Goat Newsletter

Cooperative Extension Program
Langston University

The Newsletter of the E (Kika) de la Garza American Institute for Goat Research *Winter 2013*

From the Director's Desk

It is always a pleasure to receive feedback from you and recently, we received a wonderful letter and a generous donation from Kristina and Greg Harlow of Harlow Hills Farm and Dairy in Gaston, OR. Kristina wrote:

We are pleased that Langston University does research on goats in general and specifically on management of goat herds. We are in the process of converting our pastures from grass (which grows very well in this area) to Chicory and Birdsfoot Trefoil which the goats seem to enjoy and we hope their internal parasites do not thrive on. This is some of the information we recently learned from [Dr.] Steve Hart of Langston University. Thank you for your time and investment into goat management it is making a difference in the commercial world.

If you are wondering, Dr. **Hart** suggested planting birdsfoot trefoil (*Lotus corniculatus*) and chicory (*Cichorium intybus*) because these plants contain condensed tannins, which have some anthelmintic properties. The tannins in these two plants interfere with the hatching of parasite eggs and with the development of larvae into an infectious stage. Both birdsfoot trefoil and chicory are perennials; while birdsfoot trefoil is a legume and chicory is not. Both plants are highly nutritious for goats and are readily eaten by goats. Birdsfoot trefoil's nutritive value is equal to or greater than that of alfalfa. Birdsfoot trefoil is high in quality (70 to 78% digestible). Its quality declines slightly as plant matures. Birdsfoot trefoil is a good source of protein, calcium, phosphorus, and magnesium. Goats graze both leaves and the herbaceous stems, which remain highly digestible. Chicory provides both spring and summer forage growth for goats. Unlike most forage crops, it is an herb rather than either a grass or a legume. Chicory produces leafy growth which, if managed properly, is similar in nutritive value and mineral content to alfalfa or cool-season grasses. During the winter, forage chicory is a low-growing rosette plant with broad leaves. At this stage it looks very much like dandelion. With warm temperatures in the spring, it produces large numbers of leaves from the crown.

I encourage you to give us feedback, be it positive, negative or indifferent. We love to hear from you. It really does make a difference. Again, I thank the Harlows for their letter and donation.

Recently, Dr. **Zewei Sun** completed his sabbatical and returned to the Institute of Animal Sciences and Technology of Jilin Agricultural University in northeastern China, where he is an associate professor. Dr. **Sun** worked with Dr. **Zaisen Wang** on the project entitled Effects of Selected Nutritional Components on Immunity to Haemonchus in Goats.

We also said goodbye to Ms. **Marie-Eve Brassard**, who completed her study leave and returned to the University

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of Laval in Quebec to continue her Ph.D. studies. Ms. **Brassard** worked with Dr. Ryszard Puchala on comparing and determining advantages and disadvantages of different methods of estimating the grazing activity energy cost of goats.

As one set of Visiting Scholars leave, generally, another set arrives. So we welcome Dr. **Yong-qing Guo** to the Institute.

Dr. **Guo**, native of China, has joined the Institute as a Visiting Scholar. He will be working with Dr. **Zaisen Wang** in the area of nutritional manipulation of immunology in parasite-infected goats. Dr. **Guo** graduated from China Agricultural University in Beijing in June of 2013. Immediately after graduation, Dr. Guo was offered a position of Ruminant Nutritionist in the Shijiazhuang Academy of Agriculture and Forestry Sciences in Hebei province, China. His research has focused on ruminant nutrition and feedstuff evaluation.

In addition to the ongoing research projects here, we have also been busy internationally. Dr. **Arthur Goetsch** has been very busy working on the USDA/FAS-supported project entitled “Handbook for Livestock Research on Smallholder Farms in Developing Countries.” This year, he has traveled to Kenya, Ethiopia, China, and Jordan to work with collaborators and to give presentations on the handbook. Next year, he plans to travel to Mexico, India, and, possibly, the Philippines to work with collaborators there.

Recently, Mr. **Kesete Tesfai** traveled to Bunda College of Agriculture in Malawi and supervised the installation of laboratory equipment that Langston University had purchased. Mr. Tesfai also conducted training on the newly-installed equipment. Also, Dr. **Terry Gipson** traveled to Egerton University in Kenya to conduct an artificial insemination training using fresh semen. Both of these activities are part of our India–Africa–US Trilateral Partnership for Food Security supported by the US Agency for International Development and administered by the USDA Foreign Agriculture Service.

