Goat Newsletter

Cooperative Extension Program
Langston University

The Newsletter of the E (Kika) de la Garza American Institute for Goat Research *Summer 2017*

From the Director's Desk

As usual this time of year, we are busy with research projects. I have often commented on how I think that we have the best team of goat researchers of any institution conducting goat research in the world. I am extremely proud to pass on to you more proof for my claim.

Dr. **Arthur Goetsch** has just been awarded membership into the American College of Animal Science (ACAS), which is the Board Certification option within the American Registry of Professional Animal Scientists. The American Registry of Professional Animal Scientists (ARPAS) is a registry affiliated with the American Dairy Science Association, the American Meat Science Association, the American Society of Animal Science, the Equine Science Society, and the Poultry Science Association and provides certification of animal scientists through examination, continuing education, and commitment to a code of ethics. Board Certification is the highest level of certification awarded by ARPAS. Thus, only the most-qualified experts in the fields of Animal Behavior, Animal Food Science, Animal Genetics, Animal Nutrition, Animal Physiology, and Animal Welfare Science are offered membership into the ACAS. Dr. **Goetsch** is now a Diplomate in Animal Nutrition in ACAS. This is a well-deserved recognition. We are very proud of Dr. **Goetsch** and it is always an immense pleasure to work with him. He is one of the reasons that the American Institute for Goat Research at Langston University is a world-class research institution. Congratulations, Dr. **Arthur L. Goetsch**.

Summer is also the time that our scientists gather with other scientists to share research findings at the annual meetings of the American Society of Animal Science, which is one the organizations mentioned earlier concerning Dr. **Goetsch's** Board Certification. This year we traveled to Baltimore, MD to attend the Animal Science meetings. Normally, we have a broad array of research findings to present and this year was no different. I would like to share this year's presentation/poster titles with you. They are:

- *Comparison of methods of evaluating udder health in lactating Alpine does. doi:10.2527/asasann.2017.660*
- *Comparison of high-resolution aerial photography with manual field collection in assessing the control of red cedar using goats. doi:10.2527/asasann.2017.661*
- *Lying and standing behavior of a small herd of goats in a woodland pasture. doi:10.2527/asasann.2017.674*
- *Effect of water restriction on hair sheep breeds from different regions of the United States. doi:10.2527/asasann.2017.675*
- *Effects of restricted periods of diet access on feed intake, behavior, and performance of Alpine goats in early lactation. doi:10.2527/asasann.2017.679*
- *Effects of selecting growing male hair sheep of different flocks for internal parasite resistance on performance. doi:10.2527/asasann.2017.691*
- *Effects of high heat load conditions on rectal temperature, panting*

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

Dr. Marvin Burns,
Dean,
School of Agriculture and Applied Sciences

Dr. Vernon Jones,
Associate Dean,
School of Agriculture and Applied Sciences

Dr. Tilahun Sahlu,
Director,
E (Kika) de la Garza American Institute for Goat Research

E (Kika) de la Garza American Institute for Goat Research
Langston University
P.O. Box 730
Langston, OK 73050
Phone: (405) 466-3836
FAX: (405) 466-3138
http://www2.luresext.edu
Newsletter Editor
Dr. Terry A. Gipson

score, and respiration rate of hair sheep breeds from different regions of the United States. doi:10.2527/asasann.2017.692

- *Effects of high heat load conditions on body weight, dry matter intake, and blood constituent levels of Dorper, Katahdin, and St. Croix sheep from different regions of the United States. doi:10.2527/asasann.2017.697*
- *Effects of level of intake of a fifty-percent concentrate pelleted diet on digestion and energy utilization by Katahdin wethers. doi:10.2527/asasann.2017.698*

Not only are these meetings an important opportunity to share our research with other animal scientists but also an opportunity to be informed about other research being conducted at universities around the country and around the world. I have included the Digital Object Identifier (DOI) of each presentation for your information. That way, you will be able to search directly on the Internet for the presentations' abstracts. DOI is a persistent link to an online document and is used by academia, professional organizations, and governments to track documents. Over the lifetime of a digital document, its Uniform Resource Locator (URL, also known as web address) may change but the DOI remains constant.

