AMERICAN INSTITUTE FOR GOAT RESEARCH
LANGSTON UNIVERSITY
E (Kika) de la Garza

Goat Newsletter

Cooperative Extension Program
Langston University

The Newsletter of the E (Kika) de la Garza American Institute for Goat Research *Fall 2007*

From the Director's Desk

I often start this section by saying something about what sort of general things have been going on recently, frequently the weather. The weather of Oklahoma in the past few months can perhaps be summed up as extreme. The long wet period in May and June caused considerable problems for Oklahoma farmers, notably in wheat and hay harvests. The research farm of the Institute suffered similar adversities. Now in early/mid-August we have very dry and quite hot conditions. Something between these extremes would be preferable. But, I guess I am like many others - I talk a lot about the weather but do little about it. While on the subject of extremes, many of us at the Institute have had a great deal of travel lately, particularly internationally. As noted in the summer newsletter, Dr. **Terry Gipson** and Mr. **Jerry Hayes** traveled to South Africa to select Boer goats and Dorper sheep to be transported to Ethiopia for the "Ethiopia Sheep and Goat Productivity Improvement Program," supported by USAID, for which we are providing technical expertise and assistance. Shortly thereafter, Dr. **Gipson** returned to South Africa to accompany the animals to Ethiopia. Likewise, Mr. **Hayes** spent a few weeks in Ethiopia conducting artificial insemination with Boer goat semen at Hawassa University, one of our partners in the project; Dr. **Lionel Dawson** provided health care and associated training during the early quarantine period for the Boer goats and Dorper sheep; and Dr. **Roger Merkel** assisted in artificial insemination and the quarantine process and continued work on a goat production handbook being developed for training of Kebele Development Agents (somewhat comparable to county extension agents in the U.S.). Dr. **Art Goetsch** made his third 2007-trip to Ethiopia in late August and early September for applied research and on-farm demonstration activities. These include urea treatment for ammoniation to increase feeding value of crop residues and determining reasons for short shelf-life of small ruminant carcasses from Highland areas to be followed by development of management practices to avert or lessen this problem. Drs. **Dawson**, **Gipson**, and **Merkel** again travel to Ethiopia in late September and early October primarily for the movement of the Boer goats and Dorper sheep to four "nucleus" sites in different parts of the country for multiplication of purebred animals. Another set of sites called Breeding, Evaluation and Distribution or BED sites will receive purebred animals from the nucleus sites for crossbreeding and the subsequent F1 progeny will be distributed to local farmers. Likewise, I have spent quite a bit of time in Ethiopia this year, mainly working on the administrative side of the project. There are also other international projects underway at present. For example, this fall Drs. **Goetsch** and **Gipson** will travel to coun-

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tries such as China, Jordan, and Egypt. We should not forget domestic travel, particularly of Drs. **Steve Hart** and **Steve Zeng** who are conducting the bulk of our extension activities. Because of all of this travel, people like Dr. **Ryszard Puchala** have really stepped up to the plate and taken leadership roles to see that our experiments are conducted appropriately, working closely with the fine Visiting Scholars from countries around the world that contribute so much to our research program. Currently, our Visiting Scholars are Drs. **Adnan Beker**, **Getachew Animut**, and **Asefa Asmare** from Ethiopia, **Ahmed Askar** from Egypt, and **Maristela Rovai** from Brazil. Major research projects in progress include effects of forage condensed tannins on methane emission by goats, extended lactation periods for dairy goats, comparisons of two meat goat genotypes and goats vs sheep in abilities to cope with low protein and energy diets, study of factors influencing the grazing activity energy cost to develop simple means of prediction, and characterization of the quality, safety, and shelf-life of dairy goat products in different areas of the U.S.

The extended lactation project of Drs. **Gipson** and **Rovai** has Alpine does that are more than 500 days in lactation and are still producing well. These extended lactation production curves for goats are very different than those of cattle. This project is about 75% and you will hear more about this project at its completion. Two research projects deal with grazing energy expenditure. Dr. Amit Dolev, a wildlife ecologist at the Keri Deshe Research Center of the Agricultural Research Organization in Israel, spent a full week with researchers involved in those two projects; Drs. **Asker**, **Beker**, **Gipson**, and **Goetsch**. Dr. Dolev was on his way to a national ecological meeting in San Jose, CA, and stopped by the university on his way to California. At the ecological meetings, Dr. Dolev presented his thesis research on red foxes in Israel. What does wildlife have to do with goats? You see, Dr. Dolev is also a co-investigator in Israel for the collaborative BARD project with the Institute entitled Energy Expenditure For Activity In Free-ranging Ruminants: A Nutritional Frontier and more importantly, he is an expert in Geographical Information System (GIS) software. He stopped in Oklahoma to share his GIS knowledge with the Langston researchers. It was an enjoyable and profitable week for the Langston team and we thank Dr. Dolev for including us in his itinerary. Another recent visitor was Mr. Sergi Carné from the University of Barcelona and you can read more about his visit on page 2.