I would like to return to the topic that opened this column. Sometimes, we forget the little things that pack a punch. These little things are the words "please" and "thank you." In today's fast paced society, we sometimes forget to be polite. In a recent Rasmussen poll, 76% of Americans think their fellow Americans are becoming ruder and less civilized. A noted psychologist remarked that in their purest forms, "please" and "thank you" request a favor. So I want to "thank you" for your continued support of our programs and "please" let us know how we are doing. We are really here to serve you.

Research Spotlight

Stocking Rate and Pasture Utilization.

Effects of forage conditions with different stocking rates on performance and grazing behavior of goats could vary with animal physiological state, as influencing nutrient demand and usage. Therefore, Boer goat does nursing two kids (D; 1 month after kidding), growing wethers (G; 4 month initial age), and yearling wethers (Y; 14 month initial age) grazed 1.0 acre grass/forb pastures, with one animal per type in each pasture (four per stocking rate; SR) for a low SR and two for the high SR. The experiment started in late spring and was 114 days in length, with four periods (P1, P2, P3, and P4). Forage mass was 1.1 ton/acre for all periods for low SR and 1.2, 0.9, 0.7, and 0.6 ton/acre for high SR in P1, P2, P3, and P4, respectively. Botanical composition of the diet determined from n-alkane concentration in simulated grazed forage samples and feces was similar among animal types. Likewise, chemical composition of forage samples did not differ between animal types, with average dietary levels of 11% CP and 53% NDF. Digestibility, determined from the concentration of the n-alkane hentriacontane (C_{31}) in forage samples and feces, was the greatest for growing wethers (63.5%, 67.2%, and 62.0% for D, G, and Y, respectively) and greater for the low than high SR (66.1% vs. 62.3%). There was an interaction between animal type and period in ADG (0.03, −0.03, −0.10, −0.02, 0.20, 0.06, −0.06, 0.16, 0.28, 0.11, −0.09, and −0.02 lb/day) and time spent grazing (7.5, 5.3, 7.4, 8.6, 78.6, 5.6, 10.0, 9.1, 4.8, 5.9, 8.4, and 9.5 hours for D-P1, D-P2, D-P3, D-P4, G-P1, G-P2, G-P3, G-P4, Y-P1, Y-P2, Y-P3, and Y-P4, respectively). In conclusion, with this forage of moderate nutritive value, levels of forage mass above 0.6 ton/acre would not be of benefit to performance of meat goats regardless of physiological state with different nutrient requirements.

Askara, A.R., T.A. Gipson, R. Puchala, K. Tesfai, G.D Detweiler, A. Asmare, A. Keli, T. Sahlu, and A.L. Goetsch. 2013. Effects of stocking rate and physiological state of meat goats grazing grass/forb pastures on forage intake, selection, and digestion, grazing behavior, and performance. Livestock Science, 154:82–92.

Cellulase Enzyme Additive and Digestibility.

Thirty-six Spanish, Boer, and Boer × Spanish wethers (6 months of age, ~55 lbs.) were used to test the effect of a cellulose/hemicellulase enzyme additive on intake and fiber digestion. Wethers were blocked by bodyweight and breed and randomized to 4 pens with Calan headgates to measure individual intake. Wethers were fed a chopped low quality grass hay (4.8% CP, 48.4 ADF, and 75.3 NDF) at 115% of average intake over the previous 3 days. Two pens of goats were offered a test supplement containing the enzymes and two pens were offered the control supplement. The supplement was composed of 5% of a mineral mix containing trace minerals, 8% liquid molasses, 43% soybean meal, and 44% ground corn. The enzyme preparation (69% distillers dried grains, 30% urea, and 1% enzymes) was incorporated into the supplement at the 2% level. The supplement was fed at 0.55% of bodyweight. Blood and ruminal fluid samples were collected before the morning feeding in week 4 of the study for blood urea nitrogen and rumen ammonia determination. Following the 12-week intake study, intake was reduced in half of the pens to 80% of intake in week 12, fecal bags were fitted on animals, and fecal and ort samples were collected 5 days for determining digestibility. Rumen ammonia and blood urea nitrogen were similar for control and enzyme treatments (6.8 vs. 7.1 mg/dL; 13.8 vs. 15.2 mg/dL, respectively). Hay intake was similar for control and enzyme treatments (2.63% vs. 2.83% of body weight). Dry matter digestibility and protein digestibility were similar (52.8 vs. 53.5%; 79.4 vs. 78.4%, respectively). Neutral detergent fiber digestibility and acid detergent digestibility also were similar (49.8 vs. 50.6%; 26.9 vs. 25.5%, respectively). The cellulose/hemicellulase additive did not improve intake of low quality grass hay or increase fiber digestibility in goats.