From several of the aforementioned titles, one can see the mention of hair sheep several times. That is because in early 2015, Drs. **Terry Gipson** and **Art Goetsch** traveled to four different climatic zones: Pacific Northwest (Oregon and Washington), Southeast (Florida), Southwest (Texas), and Upper Midwest (Minnesota, Iowa and Wisconsin) in order to purchase hair sheep for the USDA-funded project entitled "The Genomics of Resilience in Sheep to Climatic Stressors." Later in 2015, Drs. **Art Goetsch, Ryszard Puchala,** and **Yoko Tsukahara** returned to the four zones to transport the purchased Dorper, Katahdin, and St. Croix females back to Langston University. The hair sheep have been used in the aforementioned research project to compare resilience across breeds within region and within breed across regions. An example of the comparison would be comparing Dorper, Katahdin, and St. Croix that originated from the Pacific Northwest or comparing Dorpers that originated across the four regions. The research project will be ending in 2018 and a decision was made that the hair sheep will remain as part of the university's research herd/flock. An effort is underway to purchase appropriate rams from breeders in the central United States to mate with these foundational females this fall. We are excited about this new phase of research and the opportunities that it will afford. Being able to compare and contrast goats and hair sheep in future research will allow us to better serve limited-resource, small-scale livestock producers, be they goat or sheep producers, and to better advise them on profitable, diversification or management options. Even though we are excited about this expansion opportunity, we remain committed to our roots, that is research on goat production, and we always will be.

Dean Marvin Burns Retires

Dr. Marvin Burns

After serving as Dean of the School of Agriculture and Applied Sciences for twenty years, Dr. Marvin Burns has retired. In 1995, Dr. Burns left Tuskegee University to become the Associate Administrator of Extension at Langston University. In 1997, he was named the Acting Dean for Research and Extension and in 1998 was named the Dean of the newly formed school of Agriculture and Applied Sciences, where the E (Kika) de la Garza American Institute for Goat Research is now housed.

Dr. Burns was born in Ty Ty, Georgia and was raised on a farm. He received a B.S. in Agronomy from Fort Valley State University, an M.S. in Agronomy from the University of Wisconsin, and a Ph.D. in Plant Breeding and Pathology from the University of Arizona.

After receiving his doctorate, Dr. Burns served as Head of the Department of Plant Science at Prairie View A&M in Texas for four years. In 1978, he moved to Tuskegee University in Alabama and served as Head of the Department of Agricultural Sciences for the next 10 years.

In 1988, Dr. Burns was a Visiting Professor at the University of Delaware and in 1989, he was a Visiting Scientist in the Discovery Group at American Cyanamid in Princeton, NJ. During both of these Visiting Professor positions, Dr. Burns learned valuable biotechnology skills and techniques that he later used to establish the first biotechnology laboratory at Tuskegee University.

In 1991, Dr. Burns embarked upon a long and illustrious international career when he became the Plant Breeder/ Pathologist with the RAV II Extension and Research Project in Zaïre (now Congo) for two years. He then moved to Cameroon where he served as the Plant Breeder/Pathologist with the Root and Fiber Crop research program for two years. Dr. Burns has also had short-term assignments in Guyana, El Salvador, Burkina Faso, Chad, Zaïre, South Africa, Nigeria, Liberia and Rwanda.

In retirement Dr. Burns and his wife, Pat, intend to travel for pleasure and to visit family. Dr. Burns says that he will work on his tennis and golf games and do more fishing.

All the faculty and staff in the School of Agriculture and Applied Sciences wish Dr. Burns a pleasant, active, and restful retirement.

Dr. Burns says hello to a friend.

LINC Training in Indonesia

Dr. Arthur Goetsch spent April 29 through May 8 on a trip to Indonesia that we hope will lead to future collaboration with institutions there. In this regard, the interaction was facilitated by connections and contacts that Dr. Roger Merkel has in Indonesia, arising from his time spent conducting research on his Ph.D. program in the early 1990's.

Dr. Goetsch's travel started with a flight from Oklahoma City to Jakarta, which is on the island of Java and is the capital of Indonesia. Then Dr. Goetsch and three people with the Indonesia Center for Animal Research and Development (ICARD) flew to Medan, located in the northern part of the island of Sumatra. From May 2 to 5, Dr. Goetsch provided training in a workshop entitled 'Improvement of Researchers Competence and Knowledge: On Computerizing Feed Formulation Based on Local Resources and Goat Industry Situation & Challenges in Global Climate Change.' The workshop was funded by a World Bank development program, which was organized by ICARD. There were approximately 30 people attending the workshop from ICARD, the Indonesia Agency for Agricultural Research and Development, and the Indonesia Ministry of Agriculture, originating from nearly all provinces of the country. The main focus of the workshop was use of the web-based goat nutrient requirement calculation system of the Institute, commonly referred to as LINC for 'Langston Interactive Nutrient Calculation' program. The main general topics covered are listed below.

