lend themselves to large-scale activities, but can contribute to increasing milk production and income to farmers receiving such cows. Distributional aspects of the program appear to be limited, at least initially, and bear watching.

Many of the programs are in-kind animal loans, with the recipient being obligated to pass on the first female calf to another farmer. Such programs generally work only as long as outside

supervision is in place; providing such external support is one justification for making dairy development programs such as MDBDP, long- rather than short-term endeavors.

MDBDP supports credit programs to allow members to buy feed, veterinary drugs and other inputs. These programs suffer from problems of poor design, inadequate systems and poor implementation.

4. Recommendations

Recommendation 1

The main thrust of the program should be on improving the average quality of the milk herd by artificial insemination, rather than by purchasing animals. The focus should be on maximizing the number of participants in dairy farming, particularly by women farmers, who should be encouraged to start with local cattle, breed them up through AI, and develop their production over the medium- and long-term, based on 50 percent (and gradually higher) crosses of Friesian genotypes.

Recommendation 2

Where animals are donated to farmers, either as straight donations or in-kind credit programs, the distributional aspects of these donations/loans need to be looked at carefully. Major assets of this type can skew income distribution within a community even more than is already the case -- either in the first round or in subsequent rounds of distribution. Notwithstanding the need to focus on AI, where there are programs that provide such cows, the project should take advantage of them and try to channel the animals to low income beneficiaries with the experience needed to manage them properly.

Recommendation 3

Long-term oversight will be necessary for assuring that agreements of in-kind animal loan programs designed to pass on female calves, are in fact respected. The best guarantee that they will be respected is to make support to the dairy industry by MDBDP into a long-term activity with support from USAID; even if other donors finance the animal loans themselves.

Recommendation 4

The program needs to reconsider its exclusive focus on selling milk through the MBG and to come to some accommodation which recognizes farmers' need for quick cash and the opportunities offered by the raw milk market.

Recommendation 5

The project should encourage greater competition in the dairy processing industry by supporting new entrants into processing. The current support limited to training and study tours given new entrants is insufficient and needs to be increased. MDBDP needs to help new entrants find financing to establish and expand their operations. While supporting technological

improvements and greater efficiency for current processors, MDBDP needs to support increased competition by stimulating new processors to enter the industry.

Recommendation 6

The project should first study, then come up with a position in concert with members, with respect to liberalizing trade in veterinary drugs and supplies.

Recommendation 7

Any credit programs and loan procedures (including in-kind loans of purebred cows) need to be reviewed and amended by someone with expertise in credit. Credit programs for feed, drugs, etc. need to be reviewed and improved, both in terms of their design and in the way they operate.

Recommendation 8

All proposed activities or subprograms should be subjected to an economic and financial analysis before any significant investment is made in them. For example, silage can be produced from cassava. However, is it profitable? Under what situations is it profitable? Are there alterative uses of the cassava, which are more profitable? Work on improved financial analysis is required, both at the level of studies for MDBDP and training for its staff, as well as in training farmers on record-keeping and in the use of records to improve the management of their dairy operations.

Recommendation 9

The reestablishment of Government breeding farms to stock smallholder dairies is not the way to proceed. Animals can be acquired slowly from local estates or imported from neighboring countries. However, the main source of improved dairy animals should be through offspring resulting from AI promoted by the program.

Recommendation 10

A study should be commissioned of the market for milk vending, to establish how vending works, how prevalent it is, what opportunities it presents for farmers, what threat, if any, it represents to consumers, and the degree of competition it introduces into the milk market. The study should establish what the situation really is and abandon the legalistic approach of how it should be.

5. Lessons Learned

- Dairy development programs take longer because of the biological growth rate of cattle which is slow, nine months to calving, three years to sexual maturity, etc. Therefore, dairy development programs like this one should ideally be established as programs lasting at least five years. Such a time-frame makes it easier to focus on the elements likely to lead to successful long term development, improving the average level of breed by AI, improving management gradually, improving processing capability, etc. Shorter time frames require program managers to focus on "success" indicators that may or may not be those which really relate to the development of a viable dairy industry.

- The lack of competition at the processing industry level will retard dairy development, unless it is dealt with appropriately. Improving farmer milk prices has to be a major focus of dairy development for a program to be successful.