Goat Newsletter

Cooperative Extension Program
Langston University

The Newsletter of the E (Kika) de la Garza American Institute for Goat Research *Winter 2018*

From the Director's Desk

In the Summer 2017 newsletter, I announced that Dr. **Arthur Goetsch** had been awarded membership into the American College of Animal Science, which was a high honor. I am once again extremely proud to announce that Dr. **Goetsch** has been inducted into the Illinois State University Hall of Fame. This is a great honor and we are extremely happy for Dr. **Goetsch** and his family. He is very deserving of this honor and you can read more about it on page 3.

Recently, Dr. **Goetsch** was a member of a team that visited Purdue University on a Faculty Visitation Exchange. Other members of the team included Drs. **Phillip Lewis** (Rehabilitation Counseling), **Orlenthea McGowan** (School of Education), and **Steve Zeng** (School of Agriculture & Applied Sciences). The objective of the visit was to share strategic priorities and organizational context, to explore existing capacities and potential project ideas around faculty interests, and to build and strengthen faculty relationships. We hope that this visit will be fruitful for Langston University and will result in a lasting partnership in agriculture teaching and research. Purdue University is renowned for its innovative research in agriculture, especially precision agriculture. Students and scientists at both universities would mutually benefit from this partnership.

Every year, our scientists write grants for the USDA 1890 Institution Teaching, Research and Extension Capacity Building Grants (CBG) Program and generally, we are successful in being awarded grants. The year 2018 was a very good year and we received a record number of grants from the CBG Program. I have listed the title of the grants and the principal investigators. Suffice it to say that the principal investigator will lead the projects but it will take a team of scientists and farm and laboratory staff to conduct successfully the projects and experiments.

- LINC 2.0 - Enhanced goat management and educational tool (Dr. **Ryszard Puchala**).
- Sky Wrangler: Smart application of precision livestock farming for grazing animals and pasture management (Dr. **Terry Gipson**).
- Sustainable use of saline water by ruminant livestock species (Dr. **Arthur Goetsch**).
- Certification in a Moodle box (Dr. **Roger Merkel**).
- Establishing a large animal teaching center to enhance teaching capacity and student experiential learning at LU (Dr. **Steve Zeng**).
- Enhancement of undergraduate academic, research experience at LU by interlinking biotechnology and horticulture practices (Dr. **Kanyand Matand**).

I hope that 2018 was a good year for you and your goats and I hope that 2019 will even be better.

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.

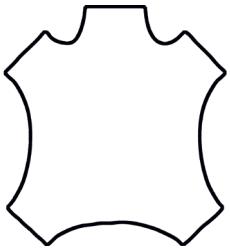
Dr. Wesley Whittaker,
Dean,
School of Agriculture and Applied Sciences

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

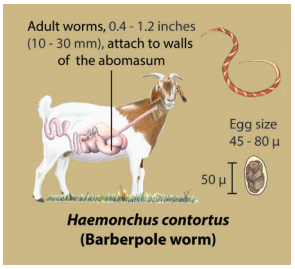
E (Kika) de la Garza American Institute for Goat Research
Langston University
P.O. Box 730
Langston, OK 73050
Phone: (405) 466-3836
FAX: (405) 466-6186
http://goat.langston.edu
Newsletter Editor
Dr. Terry A. Gipson

2019 Producer Workshops



On Saturday, April 6, 2019, 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 can practice fleshing, will apply tanning chemicals in two different methods, and 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. Registration is limited to 10 participants. A registration fee of $20 is charged. Refreshments will be provided.

For more information regarding the tanning hides workshop, contact Dr. Roger Merkel at (405) 466-6134 or merkel@langston.edu.



On Saturday, May 25, 2019, a Parasite and FAMACHA® workshop will be held at Langston University from 9:00 a.m. to 3:00 p.m. The focus of the workshop will be biology and control of worms with management, proper use of dewormers, FAMACHA® eye scoring, and fecal egg counting.

For information regarding the Parasite and FAMACHA® workshop, contact Dr. Steve Hart at 405-466-6138 or steve.hart@langston.edu.

On Saturday, October 5, 2019, an artificial insemination workshop will be held at Langston University from 8:00 a.m. to 5:00 p.m. The focus of the workshop will be basic anatomy and physiology of female 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 is limited to 20 participants. Registration fee is $50 per person. Included in the cost of registration are handouts and snacks for breakfast and breaks.

For information regarding the AI workshop, contact Dr. Terry Gipson at 405-466-6126 or terry.gipson@langston.edu.

Registration forms for each of the above workshops are available online at:
http://goats.langston.edu/Extension-Activities

Illinois State University Hall of Fame

Dr. Arthur Goetsch was recently inducted into the Illinois State University Hall of Fame. This is not only a great honor for Dr. Goetsch but also for the American Institute of Goat Research at Langston University, where Dr. Goetsch has been the Research Leader for the past 21 years. Dr. Goetsch has tirelessly directed and conducted research on dairy, meat, and fiber goats. Dr. Goetsch was instrumental in expanding the research program by including hair sheep. He has also served as a mentor to numerous Visiting Scholars, who have come to the Institute, and has provided insight and clarity for fellow Institute scientists. Therefore, it is no surprise that Dr. Goetsch received this high honor from his alma mater. The Hall of Fame citation from Illinois State University follows (https://cast.illinoisstate.edu/alumni/hall-of-fame/halloffame2018.php).

