E. (Kika) de la Garza Institute for Goat Research • OKLAHOMA •

Goat Newsletter

Cooperative Extension Program
Langston University

The Newsletter of the E (Kika) de la Garza Institute for Goat Research *Fall 1999*

From the Director's Desk

Photo #1

Dr. Tilahun Sahlu

Summer continues to be a busy time at Langston University. In cooperation with the Oklahoma Meat Goat Association, we just successfully completed the Meat Buck Performance test. You can read the final report of the test on page 3. A successful hands-on workshop was held on controlling internal parasites in goats by Drs. **Lionel Dawson** and **Terry Gipson**. A number of the participants have called my office and expressed their appreciation of this very important and timely workshop. Dr. **Steve Hart** has been busy coordinating grazing/brush control demonstrations in Oklahoma and Kansas (see page 7 for details). The DHI Program at Langston continues to service dairy goat producers. In the first half of 1999, nearly 4,000 milk samples from over 70 herds were analyzed for fat protein and somatic cell and subsequent doe records processed. In late July, Mr. Timothy Gondwe from Bunda College of Agriculture in Malawi arrived for a two-week training session on breeding plans for goat production, which was supervised by Dr. **Gipson**.

E (Kika) de la Garza Institute for Goat Research personnel made ten research presentations at the annual American Society of Animal Science meeting in Indianapolis, Indiana. We have initiated several experiments this summer. Dr. **Roger Merkel** has started a grazing study with lespedeza and Boer×Spanish doelings. While one group of goats graze, another group will be fed a high grain diet. After this initial growing phase, all goats will receive a high-grain diet in a finishing phase to look at compensatory growth in meat goats. Dr. **Sergio Soto-Navarro** is starting a performance trial with Boer×Spanish wethers that will run through the fall and early winter. We currently have two studies underway, being conducted by Dr. **Girma Abebe** and Mr. **Getachew Animut** that address different means of using low-quality crop residues for goat. Wheat straw is being fed untreated or treated with urea to increase digestion, crude protein concentration, and feed intake. In addition to the by-product wheat straw, both experiments include supplementation with different levels of deep-stacked broiler litter, which is readily available in eastern Oklahoma, Arkansas, and southwestern Missouri. Also, Drs. **Dawson** and **Abebe** are exploring the potential anthelmintic properties of seeds of a plant from Ethiopia. Mr. **Tehsome Shenkoru** and Dr. **Ryszard Puchala** are conducting an experiment with Alpine does and doelings to evaluate effects on lactation of two potential feed additives, rumen-protected betaine and choline. Drs. **Puchala** and **Tumen Wuliji**, along with Dr. **Stefan Pierzynowski**, a previous Visiting Scholar from Sweden, are conducting an experiment to study factors controlling mohair growth.

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Meet the Faculty & Staff

Dr. Ryszard Puchala

Ryszard (Richard) Puchala was born in Kielce, Poland and raised on the family's dairy farm, which had been in the family for 12 generations. In Poland, the farms are smaller than in the United States and the Puchala's dairy farm consisted of 12 Black and White cows on 20 acres. The Puchala farm was the first farm in their village to purchase a tractor. Dr. Puchala attended an agricultural high school and then enrolled in the Warsaw Agricultural University. Dr. Puchala received his M.S. and Ph.D. from the Warsaw Agricultural University. After completing his master's degree, Dr. Puchala conducted research and taught animal physiology at the Warsaw Agricultural University. After completing his doctorate, Dr. Puchala was promoted to Assistant Professor in the Department of Animal Physiology at the Warsaw Agricultural University. During his tenure at Warsaw Agricultural University, Dr. Puchala had the opportunity to enhance his research capabilities by sojourns at research institutions overseas. Dr. Puchala was awarded a Dekaban Fellowship in the Department of Animal Science at the University of British Columbia in Vancouver. Dr. Puchala then traveled to Aberdeen, Scotland where he was a British Council Fellow at the Rowett Research Institute. Dr. Puchala was also a Visiting Scholar at Langston University. In 1995, Dr. Puchala left the Warsaw Agricultural University to accept a faculty position of Assistant Research Professor at Langston University.

