



Goat Newsletter

Cooperative Extension Program
Langston University

The Newsletter of the E. (Kika) de la Garza Institute for Goat Research

Fall 2000

From the Director's Desk



Dr. Tilahun Sahlu

As summer wanes we move into fall, breeding plans are being made so that we have the right numbers and types of kids for future research/extension plans. But, this certainly does not mean that the pace of activities now is any less rapid than previously or anticipated in the future.

Regarding experiments at the farm in progress, Drs. **B. R. Min** and **Steve Hart** are continuing the first year of their project concerning grazing-based dairy goat production systems compared with a confinement system. The does bred in the spring of Drs. **Tumen Wuliji** and **Lionel Dawson** are nearing kidding time. Dr. **Roger Merkel** is busy working with Dr. **Adugna Tolera** on his exper-

iment dealing with supplementation of different quality grasses with graded levels of lespedeza, and with Dr. **Mengistu Urge** on his experiment pertaining to compensatory growth of four goat breeds. Dr. **Sergio Soto-Navarro** has initiated his first experiment in the second battery of focusing on amino acid requirements and different protein sources for fast growth of Boer crossbreds. In addition to the new Visiting Scholars from Ethiopia, we also have two other new Visiting Scholars. Dr. **Eric Ponnam**, most recently from Australia, has joined us to work with Dr. **Ryszard Puchala** on alterations of lipid metabolism in goats supplemented with ruminally protected betaine. Dr. **Jun Luo** of China, who has been with us before for nearly 2 years, returned to work with Drs. **Art Goetsch** and **John Moore**, formerly a ruminant nutritionist at the University of Florida, on the project to update and reevaluate expressions of nutrient requirements of goats. A continuing effort at the Institute is made to obtain outside sup-

port for maintaining and hopefully even expanding further the active research program. As an example, our newest scientist, Dr. **Grant Tomita**, is working on a proposal involving effects of different periods and types of stress factors on immunity in dairy goats, particularly incidence of mastitis. We recently received tentative notice of funding for two new projects: "Energy for the Productive Caprine" and "Diet Selection and Performance by Goats and Sheep Grazing Mixed Pastures." We are busy making necessary barn and pasture modifications for these important new projects.

This quarter has been busy extension-wise. The fourth annual meat buck performance test was initiated this spring and terminated this summer. We were very pleased with the 34 young bucks that were enrolled in the test. For a complete report, please see page 3 of this newsletter. This year, Dr. **Terry Gipson** was the test supervisor and Messrs. **Jerry Hayes** and **Bill Snelling** were the test managers. They all did a wonderful job.



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Meet the Faculty & Staff



Dr. Grant Tomita

Dr. Grant Tomita was born in Honolulu, Hawaii. He received his B.S. and his M.S. in Animal Sciences from the University of Hawaii. His master's research focused on the prevalence and management of mastitis in dairy herds in a subtropical environment.

Dr. Tomita attended Ohio State University and received his Ph.D. in Dairy Science in 1994. Dr. Tomita's research focused on immunology and immunomodulation of the bovine mammary gland, and the epidemiology of bovine mastitis. He was involved in the routine collection of aseptic milk samples from mammary glands to determine the incidence and distribution of mastitis in the University and local commercial dairy herds. Research at Ohio State University included synthesizing a novel vaccine against bacterial pathogens which infect the mammary gland, investigating microencapsulation of vaccine antigens with biodegradable polymers, and evaluating the role of vaccination on systemic and local immunity to intramammary infections.

Following his graduate work

at Ohio State University, Dr. Tomita was a Postdoctoral Research Associate at Louisiana State University (1995 to 1998). He was responsible for the bacteriological analysis of milk samples from dairy herds that were on a bovine somatotropin clinical trial. He was also responsible for research projects associated with the immunization of dairy cows against mastitis. This research involved the development of an intramammary bacterial challenge model to determine the efficacy of experimental and commercially available vaccine formulations against mastitis pathogens.