Arthur Goetsch grew up on a small farm near Farmersville with his mother and two brothers. At Illinois State University, from 1976– 1979, he was mentored by Joe A. Sagebiel, who provided unique opportunities for growth, such as a small research project and being a teaching assistant. Goetsch received a master's degree in animal husbandry from the University of Missouri in 1980 and a Ph.D. in animal nutrition from New Mexico State University in 1982. From 1982–1984, Goetsch was a postdoctoral research associate at Oklahoma State University. He began his tenure at the University of Arkansas in 1984, advancing to associate professor in 1990 and professor in 1994. From 1995–1997, he was a research animal scientist with the United State Department of Agriculture–Agricultural Research Service's (USDA-ARS) Small Farms Research Center in Arkansas.

Since 1998, Goetsch has been research leader at the American Institute for Goat Research of Langston University. His publications include over 260 peer-reviewed papers and numerous book chapters, proceedings, abstracts, and a book addressing on-farm research on smallholder farms in developing countries. He has been invited to speak and provide training around the world. Goetsch served on the editorial boards of the Journal of Animal Science and Small Ruminant Research. He received the American Feed Ingredient Association Award for Ruminant Research in 2011 and was certified as a diplomate of the American College of Animal Sciences in 2017.

Goetsch and his wife of 30 years, Brenda, have one son, Bryce.

Dr. Arthur Goetsch with Illinois State University Hall of Fame award.

Congratulations to Dr. Goetsch! A well-deserved honor.

Travel to Vietnam

From October 14-21, Dr. Arthur Goetsch traveled to Vietnam to participate in the 4th International Asian-Australasian Conference on Dairy Goats. The meeting was held at Trà Vinh University, located about a 4-hour drive south of Ho Chi Minh City. The University has an enrollment of approximately 20,000 students. The conference was Wednesday through Friday, October 17-19. Dr. Goetsch gave an invited presentation entitled "Recent areas of research emphasis in feeding practices and the nutrition of lactating dairy goats."

Likewise, Dr. Goetsch participated in the 3rd conference in 2016 held at the Northwest Agriculture & Forestry University in Yangling, China. There were attendees from many countries in the region, including Vietnam, Malaysia, China, Thailand, Taiwan, Indonesia, India, Philippines, Sudan, Australia, New Zealand, USA, Japan, and Pakistan. Dr. Goetsch participated in an organizational meeting of the Asian-Australasian Dairy Goat Network in which Bangkok, Thailand was selected as the location for the next 5th conference in 2020. There was also an organizational meeting held for an upcoming Special Issue of the journal Asian-Australasian Journal of Animal Science focusing on dairy goats, in which Dr. Goetsch will have an invited review on recent advances in feeding and nutrition research of dairy goats and will be a Guest Editor.

Dr. Goetsch (back row , right) and other presenters at the conference. Ms. Sanae Ishii (back row, center) was recently at Langston University for training.

Moreover, Dr. Steve Zeng will be coauthoring a review on dairy goat products. On the morning of Saturday, October 20, Dr. Goetsch met with administrative, research, and teaching personnel of Trà Vinh University to discuss programs of both institutions and potential for future collaboration.

Dr. Goetsch touring dairy goat facility with conference attendees.

Research Spotlight

Greenhouse Gas - Dairy Goats.

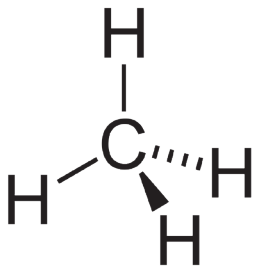
Fifty-four Alpine doelings (70 lbs body weight and 306 days of age) were allocated to nine treatments individually fed for ad libitum intake of 25% concentrate and 75% forage diets (dry matter basis; DM). Alfalfa was the forage in the control diet. Other diets contained Sericea lespedeza as the forage, with 1.25% DM of quebracho extract included in the concentrate fraction for a dietary condensed tannin level of 8.4%. Lespedeza treatments were no additive (L) and inclusion of monensin (I) at 22 ppm or 0.000022% DM (L-I), soybean oil at 3% (L-S), coconut oil at 3% (L-N), I and 3% soybean oil (L-I-S), I and 3% coconut oil (L-I-N), 1.5% soybean oil and 1.5% coconut oil (L-S-N), and I, 1.5% soybean oil, and 1.5% coconut oil (L-I-S-N). The experiment was 12 weeks with two 6-week periods. Gas exchange was determined in weeks 6 and 12, and other measures occurred in weeks 5 and 11. There were differences between the control treatment and diets with lespedeza in intake of DM (3.2, 2.8, 2.8, 2.6, 2.9, 2.5, 2.4, 2.5, and 2.2 lbs/day for control, L, L-I, L-S, L-N, L-I-S, L-I-N, L-S-N, and L-I-S-N, respectively). Ruminal methane emission was less for diets with lespedeza than for the control in MJ/day (1.36, 0.76, 0.84, 0.71, 0.71, 0.66, 0.65, 0.68, and 0.68) and relative to intake of gross energy (5.92%, 3.27%, 3.49%, 3.19%, 2.84%, 2.91%, 3.20%, 3.20%, and 3.27%) and digestible energy (11.19%, 6.98%, 7.40%, 6.38%, 5.90%, 5.69%, 6.37%, 6.38%, and 6.70% for control, L, L-I, L-S, L-N, L-I-S, L-I-N, L-S-N, and L-I-S-N, respectively). In conclusion, the magnitude of effect of condensed tannins from lespedeza and quebracho extract on ruminal methane emission by Alpine doelings did not diminish over time and was not markedly influenced by dietary inclusion of monensin, soybean oil, or coconut oil.

