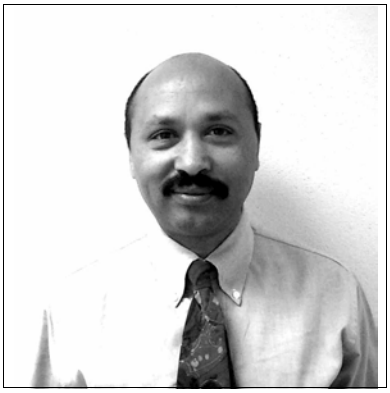
Goat Newsletter

Cooperative Extension Program
Langston University

The Newsletter of the E (Kika) de la Garza Institute for Goat Research *Winter 2002*

From the Director's Desk



Dr. Tilahun Sahlu

I am pleased to say that even with challenges such as budget cuts, we are continuing to do our best to maintain a high-quality research and extension program in order to serve our clientele well. Support for projects received from outside sources, such as USDA and USAID competitive grant programs, is a big help in this regard. Such projects make possible the participation in our program of researchers from other countries as well as the US. These visitors have often received Ph.D. degrees recently and wish to gain additional research experience. Moreover, in many cases established scientists spend sabbaticals here, and graduate students can achieve M.S. or Ph.D. degrees by conducting research at the Institute and receiving academic training in cooperation with Oklahoma State University. It is always sad when visitors return to their homes. Dr. **B. R. Min** has now begun a post-doctoral research program with Texas A&M University at the Vernon location, Dr. **Girma Abebe** recently rejoined his colleagues at Debub University in Awassa, Ethiopia, and Dr. **Dan Miller** has just departed for international work after completing a number of parasitology research and extension activities here.

Rather than listing all of the current research projects, I'll only say a little about current happenings on two projects that entail a great deal of collaboration with scientists at other locations. First, Drs. **Terry Gipson** and **Mario Villaquiran** have been making outstanding progress on initial activities of the project "Enhanced Goat Production Systems for the Southern United States." This project is supported by the USDA Initiative for Future Agriculture and Food Systems program, and includes collaboration with a number of scientists at other locations (Oklahoma State University, National Seed Storage Lab Animal Germplasm, Virginia State University, North Carolina State University, Louisiana State University, Fort Valley State University, and USDA ARS Appalachian Farming Systems Research Center). In the first phase of this project, an existing goat production system computer simulation model is being used, which should be eventually posted on our website. Later, there may be changes or modifications to the model, as well as careful study of model inputs, so that it can be used as a decision-making tool or aid

The second research item is the experiment addressing effects of flushing on reproductive performance of meat goat does in different conditions. Dr. **Lionel Dawson** and colleagues at the College of Veterinary Medicine of Oklahoma State University, have been here numerous

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Dr. Terry A. Gipson

times in the late fall/early winter period conducting ultrasound pregnancy analysis. Other participants are Dr. **Mike Looper** of the USDA ARS Dale Bumpers Small Farms Research Center at Booneville, Arkansas and Dr. **Charlie Rosenkrans** of the Department of Animal Science in the University of Arkansas at Fayetteville. Drs. **Roger Merkel** and **Girma Abebe** have been directing the project and conducting much of the work. Dr. Abebe's visit was part of a 3-institution project entitled "Improving Ethiopian Household Food Security and Enhancing the Teaching, Research and Extension Ability of Awassa College of Agriculture, Debub University," supported by United Negro College Fund Special Programs, USAID, and involving Fort Valley State, Debub, and Langston Universities.