Dr. Puchala is very excited about his current research with rumen-protected betaine. Dr. Puchala explained "In a study using growing Angora doelings, we fed a 9% crude protein diet supplemented with betaine and a 15% diet without supplementation and there was no difference in growth. This means that we can feed a lower quality diet without sacrificing production".

In his leisure time, Dr. Puchala enjoys spending time with his wife and two sons, reading, traveling and playing tennis.

Dr. Ryszard Puchala can be reached at (405) 466-3836 ext. 39 or at rpuchala@luresext.edu.

1999 Meat Buck Performance Test

by T. Gipson

In an effort to identify superior meat bucks, Langston University, in cooperation with the Oklahoma Meat Goat Association (OMGA), recently completed its third annual meat buck performance test.

On Saturday, May 24, 1999, the meat buck performance test started. The test was open to purebred and crossbred bucks born between December 1, 1998 and March 31, 1999. Forty-seven bucks from 12 ranches in Oklahoma and Texas were enrolled. There were 41 fullblood Boers and six crossbred Boer bucks enrolled. The average age was 134 days with a range from 70 to 165 days. The average weight was 58 lbs. with a range from 34 to 79 lbs. All bucks were given a thorough veterinary examination.

Bucks were grouped in pens by weight and the two-week adjustment period began. Following the 14-day adjustment period, the 70-day performance test was begun. At the start of the test, the average weight was 65 lbs.

At the end of the 70-day test, the average weight was 98 lbs., the average gain was 33 lbs. resulting in an average daily gain (ADG) of .52 lbs./day. Average feed intake over the 70-day test was 246 lbs. resulting in an average feed efficiency (FE; lbs. of feed per one lb. of gain) of 7.37. Feed efficiency was calculated using Calan feeder gates to measure individual daily feed intakes. The Calan gates feature an electronic recognition system which allows access to feed to only one particular goat per feeder. Thus, individual daily feed intake can be measured and used to calculate feed efficiency. The average loin eye area as determined by ultrasonography was 1.48 square inches and the average right rear leg circumference was 15.1 inches.

A performance index was also calculated using the following formula:

Index Score (IS) = 30% FE +30% ADG + 20% longissimus muscle (loin eye) area at the first lumbar site as measured by real time ultrasound + 20% circumference of the widest part of the hind right leg as measured with a tailor's tape. Loin eye (LEA) and circumference (RLC) were adjusted for metabolic body weight:

$$\frac{\text{LEA or RLC}}{\text{Body weight}^{0.75}}$$

This body weight adjustment gave lighter goats a fair comparison of muscling to heavier goats. At the end of the test, all bucks underwent a breeding soundness examination.

The deviation from the average of the parameters measured from the goats in the performance test was used in the index calculation. Thus, the average index score for bucks on test was 100%. Bucks that are above average have indexes above 100% and those below average have index scores below 100%.

Table of ADG, FE and Index Score (IS) of the top ten tested bucks.

Rank	ADG lb./day	FE feed/gain	IS
1	0.68	5.29	101.1
2	0.67	4.89	101.1
3	0.65	7.49	100.9
4	0.55	6.36	100.7
5	0.53	5.64	100.7
6	0.66	6.84	100.6
7	0.56	6.22	100.6
8	0.51	6.15	100.6
9	0.56	6.01	100.5

Prepare now for the 2000 meat buck performance test. Goat producers interested in bringing bucks to the year 2000 test need to contact OMGA president:

Mr. Jim Daniel
Rt. 1 - Box 95
Earlsboro, OK 74840
(405) 382-1901

For information on the meat buck performance test, contact Dr. Terry Gipson at (405) 466-3836 ext. 31 or at tgipson@luresext.edu.

Research Spotlight

Abstracted by A. Goetsch

Growth Hormone Treatment and Mohair Production.

