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 2001*

From the Director's Desk

Dr. Tilahun Sahlu

Although some of us were able to take a little time off this summer, we were still able to accomplish a great deal. This fall promises to be equally or more productive.

For research, we have a number of ongoing experiments mentioned in the last newsletter. Mr. **Yoseph Mekasha** and Dr. **Roger Merkel** have an experiment underway dealing with simple feeding practices for broiler litter with Boer-Spanish wethers. Dr. **Art Goetsch** and Mr. **Glenn Detweiler** are completing the trial looking at performance of Alpine doelings when given separate, free-choice access to concentrate and forage, compared with completely mixed diets.

Other studies about to end include "Detection of Mastitis in Dairy Goats" by Dr. **Grant Tomita** and "Sustainable Dairy Goat Milk Production from Forages" by Drs. **B. R. Min** and **Steve Hart**. Drs. **Kamal Soryal** and **Steve Zeng** are comparing properties of cheese made from milk of the different grazing treatments that are on the "Sustainable Dairy Goat Milk Production from Forages" experiment. Dr. **Bill Pomroy** from New Zealand and Dr. **Steve Hart** have their experiments "Internal Parasite Detection in Goats" and "Field Survival of Internal Parasites" nearly finished. Dr. **Ignatius Nsahlai** from the University of Natal in South Africa joined us in July for a 6-month sabbatical to work with Drs. **Jun Luo** and **Art Goetsch** in determining goat nutrient requirements with a large database constructed from research publications primarily in the past 20 years. Drs. **Eric Ponnam** and **Ryszard Puchala** are conducting a site of digestion experiment with low-quality forage and supplementation with ruminally protected betaine.

There has been a lot going on with our international projects. Dr. **Art Goetsch** traveled to the Middle East to discuss the project "Multinational Approaches to Enhance Goat Production in the Middle East" with other participants.

This summer, Dr. **Terry Gipson** visited Armenia and later in the summer, a group of four Armenian scientists, their translator and an American technical advisor visited Langston for advanced training in dairy goat management (*see report on page 7*)

The fifth annual meat buck performance test was recently completed with the largest number of bucks ever enrolled in the test. In conjunction with the end-of-the-test report, a sanctioned Oklahoma Youth Meat Goat Association show was held. More than 30 youth exhibitors participated in the show, of which Mr. Marvin Shurley of Sonora TX was the judge (*see report on page 3*).

In this issue, we have included a survey on dewormer use by goat producers and we ask your assistance in completing and returning the survey (*see page 6*).

Thank you for your continued support and cooperation.

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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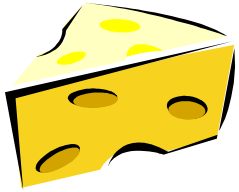
Meet the Faculty & Staff

Dr. Steve Zeng

Dr. Steve Zeng was born in China. He received his Bachelor's degree in Animal Science at Jiangxi Agricultural University in 1983. After completion of a one year meat science program at Mississippi State University as a visiting scholar, he focused his attention on dairy science. He received his Master's degree in Dairy Manufacturing at Mississippi State in 1989 and his Doctorate of Philosophy in Food Technology at Clemson University, South Carolina in 1992.

Dr. Zeng worked as a Dairy Extension Specialist/Food Technologist at Langston University from 1992 to 1999. He returned to Langston in 2001. Beside extension activities, Dr. Zeng is presently directing an USDA-funded research project titled "Quality characteristics and yield prediction models of goat milk cheeses" . His group is looking at factors affecting yield, amino acid, and fatty acid profiles of soft, semi-hard and hard cheeses. They are also studying the conjugated linoleic acid (CLA) content in goat milk and cheese, as CLA is considered to be a new found anti-carcinogen. He enjoyed working with goat producers around the country and promoting the dairy goat industry. His research and extension activities were focused on somatic cell counts in milk and its effect on milk and cheese quality, antibiotic residue test kits, and cheese and other dairy goat product workshops.

Dr. Zeng worked as a Food Scientist/R&D Manager for Galaxy Nutritional Foods in Orlando, FL for two years before he rejoined the E (Kika) de la Garza Institute for Goat Research as an Associate Professor/Dairy Product Specialist in May 2001. He hopes the experiences gained in dairy product manufacturing, quality control, nutritional analyses and labeling, federal and state inspection and regulations will enhance Langston's existing food science program.



