

**UNITED STATES AGENCY FOR  
INTERNATIONAL DEVELOPMENT**

**UNIVERSITY DEVELOPMENT LINKAGES PROJECT (UDLP)**

Submitted to A I D Project Officer

by

Helen Swartz, William Boylan,  
James Nordstrom, Sonia Patten, Leonard Kamwanja

**ANNUAL REPORT**

**IMPROVING THE HEALTH AND NUTRITIONAL WELL-BEING OF  
INFANTS AND CHILDREN IN MALAWI THROUGH INCREASING  
MILK AND MEAT PRODUCTION**

Covering Period October 1, 1996 to September 30, 1997

**AWARDEES**

Lincoln University, Jefferson City, Missouri (Lead)  
University of Minnesota, St Paul, Minnesota  
Bunda College, University of Malawi, Lilongwe

**SUBMITTED THROUGH**

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**OBJECTIVES**

**ANNUAL REPORT**  
**OCTOBER 1, 1996 TO SEPTEMBER 30, 1997**

**Improving the Health and Nutritional Well-Being of Infants and Children in Malawi Through Increasing Milk and Meat production of Small Ruminants**

***OBJECTIVE 1. Develop a data base on the production and biological of small ruminants with special emphasis on goats***

**Description of Activities for Objective 1**

- o Dr Sonia Patten of the University of Minnesota visited the UDLP in Malawi from November 6, 1996 to November 17, 1996 She met with faculty members at Bunda College who are associated with the project These individuals are Dr James Banda, Dr Leonard Kamwanja, Dr William Mfitlodze, Dr Richard Phoya, Dr Beatrice Mtimumi, Dr Mercy Ngwira and Dr George K Phiri, Dean of the College Dr Phoya has been named head of the Department of Animal Science, the position formerly held by Dr Leonard Kamwanja, now Vice-Principal of Bunda College Dr Patten in concert with the Bunda faculty developed a Proposed Plan of Work (Attachment A) for the Malawi UDLP January 1 - September 30, 1997
  
- o Workshops were held throughout the year in Malawi to share information about goat milk and soya bean production and utilization with village participants A workshop was held in June of 1997 at Mangochi, Malawi Organizers of the workshop held at Mangochi were faculty at Bunda College of Agriculture who are UDLP co-investigators Also attending the workshop were government officials, students, support staff at Bunda College, four faculty and four students from Lincoln University Prior to the opening of the workshop, characterization of the local goats, imported Saanen and Damascus goats and the crossbreeds at the Sakhula Farm on campus were discussed (Objective 1 of the project) Dr James Banda described the goat research being conducted at the station, which included the USAID/UDLP project The workshop commenced at a resort in Mangochi, Malawi the next day The welcome was given by Dr Leonard Kamwanja on behalf of Dr Kasomekera, Principal of Bunda College of Agriculture and by Dr Helen A Swartz, LU The first part of the workshop was devoted to Objective 1 of the project (Appendix A) Reports were given by Dr James Banda, Dr Leonard

Kamwanja, Dr George K Phiri, and Dr Richard Phoya on the goat research and health portion of Objective 1

**Description of the Progress Toward Completion of Objective 1**

- o The breeding season began on September 15, 1995 and ended October 9, 1996 for this set of does. The summary of the kidding is in the following table

**Table 1** Reproduction results of the 1995-96 breeding season

GROUP		SERVICE		NO		KIDS		
NO	MALE	FEMALE	1ST	2ND	JOINED	KIDDED	NO	SEX
1	LL	LL	5	1	8	5	6	3M3F
2	DD	LL	2	0	7	3	3	1M2F
3	SS	LL	13	0	16	9	13	9M4F

The following new breeding groups have been formed on the bucks and does available next breeding season

**Table 2** Summary of breeding groups for 1996-97 breeding season

BREEDING GROUP		NO OF FEMALES			
NO	MALE	FEMALE	JOINED	1ST SERVICE	2ND SERVICE
1	LL	LL	4	4	
2	DD	LL	6	6	
3	SL	SL + LL	5	5	

The breeding this year is the fifth during the course of the project. The small number of females this year is because of the goat distribution to the villages, leaving only a small number at the station. As a result, Dr James Banda has embarked on new goat doe purchases for both the station breeding program (Objective 1) and distribution to the villages (Objective 3). He needs 50-70 goats for the station and 56 goats for the villages. The average cost of goats is now K450 (US \$30).