Hart, S. 2013. Effect of a cellulase enzyme additive on hay intake and fiber digestion in goats. J. Anim. Sci. Vol. 91, E-Suppl. 2/J. Dairy Sci. Vol. 96, E-Suppl. 1, p. 369.

Visitors from the Republic of the Philippines

In November, 2013, the Institute hosted 11 people from the Department of Agriculture of the Republic of the Philippines for a week-long training and introduction to the American Institute for Goat Research. The Philippines Department of Agriculture is placing increasing importance on goat production because of the goat's high adaptability to a wide array of climatic conditions and feed resources. Goat production is also being highlighted due to the effects of global warming that have put increasing pressure on natural resources and livestock production. The Philippines Agricultural Training Institute is the arm of the Department of Agriculture that conducts livestock extension and training activities. Their goal is to expand such activities in the area of goat production.

The 11 attendees included 6 people from various locations and divisions of the Agricultural Training Institute, Drs. Ruth Miclat-Sonaco and Roberto Castro, Mr. Cristino Balancio, Ms. Rosalinda Lucero, Mr. Abdul Daya-an, and Ms. Graciela Danza. Other attendees were Mr. Manuel Jarmin, Executive Director and National Livestock Program Coordinator, Livestock Development Council; Dr. Paul Limson, Officer-in-Charge, Livestock Development Division, Bureau of Animal Industry; Mr. Joaquin Abejar, Jr., Director for Regional Engagements, Office of the Secretary; Mr. Braulio Castro, Jr., Officer-in-Charge, Institutional Support Section, National Agriculture and Fishery Council; and Ms. Floreliz Avellana, Assistant Division Chief, Special Project Division, National Agriculture and Fishery Council.

The group met with Dr. Tilahun Sahlu, Institute Director, and, later, with Dr. Marvin Burns, Dean of the School of Agriculture and Applied Sciences. Dr. Roger Merkel presented an overview of the Institute's research, extension, and international activities. Training and discussions with the group were held at the farm and in laboratory and group discussion settings. Training at the research farm began with a brief farm tour. The group learned about the working of the Institute feed mill and rations used by the various classes and types of goats on the research farm with Mr. Italo Portugal. Mr. Jerry Hayes discussed goat management, handling, and identification procedures of the research herd. The group met with Dr. Erick Loetz, Farm Manager, to discuss goat breeding and management, record keeping, and farm procedures.

From left to right:
Cristino Balancio, Joaquin Abejar, Jr., Roger Merkel, Manuel Jarmin, Graciela Danza, Paul Limson, Ruth Miclat-Sonaco, Marvin Burns, Tilahun Sahlu, Braulio Castro, Jr., Floreliz Avellana, Rosalinda Lucero, Roberto Castro, and Abdul Daya-an.

Les Hutchens, owner/operator of Reproduction Enterprises, Inc., discusses embryo transfer techniques.

The group then had the opportunity to view laparoscopic artificial insemination of some of the Institute's does done by personnel from Oklahoma State University's College of Veterinary Medicine. Ms. Amanda Manley and Mr. Italo Portugal demonstrated milking procedures, milk handling, and mastitis prevention.

Dr. Steve Hart spoke with the group about goat nutrition and internal parasite control. The group had the opportunity to conduct fecal egg counts, do FAMACHA scoring, and learn about larval culture and worm identification. Dr. Lionel Dawson spoke with the group about goat herd health procedures and prevention strategies as well as common diseases of goats, causes, and treatment. Drs. Arthur Goetsch and Yoko Tsukahara discussed climate change and current research being conducted to study the effect of climate change in goats. Finally, Dr. Roger Merkel spoke with the group about mortality composting, sources of extension information, and tanning goat skins. On the last day of their visit, the visitors toured the Oklahoma State University College of Veterinary Medicine and Reproduction Enterprises, Inc. of Stillwater, Oklahoma. It was a pleasure for the Institute to host these visitors and Institute scientists look forward to the potential for more collaboration.

The ***Philippines***, officially known as the Republic of the Philippines, is a sovereign island country in Southeast Asia situated in the western Pacific Ocean. Its location on the Pacific Ring of Fire and close to the equator make the Philippines prone to earthquakes and typhoons, but also endows it with abundant natural resources and some of the world's greatest biodiversity. At 300,000 square kilometers (115,831 sq mi), the Philippines is the 73rd-largest country in the world, consisting of an archipelago of 7,107 islands that are categorized broadly under three main geographical divisions: Luzon, Visayas, and Mindanao. Its capital city is Manila while its most populous city is Quezon City.