Be careful out there and may your goats have a great breeding season.

Research Spotlight

Abstracted by A. Goetsch

Stocking Rates for Grazing.

One of the key management decisions that impacts forage available for grazing is stocking rate (SR). High SR decrease forage mass and lessen potential forage selectivity, with the consequence of low growth rate and possibly body weight loss. Though compensatory growth in sheep and goats has been documented, effects of SR as the factor influencing capacity for compensatory growth has not been investigated. A study was conducted to determine effects of grazing of mixed grass/forb pastures at three SR on subsequent performance of goats and sheep fed a concentrate-based diet. Experimental periods, in 2002 and 2003, were 15 weeks in length, following 16 weeks of grazing (May to September) of pastures with warm season grasses and various forbs. Sheep (Katahdin) and goat (75% Boer blood) wethers were 4 to 5 months of age when grazing began. Stocking rates were four (SR4), six (SR6), and eight (SR8) animals per 1-acre pasture, with equal numbers of sheep and goats and three pastures per SR. Average daily gain by all animals during grazing tended to decrease linearly with increasing SR (61, 51, and 47 g/day for SR4, SR6, and SR8, respectively). In the period after grazing, dry matter intake (DMI) tended to be affected by an interaction between SR and year (year 1: 2.1, 2.1, and 2.2 lbs/day; year 2: 2.4, 2.0, and 2.0 lbs/day for SR4, SR6, and SR8, respectively). Sheep had higher overall ADG than goats (0.43 vs 0.29 lb/day). Energy expenditure measured in weeks 3 and 9 increased linearly with increasing SR (1238, 1297, and 1383 kJ/lb body weight$^{0.75}$ for SR4, SR6, and SR8, respectively). In conclusion, effects of SR on ADG during grazing by small ruminants may not necessarily be compensated for later with a high quality diet and, in fact, negative effects of high SR during grazing may in some cases continue.

Animut, G., A. L. Goetsch, G. E. Aiken, R. Puchala, G. Detweiler, C. R. Krehbiel, R. C. Merkel, T. Sahlu L. J. Dawson, Z. B. Johnson, and D. H. Kiesler. 2006. Performance by goats and sheep consuming a concentrate-based diet subsequent to grazing of grass/forb pastures at different stocking rates. Small Ruminant Research 66:92-101.

Dietary Ratios of Fish and Blood Meals.

The high growth potential of Boer goats compared with other meat goat genotypes might be accompanied by an increased demand for essential amino acids. Therefore, six yearling Boer x Spanish wether goats and 24 growing Boer x Spanish and 24 Spanish wethers were used to determine the effects of total crude protein (CP) and two supplemental protein sources (fish meal, FIM; blood meal, BLM) in a 70% concentrate diet on sites of digestion, small intestinal amino acid disappearance, and growth performance. Diets were formulated to be 12% or 15% CP (DM basis), with predicted ruminally undegraded intake protein (UIP) from FIM and BLM of 1.2 and 3.0% DM, respectively, achieved from FIM supplying 100, 67 and 33% and BLM 0, 33 and 67%, respectively (100 FIM, 67 FIM and 33% FIM, respectively). True ruminal OM and N digestibilities were greater for 12 vs 15% CP and decreased linearly as level of FIM decreased. Duodenal flows of both microbial and nonmicrobial, nonammonia (feed plus endogenous) nitrogen were greater for 15 than for 12% CP and increased linearly with decreasing FIM level in the diet. Correspondingly, small intestinal disappearance of essential amino acids was greater for 15 vs 12% CP and increased with decreasing FIM. In an 18-week growth experiment, dry matter intake (DMI) (2.1 vs 1.7 lbs/day), average daily gain (ADG; 0.32 vs 0.24 lb/day), and ADG:DMI (0.16 vs 0.14) were greater for Boer x Spanish compared with Spanish wethers. In conclusion, with diets relatively high in concentrate and a CP level of 12%, amino acid requirements of common genotypes of growing meat goats in the US may be satisfied by basal dietary ingredients, with little or no potential to enhance performance by addition of feedstuffs high in UIP regardless of amino acid profile.