The lactation data are still being summarized for station goats. Once completed, the analyses of the data will be done in conjunction with Mrs Fanny Chilera and

Dr James Banda A B Sc student, Mr Kaonda, has been allocated a project to study differences in lactation persistence between/among the various breeds He is supervised by Dr James Banda Another B Sc student, D P Kaunda, was allocated a project to study 16 occurrences of nematode parasites in 16 Local goats and its F1 crosses with 16 Saanens, Damascus and Boers This fiscal year, project faculty have looked at effects of four different treatments for feeding trials, using local goats and crosses, and slaughter weights have been compared Comparison of meat quality cannot occur until all of the necessary abattoir equipment is purchased

### **Problems or Barriers Affecting the Progress Toward Achieving the Linkage Objective 1**

The comparison of the Local goats to three exotic breeds will not be attainable due to the loss of the original breeding stock with the exception of one Damascus buck The reduction in funding in FY96 resulted in cutbacks that hampered purchase of replacement goats The original goats were lost to disease and poor management Changes in faculty due to the death of Dr Peter Makhambera, a quantitative geneticist, also slowed down the data collection of Objective 1

Internal parasites are a major health problem for all of the goats, this true for many geographical areas throughout the world that are not arid land Fecal egg counts have been accomplished by one of Dr Mfitlodze's students (Dr Mfitlodze is the faculty veterinarian at Bunda College) This project compares nematode egg count, anemic condition of the goats and body condition scores of the goats The animals need early treatment to control internal parasites as an ongoing management practice The rainy season presents the most problems, from mid-November through March The greatest number of losses occur during this period Some research has been done on infestation levels in the pasture and how this relates to levels of infestation in the goats It has been established that treatment of Local goats during the dry season reduces infestation during the rainy season This needs to be further researched with the crosses Pasture infestation approximates zero from July to the first rains, as is seen in other dry climates Three days after the rains begin, pasture infestation starts to rise Therefore, if the goats are free of internal parasites at the beginning of the rainy season, perhaps the cycle can be broken and no parasite eggs will be passed from feces to the ground to hatch and cause infestation of goats One or two treatments in the dry season would alleviate the need for three-to-five treatments during the wet season and cut down on the cost of anthelmintic and labor

Poor management and changes in personnel at the experiment station has been a problem Added support staff with the reinstatement of full funding will help and an extension of one year to help us compensate for the effects of the partial loss

of funding during FY96 should allow us to complete Objective 1 in FY98  
Additional support staff to collect data on village goats must be identified and recruited immediately

### **Progress Toward Ensuring the Sustainability of Linkage Objective 1**

Bunda project faculty and staff will visit a CRSP and Nutribusiness UDLP project in Nairobi at some point in the future. One objective of this visit is to network and explore the possibilities for a collaborative grant proposal to assure sustainability for the various related efforts in the region. A proposal to support Objective 1 was submitted October 1, 1997 to A P Green Foundation in Mexico, MO, USA to provide funds for embryo transfer (ET) research at the experiment station to be conducted by Dr Leonard Kamwanja and a graduate student. Since we cannot ship goats from the United States, Europe or Cyprus due to the change in policy of the air carrier in France, the only carrier that would transport goats, ET will provide dairy goat breeding stock. We can bring in frozen embryos from superior breeding stock and place in recipient does to develop an extensive data base on the production and biological characteristics of exotic dairy goats compared to Local goats and crosses.

### **Quantitative Outputs of the Objective 1 Linkage Activities**

- o Papers and reports which have been produced recently from the work described above, will be given at appropriate meetings. Bunda faculty are planning to pool project data on Local X Saanen crosses with comparable data available from Zimbabwe and Zambia in order to achieve statistically significant data analysis. No work on the Damascus X Local crosses is being done anywhere else in the region, so it will take a longer period of time and some embryo transfers to make significant comparisons for publication. Papers will be presented at appropriate professional meetings in the near future.

