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 *Summer 2001*

From the Director's Desk

Dr. Tilahun Sahlu

Now that the busy spring kidding season is over and warm Oklahoma temperatures are back, we have a number of experiments underway with weaned kids. Dr. **Art Goetsch** has a trial in progress looking at performance of Alpine doelings when given separate, free-choice access to concentrate and forage, compared with completely mixed diets. Other studies underway include "Detection of Mastitis in Dairy Goats" of Dr. **Grant Tomita**, and "Sustainable Dairy Goat Milk Production from Forages" of Drs. **B. R. Min** and **Steve Hart**. Dr. **Steve Zeng** recently rejoined the Institute, and he and a new Visiting Scholar from the Desert Research Center in Egypt (Dr. **Kamal Soryal**) have begun work on the project "Quality Characteristics and Yield Predictive Models of Goat Cheeses." Another visitor, Dr. **Bill Pomroy** from New Zealand, along with **Steve Hart** and **B. R. Min**, are conducting an experiment entitled "Internal Parasite Detection in Goats and Field Survival of Internal Parasites." Dr. **Cesar Pinares**, a new Visiting Scholar also most recently from New Zealand, assisted by **Art Goetsch** and **Glenn Detweiler**, is initiating a project entitled "Energy for the Productive Caprine," to determine energy requirements for different functions and breeds of goats. This trial uses a new calorimetry system previously obtained through a USDA equipment grant. Besides activities associated with these research projects and experiments that are underway, we also devote considerable time and effort to getting ready for upcoming projects. For example, final approval was recently received by Drs. **Goetsch**, **Hart**, **Gipson**, and **Merkel** from the USDA Sustainable Agriculture Research and Education program (SARE) for a project entitled "Use of Goats for Vegetation Management in Grazing Lands." So we are busy preparing for the goat research/demonstration activities of this project that will begin next spring, with grazing in different pasture/vegetation scenarios on tribal lands or lands of tribal members of six collaborating Native American Nations (Caddo, Cherokee, Choctaw, Greater Seminole, Osage, and Sac and Fox). The staff of the farm will be very important in setting up for these activities. We are happy to have a new Research Farm Coordinator, Mr. **Erick Loetz**. Erick will be assisted by Mr. **Jerry Hayes** who, along with **Glenn Detweiler**, has been handling many of the Coordinator duties in the past couple of years.

The fifth annual buck performance test started in early May and is supervised by Dr. **Terry Gipson**. This year, we have 50 bucks enrolled in the test, which is the most that we have had enrolled in a test. We appreciate the support that you, the producers, give us.

Goat Newsletter is published quarterly by the Cooperative Extension Service of the E. (Kika) de la Garza Institute for Goat Research, Langston University, Langston, Oklahoma.

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Meet the Faculty & Staff

Dr. Roger Merkel

Dr. Roger Merkel was born on a grain/livestock farm in northern Illinois. He received his B.S. degree in Agriculture from the University of Illinois in 1982. Dr. Merkel then spent the following four years serving in the U.S. Peace Corps in Thailand, first as an agricultural education volunteer working with teachers and students in village schools and later as a trainer for incoming volunteers. Dr. Merkel received his M.S. in Animal Science from the University of Florida in 1989 in the area of mineral nutrition. In 1994, he received his Ph.D. in Nutrition from North Carolina State University. For his doctoral research on the effects of tannins in tropical tree legumes, Dr. Merkel spent one year in North Sumatra, Indonesia through NCSU's involvement in the Small Ruminant Collaborative Research Support Program (SR-CRSP). In 1995, Dr. Merkel returned to North Sumatra as project liaison officer of the SR-CRSP, a position he held until project termination in late 1996.

In 1997, Dr. Merkel joined Langston University in a post-doctoral position to conduct research on the utilization of browse by goats. In 2000, Dr. Merkel was hired as an Assistant Professor at Langston University. His current duties include research, teaching and extension. Dr. Merkel also conducts the international activities of the E (Kika) de la Garza Institute for Goat Research. He has written successfully funded grants for work with universities in Ethiopia and Armenia and currently administers those grants. In November, 2000 Dr. Merkel co-organized a conference on small ruminant production in Ethiopia and has organized a similar conference in Indonesia in the past. The Ethiopia conference proceedings can be found on GIGR's new website, http://www2.luresext.edu under the "Other Activities" section in the International Activities area.