Dr. Steve Zeng can be reached at (405)466-3936 ext. 26 or at szeng@luresext.edu.

2001 Meat Buck Performance Test

by T. A. Gipson

The fifth annual meat buck performance test started on May 5, 2001 at the South Barn complex of Langston University with 50 bucks enrolled from eighteen different breeders. Forty-eight of the bucks were fullblood or crossbred Boer bucks and the other two were Kiko bucks. Thirty-one bucks were from Texas, fourteen from Oklahoma and five from Illinois. The test was open to purebred and crossbred bucks born between December 1, 2000 and March 31, 2001. Bucks were given a thorough physical examination at check-in.

Entrance weight for the 50 bucks averaged 53.1 lbs. with a range of 34.1 to 83.7 lbs. The average age was 92 days with a range from 50 to 158 days.

Adjustment Period

All bucks underwent an adjustment period of eighteen days immediately after check-in. During the adjustment period, bucks were acclimated to the test ration and to the Calan feeders. Nine bucks were assigned to each 20' x 20' inside pen equipped with nine Calan feeders. Each pen also had a 20' x 20' outside run. The inside and outside pen space is separated by an overhead door which can be raised or lowered as the weather dictates. Every other pen was also equipped with a fan to circulate air in the barn complex whenever needed. The grass in the outside pens was mowed often, and grazing was negligible. Each buck wore a collar with an electronic "key" encased in hard plastic. The key unlocks the door to only one Calan feeder, thus enabling the buck to eat out of his individual feeder. Each morning, yesterday's feed that remains in the Calan feeder was weighed and removed from the Calan feeder. Fresh feed was weighted and placed into the Calan feeder. The difference in weights between the fresh feed place in the Calan feeder one morning and the remaining feed the next morning is the amount consumed. Because only one goat is capable of opening the Calan door and eating, it is possible to calculate the feed intake of the individual bucks. The area immediately around the Calan feeders and waterers is concrete, however, the large majority of the inside pen is earth and is covered by pine shavings. Pine shavings were periodically added as needed to maintain fresh bedding. Bucks had free access to water provided by a float-valve raised waterers.

Body weights at the beginning of the test (two weeks after the entrance date) averaged 58.3 lbs. with a range of 29.7 to 98.0 lbs.

Ration

The ration was fed free-choice during the adjustment period and during the 12-week test. The crude protein content of the ration was 16% with 2.5% fat, 20.4% fiber and 60.6% TDN. Calcium, phosphorus and sodium levels were .74%, .37% and 1.07%, respectively.

ABGA Approved Performance Test

The Oklahoma performance test has been designated by the American Boer Goat Association Board of Directors as an ABGA Approved Performance Test. Qualified fullblood or purebred Boer bucks will be eligible to earn points toward entry into the "Ennobled Herd Book".

Gain

Average weight at the end of the test was 108.4 lbs. with a range of 68.3 to 152.0 lbs. Average gain for the test was 50.1 lbs. with a range of 24.2 to 74.9 lbs.

Average Daily Gain (ADG)

Bucks gained on averaged .60 lbs./day with a range from .29 lbs./day to .89 lbs./day.

Feed Efficiency

Bucks consumed an average of 308.1 lbs. of feed with a range of 143.7 lbs. to 470.7 lbs. For the test, the bucks averaged a feed efficiency of 6.30 (feed efficiency is defined as the number of

lbs. of feed needed for one lb. of gain), with a range of 3.98 to 11.71.

Muscling

The average loin eye area as determined by ultrasonography was 1.98 square inches with a range of 0.97 to 3.02 square inches and the average right rear leg circumference was 17.6 inches with a range of 13.0 to 22.5 inches.

Index

For 2001, the index was calculated using the following parameters:

- 30% on efficiency (units of feed per unit of gain)
- 30% on average daily gain
- 20% on area of longissimus muscle (loin) at the first lumbar site as measured by real time ultrasound adjusted by the goat's metabolic body weight
- 20% circumference around the widest part of the hind right leg as measured with a tailor's tape adjusted by the goat's metabolic body weight:

The adjustment to metabolic body weight gives lighter weight goats a fair comparison of muscling to heavier goats.