- *Energy and protein requirements and supplies for ruminants*
- *Requirement adjustments*
- *Different animal classes and physiological states*
- *Use of the LINC 'Estimating Supplemental Concentrate Needs' calculation system (ESCNC)'*
  - *Factors affecting feed intake and feed intake prediction*
  - *Performance levels*
  - *Feedstuff associative effects*
  - *Previous and current nutritional plane*
  - *Common technologies for improved nutrition*
- *Total mixed rations*
  - *LINC 'Least Cost Ration Balancer (LCRB)'*
  - *Spreadsheets*


INDONESIAN CENTER FOR ANIMAL RESEARCH AND DEVELOPMENT
INDONESIAN AGENCY FOR AGRICULTURAL RESEARCH AND DEVELOPMENT
MINISTRY OF AGRICULTURE

Certificate

Presented to
Dr. Arthur Louis Goetsch
as
Training Instructor
on
Improvement of Researchers Competence and Knowledge :
On Computerizing Feed Formulation Based on Local Resources and Goat Industry Situation
& Challenges in Global Climate Change

Medan, May 2 - 5th, 2017, with a total 40 hours of training program

Director

Dr. Ir. Atien Priyanti, M.Sc
NIP. 19600527 198903 2 001

SCIENCE.INNOVATION.NETWORKS

LINC consists of many different calculation options or 'calculators,' such as for energy and protein requirements and feed intake prediction for different biotypes of goats (i.e., dairy, indigenous or local, meat or ≥ 50% Boer, and Angora) in various stages of production (e.g., nursing, growing, mature, gestation, and lactation). Some calculators also have links to others, such as the ESCNC. With this calculator, animal characteristics are entered to determine requirements, properties of basal dietary forage are given, and information is provided about a possible feedstuff to be supplemented. There are calculations to deter-

Dr. Goetsch (seated, fourth from left) with facilitators and participants of the training workshop.

Goat raised in elevated, slatted floors at SPGRI.

mine the amount of the supplemental feedstuff needed to meet energy and protein requirements, one of which will be exactly matched and the other that will be in at least slight excess. Also, the appropriate lower concentration of protein or available energy in the supplement that will exactly meet the requirement previously in excess is estimated. This allows for use of least-cost supplements that meet both energy and protein requirements without excesses to most efficiently and cost-effectively correct for deficits of the basal forage and achieve target levels of performance.

An important aspect of the LINC ESCNC is the addressing of associative effects between the basal forage and supplemental concentrate. An associative effect occurs when a feedstuff or mixture of feedstuffs has an effect, negative or positive, on utilization of another feedstuff or feedstuff mixture. If associative effects are not addressed, then the previously described calculations will not yield accurate estimates.

During the workshop, in addition to use of the LINC ESCNC, there was considerable attention given to the LCRB. With the LCRB, least-cost diets are formulated with requirements expressed on a concentration basis, such as percentages of crude protein and total digestible nutrients (TDN). Therefore, besides input of the cost of all available feedstuffs, an estimate of feed intake is required, which can be obtained from one of the LINC feed intake calculators. Animal settings and feedstuffs common in Indonesia were used in the workshop. Moreover, in working through some of the example scenarios, a few minor problems were detected in the function of some aspects of the LCRB. Thus, presently Dr. Terry Gipson, who has done all of the LINC programing, and Dr. Goetsch are working on these improvements.

Manure collection system at SPGRI.

Fodder feeding system for kids at SPGRI.

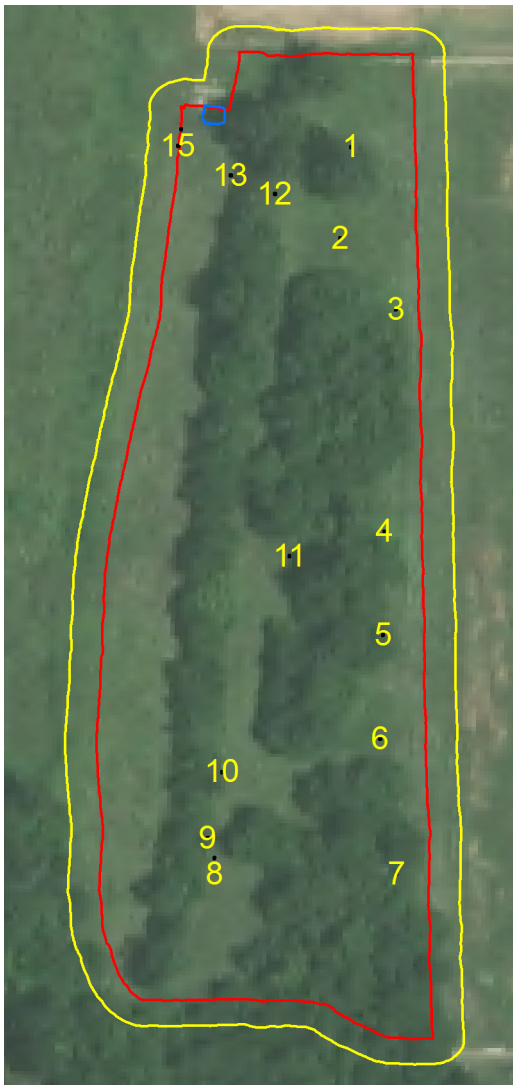
Also during the time in Indonesia, Dr. Goetsch had the opportunity to visit the Sei Putih Goat Research Institute (SPGRI) in North Sumatra where Dr. Merkel previously conducted his research. Other visits were to the ICARD Research Institute for Animal Production and local goat and sheep farms near Bogor located south of Jakarta in Sumatra.