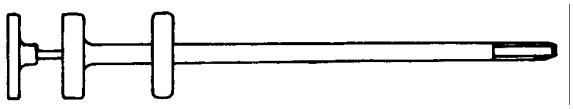
Dr. Merkel is very interested in international agricultural development and the issue of food security in the world. In addition to his research and international interests, Dr. Merkel is knowledgeable in tanning goat skins and makes presentations of the basics of tanning, an activity that is gaining popularity among goat producers and hobbyists.

Dr. Roger Merkel can be reached at (405) 466-3836 or at rmerkel@luresext.edu.

Artificial Insemination Workshops

The Goat Extension Program will be conducting two artificial insemination workshops this fall.

The first will be at Langston University on Saturday, September 8, 2001 and the second will be at the Cherokee County Fairgrounds in Tahlequah, OK on Saturday, October 13, 2001. Both workshops will present basic anatomy and physiology of goats, estrus detection and synchronization in goats, and semen handling. Participants will have opportunity to practice with fresh reproductive tracts and with live animals.



Are you proficient with one of these? If not, you will want to attend our artificial insemination workshops.

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

Mastitis Workshop

The 1st annual Mastitis Workshop is scheduled to be held on Saturday, September 22, 2001, at the E (Kika) de la Garza Institute for Goat Research dairy facility. The workshop will consist of a comprehensive lecture on mastitis in the morning session and a hands-on laboratory course in the afternoon session.

In the morning session, Dr. Grant M. Tomita, a mastitis researcher at the Institute, will start off the program with a seminar on the cause, prevention, and management of mastitis in dairy goats. The pathogenesis of the disease as well as management strategies to prevent mastitis and treatment options in the event of intramammary infection will be covered in the presentation. Dr. Tomita's seminar will be followed by a presentation given by Dr. Max J. Paape of the United States Department of Agriculture, Immunology and Disease Resistance Laboratory, located in Beltsville, Maryland. Dr. Paape is a nationally and internationally recognized expert in the area of milk somatic cell function and mastitis. The role of milk somatic cells during mastitis and the effect of increased somatic cell count on milk quality will be discussed by Dr. Paape. This session will provide a basic knowledge of mastitis to participants, as well as an understanding of how to prevent and treat the disease.

In the afternoon session of the workshop, Drs. Tomita and Paape will conduct a laboratory course on the detection and diagnosis of mastitis. Participants will be instructed on various techniques that are utilized to collect milk samples for the observation of mastitis and the identification of mastitis pathogens. Live dairy goats will be utilized for all demonstrations and for practice by workshop attendees. This session will provide the participant hands-on experience in determining the udder health of lactating goats.

For information regarding the mastitis workshop, contact Dr. Grant Tomita at (405)466-3836 or gtomita@luresext.edu.

ABGA Acknowledgment

At their recent annual meeting in Lawton, OK, the American Boer Goat Association acknowledged the contributions of Langston University to the goat industry. The photo at the right shows Mr. Bruce Lott, Executive Secretary of the ABGA, presenting an appreciation plaque to Dr. Tilahun Sahlu, Director of GIGR.

Goat Management Tips - Diseases

Obstructive Urolithiasis *by Lionel Dawson, D.V.M.*

In goats, obstructive urolithiasis is usually seen in young castrated males. This condition may also be seen in intact males. The incidence may be quite high in some geographical areas, while relatively low in others. Bucks and wethers (castrated males) on high concentrate rations are most often affected.

Obstruction or partial blockage may be due to calculi formation. In goats, calculi are usually comprised of phosphate salts, especially calcium phosphate (apatite) and magnesium ammonium phosphate (struvite). In the United States and Europe, goats kept as pets are at high risk for developing this condition primarily due to feeding of excessive grain in the diet. A grain diet has a high phosphorus content.

Urethral calculi more commonly affects males due to the length and diameter of the urethra, and may also be due to early castration. Management of urolithiasis and urethral obstruction can be frustrating. Simple, inexpensive management techniques usually provide only temporary relief, and the costs of techniques with better long-term success rates often exceed the value of the animal. It is important to understand how diet, urine pH, water consumption and the concentration of minerals in the urine affect the calculi formation. Identifying the type of calculi and instituting dietary and management practices that discourage calculi formation are important for developing long term plans for prophylaxis.