From 1998 to June 2000, Dr. Tomita was also a Postdoctoral Research Associate at the United States Department of Agriculture, Agriculture Research Service, in Beltsville, Maryland. Research at the USDA focused on the development of alternative methods of treatment for mastitis to reduce the use of antibiotics and to characterize the immune response to mastitis.

In July of 2000, Dr. Tomita joined the E. (Kika) de la Garza Institute for Goat Research at Langston University. He is an Assistant Research Professor in Lactation Physiology and specializes in mastitis research.

In his spare time, Dr. Tomita is an avid zymologist. He has competed and received several awards in his quest for the perfect combination of water, malt, hops, and yeast.

Dr. Grant Tomita can be reached at (405) 466-3836 or at gtomita@luresext.edu.

4th Annual Meat Buck Performance Test

by T. Gipson

Meat goat production represents the most rapidly growing animal industry in the US today. To further the genetic progress through the identification of superior sires in the industry, Langston University and the Oklahoma Meat Goat Association established a meat goat performance test in 1997.

The fourth annual meat buck performance test started May 5, 2000 with 34 bucks enrolled from nine different breeders. Thirty-three of the bucks were fullblood Boers and one Kiko buck. Twenty-five bucks were from Texas, eight from Oklahoma and one from Tennessee. The test was open to purebred and crossbred bucks born between December 1, 1999 and March 31, 2000. Bucks were given a thorough physical examination upon entry.

Entrance weight for the 34 bucks averaged 53.5 lbs. with a range of 37.2 to 71.6 lbs. The average age was 92 days with a range from 77 to 155 days.

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 30' outside run. The inside and outside pen space is separated by an overhead door which can be raised or lowered as the weather dictates. 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 only his individual feeder. Each morning, yesterday's feed refusals 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 was the amount consumed. Because only one goat was capable of opening the Calan door and eating, it is possible to calcu-

late individual feed intake.

Weights at the beginning of the test averaged 57.1 lbs. with a range of 41.9 to 95.8 lbs.

The following ration was formulated by nutritionist at Langston University. In 1999, the amount of salt and ammonium chloride was doubled due to problems with urinary calculi the previous year. Except for increased salt and ammonium chloride, the ration was unchanged from that used in the first two meat buck performance tests. The ration was fed free-choice during both the adjustment period and the 12-week test. The crude protein content of the ration was 16%, with 2.5% fat, 20.4% fiber and 60.6% TDN.

Ration Ingredients

Ingredient	Percentage (as fed)
Cottonseed hulls	29.07%
Alfalfa meal	19.98%
Cottonseed meal	15.99%
Ground corn	15.99%
Wheat midds	9.99%
Pellet Partner (binder)	5.00%
Ammonium chloride	1.00%
Yeast	1.00%
Calcium Carbonate	0.95%
Salt	0.50%
Trace mineral salt	0.50%
Vitamin A	0.02%
Rumensin	0.01%
TOTAL	100.00%

In early 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 will be eligible to earn points towards entry into the "Ennobled Herd Book".

Gain

Average weight at the end of the test was 102.2 lbs. with a range of 79.3 to 136.6 lbs. Average gain for the test was 45.2 lbs. with a range of 26.4 to 56.1 lbs.

Average Daily Gain (ADG)

The bucks gained on averaged .59 lbs./day with a range from .31 lbs./day to .76 lbs./day.

Feed Efficiency

The bucks consumed an average of 320.0 lbs. of feed with a range of 207.9 lbs. to 408.7 lbs. Average feed efficiency was 7.2 (feed efficiency is defined as the number of lbs. of feed needed for one lb. of gain), with a range of 5.5 to 9.4.

Muscling

The average loin eye area as determined by ultrasonography was 1.54 square inches with a range of 1.01 to 2.23 square inches and the average right rear leg circumference was 8.9 inches with a range of 7.5 to 10.0 inches.

Index

For 2000, the index was calculated using the following parameters:

- 30% on feed 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
- 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. 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 be-

low average have index scores below 100%.