### ***OBJECTIVE 2 Implement Demonstration and Extension Programs for Goat Husbandry***

#### **Description of Activities For Objective 2**

- o At the workshop held in June at Mangochi, committees were formed to review the manuals produced earlier in the project. One manual is on nutrition and the other is on Dairy Goat Husbandry. Recommendations by the committee members were made at the workshop. The objective of these committees is to distribute the most updated manuals to Extension workers, to be applied in the villages.

## Description of the Progress Toward Completion of Objective 2

- o Two committees were formed at the workshop consisting of faculty from Bunda College, Lincoln University, Extension workers, Village Chiefs and Government workers. The recommendations from the committee for the nutrition manual are noted below.

### **Recommendations for the Nutrition Manual**

- A
  - a) To update the background information in the manual
  - b) Inclusion of basic information on soybean analysis and value
  - c) Inclusion of information on the preference rating of the different soybean products
  - d) Inclusion of pictures, and the cover should carry a picture of a mother and child/Extension worker
  - e) The title of the manual should be changed to reflect the soybean component as well as the goat milk nutrition. The recommended title was "Food and Nutrition Manual for Promoting the Utilization of Goat Milk and Soybean in the Home"
  - f) Production of a supplementary manual for the users of information
  
- B. **Pictorial manual for the village women**
  - a) The pictures should depict food processing and preparation e.g. soybeans in a plate - boiling pot - hand dropping the soybean into the boiling water - dried decotified soybeans  
  
Dried soybeans taken to a mill - soybean preparation - a mother feeding a baby
  - b) A goat milked - goat milk boiling on the fire - mother feeding baby
  - c) Father/Mother  
Goat milk/malnourished baby - Goat milk fed healthy baby
  - d) Grandparent  
Goat milk/malnourished baby - Goat milk fed healthy baby

## **C. Computer Software**

- a) Scanning software and scanner
- b) Word processing software (any type of software)

## **PLAN OF ACTION**

<u>Activity</u>	<u>Time</u>
Updating nutrition manual	31st of July 1997
Pictorial material preparation	December 1997
Workshops	1998

### **Proposed Workshops**

- Two workshops for the new village
- Two workshops for Mlewa and Mlubzya (one each)
- One workshop for all Extension Workers
- Three workshops for Group Leaders

## **D. Review of Manual for Goat Husbandry**

The committee agreed to receive the manuals for review and noted that no information on artificial insemination was included in the original manual

A review Committee was formed comprised of the following individuals

- Mr M A Mphepo
- Dr M W Mfritlodze
- Dr N Gondwe
- Mr Q Mvula
- Mr W C Chimombo
- Dr D G Simango
- Mr C P A Chiutsi

## **PLAN OF ACTION**

June 20, 1997  
June 27, 1997

Hard copies and illustration distribution  
Review Meeting + Budgeting

It was noted that clearance from the Government to release Extension literature from Bunda College is not a problem. Dr James Banda and Mr M Mphepo are to seek clearance from PS Agriculture

It was agreed that the committee should simply design and the insert pictures in the manual and also translate into local vernacular

### **Workshops and Visits**

- a) The committee agreed to have workshops on artificial insemination (AI) and goat management but agreed that July was too early
- b) Leadership Training for Trainers should be planned (including committee members)
- c) Upgrading of recipients to be organized
- d) Formation of Farmers' Committee's and Village Committee's are very important. Mr Chimombo and Mrs Phekanı are to coordinate this effort. A notice for the meeting should be posted on June 24, 1997 and the meeting to establish the committee should be held on June 27, 1997 (morning hours)

Later, during the discussion, it was noted that committees have been formed but guidelines have not been established. There is a need to draw up terms of reference and train the members in workshops through pamphlets, research information and newsletters

At the moment none of these are available and information is being gathered for distribution

### **Problems or Barriers Affecting the Progress Toward Achieving Linkage Objective 2**

- o The reduction in funding of the project in FY96 resulted in the inability to hire someone to complete the figures and drawings in the goat husbandry manual. This has caused delays in reviewing the manuals and updating them from the initial drafts. With the original funding being reinstated, the manuals are now being updated and should be ready for publication shortly