Soto-Navarro, S. A., R. Puchala, T. Sahlu, and A. L. Goetsch. 2006. Effects of dietary ratios of fish and blood meals and level of crude protein in a concentrate-based diet on sites of digestion, small intestinal amino acid disappearance and growth performance of meat goat wethers. Small Ruminant Research 64:255-267.

2007 Buck Performance Test Results

The eleventh annual meat buck performance test started May 5, 2007 with 23 bucks enrolled from 6 different breeders. Geographical distribution is given in the table below.

State	Bucks
MO	4
OK	3
TX	16
Total	**23**

Bucks were given a physical examination by Dr. Lionel Dawson, dewormed with Cydectin (moxidectin), deloused with Atroban De-Lice, given a preemptive injection of Nuflor for upper respiratory infections, and booster or initial vaccinations for enterotoxemia and caseous lymphandinitis. Four weeks after check-in, all bucks were given a booster vaccination for enterotoxemia and caseous lymphandinitis.

Average age in days and entry weight are detailed in the table below.

Data	Total
Average of Entry Weight (lbs)	59.7
Average of Entry Age (days)	92

Adjustment Period

The Feed Intake Recording Equipment (FIRE) system was used for all animals. The FIRE system is a completely automated electronic feeding system, which was developed for swine but we have adapted it to goats. Animals wear an electronic eartag, which is read by an antenna in the feeder. The FIRE system automatically records body weight and feed intake. All bucks underwent an adjustment period of two weeks immediately after check-in. During the adjustment period, bucks were acclimated to the test ration and to the FIRE system.

The area immediately around FIRE feeders and waterers is concrete, however, the large majority of the inside portion of the 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 float-valve raised waterers. Whenever the weather permitted, the bucks had access to the outside pens as well as the inside portion of the pens.

This year we were fortunate to hire a second year veterinary student from Oklahoma State University, Ms. Janelle Blaylock, to care for the bucks. Janelle has done a wonderful job with the bucks.

Ration

Nutritionists at Langston University formulated the following ration. In 1999, the amount of salt and ammonium chloride was doubled due to problems with urinary calculi the previous year. Except for the increase in salt and ammonium chloride, the ration remains unchanged from that which was used in the first two meat buck performance tests. The ration was fed free-choice during the adjustment period and during the 12-week test.

The crude protein content of the ration is 16% with 2.5% fat, 20.4% fiber and 60.6% TDN. Calcium phosphorus and sodium levels are .74%, .37% and 1.07%, respectively. Zinc concentration is 33.04 ppm, copper is 17.15 ppm and selenium is .21 ppm. In 2003, competitive bids were sought for the buck-test feed and Bluebonnet Feeds of Ardmore, OK was awarded the contract to supply feed for the buck performance test for 2003, 2004, 2005, 2006, and 2007.

ABGA Approved Performance Test

In the year 2000, the Oklahoma performance test was designated by the American Boer Goat Association Board of Directors as an ABGA Approved Performance Test. Qualified fullblood or purebred Boer bucks are eligible to earn points towards entry into the "Ennobled Herd Book". Candidate bucks must pass a pre performance test inspection conducted by one (1) or more ABGA approved breeders. Ten (10) points will be awarded to a Boer buck that shows an average daily weight gain (ADG) in the top five percent (5%) of the animals on test. Five (5) points will be awarded to a Boer buck that shows an average daily weight gain (ADG) in the next fifteen percent (15%) of the animals on test. All bucks must gain at least three tenths (.3) pounds per day to be awarded any points.

International Boer Goat Association, Inc. Sanctioned Test

In 2003, the Oklahoma buck performance test was sanctioned by the International Boer Goat Association, Inc.

The Oklahoma performance test continues to grow and to serve the meat goat industry.

Gain

The official performance test started on May 23 after the adjustment period was finished. Weights at the beginning of the test averaged 64 lbs with a range of 42 to 82 lbs. Weights at the end of the test averaged 116 lbs with a range of 85 to 140 lbs. Weight gain for the test averaged 52 lbs with a range of 29 to 72 lbs.

Average Daily Gain (ADG)

For the test, the bucks gained on averaged 0.62 lbs/day with a range of 0.35 lbs/day to 0.86 lbs/day.

Feed Efficiency (Feed Conversion Ratio)

For the test, the bucks consumed an average of 332 lbs of feed with a range of 223 to 400 lbs.

For the test, the bucks averaged a feed efficiency of 6.69 (feed efficiency is defined as the number of lbs. of feed needed for one lbs. of gain), with a range of 4.95 to 11.14.

Muscling

The average loin eye area as determined by ultrasonography was 1.79 square inches with a range of 1.18 to 2.12 square inches and the average left rear leg circumference was 14.9 inches with a range of 13.0 to 17.5 inches.