Congratulations

The Oklahoma Meat Goat Association and the Agricultural Research and Extension Program at Langston University congratulate

- Mr. Marvin Shurley of Sonora, TX for having the Top-Indexing buck in the 2001 Oklahoma Meat Buck Performance Test

2001 Top Indexing Buck

Also, deserving congratulations are:

- Mr. Tommy Morriss of Sonora, TX for having the #1 Fastest-Gaining buck
- Mr. Richard Williams of Stillwater, OK for having the #2 Fastest-Gaining buck
- Mr. Marvin Shurley of Sonora, TX for having the #3 Fastest-Gaining buck
- Mr. Marvin Shurley of Sonora, TX for having the #4 (tie) Fastest-Gaining buck
- Mr. Jim Rosenbaum of Gainesville, TX for having the #4 (tie) Fastest-Gaining buck
- Ms. Judy Hollis of Sonora, TX for having the Most-Feed-Efficient buck
- Mr. Marvin Shurley of Sonora, TX for having the Most-Heavily-Muscled buck
- Dr. Fred Homeyer of Robert Lee, TX for having the Best-Conformation-Boer buck.

Acknowledgments

The Buck Test supervisor wishes to acknowledge Dr. Lionel Dawson of Oklahoma State University for his contributions as the admitting and on-call veterinarian, Mr. Jerry Hayes of Langston University for aid and supervision, Dr. Fred Ray of Oklahoma State University for conducting the ultrasound measurements for the lion eye area, Mr. Les Hutchens and his associates at Reproductive Enterprises, Inc. for conducting the breeding soundness exams, and Stillwater Milling for custom mixing the feed.

For further information regarding the 2001 Buck Performance Test, contact Dr. Terry Gipson at (405)466-3836 or tgipson@luresext.edu.

Goat Management Tips - Diseases

Tetanus *by Lionel Dawson, D.V.M.*

Tetanus, also called "Lock Jaw", is a disease caused by *Clostridium tetani*, which are spore-forming bacteria found widely in soil and animal feces. Spores are very resistant to destruction and can persist in soil for many years.

The spores may gain entrance to the body through wounds from shaving, docking, castration and vaccination. The organism in general does not spread from the site it enters, but creates an anaerobic environment by killing the tissue around the wound. This enables the spores to release the toxin or neurotoxin which spreads through nerves to the spinal cord, where it blocks the inhibitory effects of the neurons. This leads to sustained discharge of impulses causing signs of constant stimulation or tetany in the animal.

Clinical Signs

- Stiffness.
- Difficulty in moving or walking.
- Easily excited to touch or noise.
- Mild bloat.
- A "saw horse" stance-Spasm of the neck and back causing them to extend.
- Tail and ears become stiff.
- "Lock Jaw". Difficulty opening the mouth.
- Salivation.
- Food accumulated in the mouth.
- Prolapse of the third eye lid.
- Seizures or convulse periodically to slight disturbance.
- Lateral recumbency and cannot get up. Later resulting in stiff limbs.
- Death is usually caused by tetanic spasm of the diaphragm and finally respiratory arrest.

Treatment

Prognosis is guarded. Early identification and intervention improve the recovery rate.

1) Site of bacterial proliferation and toxin release should be neutralized by cleaning the wound, opening the wound to make it aerobic, dead tissue removed and cavity flushed with hydrogen peroxide.

2) Systemic penicillin injections for 4-7 days.

3) Tetanus antitoxin. 10,000-15,000 units given intravenously every 12 hours, for the first 24-36 hours.

4) Keep the animal in a quiet and dark room.

5) Control.
   A) Convulsions and seizures = Diazepam
   B) Calm the animal = Acepromazine.
   C) Muscle relaxant = Methocarbamol.
   These drugs are controlled substances, should consult your veterinarian.

6) Intravenous fluids are needed if the animal is not eating or drinking.

Control

1) Hygiene:

- Pen or barn where they are housed should be cleaned and disinfected.
- Wounds should be cleaned promptly and thoroughly.
- Surgical procedures should be carried out in a strictly sanitary manner.
- Elastrator bands are not recommended for castration in areas when tetanus is a problem.
- If elastrator is used, keep the elastrator rings in alcohol or good disinfectant like betadine or nolvason.
- Ear tags should also be kept in disinfectant prior to use.