### **Quantitative Outputs of Objective 2 Linkage Activities**

- o Two manuals are in draft form and materials are being used on campus for teaching. The precise format for the manuals may use a folder approach, with clearly demarcated sections for particular content areas. These would be loose-leaf folders so that updated materials could be easily added. Consideration will be given to creating single sheets of pictorial instructions and laminating them. Instructions for all aspects of goat management, milk handling and utilization, soybean processing and inclusion in recipes and nutritional information for families will be provided. Proceedings from the workshops held with the village women have been incorporated into the manual for extension workers which the Home Economics/Human Nutrition faculty have prepared. New national data from the recent National Statistical Study was available in December. Faculty will incorporate the current comparative data into the manual and then submit it to the National Food and Nutrition Committee for clearance for release. Once finalized in this way, the manual will be translated into the indigenous language.

### **Progress Toward Ensuring the Sustainability of Linkage Objective 2**

- o There will continue to be a need for literature for extension workers and students at Bunda College in English and indigenous language. A proposal for conducting a socioeconomic evaluation of the project's impact in the pilot villages and the effect Education has had on the nutrition, health and well-being of children under five years of age will lend sustainability to the project. Project faculty are developing proposals to continue and expand the present project and continue publications.

***OBJECTIVE 3 Plan and implement extension programs, which include health workers, on utilizations of goat milk, milk products and meat in families diets. Major emphasis will be on incorporating milk and milk products in weaning food and as regular part of the diet for children under five***

### **Description of Objective 3 Activities**

- o The development of the proposed Plan of Work by Dr. Sonia Patten and faculty at Bunda College participating in the USAID/UDLP and project village sites occurred in November, 1996. Extensive discussions among project faculty occurred at that time, with the goal of identifying lessons learned to date and recommending appropriate modifications of activities, especially pertaining to Objective 3. The

management challenge which village women face in trying to keep a steady supply of milk available for their young children when they have been recipients of one doe, either pregnant or with a kid is too great. When the goat dries up, or becomes ill, there is a rapid downturn in the health and well being of young children in the family. A more substantial package of resources must be available to participating women. Project faculty and women participants have identified a more viable input - two does and, at planting time, soybean seed to allow women to grow a crop that will sustain their children if and when milk production is low. Appropriate training in animal care, milk utilization and soybean production and processing has been organized and supported by Dr. Richard Phoya, Dr. Beatrice Mtumuni, Dr. Mercy Ngwira, and other project faculty. Dr. Ngwira and Dr. Mtumuni also developed recipes utilizing soybean and goats milk. Soya beans processed by dropping beans into boiling water a few beans at a time resulted in cooked beans with no "off flavor". The soybean were then ground similarly to ground maize and added to recipes developed at Bunda College. The results were positive and the diets were much higher in protein, a nutrient deficient in the diet of most village people. Malawi, with assistance from FAO, is committed to a major effort in introducing soybean on a major scale for household and national food security. This is especially important since FAO will stop food aid to Malawi in 1998. The workshops were very positive and soybean well accepted as demonstrated in the workshops conducted by Bunda College faculty.

### Description of the Progress Toward Completion of Objective 3

- o Goat multiplication should improve so that as many families as possible should benefit from the project, since many are interested. In addition, this would also create a reserve for those families losing goats through death or theft. The consumption of goat milk by Malawian households is very minimal and in some areas nonexistent. The milk is unfamiliar to most households and hence its utilization needs to be promoted. The nutritional value of goat milk is indicated to the women participants in the project. It provides slightly higher energy, calcium, thiamine, riboflavin and niacin (B vitamins) than cows milk. The goat milk not only adds variety in the diet but also increases energy and nutrient intake of the young children consuming the goat milk, resulting in healthier children. The major emphasis has been incorporation of the milk in children's diets. A report on the progress of utilization of goat milk in the home is given in attachment B, presented at the June 1997 workshop by Dr. B. M. Mtumuni and Dr. Mercy Ngwira. Distribution of the goats started in Mlubza village to

mothers with malnourished children. As planned, each mother was to pay back a kid in payment for the goat. To date, all households have returned the kids to the experiment station at Bunda College. Generally, the children have continued to gain weight as long as the goats are milking. When the goats dry up, weight gain is reduced, in some cases the child even loses weight. In Mlewa goats were distributed to 16 households with malnourished children. However, it is unfortunate that six goats were stolen in November 1996 and two died. Currently, only two households have returned kids to the college. Due to the problem with goats drying up and reducing nutrition in the diet of malnourished children, the research team made the decision in December to distribute soybean seed to the two villages cooperating in this pilot project, as outlined in the Plan of Work. A major feature as noted by the village headman of Mlubza is improved survival of infants in his village as a result of the project.