Langston Goats Go to Work on Plants at a Wastewater Treatment Plant

In mid-May 2017, Langston University transported 15 Boer wethers to the Wastewater Treatment Plant (WTP) in Midwest City, OK. Their job is to clear unwanted brush and vegetation that is a constant maintenance problem for the facility. This partnership between Langston University and WTP is made possible by the USDA/NIFA Renewable Resources Extension Act (RREA), which provides funding for extension activities related to forestry and natural resources at land grant universities. The first tract to be reclaimed is a 5½-acre plot that is a mixed plot of trees, shrubs, grasses, and weeds. On the map below right, Langston researchers identified 13 monitoring locations (15 is superimposed on 14, which are the feeder and waterer, respectively) and will be documenting the vegetation change at these locations. The majority of the monitoring sites contained poison ivy and johnson grass with red cedar, green briar and giant ragweed at other sites. Site #13, which was located near the shelter, feeder, and waterer, was a large stand of giant ragweed (*Ambrosia trifida*). The top photo (below, left) shows the healthy stand of giant ragweed immediately before the goats were released into the plot. The bottom photo shows the monitoring site just two weeks after the goats' release, a wonderful job of weed control. We will keep you updated on this project .

Before goat were introduced.

Two weeks after.



Research Spotlight

Maintenance Energy Requirements for Boer.

Boer goats (7/8 and 1/8 Spanish breed) were used to characterize effects of gender and age on the ME requirement for maintenance (ME_m). There were eight animals of each gender, doelings, intact males, and wethers castrated at 2 months of age. Kids were weaned at 4 months and thereafter consumed a 50% concentrate pelleted diet ad libitum while in group pens at most times. Measurement periods consisted of three segments of 12, 10, and 4 days with consumption ad libitum and near ME_m and while fasting, respectively. Maintenance segment measures began at 5, 8, 12, and 15 months of age in periods 1, 2, 3, and 4, respectively. Feed intake data, feces and urine collections, and a calorimetry system were used to determine ME intake and heat energy (HE). The ME_m estimate was based on fasting HE and the slope of the regression of recovered energy (RE) against ME intake with intake near ME_m and while fasting, and body weight was RE with ad libitum intake relative to ME intake above ME_m. Body weight during the maintenance segment was 45, 68, 103, and 126 for doelings, 57, 88, 148, and 170 for males, and 51, 77, 119, and 143 lbs for wethers in periods 1, 2, 3, and 4, respectively. Fasting HE and ME_m were affected by gender×period interactions. Fasting HE on a metabolic body weight basis was 277, 272, 281, and 281 for doelings, 288, 327, 334, and 398 for males, and 274, 303, 274, and 305 for wethers; ME_m was 382, 390, 399, and 420 for doelings, 412, 469, 492, and 569 for males, and 384, 417, 426, and 439 for wethers in periods 1, 2, 3, and 4, respectively. In conclusion, ME_m was not greatly different between doelings and wethers and increased for both as the study progressed, whereas that for males was greater, with the difference increasing considerably as age rose.

Tovar-Luna, I., R. Puchala, T. Sahlu, A.L. Goetsch. 2017. Effects of gender and age on energy use by young Boer goats. Livestock Science 199:86–94. doi:10.1016/j.livsci.2017.03.016

Editor's Note: Metabolic body weight is a term that is often used by animal nutritionists. This is because an animal that is twice as large as another does not need twice the nutrients. Metabolic body weight is calculated by raising body weight to the ¾ power ($BW^{0.75}$), which scales the amount of metabolically active tissue in the animal.

Restricted Feeding Time in Lactating Goats.