Causes

Calculi formation is due to an interaction of numerous physiological, nutritional, and management related factors. Urine is a highly saturated solution of minerals. Under normal circumstances, these solutes or minerals usually remain in solution. However, factors such as increased urine concentration during times of decreased water intake or increased water loss and urine stasis will predispose the animal to increased urine pH.

Crystalline formation is the initial step in the development of urinary calculi and occurs when urine proteins coalese and precipitate as crystals in the urine. Inadequate levels of Vitamin A, diets high in concentrates, and administration or consumption of feed with high levels of estrogen cause increases in urinary protein, which along with minerals in the urine, coalese and continue to enlarge as calculi.

Clinical Signs

- Fever
- Increased heart rate
- Increased respiratory rate
- Restlessness
- Colicky signs
- Repeated tail switching
- Persistent straining
- Blood tinged urine

Examination of the abdomen will reveal a distended or enlarged bladder and probably swelling around the sheath. The swelling may be towards the urethral opening or posteriorly towards the testicles.

Rupture of the bladder or urethra produces alleviation of discomfort and anxiety, and animals resume a normal attitude, at least until the signs of uremia supervene. Signs of uremia include off feed, weakness, depressed, and finally an animal who is down and stretched out.

Diagnosis

- Symptoms
- Aspiration of the peri urethral swelling and peritoneal fluid
- Creatinine and urea nitrogen levels in the fluid
- Ultrasonography

Treatment

Depends on the stage of the disease. If this condition is diagnosised early, medical or conservative management can be attempted.

Medical Management

A) If calculi is lodged in the urethral process, the urethral process can be removed. When sandy

material is present in the urethral process, it sometimes can be successfully milked out without removing the process itself.

B) If calculi is lodged proximal to the urethral process, tranquilizers and antispasmodics may be helpful to promote urethral relaxation and facilitate natural expulsion of the calculus by the pressure of attempted urination. Tranquilizers commonly used are Diazepam, acepromazine, and aminopromazine with variable results. Also, a catheter may be inserted far enough into the urethra to permit infusion of sterile saline in an attempt to distend the urethra and dislodge the offending stone.

C) Administering anti-inflammatory drugs like Banamine or Azium sodium phosphate I/V for 24 to 48 hours will reduce some of the inflammation around the urethra.

D) Acidification of the urine with ammonium chloride, increasing salt content of the diet and Vitamin C may aid in dissolving the calculi.

If medical or conservative management fails, or if urinary tract rupture has occurred, then some sort of surgical intervention becomes necessary.
Before any surgery is attempted the patient should be evaluated with blood tests for uremia and electrolyte imbalances and stabilized accordingly. If the bladder has ruptured, urine should be drained from the abdomen to slow the uremic process.
Radiographic contrast or ultrasound studies can be helpful in determining the appropriate surgical management.

Surgical Options

1. Urethral process amputation
2. Penile Amputation - salvage
3. Perineal Urethrostomy - salvage
4. Cystotomy - Retrograde flushing of the urethra. Intact bucks.
5. Tube cystotomy. A catheter is placed in the bladder allow the urethral mucousa to slough off including the calculi. Intact bucks.
6. Urethrostomy. Urethra is opened over the calculi and the mucousa silvered. Intact bucks.
7. Laparotomy. If bladder is ruptured, usually perineal urethrostomy is performed along with closing the bladder if possible.

Prevention

Dietary management is key to the control and prevention of obstructive urolithiasis.

1. Maintain a calcium to phosphorus ratio of 2:1 to 2.5:1 in the diet.
2. Feeding excess grain supplements to goats, increases the chances of calculi formation.
3. Good quality hay with salt and trace minerals is adequate to feed a goat. Feeding grain could be eliminated.
4. When good quality hay like alfalfa hay is not available, grain is fed with dicalcium phosphate or calcium carbonate.
5. Adequate supply of clean fresh water
6. Increasing the concentration of salt in the ration up to 4% will promote increased water consumption.
7. Insure adequate levels of vitamin A in the diet to prevent epithelial desquamation into bladder.
8. To prevent phosphate calculi like apatite or struvite when feeding a predominately high grain diet, a continuous administration of ammonium chloride at a dose of 10 grams per day or at a level of 2% in the concentrate ration has been recommended. Ammonium sulphate is sometimes used at the rate of 0.6-0.7% of the total ration.
9. Calculi in preweaned goats fed a milk replacement may be due to Ca to P ratio less than 2:1 in the milk replacer.
10. Delaying castration may be another management tool for reducing the prevalence of obstructive urolithiasis.