### **Problems or Barriers Affecting the Progress Toward Achieving the Linkage Objective 3**

- o Lack of funding when the FY96 budget was cut resulted in a loss of numbers of goats to be distributed to the village women having children under 5 identified as malnourished. The women need two goats to get through the year with enough milk to keep the malnourished children gaining weight and consuming adequate nutrition needed in these early months and years of development. The soybean have the potential to help provide needed protein, energy, and calcium and micronutrients. The purchase of additional goats to replace and expand the population in the villages, transportation for the goats to the villages, adding a veterinary and field assistants in the villages and a full-time field supervisor will supplement the areas that are now deficient. Extension to goat owners to prevent premature drying up of goats is necessary.

### **Progress Toward the Sustainability of Linkage Objective 3**

- o The extension agents working in the two villages including the Development Officer of EPA have been in all the village training workshops as an effort to make the project sustainable after funding is over. The workshops have been practical in nature so that the mothers are involved in all the stages of processing and preparation of food products. Dr. Sonia Patten has prepared a draft proposal to submit to UNICEF in Malawi for \$10,000 a year for a period of four years in order to sustain a project that demonstrates an excellent fit with UNICEF's Programme Plan of Operation for Care and Nutrition in Malawi, 1997-2001.

## Activities Related to the USAID/UDLP

### **ADVISORY BOARD OF UDLP - LINCOLN UNIVERSITY**

- o The UDLP advisory board at Lincoln University met on February 6, 1997. The members of the board are the following

Dr Helen A Swartz, Professor, Chairperson  
Dr Ikbal Chowdhury, Director of International Programs  
Dr Felix Edoho, Associate Professor  
Dr Frieda Eivazi, Professor  
Dr Richard C Hirst, Dean of the College of Business  
Dr Dyremple Marsh, Interim Director of Cooperative Extension  
Dr Arnold Parks, Executive Director, Advancement & External Affairs  
Dr Delores Penn, Assistant Professor  
Ms Linda Klein, Coordinator of Services for International Programs

The objectives of the project were discussed and progress to date shared. The committee made some positive suggestions and comments. The comments were considered for inclusion in the project.

### **DELEGATION OF ADMINISTRATION, FACULTY AND STUDENTS TO MALAWI**

- o Funding from several sources provided for three faculty and four students to visit Malawi with Helen A Swartz on a planned visit to the USAID/UDLP at Bunda College in June, 1997. Two briefing meetings were held with the faculty, chaired by Helen Swartz. Linda Klein and Ikbal Chowdhury met with the four students for briefings before they left campus at the end of the spring semester. Linda Klein made all the logistic arrangements for all faculty and students making the trip.

### **LINCOLN UNIVERSITY, UNIVERSITY OF MINNESOTA MEET**

- o Administrators, faculty and support staff from Lincoln University and the University of Minnesota having responsibilities in the USAID/UDLP met in Kansas City, MO in order to coordinate information and identify problems and solutions to assure the fulfillment of the three objectives in the project. Drs Helen Swartz and Ikbal Chowdhury planned to visit Malawi in June of 1997. Dr

Sonia Patten, UM, will be visiting Malawi in August. The committee made the decision to request a one year extension (no cost) of the Malawi USAID/UDLP. Rationale for the extension is the need for a more substantial package of goat resources when introducing goats into the villages. Two project does, rather than a single doe, as is the present standard, need to be supplied to each participating family. This should provide a more stable source of continuous supply of milk.

- o The Saanen breed has adapted well in Malawi. An additional sample of breeding stock will be obtained from South Africa. Saanen goats, originally obtained, came from a high quality herd in South Africa. It has been planned to purchase additional goats from the same source. Six Saanen bucks will be assigned to the village buck stations. Fifty-six indigenous village does (local Malawi) will be obtained for the villages.
- o Three Saanen bucks and eight Saanen does will be obtained for the Bunda College Research herd. Fifty indigenous (local Malawi) goats will be purchased to be used as replacements in the Bunda College Station herd.
- o In anticipation of the utilization of meat from goats, meat quality and quantity will be studied. A Warner-Bratzler shear machine for assessing meat quality and tenderness will provide for the assessment of the meat quality produced from the goats at the experiment station.