On the extension side, Dr. **Terry Gipson** and Mr. **Ted Alexander**, Small Farms Coordinator, have been very busy implementing a grant entitled " Establishment of a Summer Institute Promoting Farm Security and Diversification among African-American and Native American Small Farmers" funded through the USDA Risk Management Education Competitive Grants Program. Many socially disadvantaged farmers have expressed a desire to raise goats. However, they lack the necessary knowledge, skills and abilities to succeed in this enterprise. Langston University, which has the nation's foremost goat research program, established a Summer Institute for goat management workshops for minority farmers. A Summer Institute is an all-day workshop held approximately every other week over the course of the summer. Workshops were held at Muskogee, Idabel, Wewoka and Binger, Oklahoma. Workshop topics included 1) fencing and facilities, 2) acquisition and selection of stock, 3) record keeping and marketing 4) feeding and nutrition, 5) general herd health and other management concerns, 6) internal parasites, and 7) breeding and kidding management. Through the Summer Institute minority farmers have learned the management knowledge, skills and abilities needed to succeed in meat goat production, an alternative agriculture enterprise suited for part-time farmers with small acreage, both of which are characteristic of minority farmers.

In addition to the Summer Institute, Dr. **Terry Gipson** coordinated two successful artificial insemination workshops this fall; 20 participants attended at Langston University and 20 in Tahlequah.

All in all, it's been a very successful research/extension year. I hope that your's has been also.

Research Spotlight

Abstracted by A. Goetsch

Mohair Growth.

Until recently, it was commonly believed that gastrointestinal digestion of proteins is complete and that only free amino acids enter circulation. However, a considerable body of evidence for absorption of peptides from the digestive tract has accumulated. There are also indications of peptide clearance from the blood, suggesting utilization by tissues of the body. And, there are some reports suggesting effects of small peptides on fiber growth. Therefore, an experiment was conducted to compare effects of infusing a defined area of skin of Angora goats with small quantities of a mixture of dipeptides (methionine-leucine and lysine-leucine) or free amino acids on mohair fiber growth. Supplying small peptides or their amino acids directly to the skin equally increased mohair production (by 25%) compared with a control saline solution. Similar blood concentrations of various hormones and metabolites suggest that small peptides were utilized by skin for mohair fiber growth via supplying limiting free amino acids directly to the fiber follicle for protein synthesis. However, this research was with two dipeptides and three free amino acids. Future research should be conducted with other peptides, such as larger ones that have been shown in some instances to have regulatory effects on metabolic events.

Puchala, R., S. G. Pierzynowski, T. Wuliji, A. L. Goetsch, T. Sahlu, M. Lachica, and S. A. Soto-Navarro. 2002. Effects of small peptides or amino acids infused to a perfused area of the skin of Angora goats on mohair growth. Journal of Animal Science 80:1097-1104.

Vegetation Management Using Goats.

Characteristics of goats that make them especially suitable as vegetation management tools include diet diversity, an ability to select a high quality diet, and resistance to many plant toxins and antinutritive factors. Goats are capable of defoliating most plant species, many of which cattle will not utilize. One of the factors that influences what plant species goats will consume and, thus, control, is exposure when young. Time of the year can influence consume of particular plants, such as eastern red cedar, which appears most palatable in the winter. Although considerable research has demonstrated the usefulness of goats in controlling undesirable plant species like shinnery, blackjack, and post oak, sericea lespedeza, and many others, this method still is not widely employed. Environmental concerns and increasing costs of chemical and mechanical means of vegetation management, however, are providing impetus for greater utilization of such biological management techniques for removal of unwanted vegetation. Goats have an advantage over other biological controls in that a saleable product results from their consumption of brush and weeds, and they can be co-grazed with cattle. Moreover, goats increase cycling of plant nutrients in undesirable vegetation, typically increasing prevalence of grasses. A significant limitation to use of goats for vegetation management is the social stigma attached to goats by cattle producers. However, constraints of a small number of animal markets, few sources of large numbers of adapted animals, and little producer experience and knowledge of production practices are gradually being overcome as the goat industry grows. Most appropriate production systems need to be developed for specific environments, which entails proper kidding date, parasite management, predator control, fencing, and marketing strategy. Nonetheless, there appears a bright future in use of goats for vegetation management because environmental conditions have become more conducive to growth of weedy plant species and, in most cases, goats are the most cost-effective, nontoxic, and nonpolluting solution available.