Bovine somatotropin (bST) treatment increases milk production by dairy cattle; however, responses in milk production by goats and sheep are more variable. Bovine somatotropin typically influences growth positively; wool production has been increased as well, but effects on fiber production are variable and carryover effects have not been studied. Effects of bST on mohair or milk production by Angora does are unknown. Therefore, this experiment was conducted to determine whether slow-release bST treatment of lactating Angora does affects amounts of nutrients being used for milk production and fiber growth. In this regard, live weight gain of kids from bST-treated does was 32% greater than that of kids from untreated does, indicating enhanced milk production. These increases in kid live weight gain and doe milk production occurred without change in feed intake or body weight of the does. Live weight gain of kids from treated does was the same as that of kids from untreated does after bST treatment was stopped, implying no carryover effects. Milk composition was not altered by bST and, very importantly, mohair fiber growth was unchanged. In summary, these results do not show potential to enhance mohair production by slow-release bST treatment of Angora does. Growth by suckling kids may be enhanced, although cost-effectiveness of the treatment is unknown.

Davis, J. J., T. Sahlu, R. Puchala, M. J. Herselman, J. M. Fernandez, J. P. McCann, and S. W. Coleman. 1999. The effect of bovine somatotropin treatment on production of lactating Angora does with kids. Journal of Animal Science 77:17-24.

Recent Publications:

Davis, J. J., T. Sahlu, R. Puchala, M. J. Herselman, J. M. Fernandez, J. P. McCann, and S. W. Coleman. 1999. The effect of bovine somatotropin treatment on production of lactating Angora does with kids. Journal of Animal Science 77:17-24.

Davis, J.J., T. Sahlu, R. Puchala, M.J. Herselman, S.P. Hart, E.N. Escobar, S.W. Coleman, J.P. McCann and A.L. Goetsch. 1999. Effects of bovine somatotropin and ruminally undegraded protein on feed intake, live weight gain, and mohair production by yearling Angora wethers. Journal of Animal Science 77:1029-1036.

Herselman, M. J., S.P. Hart,, T. Sahlu, and A.L. Goetsch, 1999. Heat energy for growing goats and sheep grazing different pastures in the summer. Journal of Animal Science 77:1258-1265.

Puchala, R., T. Sahlu and J.J. Davis. 1999. Effects of zinc-methionine on performance of Angora goats. Small Ruminant Research 33:1-8.

Reis, P.J., R. Puchala, T. Sahlu, S.P. Hart and A.L. Goetsch. 1999. Effects of mimosine on plasma amino acid concentrations in Angora goats. Small Ruminant Research 33:55-61.

Reis, P.J., R. Puchala, T. Sahlu and A.L. Goetsch. 1999. Effects of mimosine and 2,3-dihydroxypyridine on fib r shedding in Angora goats. Journal of Animal Science 77:1224-1229.

Sahlu. T., H. Carneiro, H.M. El Shaer, J.M. Fernandez, S.P. Hart and A. L. Goetsch. 1999. Dietary protein effects on and the relationship between milk production and mohair growth in Angora does. Small Ruminant Research 33:25-36.

Sahlu, T., S.P. Hart and A.L. Goetsch. 1999. Effects of level of feed intake on body weight, body components, and mohair growth in Angora goats during realimentation. Small Ruminant Research 32:251-259.

Toerien, C.A., R. Puchala, J.P. McCann, T. Sahlu and A.L. Goetsch. 1999. Adrenocortical response to ACTH in Angora and Spanish goat wethers. Journal of Animal Science 77:1558-1564.

HACCP and the Goat Producer: A Workshop

In 1993, the outbreak of foodborne illness caused by the *E. coli* pathogen focused the attention of the public, the Congress, and USDA on the fact that the current system of meat and poultry inspection based on visible detection did not address the major cause of foodborne illness, which is invisible pathogens. Therefore, the Food Safety and Inspection Service of the United States Department of Agriculture published *Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems.* It established new requirements for meat and poultry plants, designed to reduce foodborne illness from these products. The HACCP requirements must be implemented by January, 2000.

One of the process step in the HACCP plan is the receiving of live animals. There are three types of food hazards that have been identified at this step and they are biological, chemical and physical. The biological hazards would include the presence of bacteria and other pathogens; chemical hazards would include drug residues; and physical hazards would include items such as broken needles, etc.

This assurance of a safe and wholesome product at this process step requires a strong and trusting relation ship between the livestock producer and the slaughter facility operator. Unfortunately, both parties are not well educated as to safe food handling and standard operating procedures of the other party.