For more information regarding goat diseases, contact Dr. Lionel Dawson at (405) 744-8580 or at dlionel@okstate.edu

Research Spotlight

Abstracted by A. Goetsch

Supplemental Protein for Angoras.

The US Angora goat, on a body weight basis, is one of the heaviest fleece-producing ruminants. Although mohair requires little energy for growth, the protein required is considerable. In particular, requirements for the sulfur-containing amino acids cysteine and methionine are high. However, the array of amino acids needed for fleece-free body weight gain is different from that needed for fiber growth. Thus, diets containing supplemental protein sources promoting high body weight gain may not necessarily do so for fiber growth, which would be of special importance for growing, fiber-producing ruminants, such as yearling Angora doelings typically bred for kidding at 2 years of age. Therefore, objectives of this study were to determine if different common supplemental dietary protein sources have similar effects on live weight and mohair growth in yearling Angora doelings. Yearling Angora doelings (44 lb initial body weight) were used; diets consisted of approximately 40% roughage and 18 to 19% crude protein (dry matter basis), of which two-thirds was supplied by corn gluten meal, cottonseed meal, hydrolyzed feather meal, or Menhaden fish meal; dry matter intake was restricted at about 1.5 lb/day. Results of this experiment indicate that dietary characteristics promoting body weight gain may not be those most conducive to high mohair growth. In this particular instance, a diet with supplemental fish meal resulted in greater body weight than diets with feather, corn gluten, or cottonseed meals, whereas corn gluten meal produced greatest mohair growth.

A. J. Litherland, T. Sahlu, C. A. Toerien, R. Puchala, K. Tesfai, and A. L. Goetsch. 2000. Effects of dietary protein source on fleece and live weight gain in Angora doelings. Small Ruminant Research 38:29-36.

Boer × Alpine Crossbreeding.

The Alpine goat has high milk production but low rates of carcass fat and protein deposition compared with meat goat breeds like the Boer. Thus, crossbreeding Alpines with a meat goat breed is a means of increasing profit potential from sale of kids for meat production. Therefore, in this experiment Boer × Alpine wethers were used to determine effects of feeding from 15 to 31 weeks (Phase 1) and from 38 to 50 weeks (Phase 2) on performance and slaughter characteristics. All wethers consumed diets free-choice with 20 and 16% crude protein in Phase 1 and 2, respectively. Body weight after Phase 1 and 2 was 92 and 125 lb, respectively; body weight gain was greater in Phase 1 than in Phase 2 (228 vs 118 g/day, or 0.50 vs 0.26 lb/day); and the ratio of body weight gain to dry matter intake differed between phases (0.19 in Phase 1 vs 0.10 in Phase 2). Cold carcass weight (20.4 vs 29.6 kg, or 44.9 vs 65.1 lb), dressing percentage (50.1 vs 56.5%), and percentage of carcass fat (16.4 vs 20.2%) were greater after Phase 2 than Phase 1, and leg cut percentage (30.5 vs 28.3%), carcass bone percentage (23.7 vs 20.6%), and backfat thickness (0.44 vs 0.30 cm, or 0.17 vs 0.12 in) were greater after Phase 1. However, carcass lean percentage (58.3 and 57.1%) and the percentage of noncarcass fat (6.39 and 7.07% for Phase 1 and 2, respectively) were similar between phases. In conclusion, Boer × Alpine male castrates had appreciably greater body weight gain and more efficient conversion of feed to gain in Phase 1 (14 to 31 weeks of age) than in Phase 2 (38 to 50 weeks of age). Most important carcass characteristics favorably affected by the lengthy feeding period were carcass weight and dressing percentage. In general, age did not have appreciable effects on other carcass characteristics, although the carcass fat percentage was 3.8 percentage units greater after Phase 2 than after Phase 1. Overall, it would appear that considerably more desirable marketing opportunities after Phase 2 than after Phase 1 would be required to justify the high feed costs of Phase 2 for Boer × Alpine wethers.