Hart, S. P. 2001. Recent perspectives in using goats for vegetation management in the USA. Journal of Dairy Science 84(Electronic Supplement):E170-176.

International Update

by Roger Merkel
Armenia

The E (Kika) de la Garza Institute for Goat Research is continuing to provide technical expertise to the ARmenian Improved Dairy dairy goat project (ARID) of the USDA Marketing Assistance Project in Armenia. In August, Drs. Terry Gipson and Roger Merkel and a Langston University student, Mr. Mark Davis II traveled to Armenia. Drs. Gipson and Merkel provided recommendations for a long-term breeding strategy for the project.

Mark Davis II presenting a seminar on Langston University to students of the Agribusiness Technical School in Yerevan, Armenia.

Currently, genetic improvement is based upon the importation of purebred goat semen from the United States and its use in crossbreeding local Armenian does. The breeding strategy devised calls for a system of testing the resulting crossbred progeny for milking characteristics and selection of superior animals for breeding. After sufficient genetic material has been introduced into the country, presumably following one or two more years of semen importation, the best crossbred bucks would then be used for both natural matings and semen collection for artificial insemination. This strategy promotes ultimate sustainability of the project through use of the best local resources, relying less upon costly semen importations and keeps the hardiness and adaptability of the local animals in the resulting genotype. While in Armenia, Mr. Mark Davis II presented a seminar to students of the Agribusiness Teaching Center and visited the ARID goat center as well as village goat producers.

To provide ARID Center personnel with additional expertise in artificial insemination and semen collection and freezing, the Goat Institute sent Mr. Mark Mouttet of Tahlequah, OK and Mr. Les Hutchens, CEO and owner of Reproductive Enterprises, Inc. of Stillwater, OK to Armenia in September. Mr. Mouttet concentrated on assisting and providing training in estrus synchronization protocols and artificial insemination. Mr. Hutchens also provided expertise in insemination and synchronization but concentrated his efforts at devising a method for freezing goat semen using the current equipment and facilities at the ARID Center. His efforts proved successful and he was able to train ARID Center staff on the procedures devised. The ability to freeze and store semen at the ARID Center is vital to accomplishment of the breeding strategy formulated for Armenia and for the long-term sustainability and viability of the project.

Milking facilities in many Armenian milk cooperatives have been upgraded during the past year.

The issue of herd health was also strengthened through a trip to the ARID Center by Dr. Jeremiah Saliki of the Oklahoma Animal Disease Diagnostic Laboratory at Oklahoma State University. Dr. Saliki installed computerized equipment capable of performing diagnostic tests at the ARID Center. This equipment was recommended by Goat Institute staff and the USDA to upgrade the diagnostic capabilities of the Center.

Other support activities that occurred in the recent past include visits to Armenia by Dr. Steve Zeng of the Goat Institute and Ms. Sara Bolton co-owner/operator of Pureluck Texas to provide assistance in cheese manufacturing and product safety. Dr. Lionel Dawson, College of Veterinary Medicine of Oklahoma State also provided training in herd health to ARID Center staff and Armenian goat producers through a series of seminars held throughout the country.

Ethiopia

Grant activities have begun on a new collaborative grant among Debub University, Awassa, Ethiopia; Fort Valley State University, Fort Valley, GA and Langston University. This grant calls for training of three scientists at Langston and Fort Valley and the expansion of the women's goat groups development/extension project at Debub University.

Dr. Girma Abebe of Debub University participating in an artificial insemination workshop at Langston University.

In August, Dr. Girma Abebe of Debub University arrived at the Goat Institute for a five-month training period. Dr. Abebe began a trial with Drs. Roger Merkel and Art Goetsch evaluating the effects of nutritional flushing of meat goats on conception and kidding.

Dr. Abebe also received training in artificial insemination, semen collection and freezing and in ultrasound techniques for pregnancy determination. He also had training in constructing and evaluating lactation curves with Dr. Terry Gipson.