## **STUDENTS PARTICIPATING IN THE MALAWI UDLP WORKSHOP**

- o Sam Shakelford, Todd Lenger, Reneesha Brooks and Shavon M. Hannah met with advisors to select areas of study and potential contacts in Malawi prior to leaving. Shavon M. Hanna made the decision to study the goat project. Helen Swartz was assigned as her advisor. Upon return all four students gave a Seminar before the University faculty and wrote a 20 page research paper on their respective areas.

## **USAID/UDLP MALAWI PROJECT TRIP REPORT - JUNE 12-22, 1997 HELEN W. SWARTZ - (Appendix)**

Returning to campus on June 23, 1997, Helen A. Swartz completed her trip report to Malawi from June 12-20, 1997. The trip to South Africa was to investigate the purchase of Saanen goats and look at a project funded by churches in South Africa that begins with malnourished children. The mothers of these children are exposed

to classes that teach them how to weave wallhangings and rugs that are marketed in downtown Cape Town to the tourists. The women are taught to make cartoons that resemble landscape in Cape Town or some life experiences related to South Africa. They produce quality work and in addition to receiving some assistance with nutrition for their malnourished children, they also learn how to produce a product that results in profitability. The materials are donated to the center by a factory that has rejected materials that work well in weaving. Dr. Delores Penn accompanied Dr. Swartz and looked into assistance for the senior generation in projects developed for South Africans in Cape Town. The Phalanı Center assists very young, middle aged and senior citizens. This was a very good model to use in Malawi and will be pursued in a proposal for sustainability of the project we are now conducting.

**APPENDIX**

**USAID/UDLP MALAWI PROJECT TRIP  
JUNE 12-22, 1997**

Submitted by

Helen A Swartz, Co-Principal Investigator  
Lincoln University (Lead Institution)

**June 12, 1997**

Faculty and students left the LU campus and drove to St Louis to fly TWA to London. The group included Drs Lurline Marsh, Delores Penn, Helen Swartz and Ikbal Chowdhury, and students Sam Shakelford, Reneesha Brooks, Todd Lenger and Shavon Hannah.

**June 13, 1997**

The delegation arrived the next morning in London on schedule. They boarded British Airways at 9:30 pm, Dr Swartz was seated next to Mr Southwood Ng'oma, Commissioner for Workers/Compensation in Malawi. Annie Muluzi, wife of the President of Malawi, his Excellency Dr Bakili Muluzi, was on board as well as some other Malawians officials who turned out to be key contacts for the students regarding their project assignments in Malawi.

**June 14, 1997**

Lincoln University faculty and students arrived in Malawi about noon, and were met at the airport by Dr Richard Phoya and Dr Kenneth Neils. They were taken by car to the Capital Hotel where they had dinner with Dr and Mrs Phoya and Dr Neils, project director of ASAP (headed by Dr Felix Edoho, Lincoln University). They were briefed on the two projects. Dr Swartz delivered important documents to Dr Richard Phoya. Plans for the next day were shared with all present and an itinerary was handed out to the faculty and students for the next three days. A bus was engaged for the trip to Mangochi which was to follow the visit to Bunda College campus and Skhula Farm, the experiment station where the goat research is being conducted.

**June 15, 1997**

The delegation left Capital Hotel for the Bunda College of Agriculture campus at 8:00 am. They were introduced at Bunda College to the faculty participating in the project and then proceeded to visit the Sakhula Farm, the Agriculture Experiment Station for Bunda College of Agriculture.

Objective 1 --- The delegation looked at the characterization of the local goats, imported Saanen and Damascus goats and the crossbreeds. The delegation was informed of the progress of Objective 1 by Dr. James Banda and Dr. Richard Phoya. There were participants from Bunda College, Lincoln University faculty and students and government workers present at the experiment station. Feeding trials were in progress at the station to investigate the performance of different feedstuffs to determine the recommended rations for optimizing weight gain in the kids following weaning. The kids being raised in the feeding trials will be placed in villages to complete Objective 3--- improving the health and well-being of infants and children under five.