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, Messrs. Jerry Hayes and Bill Snelling of Langston University for their management and oversight of the day-to-day activities, Dr. Fred Ray of Oklahoma State University for conducting the ultrasound measurements for the lion eye area, and Mr. Les Hutchens and his associates at Reproductive Enterprises, Inc. for conducting the breeding soundness exams.

Honors

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 2000 Oklahoma Meat Buck Performance Test.**

Also, deserving congratulations are:

- ▶ **Mr. Marvin Shurley of Sonora, TX for having the Fastest-Gaining buck**
- ▶ **Mr. Marvin Shurley of Sonora, TX for having the Most-Feed-Efficient buck**
- ▶ **Mr. Richard Williams of Stillwater, OK for having the Most-Heavily-Muscled buck**
- ▶ **and Mr. M.D. Shurley of Sonora, TX for having the Best-Confirmation-Boer buck.**

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

For a complete report of the 2000 Meat Buck Performance Test, contact Dr. Terry A. Gipson at (405)466-3836 or tgipson@luresext.edu

JOBGA Show

by T. Gipson

On Saturday, July 8, the Junior Oklahoma Boer Goat Association held their annual fund-raising show at Langston University.

There were 42 entries with 18 exhibitors with 4 classes of does, 3 classes of wether market goats, and 2 buck classes. There were also 3 classes of showmanship. The judges for the show were Dr. Terry Gipson, Mr. Jim Daniel and Mr.

Wiley Robison. The JOBGA show was a huge success. Langston University was pleased to play a role in providing the opportunity for the youth of Oklahoma to gain experience in showing and exhibiting livestock.

For information regarding the JOBGA, contact Ms. Kim Perschbacher at 405-527-1033.

Artificial Insemination Workshop

The Goat Extension Program conducted an artificial insemination workshop on September 9, 2000. Twenty participants learned about basic anatomy and physiology of goats, estrus detection and synchronization in goats, and semen handling. Participants also had an opportunity

to practice with fresh reproductive tracts and with live animals. Dr. Terry Gipson and Mr. Les Hutchens were the instructors for the AI course.

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

Arkansas Dairy Goat Conference



Drs. Steve Hart, Grant Tomita and Terry Gipson traveled to Yellville, AR to conduct a dairy goat management conference. Dr. Hart spoke on Internal Parasite Control and on Feeding Goats for Milk Production. Dr. Tomita spoke on Mastitis Prevention. Dr. Gipson spoke on Breeding and Genetics Principles and on Meat Goat market Outlook.

Fifty-eight participants from Arkansas and Missouri attended the dairy goat management conference which was held at the Yellville Presbyterian Church. The Marion County Cooperative Extension Service, Marion County Goat Club, and the Jackson-Mitchell Dairy Goat Milk Plant sponsored the all-day conference.

After the conference, Mr. Terry Davis, county livestock agent for the Marion County Cooperative Extension Service, arranged a tour of the Jackson-Mitchell Dairy Goat Milk Plant and of two dairy producers in the Yellville area.

Mr. Mike Mason, plant manager of the

Jackson-Mitchell Dairy Goat Milk Plant, gave the Langston group a tour of the dairy goat milk plant. The milk plant is the largest producer of evaporated goat milk in the United States, which is marketed under the label of Meyenburg®. The milk plant produces only evaporated milk and its annual production is 81,000 cases. Mr. Mason estimated that it takes 2 gallons of goat milk to produce one 12-oz can of evaporated milk. That translates to 243,000 lbs of goat milk needed annually for the production of evaporated goat milk.

Due to the seasonal aspect of goat milk production, the milk plant is shut down from November until February of every year. Dairy goat producers would like to see the plant operate year-round but Mr. Mason stated that there is not sufficient quantity of goat milk in the off-season to warrant processing.

For information regarding the AR goat conference, contact Dr. Terry Gipson at (405)466-3836 or Mr. Terry Davis at (870) 449-6349.

Goat Management Tips

Preparing for Breeding Season by S. Hart.