In November, Dr. Abebe also spent two weeks at Fort Valley State University receiving training

Dr. Girma Abebe of Debub University receiving training in the use of ultrasound by Dr. Lionel Dawson of Oklahoma State University.

in meat science and parasitology techniques. He returned to Ethiopia on December 19. Two more Debub University scientists will travel to the US in 2003 as grant activities continue.

For further information regarding these international projects, contact Dr. Roger Merkel at (405)466-3836 or rmerkel@luresext.edu.

Dewormer Resistance Survey Results

by Dan Miller

In the summer newsletter, goat producers in Oklahoma were requested to participate in a dewormer resistance survey conducted by Dr. Daniel K. Miller, Visiting Scholar at the E (Kika) de la Garza Institute for Goat Research. Nine goat producers with sufficient numbers of animals were selected to participate in the dewormer resistance survey (Figure 1). Drs. Terry Gipson, Roger Merkel, Mario Villaquiran, and Steve Hart assisted Dr. Miller with this survey.

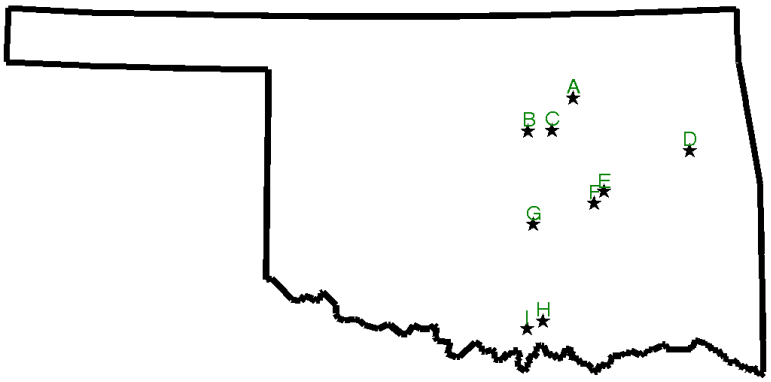

Figure 1. Locations of farms participating in the dewormer resistance survey.

Rationale

Nematodes are a major health problem for goats, which seem to be less resistant than sheep. Because of their browsing habits, normally they are unlikely to come into contact with infective larvae, but when forced to graze, as is the common practice on commercial ranches, goats can become heavily infected. The common response on the part of the producer is the use of anthelmintics. These frequent and irregular treatment intervals select for development of parasite resistance to anthelmintics.

Dr. Miller (background) and Dr. Gipson (foreground) weighing goats and collecting samples for the dewormer resistance survey.

Procedure

Dr. Miller conducts fecal egg counts.

On the initial visit groups of 15 goats were treated orally with either levamisole, albendazole or ivermectin or left untreated. The animals were weighed on a livestock scale at the time of treatment and individual fecal samples were collected to determine eggs per gram (EPG). One to two weeks later a second visit was made to collect the follow-up samples. The producers were asked about their parasite control program and the source of their animals.

In all cases the initial mean EPG's were more than sufficient to provide adequate comparisons (>500 EPG). The breeds were mostly Boer and Boer crosses although in one herd there were some LaManchas, in another there were sheep, and a third was composed of Spanish cashmere goats. Ages ranged from yearlings to aged, but in each group an attempt was made to equalize the ages as much as possible. In every case some of the goats had been purchased within the last two years, usually at an auction, but also from private breeders, so that there was always the possibility

that in each farm, we were dealing with parasites from different sources.

The EPG's were determined by a modified McMaster's test with a sensitivity of 50 EPG.

Fecal egg count reduction results were analyzed using arithmetic means and percent reduction was calculated:

% Reduction = 100{1 – (EPGfin/EPGinit) x (CONTinit/CONTfin)}.