With a population of more than 98 million people, the Philippines is the seventh-most populated country in Asia and the 12th most populated country in the world. An additional 12 million Filipinos live overseas, comprising one of the world's largest and most influential diasporas. Multiple ethnicities and cultures are found throughout the islands.

The arrival of Ferdinand Magellan in 1521 marked the beginning of an era of Spanish interest and eventual colonization. In 1543, Spanish explorer Ruy López de Villalobos named the archipelago Las Islas Filipinas in honor of Philip II of Spain. The Spanish Empire began to settle with the arrival of Miguel López de Legazpi from New Spain (present day-Mexico) in 1565 who established the first Spanish settlement in the archipelago, which remained a Spanish colony for more than 300 years.

The Treaty of Paris, at the end of the Spanish–American War, transferred control of the Philippines to the United States. After World War II, the Treaty of Manila established the Philippine Republic as an independent nation.

Source: Wikipedia.

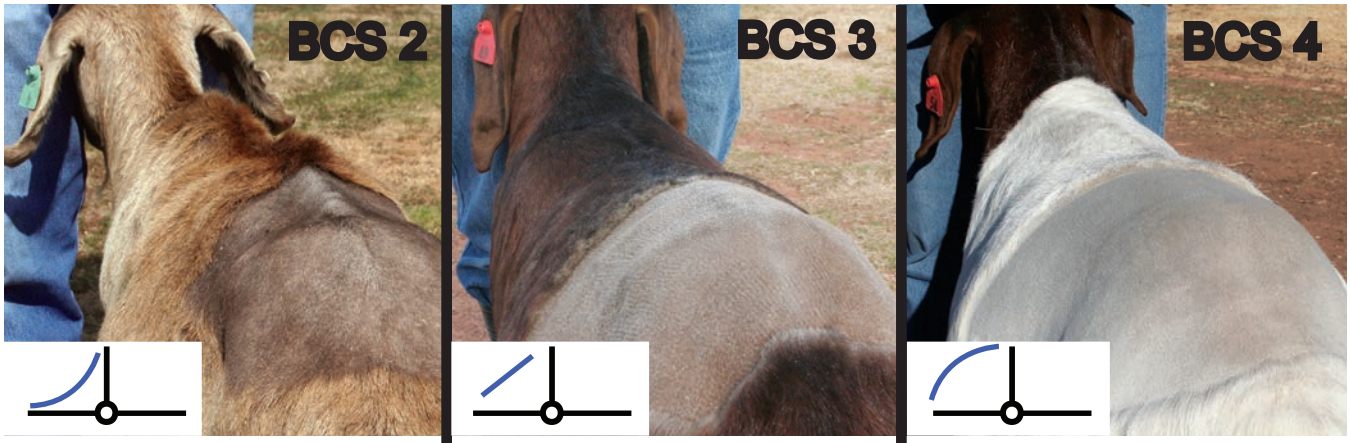
Goatkeeping 101: Care of the Pregnant Doe

by S. Hart

For most goat producers, breeding season is over and we are in the "pregnant doe" stage of the production cycle. Traditionally at this time of the year, dairy does are in the later stage of pregnancy and meat goat does are in the early stage of pregnancy. During the early stage of pregnancy, the nutritional demands of does are moderate and only in the later stage of pregnancy, at the time of increased fetal growth, should the plane of nutrition be increased. Inadequate nutrition during late gestation can result in abortion, ketosis or pregnancy toxemia, stillborn and weak kids, and also may limit availability of colostrum for the newborn kid.

Using the Langston Interactive Nutrient Calculator (http://www2.luresext.edu/goats/research/nutritionmodule1.htm), we can calculate the nutrient requirements for a 130-pound, mature Boer doe, 140 days pregnant (10 days from kidding), gaining no weight, other than that due to pregnancy, and carrying twins. The requirements are 2.45 pounds total digestible nutrients (TDN), 0.45 pounds crude protein (CP), 3.97 pounds intake, 6.03 grams calcium, and 4.22 grams phosphorus. A ration can be balanced using Bermuda grass hay and 20 percent range cubes to meet the requirements by feeding 1.5 pounds of 20% range cubes and 3.0 pounds of Bermuda grass hay. This illustrates the high level of nutrition that is needed, especially in the last three weeks of pregnancy. High quality hay as well as supplementation is usually required. The range cubes contain a mineral, so no additional mineral mixture is needed.