Breeding season is the most important time of the year for your goats. No matter how hard you try the rest of the year, you will not be able to overcome problems created by a poor breeding season. It may be does that didn't conceive, does that were bred too late or does that only had singles. Open does cost you money, does with singles don't make you money and does that breed late cause management problems because they require extra labor.

The first thing about breeding season is to plan what you want breeding season to accomplish. You may plan certain matings to produce a show ring champion, certain crosses to produce animals for sale or you may plan for all your commercial does to have twins. You also need to plan when you want your animals to kid. If you are a registered breeder, you may want animals born early in the spring so they are bigger whereas a commercial producer may want to kid later when there is better weather and plants are growing. Since the gestation length on goats is approximately 5 months, the breeding date needed to produce kids at a given date can be easily calculated.

It is important for all animals to be structurally sound prior to being bred. For an animal to be sound, they should have all four legs properly placed under the body. The rear legs should not be fence post straight, but should have a natural curve. The pasterns should have a normal angle and not be too low. The jaws should not be overshot or undershot or twisted. The animal should have a good topline. The animal should have good body condition and look healthy. The udder should be soft and pliable with no evidence of hard lumps. Teats should be functional and able to be nursed. The buck should have a large pair of testicles, both similar in size. The testicles should be palpated for lumps that could indicate epididymitis.

Does to be bred should be examined for soundness and unsound animals culled. You should have notes or a good memory to remember those that had problems mothering, a bad udder or did not wean any kids. Doelings with any serious structural defect should be culled. Spanish doelings should be at least 7 months old and weigh at least 65 lbs prior to breeding. Boer doelings should weigh more. It is very difficult to get a doeling to grow to her full potential if she is bred when she is too small. Only about 80% of doelings will conceive whereas 95% of the does that kidded the previous year will conceive. Flushing is the practice of giving a supplement about 3 wks prior to and the first three weeks of breeding season. If does have good body condition, flushing does not increase kidding rate. If animals are thin such as from drought, flushing with .5 to 1.0 lb of whole shelled corn/hd/day may be beneficial.

Bucks should be in good body condition prior to breeding season because they often lose some weight. If bucks are on good quality pasture prior to breeding season, they will usually have the necessary body condition. Their feet should be trimmed at least two weeks prior to breeding season. Breeding soundness exams tell if a buck is producing a sufficient amount of viable sperm. While the incidence of infertility in meat goat bucks is relatively low (3-5%), if you are depending on one buck in a single sire group to do his job and if you do not get him fertility tested, then be alert for repeat breeding that may indicate he is not settling does. A marking harness with a colored wax crayon marks the rear of a doe when the buck breeds her. By reading marks every three days, you know how many kids to expect early in the kidding season. By changing the crayon color after 15 days, repeat breeders can be identified. While a mature buck may serve over a hundred does, kidding season will be spread out. Kidding season will be shorter (and less labor per animal required) if one buck is used for every 40-50 does. A young buckling should not be depended on to serve more than 25 -30 does.

For more information regarding goat management, contact Dr. Steve Hart at (405) 466-3836 or at shart@luresext.edu

Research Spotlight

Abstracted by A. Goetsch

Cashmere Production.

Most research concerning nutritional plane on growth and characteristics of cashmere fiber has been with feral goats. This work has shown that nutritional plane has relatively small effects on cashmere fiber growth and quality other than when the nutritional plane is very low. Effects of protein and energy levels in diets consumed free-choice on cashmere fiber growth have not been studied. Thus, an experiment was conducted with 36 Spanish goat wethers (averaging 196 days of age and 17.5 kg body weight at the start of the experiment) from a herd previously selected for cashmere growth. Wethers consumed (free-choice) diets with 10 or 15% crude protein and 40, 60, or 80% concentrate, providing ME concentrations of 2.00, 2.35, or 2.70 Mcal/kg dry matter. Cashmere fiber diameter was greater for 15 versus 10% dietary crude protein regardless of metabolizable energy level. Diet composition did not impact cashmere fiber length. Dietary concentrations of crude protein and metabolizable energy did not alter guard hair weight but interacted with weight of cashmere fiber. These results imply that fiber characteristics of goats selected for cashmere production might be relatively more susceptible to nutritional plane effects than in the case for feral goats.