Langston University has been awarded a small grant to conduct four workshops to bring together goat producers and very small establishment operators. Usually, the very small establishments are the ones that slaughter the majority of the goats in the United States. The objective of the workshops will be to educate all parties involved in assuring a safe food product.

The dates and locations of these four workshops has not yet been determined but they will occur either in late fall or early winter and will be located off-campus and in areas of the state to provide easy access for producers and very small establishment operators. **The workshops will be free and open to the public**.

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

Sustainable Agriculture Grants Workshop

The Southern Sustainable Agriculture Research and Education (SARE) Producer Grant program and the Kerr Center for Sustainable Agriculture will soon be soliciting grant proposals from Southern/Oklahoma farmers, ranchers and farmer/ranch organizations to conduct research, education and marketing projects that promote sustainable agriculture. The deadlines for next year's producer grants are late January, 2000 for SARE and mid-February, 2000 for the Kerr Center.

In order to facilitate grant writing, the E (Kika) de la Garza Institute for Goat Research will host a Sustainable Agriculture Grant writing workshop on December 4, 1999 at 10:00 a.m. This two-hour workshop will be held on the Langston campus and will provide page-by-page application information and examples of successful proposals. Workshop presenters will include producers who have been awarded producer grants and are currently conducting research on their farms.

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

Goat Management Tips

Preparing for Breeding Season *by S. Hart and T. Gipson.*

Fall is when a young buck's and a young doe's fancy turns to love. However, merely putting males and females together does not ensure a successful breeding program. The building of an exceptional goat herd is not a random event but one that is thoughtfully and methodically planned. Deciding who will breed, or in other terms who will pass on their genes to the next generation, is at the core of a successful breeding program. Selection of the parents of the next generation should be based upon:

1) performance,
2) physical/visual assessment and
3) pedigree.

Performance traits of interest will depend upon the commodity that you are producing. For example, a meat goat producer might be interested in weaning weight and average daily gain, a dairy goat producer might be interested in milk fat percentage and total lactational yield, and a fiber goat producer might be interested in fleece weight and yield. Conformation, which is structural correctness, and general appearance, which encompasses size and scale, and depth and width are traits that are visually assessed on the animal and are of quasi-economic importance because they are generally related to longevity. Except for the dairy goat industry, selection based upon pedigree is of little value because a pedigree is just a list of names and does not contain production information. However, a pedigree analysis is very useful as a check on inbreeding. A general rule of thumb is that if the parents are related, then the progeny will be inbred. As the percentage of inbreeding increases in a herd, the productivity decreases.

Before breeding season, a producer should analyze past reproductive performance of does in the herd. If a doe has been open the last two breeding seasons or if she failed to wean kid(s) the last two breeding seasons or she has a broken-down udder or she is generally a "poor-doer" then that doe is a prime candidate for culling. The producer should also determine the current buck's or bucks' progeny performance and make selection decisions based upon the progeny's performance. If the current buck(s) is retained for breeding, then the producer should use pedigrees to determine potential inbreeding.

The buck is 50% of the breeding equation and the goat producer should pay special attention to him. One buck can be used on as many as one hundred does. However, if a more compact kidding season is desired, 40-50 does per buck should be the upper limit. Be sure that the buck in reasonably good flesh before breeding season, because the buck will be thinking about things other than eating and will lose weight during breeding season. Another step that the producer can take to ensure a successful breeding season is to conduct a breeding soundness examination on the buck(s). This can be done by the local veterinarian. A breeding soundness examination consists of a physical evaluation of the penis and scrotum and a microscopic evaluation of the semen. Once the producer has made sound selection decisions based upon performance, visual assessment and pedigree, and once the buck(s) has passed a breeding soundness examination, the breeding season is ready to begin.