2) Vaccination:

It is recommended that routine vaccination for tetanus be incorporated into the herd health program. If does are vaccinated during late gestation, kids will be protected by passive colostral antibody for at least 3-4 weeks. So kids should be vaccinated for the first time:

Kids	3 weeks of age Boostered 4 weeks later Revaccinated annually
Does	Does preferably 3-4 weeks before kidding.
Bucks	Bucks should be vaccinated annually. Usually done 2-4 weeks before they are turned out in fall for breeding.

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 Fat for Dairy Goats.

In dairy cattle, fat supplementation of early lactation diets can increase energy density to enhance milk production without necessitating a higher amount of concentrate. Fat supplementation also has improved dairy goat milk production and(or) fat concentration in many studies. Although there are a number of reports in which effects did not occur possibly because of the particular source of fat used. In many instances the number of dietary fat levels used was low, and there is a variety of commercial fat products presently available. Therefore, in this experiment 60 Alpine does in weeks 3-11 of lactation were fed diets with 0, 1.5, 3.0, 4.5, or 6.0% of partially hydrogenated tallow. The 0% fat diet contained 30% concentrate and other diets were 42-46% concentrate. Milk yield increased as dietary tallow level was increased to 3 and 4.5% but decreased when the level was raised to 6.0%, although milk fat concentration increased linearly and protein level was unchanged. These results suggest beneficial usage by lactating Alpine does of low to moderate levels of partially hydrogenated tallow in diets moderate in concentrate level, although ingredient availability and costs will influence ultimate dietary ingredient decisions.

I. E. Brown-Crowder, S. P. Hart, M. Cameron, T. Sahlu, and A. L. Goetsch. 2001. Effects of dietary tallow level on performance of Alpine does in early lactation. Small Ruminant Research 39:233-241.

Improved Rangeland Utilization.

Many rangeland/grazing areas possess forage and shrub species that are considered poor quality due to the presence of antinutritive factors such as phenolic compounds and tannins. Goats are known for their ability to consume tannin-containing brush and can utilize forage and shrub species containing tannins and phenolic compounds at levels that prohibit their use as feeds for sheep or cattle. Water oak (Quercus nigra) and shining sumac (Rhus copallina) are two examples of shrub species present in grazing or woodland areas that contain antinutritive factors. Therefore, eight Alpine wethers 8-9 months of age, were fed diets consisting solely of dried leaves of water oak or shining sumac. Feed intake was similar between the two types of leaves, averaging 616 grams or 2.24% of body weight. However, based on higher digestibilities for water shining sumac than for water oak (for example, 64 versus 42% apparent organic matter digestibility), nutritive value may be greater for shining sumac. This ability of goats to consume and derive nutrients from such plants is one of the reasons why goats are often used to control or eliminate brush and other undesirable forage species from pasture lands and to rehabilitate pastures.

R. C. Merkel, C. Toerien, T. Sahlu, and C. Blanche. 2001. Digestibility, nitrogen balance and blood metabolite levels in Alpine goat wethers fed either water oak or shining sumac leaves. Small Ruminant Research 40:123-127.

Dewormer Survey

In this issue, we have enclosed a survey on your use of dewormers. We hope you will complete and send back the survey to Langston University. Dr. Bill Pomroy, a noted parasitologist from Massey University in New Zealand, is on a short sabbatical at Langston University and devised this survey. Why is this survey important? Dr. Pomroy says, *"Worm control in goats is a continuing problem but we only have a limited number of dewormers and many farms already have worms resistant to one or more of these. Information in this survey will provide us with a baseline of current practices so we can plan research to assist you [goat producers] with worm control in the future. The results from this survey will allow you to compare your current deworming practices with those of similar farmers."*

GIGR Hosts Armenian Scientists for Training

by R. Merkel

As part of a grant awarded to Langston University from the USDA Cooperative State Research, Education, and Extension Service (CSREES) Innovation Fund Program, five Armenian scientists and one USDA employee spent three weeks at GIGR during August and September to receive training. Two of the five Armenian scientists, Dr. Volodya Abrahamyan and Dr. Aram Muradyan, are professors at the Armenian Agricultural Academy whereas the other three Armenian scientists, Dr. Narine Babayan, Dr. Vachagan Grigoryan and Ms. Armine Poghosyan, as well as an American USDA employee, Mr. Terry Hutchens, work with the Armenian Improved Dairy Goat Center (ARID) that is part of the USDA-CSREES Marketing Assistance Project in Armenia. The goal of the training was to provide knowledge and hands-on experience in aspects of dairy goat production and management and in the running of a Dairy Herd Improvement (DHI) laboratory.