The delegation boarded a bus and traveled to the village where we first began the project. Objective 3--- placing the crossbred goats with the women identified as having malnourished infants and children under five years of age in order to supplement their diets with goats milk. Upon receiving a milking goat, the women are required to give back a kid to the experiment station and in return will have ownership of the goat in the village. Information shared with us by Dr. Mtimuni was that 150 ml of goat milk in the diet of a one-year-old child would contribute significantly to the nutrition of the child. The children all looked so much healthier than they did four years ago when we first visited the village. Dr. Richard Phoya taught the women how to milk the goats and care for the milk. Drs. Beatrice Mtimuni and Mercy Ngwira have held workshops recently to teach the women how to convert soybean into soy flour, included in the recipes for common dishes consumed in the village. This will increase protein intake considerably when added to sima, a ground corn dish prepared and eaten daily by the village dwellers. Several recipes were tested by the village families and all of the recipes shared were well accepted. The results of the village workshops are to be shared with participants at the workshop to be held at Mangochi. Drs. Mtimuni and Ngwira took Helen Swartz to the second village to see how the soybean had been processed and incorporated for consumption in the diets of the family. They met with the women and who seemed quite happy to show them the soybean they had processed as directed by the human nutrition professors. The children looked very healthy as well. The group returned to Bunda College to meet the other participants of the workshop and travel to Mangochi.

The delegation boarded a bus at Bunda College (some traveled by car) for Mangochi, where the workshop would be conducted. They arrived very late at night after traveling on a very bumpy road. Lincoln University faculty and students stayed at Makokola, about five miles from Mangochi. The village chiefs of Mlubyza and Mlewa were in attendance and had a translator to translate the discussions from English to Chechewa.

### June 16, 1997

Registration was at 8:30 am. Mrs. M. C. Piringu and Dr. Richard Phoya were in charge of the registration. The chairperson for the first session was Dr. Mercy

Ngwira and rapporteur was from the food and nutrition section. The introductions and introductory remarks were given by Dr Richard Phoya. The welcome from Bunda College and professional remarks were delivered by Professor Leonard Kamwanja. This was followed by a welcome from Lincoln University and the University of Minnesota by Dr Helen Swartz. A break was taken for five minutes and Dr Ikbal Chowdhury continued with welcoming remarks.

Progress on the USAID/UDLP was the charge of Dr Richard Phoya, followed by discussions. The participants then broke for lunch.

The afternoon session began at 1 30 pm with Dr I M G Phira acting as chair. The rapporteur was Mr S C Ngwira. The first paper given after lunch was by Professor Leonard Kamwanja and Dr James Banda on the progress of the breeding component of the UDLP and reproductive performance of two breeds of imported (Saanen and Damascus) Local and crosses.

At 2 45 pm Professor Kamwanja proposed an in vitro production of embryos and embryo transfer work in the experiment station to assist with increased numbers of dairy goats needed to improve the village goat's milk production. Other reports of experiences and prospects on the station and in the villages was given by Drs James Banda, Bill Mfitilodze, George Kanyama-Phiri and Leonard Kamwanja. This completed the program for the day. A reception was held at 5 30 pm and was hosted by Dr Bill Mfitilodze, Mrs M C Piringu, Mr C P A Chiutsi, Mr W J Sakala, Mr W M D Mvula and Mrs S Phikani.

Dr Lurline Marsh, Dr Dolores Penn, and students Shavon Hannah, Reneesha Brooks, Sam Shakelford and Todd Lenger attended the entire session the first day. The next day was spent looking for resource materials for the students on the subjects they selected for their papers and slide presentations back on campus at Lincoln University.

### June 17, 1997

The workshop continued at 9 00 am. Mrs J A Jere was chairperson and the rapporteur was Mr M M Chimoyo. The early morning was spent with reports from Drs Mercy Ngwira and Beatrice Mtimuni on the progress of the nutritional component of the project. Following the break, Drs Mfitilodze, Ngwira and Mtimuni reported on the husbandry of goats and nutrition of children in the villages.