J. Luo, T. Sahlu, and A. L. Goetsch. 2000. Growth and carcass traits of Boer × Alpine wethers slaughtered at the ages of 31 and 50 weeks. Journal of Animal and Feed Sciences 9:309-316.

GIGR's International Activities now includes the Republic of Armenia

by R. Merkel

GIGR has been awarded a 12-month grant from the USDA's Cooperative State Research, Education, and Extension Service (CSREES) Innovation Fund Program for activities with the Armenian Agricultural Academy. Recently, the USDA-CSREES Marketing Assistance Project (MAP) in Armenia has assisted the Armenian Ministry of Agriculture and the Armenian Agricultural Academy in establishing a dairy goat breeding center in

Yeghegnadzor, Armenia that will be cooperatively owned by farmers of the Armenian Dairy Goat Products Cooperative. The purpose of the center is to use research and extension to assess village dairy goat production systems and constraints, develop successful intervention strategies and transfer that knowledge to producers. Additionally, the Center wishes to improve the quality of Armenian goat milk and goat milk products through the institution of a Dairy Herd Improvement (DHI)-like organization in Armenia. GIGR has the only DHI laboratory and record keeping system in the United States devoted solely to goats.

To support and strengthen the activities of the dairy goat breeding center in Armenia, GIGR will host three Armenian personnel for a three-week training period. Armenian personnel will be trained in the use of equipment for the analysis of milk fat and protein content. They will also be trained in dairy goat record keeping and processing and in the interpretation of those records for producers. This training will equip them with the knowledge to implement such a program in Armenia. In addition to DHI training, the Armenian personnel will be trained in artificial insemination, semen collection, evaluation and freezing. They will also be trained in the conduct of breeding soundness exams that can be used in evaluating young bucks. Along with the training, the visitors will have the chance to visit Oklahoma goat farms and interact with producers before their return to Armenia. As a final part of the grant, three GIGR personnel will travel to Armenia to provide technical assistance to their fledgling dairy goat industry and determine ways in which GIGR can assist the Armenian Agricultural Academy and the RDBC in the future.

From the MAP website (http://usda.am/)

MAP will assist farmers and agribusinesses in production, marketing, and exporting food and related products to increase incomes, create jobs, and raise the standard of living for Armenians working in the agro-processing sector. This assistance will come in the form of timely technical, financial, and marketing support to farmers and farmer groups, agribusinesses, as well as education, extension services and applied research throughout the country.

The Goat Industry Development Project is a major new project initiative in Armenia that involves the dairy goat husbandry and goat cheese industry in the southern part of Armenia. The focus of this effort is the new "ARID Goat Center" (ARmenian Improved Dairy Goat Center). The Center's goal is to increase dairy goat lactation in the Vayots Dzor Region, and later in other regions of Armenia, by 100 liters/goat/year. This increased milk supply will increase new goat cheese products for which there is a demonstrated export potential.

Noteworthy News

Dr. **Steve Zeng** rejoined the faculty of the goat institute at Langston University. Dr. Zeng will conduct research and extension activities in cheesemaking and dairy foods processing

Dr. **Kamal Soryal**, a visiting scholar from Egypt, arrived to work with Dr. **Zeng** to conduct research in cheesemaking.

Mr. **Erick Loetz** recently rejoined the goat institute at Langston University as farm manager. Mr. Loetz had worked at the goat institute in the early 1980s.

Ms. **Karen Strong**, a student from Berea College in Kentucky, conducted her student internship at Langston University this Spring.

On May 5 through May 8, 2001, Dr. Grant M. Tomita attended the National Conference on Interstate Milk Shipment (NCIMS), in Wichita, Kansas. This conference convenes every two years to consider changes or modifications to the Grade "A" Pasteurized Milk Ordinance regulations. As a representative of Langston University, Dr. Tomita spoke with numerous federal and state regulatory agents, and representatives from the dairy industry to remind them of the fact that the E. (Kika) de la Garza Institute for Goat Research has and will continue to conduct research to support proposals of regulations that affect milk quality.

Drs. **Steve Hart** and **Terry Gipson** gave presentations on meat/dairy goat production at a producer-sponsored field day near Stillwell, OK.

Dr. **Terry Gipson** gave a presentation on Expected Progeny Differences at the national American Boer Goat Association show in Lawton, OK.

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