Index

For 2007, the index was calculated using the following parameters:

- 30% on efficiency (units of feed per units 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 ($BW^{0.75}$)
- 20% circumference around the widest part of the hind left 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.

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 indices above 100% and those below average have index scores below 100%.

Congratulations

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

- Mr. Ralph Webb of Monroe, OK
  for having the Top-Indexing buck

Also, deserving congratulations are:

- Mr. Marvin Shurley of Sonora, TX
  for having the #1 Fastest-Gaining buck
- Mr. Marvin Shurley of Sonora, TX
  for having the #2 Fastest-Gaining buck
- Mr. Ralph Webb of Monroe, OK
  for having the #3 (tie) Fastest-Gaining
- Mr. AL Paul of Aubrey, TX
  for having the #3 (tie) Fastest-Gaining
- Mr. AL Paul of Aubrey, TX
  for having the #5 (tie) Fastest-Gaining
- Mr. AL Paul of Aubrey, TX
  for having the #5 (tie) Fastest-Gaining
- Mr. AL Paul of Aubrey, TX
  for having the Most-Feed-Efficient buck
- Mr. Ralph Webb of Monroe, OK
  for having the Most-Heavily-Muscled 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, Ms. Janelle Blaylock for her management and oversight of the day-to-day activities, Mr. Jerry Hayes and Mr. Erick Loetz of Langston University for aid and supervision, Mr. Les Hutchens and his associates at Reproductive Enterprises, Inc. for conducting the ultrasound measurements for the loin eye area, and Bluebonnet Feeds of Ardmore, OK for custom mixing the feed.

Buck #66 is was the top-indexing, third-most fastest growing, and most heavily muscled buck in the 2007 buck performance test.

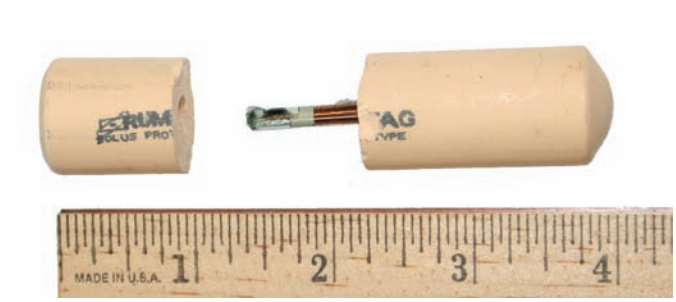
Electronic ID: A European perspective

The USDA is proposing a National Animal Identification System (NAIS) which will ensure the traceability of animals and animal products. Currently, NAIS is a voluntary program and only enrolls premises and not individual animals. However, NAIS may move beyond both of those limits. The European Economic Community (EEC) has legislated a very comprehensive community-wide animal identification system.

A reliable and lifetime identification of livestock is at the heart of a national system. Visual and electronic devices for animal identification and registration have both advantages and disadvantages. The International Committee for Animal Recording has adopted a minimum retention rate of 98% for animal identification devices. This value is rarely reached when using conventional plastic ear tags in cattle, sheep, and goats.

Therefore, the EEC has moved away from relying upon conventional eartags for animal identification. From the mid-90's, different European projects have evaluated the feasibility of animal electronic identification (e-ID). They have evaluated different forms of passive radio frequency identification (RFID) devices, namely: injectable transponders, electronic ear tags, and electronic ruminal boluses. From the results of those investigations, European Regulation 21/2004 was approved, which lays down the official use of ruminal boluses as the official electronic identification device in sheep and goats.

Electronic ruminal boluses consist of two parts: a high density capsule (mainly made of ceramic) free of electromagnetic interferences and resistant to reticulorumen environment and a passive transponder located inside the capsule working at low frequency (134.2 kHz). Based upon the Spanish studies, ruminal boluses have proved to be a reliable and tamper-proof identification system for ruminants from birth to slaughter. Boluses are orally applied in an easy and safe manner. Moreover, boluses are safely recovered at slaughter, preventing food chain contamination. No negative effects have been described on feed intake, digestibility, productive performances and health status of animals, and no alteration of forestomachs development and histological patterns have been reported. A model for predicting optimal retention of ruminal boluses in both sheep and cattle has been established. However, bolus retention in goats seems to be less efficient than in sheep or cattle



80 g e-bolus showing ceramic coating and transponder.