Interpretation of a California Mastitis Test

To begin their training, the visitors spent several days in the GIGR DHI Laboratory learning the procedures required for the analysis of milk components (fat, protein, lactose and solids non-fat). They were also trained in record processing using DHI software and in the interpretation and use of the various reports generated. Following DHI training, the management of the GIGR goat farm was presented and topics such as the yearly calendar of events at the farm, daily management of goats, fencing and pasture management, management of the pregnant dairy doe and kidding and early kid care were discussed. The visitors were introduced to a Grade A goat milking facility, had the opportunity to work in the milking parlor and saw how lactation data was recorded and used. In addition, the visitors also spent time at the Oklahoma State University Veterinary Teaching Hospital where they participated in daily rounds in the animal clinic.

Dr. Grigoryan concentrates while implanting a doe for estrus synchronization

Another major training activity was instruction in artificial insemination, semen collection, evaluation and freezing, and in the various methods used to synchronize does in preparation for insemination. The visitors synchronized does using two different methods and had hands-on practice in insemination. They participated in an artificial insemination workshop held at GIGR. The visitors also learned and performed a simple surgical technique used to make "teaser" bucks.

Other areas in which the visitors had training were in the conduct of laboratory forage analyses and other laboratory equipment, blood collection, rumen fluid collection, cheese making and mastitis detection and control. The visitors also had the opportunity to speak with scientists about research conducted at GIGR. The visitors presented a seminar on Armenian agriculture and the ARID Goat Center.

In addition to training activities, the visitors also accompanied GIGR staff on extension farm visits, speaking engagements and judging events to observe U.S.-style extension activities. The visitors were able to visit several goat farms in the state to see the different breeds raised by Oklahoma goat producers and the different production practices employed.

For more information regarding the Armenian dairy goat project, contact Dr. Roger Merkel at (405) 466-3826 or at rmerkel@luresext.edu

Noteworthy News

Drs. **Terry Gipson**, **Art Goetsch**, **Steve Hart**, **Jun Luo**, **Yoseph Mekasha**, **Roger Merkel**, **B.R. Min**, **Ryszard Puchala**, **Tilahun Sahlu**, **Sergio Soto-Navarro**, **Tumen Wuliji**, **Steve Zeng** and Ms. **Rowena Joemat** traveled to Indianapolis, IN to present scientific abstracts at the joint American Society of Animal Science (ASAS) and American Dairy Science Association meetings. During the meeting, Dr. Sahlu received the 2001 ASAS International Animal Agriculture Bouffault Award in recognition of his leadership and outstanding contribution international animal agriculture.

Drs. **Tilahun Sahlu** and **Roger Merkel** traveled to Washington, DC to give an update on our project with Debub University in Ethiopia at the Synergy in Development 2001 conference.

Mr. **Yoseph Mekasha**, a visiting scholar from Alemaya University in Ethiopia, arrived to work on the project entitled "Simple Feeding of Broiler Litter for Growing Meat Goats".

Dr. **Ignatius Nsahlai**, visiting scholar from the University of Natal in South Africa, arrived to assist with an ongoing project determining goat nutrient requirements.

Dr. **Bill Pomroy**, a visiting scholar from Massey University in New Zealand, arrived on a short-term sabbatical to work on internal parasite research.

Langston University was awarded an USDA Food Safety and Inspection Service grant for the implementation of HACCP systems in quality assurance for small food animal producers in Oklahoma and New Mexico. The project is a collaborative work among Langston University, Crownpoint Institute of Technology and New Mexico State University. Drs. **Terry Gipson** and **Steve Zeng** will lead this project.

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