Discussion

The evidence indicates that in Oklahoma, ivermectin and the benzimidazoles are ineffective, even at increased doses. Only levamisole and moxidectin seem to show any promise as effective anthelmintics, a situation that severely restricts the producers' options in parasite control because annual rotation of anthelmintics is one of the primary methods of retarding resistance development. Having only one or at the most, two, options does not lend itself well to rotation.

The situation will only get worse in the future as the effective anthelmintics are used excessively stimulating the development of resistance to them as well. To postpone that day it would be advisable for the producers to begin now with other control measures that reduce the need for chemical control of worms.

The resistance patterns on all the ranches were very homogenous. This suggests that there is a similarity of control programs among the producers as well as a significant amount of animal movement between herds. Since meat goat raising on an intensive scale is relatively new in Oklahoma, and since the Boer breed is also new to the area, to acquire the numbers of goats present, there is a lot of buying and selling with a resultant transfer of nematodes. Most of the pure bred raisers supplying the market are in Texas where resistance to all anthelmintics was shown to already be present more than ten years previously, so the transfer of resistant parasites is very likely to have occurred without the necessity to develop indigenous resistant strains. None of the herds that we examined were closed herds.

Table 1. Efficacy of anthelmintics against internal parasites of goats in Oklahoma.

Farm	IVM	ALB	LEV	MOX	MOR
A	-57.78	43.37	99.04	-	-
B	18.25	85.31	97.58	-	-
C	-	3.65	98.54	-	-
D	54.28	91.42	99.95	-	-
E	61.74	59.77	92.96	-	1.48
F	57.36	53.98	98.71	-	-
G	38.20	74.41	87.66	-	-
H	-	68.75	99.48	100.00	-
I	44.20	-	92.08	-	-

IVM – ivermectin, ALB – albendazole, LEV – levamisole, MOX - moxidectin, MOR - morantel

An area of hope was that the resistant parasites would not be the most pathogenic (*H. contortus*) so that the anthelmintics that appeared to be ineffective might actually have use against this species even if the other relatively nonpathogenic species were resistant. This was not the case. *Haemonchus contortus* was the most common resistant nematode, a result not unexpected given its reproductive prolificacy compared to the other common species. Because of this, the use of nonanthelmintic control measures is even more necessary than ever.

For further information regarding the dewomer survey, contact Dr. Terry Gipson at (405)466-3836 or tgipson@luresext.edu.

Noteworthy News

Dr. **Girma Abebe** spent five months conducting research and receiving training at Langston University as part of activities under a collaborative grant among Langston, Fort Valley State University, Fort Valley, GA and Debub University, Awassa, Ethiopia.

Drs. **Tilahun Sahlu** and **Roger Merkel** attended the annual meeting of the Association Liaison Office for University Cooperation in Development in Washington DC.

Drs. **Roger Merkel** and **Terry Gipson** and Mr. **Mark Davis II**, Langston University student, traveled to Armenia to present technical assistance to the USDA dairy goat project. Mr. Davis presented a seminar on Langston University to students of the Agribusiness Training Center in Yerevan, Armenia.

Drs. **Art Goetsch** and **Roger Merkel** traveled to Fort Valley State University, Fort Valley, GA to train their staff on surgical cannulation techniques.

Drs. **Tilahun Sahlu**, **Steve Hart**, and **Art Goetsch** traveled to Prairie View A&M University to participant in the "Scientific Conference on Goats," each making an oral presentation.

Dr. **Fekadu Beyene**, of Awassa College of Agriculture at Debub University, arrived to work with Dr. **Steve Zeng** on the project "Quality Characteristics and Yield Predictive Models of Goat Milk Cheeses."

Drs. **Tilahun Sahlu** and **Steve Zeng** traveled to China on a US-China Scientific Exchange project to help Chinese universities create curricula in cheese manufacturing and to promote the U.S. cheese export to China.

Dr. **Dan Miller**, visiting scholar from Mexico, and Dr. **Chun-Tian Zheng**, visiting scholar from China, have completed their sabbatical leaves at Langston University and will be returning to their home universities.

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