D. S. Ivey, F. N. Owens, T. Sahlu, T. H. The, P. L. Claypool, and A. L. Goetsch. 2000. Growth and cashmere production by Spanish goats consuming ad libitum diets differing in protein and energy levels. Small Ruminant Research 35:133-139.

Pregnancy and Energy.

Pregnancy and lactation appear to influence mohair growth via competition for nutrients between skin follicles and other tissues. Conversely, effects of pregnancy and lactation on cashmere fiber growth are due to physiological changes associated with pregnancy and lactation rather than through nutrient competition, which impact times

of cashmere cessation and initiation in the growth cycle. Effects of the nutritional plane in the last one-third of gestation and of kids during suckling also have not been extensively studied. Therefore, this experiment was conducted to determine effects of supplement levels of metabolizable energy and crude protein for cashmere-producing Spanish does in gestation and lactation on performance of does and kids during suckling and post-weaning. At 60 days of gestation, mature does (48) with single or twin fetuses consumed mature bermudagrass hay free-choice, along with 1% body weight (dry matter basis) of supplements with 18.6 or 28.5% crude protein and 2.2 or 2.8 Mcal/kg metabolizable energy. The high energy-high protein supplement was offered at 1.5% body weight (dry matter basis) for 15 days after birth, and does received the same supplement treatments as in gestation thereafter until weaning at 50 days after parturition. For a 50-day post-weaning period, kids consumed ad libitum the high energy-low protein supplement. With shearing in February at 100 days of gestation, number of fetuses did not affect cashmere weight. Levels of metabolizable energy and crude protein in supplements given during gestation and lactation did not influence birth weight of single or twin kids. Kid body weight and cashmere weight after 50-day suckling and post-weaning periods were affected by an interaction between the number of fetuses and level of metabolizable energy in supplements given to does in gestation and lactation. This suggests that the effect of the number of fetuses on nutrient demand of does influenced how milk production (influencing kid growth) responded to the different supplements.

D. S. Ivey, F. N. Owens, T. Sahlu, T. H. The, L. J. Dawson, G. A. Campbell, and A. L. Goetsch. 2000. Influences of the number of fetuses and levels of CP and ME in gestation and lactation supplements on performance of Spanish does and kids during suckling and post-weaning. Small Ruminant Research 35:123-132.

Noteworthy News

Drs. **Art Goetsch**, **Steve Hart**, **Roger Merkel**, **Ryszard Puchala**, **Tilahun Sahlu**, **Sergio Soto-Navarro**, **Tumen Wuliji**, Ms. **Rowena Joemat** and Mr. **Tshesome Shenkoru** traveled to Baltimore, MD to present scientific abstracts at the annual meeting of the American Society of Animal Science.

Two new visiting scholars from Ethiopia have begun short-term visits at the Institute. Dr. **Adugna Tolera**, from Awassa College of Agriculture of Debub University, arrived in July for a four-month stay. He has begun a research trial evaluating the associative effects of feed-

ing sericea lespedeza, a tannin-containing forage, with either a poor- or medium-quality hay. Mr. **Mengistu Urge**, from Alemaya University of Agriculture, arrived in August and has begun a trial researching the effect of early post-weaning plane of nutrition upon growth in the late-weaning period. Mr. Urge will be at Langston through January 2001. These visits are supported through the institutional partnerships Langston University has with Debub University and Alemaya University of Agriculture.

Langston University was re-

cently awarded two USDA Capacity Building Grants. They are "Energy for the Productive Caprine" and "Diet Selection and Performance by Goats and Sheep Grazing Mixed Pastures."

Dr. **Eric N. Ponnam** joined the Institute as a Postdoctoral Fellow (Visiting Scholar) after recently completing his doctorate at the Department of Animal Production, The University of Melbourne, Australia. Dr. Ponnam is working with Dr. **Ryszard Puchala** on a project entitled "Metabolic changes affecting utilization of poor quality diet by goats".



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