Restricting periods of diet access to lactating dairy goats could influence level or efficiency of production and offer different management options. Therefore, 40 Alpine goats (12 and 28 of parity 1 and ≥ 2, respectively) with initial BW of 128.0 lbs and 14.2 days in milk were offered a 40% forage diet (16.6% CP and 37.5% NDF; 20% alfalfa pellets, 10% cottonseed hulls, 10% coarsely ground grass hay, 12.9% wheat middlings, 12.9% rolled oats, 12.9% rolled corn, 11.0% soybean meal, 3.0% soybean oil, 5.0% molasses, and 2.3% other ingredients) free-choice in Calan gate feeders for 12 weeks. Feed access was continuous other than during morning and afternoon milking (Control), during the day for 8 hours (Day) or night for 16 hours (Night), or for 1 or 2 hours after morning and afternoon milking (2Hour and 4Hour, respectively). Digestibilities were not influenced by treatment (e.g., organic matter 73.1, 76.9, 77.1, 76.3, and 77.3%), Dry matter intake was greater for Control than for most treatments (4.6, 4.9, 6.0, 5.1, and 4.4 lbs/day), and ADG was greater for Control than for the mean of restricted feeder access treatments (0.09, 0.02, 1.06, 0.05, and 0.05 lb/day for 2Hour, 4Hour, Control, Day, and Night, respectively). Milk yield was similar among treatments (5.7, 7.1, 6.7, 6.8, and 5.7 lbs/day), fat concentration tended to be lower for Control than for other treatments (3.88, 4.21, 3.41, 3.70, and 3.49%), and milk energy yield was not affected by treatment (7.36, 9.53, 8.20, 8.56, and 6.91 MJ/day for 2Hour, 4Hour, Control, Day, and Night, respectively). Intake of ME and heat energy were greater for Control than for other treatments, resulting in milk energy that was 31.9, 37.6, 26.0, 31.4, and 30.0% of ME intake for 2Hour, 4Hour, Control, Day, and Night, respectively. In conclusion, continuous diet access may affect partitioning of nutrients between milk synthesis and tissue accretion differently than some restricted feeder access treatments, particularly 4Hour.

Silva, N.C.D., R. Puchala, T.A. Gipson, T. Sahlu, Goetsch, A.L. 2017. Effects of restricted periods of diet access on feed intake, behavior, and performance of Alpine goats in early lactation. Journal of Animal Science. 95(Suppl. 4):331. doi:10.2527/asasann.2017.679

Noteworthy News

►In May, Dr. **Steve Hart** conducted a parasite workshop and FAMACHA training at Langston University.

►In May, Dr. **Goetsch** conducted a workshop on the use of the Langston Interactive Nutrient Calculators (LINC, http://www.luresext.edu/NutrientCalculators) system to Indonesian scientists at a workshop entitled "Improvement of Researchers Competence and Knowledge: On Computerizing Feed Formulation Based on Local Resources and Goat Industry Situation & Challenges in Global Climate Change" in Medan, Indonesia. A full report of his training can be found on page 4.

►In June, Dr. **Steve Hart** conducted a FAMACHA training for attendees at the American Kiko Goat Association Convention and Showcase Sale in Vinita, OK.

►In June, Dr. **Terry Gipson** conducted a Nose-to-Tail demonstration for local goat producers in Spencer, OK.

►In July, Drs. **Terry Gipson, Arthur Goetsch, Steve Hart, Raquel Lourencon, Roger Merkel, Ryszard Puchala,Tilahun Sahlu, Dereje Tadesse** and Mr. **Ali Hussein** attended the national meetings of the American Society of Animal Science in Baltimore, MD to present research findings and attend scientific sessions. One of the abstracts of research findings can be found on page 7.

►In June, Dairy Product Specialist Dr. **Steve Zeng** and agriculture student Mses. **Monica Mascarenas** and **Jasmine Middleton** undertook a week-long Summer Research Team project in the Center of Excellence for Emerging and Zoonotic Animal Diseases of U.S. Department of Homeland Security (DHS) at Kansas State University. In addition Dr. Jianfa Bai from Kansas State University spent three days at Langston University working with the team. Their research topic is entitled "Detection and Quantification of S*taphylococcus aureus*, *Listeria monocytogenes*, and *Brucella* spp. in Goat Milk Using Real-time PCR Assays."

►In June, Dr. **Steve Zeng** accompanied Dr. **Kent Smith, Jr.**, Langston University President and Dr. **Clyde Montgomery**, LU Vice President for Academic Affairs, on a trip to China to renew existing linkages and establish new linkages with Chinese universities.

Goat Newsletter
E (Kika) de la Garza American Institute for Goat Research
Langston University
P.O. Box 730
Langston, OK 73050