Nutritional status of the doe can be easily assessed using body condition scoring (BCS; http://www.luresext.edu/goats/research/bcshowto.html), which is a quick method of describing how thin or fat a goat is, using a numerical score from 1 to 5. A goat may be given a half score. Assigning a BCS cannot be done by looking at the goat, one must feel for muscle and fat cover. BCS is commonly assessed in the loin area. In very thin goats the bones can feel “sharp.” As the animal gains condition, the thicker tissue covering makes the bone ends feel more rounded and smooth. An appropriate BCS range for goats at breeding is from BCS 2 to BCS 3.



BCS 2 - Spinous process is felt as a ridge. A depression is felt between the spinous and transverse processes. Little muscle and fat can be felt. If bone ends are sharp and individual vertebrae felt, the BCS is 1.

BCS 3 - Spinous process does not feel like a ridge, but smooth with small ripples indicating the bones. Area between spinous and transverse processes is filled with muscle and fat cover and felt as a straight or slightly bowed out slope.

BCS 4 - Spinous process feels smooth but not buried in tissue. Individual bones are difficult to feel. Area between the spinous and transverse processes feels full and rounded. If bones are buried in tissue and not felt, the BCS is 5.

2014 Producer Workshops

Tanning Goatskins Workshop

Have you ever wondered how to tan a skin? On Saturday, March 29, 2014, a tanning goatskins workshop will be held at Langston University from 8:00 a.m. to 12:30 p.m. The focus of the workshop will be tanning hair-on goatskins but the process of unhairing skins and making leather will also be discussed. After discussing the stages of tanning from how to handle and store a raw hide to softening and finishing a tanned skin, participants will have hands-on practice with goatskins in several of the different tanning steps. Participants will practice fleshing, will apply tanning chemicals in two different methods, and will soften a goatskin prepared for the workshop. Various tanning methods will be discussed and examples of tanning kits and chemicals displayed. All of the tanning procedures presented and chemicals used are appropriate for home tanning with all of the work done by hand. While the tanning of goatskins will be demonstrated, the tanning processes learned can be used on sheep, deer, coyote, and other skins. *Registration is limited to 10 participants. A registration fee of $20 is charged.* Refreshments will be provided.

Dr. Merkel and participant holding a washed goatskin.

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

Scan this QR code with your smartphone to send Roger an email about the workshop.

Artificial Insemination Workshops

The Goat Extension Program will be conducting two artificial insemination workshops in the fall of 2014. The schedule will be:

- **Langston University**
  - **September 6, 2014**
  - **October 11, 2014**
  - **Both dates are Saturdays.**
- **Both workshops will be hands-on and will follow the same format.**

Practice with live animals.

Workshops will present basic anatomy and physiology of goats, estrus detection and synchronization in goats, and semen handling. Participants will have the opportunity to practice with harvested reproductive tracts and with live animals. *Registration for each workshop is limited to 20 participants. Registration fee is $45 per person.* Included in the cost of registration are handouts and snacks for breakfast and breaks.

For information regarding the AI workshops, contact Dr. Terry Gipson at 405-466-6126 or tgipson@langston.edu. Registration forms are available online at: http://www2.luresext.edu/goats/extension/workshops_field_day.htm.

Scan this QR code with your smartphone to send Terry an email about the workshop.

Noteworthy News

►In October, Dr. **Steve Hart** conducted a pasture walk for an Arkansas Cooperative Extension meeting near St. Joe, AR.

►In October, Drs. **Marvin Burns** and **Tilahun Sahlu** traveled to Ethiopia to visit several Ethiopian universities as part of a higher education consortium initiative.

►In November, Dr. **Terry Gipson** traveled to Egerton University in Kenya to fulfill objectives of the India–Africa–US Trilateral Partnership for Food Security project, which is funded by the US Agency for International Development.

►In December, Drs. **Tilahun Sahlu** and **Steve Zeng** traveled to Northwest Agriculture and Forestry University in Yangling, China to participate in a dairy goat conference and to fulfill objectives of a MOU with NAFU.

►In December, Dr. **Steve Hart** presented on Vegetation Management and on Look Before Leaping Into Goats at the Missouri Livestock Symposium in Kirksville, MO.

►In December, Dr. **Arthur Goetsch** traveled to Jordan to fulfill objectives of the USDA FAS - SCRP project.

►In December, Dr. **Steve Hart** presented on Do's and Don'ts of Goat Management at the Small Farmers Conference in Dover, DL.

Season's Greetings and the Best to You and All Your Goats in the Coming Year.

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