When is the best time to start the breeding season? The answer lies with kidding. Some breeders opt for March kidding because it gives bigger kids at the end of the Summer. However with this kidding scenario, the producer will have higher feed costs. Kids are more likely to need shelter against the wet and cold weather that many locations see early in the Spring. This may be worthwhile in the purebred/registered goat business because buyers like to see

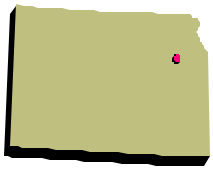
and buy bigger kids. But in the commercial meat goat business, a producer may end up subsidizing the kids that are sold for meat. For a commercial goat business, it is often more profitable to kid later. In the first 10 weeks after kidding, a doe will eat as much as she will in any 4 months during the rest of the production cycle. At this time, she also needs the highest quality nutrition. If a producer can match this nutritional need to the flush of forage growth in Spring, it will do the doe, kid and pocketbook all good. Also, there is usually better weather for kidding later. There is a tradeoff in that later born kids tend to grow slower, which may be due to the hotter weather or due to internal parasite problems, because these may be greater, especially if they are run with early-kidded animals. Sheep producers give additional feed (i.e. half a lb of corn per day) 3 weeks prior to breeding season and for the first three weeks of the breeding season to increase the lambing rate. This has been extrapolated to goats without any scientific data to support such practice. In a small study here at Langston, flushing did not increase conception rate (~96%) nor did it affect the number of kids born (2.0 vs 2.1 kids/doe). All does had kidded the previous year and were not thin at the time of breeding. Does on all treatments averaged conceiving 10 days after the breeding season started. This supports claims by several goat producers that as long as goats are in good flesh, they do not respond to flushing. If goats have sufficient forage or browse available, they will be in good condition for breeding. Goats have to be overstocked or in a drought to be too thin for breeding.

Dr. Steve Hart can be contacted (405) 466-3836 ext 40 or at shart@luresext.edu and Dr. Terry Gipson can be contacted (405) 466-3836 ext 31 or at tgipson@luresext.edu

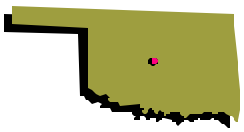
Grazing/Brush Control Demonstrations

by S. Hart

Langston University is conducting three demonstrations to show how goats can be used to control unwanted vegetation. This is the fifth year of a project in Kansas using goats to control serecia lespedeza as well as other weeds and brush. Serecia lespedeza has been declared a noxious weed and is spreading explosively in southeastern Kansas. To date, the only cost effective method for controlling it is by using goats. This year, we are running stocker goats in Kansas, looking at the effect of beginning weight and sex (doe vs wether) on animal weight gains. Weight gains have varied throughout the year from 3 to 9 lbs/month. Relative humidity may be an important factor in weight gains of stocker goats.



The second project is at Lake Oolagah in Oklahoma. Due to declining budgets, the Army Corps of Engineers must find more cost effective methods for controlling unwanted vegetation on their watersheds. Herbicides cannot be used for control due to the runoff hazard which may contaminate the lake. The goats have severely stripped the bark off of the honey locust trees and have made a definite impact on the blackberries, sumac, broomsedge, buckbrush and broomsedge bluestem. The goats have been very good at controlling the vegetation in a cost-effective manner without creating a pollution hazard. The third project is in Haskell, Oklahoma to use goats for controlling woody species of vegetation. The most common woody species is blackberry as well as significant persimmon, sumac and buckbrush. The goats have made a significant impact on controlling these species.



For more information on using goats to control brush, contact Dr. Steve Hart at (405) 466-3836 ext. 40 or at shart@luresext.edu.

Noteworthy News

This summer, Dr. **Irene Brown-Crowder** was an USDA-CREES Summer Fellow. Dr. Brown-Crowder has been updating the Extension Goat Industry Handbook. The handbook will be published in print form and electronically on CD-ROM. The expected date of publication is Spring 2000.

Drs. **Maxine Cameroon, Art Goetsch, Steve Hart, Manuel Lachica, Isabel Prieto, Ryszard Puchala, Tumen Wuliji** and Mr. **Tehsome Shenkoru** presented research findings at the annual meetings of the American Society of Animal Science in Indianapolis, Indiana, June 21-23, 1999.

Dr. **Steve Zeng** has resigned his faculty position at Langston University and has accepted a position with Galaxy Food in Orlando, Florida. We wish Dr. **Zeng** the best in his new endeavors.

Drs. **Girma Abebe**, **Marvin Burns**, **Tilahun Sahlu** and **Roger Merkel** traveled to Washington DC to attend the Annual Meeting of Partners in Higher Education for International Development. Dr. **Abebe** gave a presentation on the university linkage between Langston University and Awassa University in Ethiopia and a presentation on grant activities at the two universities.

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