### LUNCH

Dr G Y K Phiri chaired the afternoon session. The rapporteur was Mr J A Kadzanja. Dr Helen Swartz gave a review of the action plans developed at the 1995 workshop held in Malawi. All participants were divided into groups of three and were assigned a task to address issues of need to help speed up the progress.

in the identified areas. The groups met in three different locations and brought back the plans of work to share with the total attendees. The discussion continued until 6:30 pm and it was evident that there was such interest in the progress of the project. The comments made were positive and cohesive.

Closing remarks were given by Dr. Helen Swartz, Dr. Richard Phoya and Dr. Iqbal Chowdhury.

### **June 18, 1997**

Drs. Chowdhury, Penn, and Swartz traveled to Zomba to visit the library and some faculty interest in developing future proposals in the areas of child health, nutrition, gerontology and animal science. Some papers were obtained at the library in Zomba for Shavon Hannah to use in her paper and slide presentation. We left in mid-afternoon to return to Lilongwe. Dr. Lurline Marsh and students met at the library the University of Malawi at Zomba.

### **June 19, 1997**

Dr. Richard Phoya and Dr. Helen Swartz met in the morning to discuss the outcome of the workshop and the plan of work developed by those in attendance. It was suggested by Dr. Swartz that a proposal be submitted to the A.P. Green Foundation for materials needed for embryo transfer research proposed by Dr. Leonard Kamwanja. Dr. Phoya met with some of the faculty members at Bunda College who were in agreement for the submission of the A.P. Green Foundation proposal. Drs. Dolores Penn and Helen Swartz flew to Johannesburg and on to Cape Town, South Africa at 2:30 pm. They arrived in Cape Town at 10:30 pm. Dr. Lurline Marsh and the students returned to the Capital Hotel in Lilongwe.

### **June 20, 1997**

A taxi service transported Drs. Swartz and Penn to much of their many appointments in Cape Town. They began the morning visiting with a woman who is interested in writing a proposal with Dr. Dolores Penn. She works with the Truth Commission in Cape Town and shared the background that was needed to pursue grant money to help South Africans get improved medical care and assistance in their older years. Following this meeting, they visited the Philani Center that was originally funded by a church in Sweden. The children there were very much like the children in Malawi and were identified as malnourished. Training is given to the mothers of the children to learn skills in weaving. They had numerous rugs of various sizes designed at the Philani Center with the assistance given by the manager of the facility. The Philani Center is now being funded by several non-governmental agencies outside South Africa, Kellogg Foundation in the US is a big supporter. The center brings in women from six centers located throughout Cape Town after identifying those with malnourished children. Those

interested in learning to weave are transported daily to the center to weave. The children are cared for by women employed by the center who had designed a room for teaching the children skills in learning to read and write even though the children were very young. Family planning is also being taught and there are nurse practitioners on staff to assist with any problems the women might have. This is an excellent model that could easily be adapted by Malawi. Learning to weave gives the women some cash flow since they retain 66% of the price paid for the rugs. The weaving was very interesting and quite simple. Nails were driven in the frame work of the rooms at the top and bottom and the staggering of the nails provide a very tight warp for weaving. The materials used in weaving were given to them by a factory that makes cotton T-shirts in various colors. The T-shirts are cut in one-inch strips and used for both warp and weft. Cartoons designed by the women and staff are used behind the warp and weaving is done in patterns that tell a story about the people of South Africa. This is quite an art form and the rugs sell exceptionally well in craft stores in Cape Town. Drs Swartz and Penn then visited with the women in the Truth Commission office in Cape Town and were transported very late back to their hotel. Time was limited, however, they did accomplish the task they had pursued. The trip was well worth the effort and it will be a help towards the efforts to seek sources of funding for a proposal for the village women of Malawi in order to establish a center similar to the Philani Center in Cape Town, South Africa. Once established, such a center would help provide cash flow which will improve the quality of life for their families.

### June 22, 1997

Drs Swartz and Penn boarded British Airways to London. They arrived at Heathrow Airport, took a bus to Gatwick and proceeded to check their luggage through on TWA to St. Louis. At this time they were joined by Dr Marsh and the students. The flight was delayed with a final departure at 7:30 pm. The delegation arrived in St. Louis the evening of June 22, 1997.