The University of Barcelona approached Langston University for collaboration in studying electronic ruminal boluses in goats. So this summer, Mr. Sergi Carné, a Ph.D. candidate from Barcelona came to Langston University and nearly 300 ruminal boluses were administered according to the table below. After four weeks, we have had 100% retention of the boluses and we will be following the boluses for a full year. We will keep you informed about this project as it progresses.

	e-Bolus type			
Breed	standard-dimensioned bolus of 75 g of weight, 22 ml of volume and a specific gravity of 3.4	heavier and smaller bolus of 80 g of weight, 19.5 ml of volume and a specific gravity of 4.1	small-dimensioned bolus or mini-bolus of 20 g of weight, 5.1 ml of volume and a specific gravity of 3.9	**Overall**
Alpine	24	25	25	**74**
Angora	25	26	24	**75**
Boer-cross	26	24	23	**73**
Spanish	25	25	23	**73**
Overall	**100**	**100**	**95**	**295**

Tanning Goat Hides Workshop

Dr. Merkel examines a tanned Angora hide.

Have you ever wondered how to tan a hide? On Saturday, November 3, 2007 a four-hour workshop will be held at Langston University from 8:00 a.m. to 12 p.m. to teach participants the basics of tanning goat hides. The focus of the workshop will be tanning hair-on hides but the process of dehairing hides and making leather will also be discussed. The tanning procedures that will be discussed and demonstrated are appropriate to be done at home with all of the work done by hand. The complete tanning process will be presented beginning with how to handle and preserve a fresh skin and ending with finishing a tanned hide. Different tanning methods will be discussed and examples of tanning kits and chemicals displayed.

The complete tanning process will be presented using actual hides in many of the steps so that participants can see, feel and better understand the process. Participants will review skin structure as it relates to preparing a hide for tanning. Recommendations on skin preparation and storage prior to tanning will be discussed and participants will have the opportunity to try these steps on goat hides. Participants will also assist in the actual tanning of goat hides using two different tanning methods. Participants will also practice softening, oiling, and finishing hides. While the tanning of goat hides will be discussed, the processes learned can be used on deer and other skins. Registration is limited to 10 participants. A registration fee of $5 is charged to cover the cost of handouts. Refreshments will be provided.

For more information regarding the tanning hides workshop, contact Dr. Roger Merkel at (405) 466-6134 or rmerkel@luresext.edu. A registration form is available online at http://www2.luresext.edu/goats/extension/TanningHidesWorkshop.pdf.

Finished goat hides.

Bequeathal Benefits Goat Institute

Judy McCasland, a longtime dairy goat producer in McClain County in Oklahoma, passed away in 1994. Her trust estate was to be used for the use and benefit of her brother, Billy Jack Thomas, during his lifetime. Mr. Thomas passed away this summer. Ms. McCasland's trust provided that after her and her brother's death 20% of the trust estate shall be distributed to the E (Kika) de la Garza American Institute for Goat Research of Langston University. We are humbled by this gift from Ms. McCasland and will use it to further the goat industry in Oklahoma.

Noteworthy News

In June, Drs. **Marvin Burns**, **Tilahun Sahlu**, and **Steve Zeng** traveled to China to sign a MOA with Beijing Agricultural University.

In June, Drs. **Lionel Dawson**, **Terry Gipson**, and **Roger Merkel** and Mr. **Jerry Hayes** traveled to Ethiopia to work on the ESGPIP project.

In June, Dr. **Steve Hart** gave a talk on "Feeding the doe prior to breeding and during the three phases of pregnancy" at Wilmington College in Wilmington, OH.

In June, Dr. **Steve Hart** attended the American Kiko Goat Association meeting in Stillwater, OK. Dr. **Hart** gave a tour of the Goat Institute facilities to Dr. Garrick Batten, originator of the Kiko breed who spoke at the meeting.

In July, Drs. **Getachew Animut**, **Asefa Asmare**, **Terry Gipson**, **Art Goetsch**, **Steve Hart**, **Ryszard Puchala**, **Maristela Rovai**, **Tilahun Sahlu**, and **Steve Zeng** attended the national meetings of the American Society of Animal Science in San Antonio, TX to make research presentations and attend scientific sessions.

In August, Drs. **Roger Merkel** and **Tilahun Sahlu** traveled to Washington, DC for the Higher Education for Development conference.

In August, Dr. **Tilahun Sahlu** traveled to Washington, DC to report project findings at the United Negro College Fund Special Programs annual conference.

In August, Dr. **Art Goetsch** traveled to Ethiopia to work on the ESGPIP project.

Drs. Arieh Brosh and Amit Dolev from Israel visited the Goat Institute. They are co-investigators for the collaborative BARD project with the Institute entitled Energy Expenditure For Activity In Free-ranging Ruminants: A Nutritional Frontier,

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