Liu, H., R. Puchala, S. LeShure, T. Gipson, M. Flythe, A. Goetsch. 2018. Effects of Lespedeza Condensed Tannins Alone or with Monensin, Soybean Oil, and Coconut Oil on Feed Intake, Growth, Digestion, Ruminal Methane Emission, and Heat Energy by Yearling Alpine Doelings. Journal of Animal Science 97:, https://doi.org/10.1093/jas/sky452.

Greenhouse Gas - Meat Goats.

Mature Boer goat wethers were supplemented with 0.5% body weight rolled corn and consumed pelleted alfalfa (CON), pelleted Sericea lespedeza (HSL; 6.4% condensed tannins), a 1:1 mixture of alfalfa and lespedeza (MSL), or alfalfa with monensin (ION; 22 mg/kg), coconut oil (CCO; 4%), or soybean oil (SBO; 4%). Total dry matter intake in the 20-week study (3.86%, 3.75%, 3.52%, 3.69%, and 3.64% of body weight) and total tract OM digestibility determined every 5 weeks (72.8%, 69.5%, 70.3%, 72.0%, and 71.1%) were not affected by treatment, although there were differences in nitrogen digestion (77.5%, 70.7%, 67.0%, 77.0%, 75.7%, and 73.6% for CON, MSL, HSL, ION, CCO, and SBO, respectively). Ruminal methane emission was not influenced by period and was lowest among treatments for CON expressed as percentages of gross (10.3%, 6.8%, 6.3%, 7.2%, 6.5%, and 6.5%) and digestible energy (14.8%, 10.2%, 9.3%, 10.6%, 9.8%, and 10.1% for CON, MSL, HSL, ION, CCO, and SBO, respectively). In conclusion, both levels of lespedeza elicited similar depressions in ruminal methane emission, with a magnitude of change similar to that of an ionophore and coconut and soybean oils, and effects did not vary with week of the study.

Puchala, R., S. LeShure, T. Gipson, K. Tesfai, M. Flythe, A. Goetsch. 2018. Effects of Different Levels of Lespedeza and Supplementation with Monensin, Coconut Oil, or Soybean Oil on Ruminal Methane Emission by Mature Boer Goat Wethers After Different Lengths of Feeding. Journal of Applied Animal Research 46:1127-1136, https://doi.org/10.1080/09712119.2018.1473253



Drawing of a methane molecule. Source: Wikipedia.org.

Editor's Note: A USDA/NIFA project #OKLUAGOETSCH2014 (Accession number 1004179) entitled "Sustainable Control of Greenhouse Gas Emission by Ruminant Livestock" provided funding for this research.

3rd National Goat Conference

The third National Goat Conference was held in September 2018 in Montgomery, AL and hosted by Tuskegee University. The first National Goat Conference was held in 2010 at Florida A&M University. The second was held in 2013 at North Carolina A&T University.

More than 250 participants attended the 3rd National Goat Conference (NGC) and learned about a wide variety of topics. Several Langston University personnel participated in the NGC with Drs. Terry Gipson, Steve Hart, and Roger Merkel presenting. Dr. Gipson presented on "Central Performance Testing: Purpose, Benefits, Impacts, and Trends" and "History of the U.S. Goat Industry," Dr. Hart on "Grazing System and Management for Goat Production," Dr. Merkel on "Mortality Composting," and Drs. Hart, Merkel, and Gipson jointly on "Current Situation and Future Prospects of the US Goat Industry." The abstract of the joint presentation is presented below. In addition to the oral presentations, Dr. Arthur Goetsch presented two posters on internal parasite research.

Dr. Roger Merkel discusses mortality composting with a NGC participant.

Dr. Steve Hart discusses poster presentations (background) with a NGC participant.

Dr. Terry Gipson discusses goat production with Dr. Niki Whitley of Fort Valley State University.

Current Situation and Future Prospects of the US Goat Industry

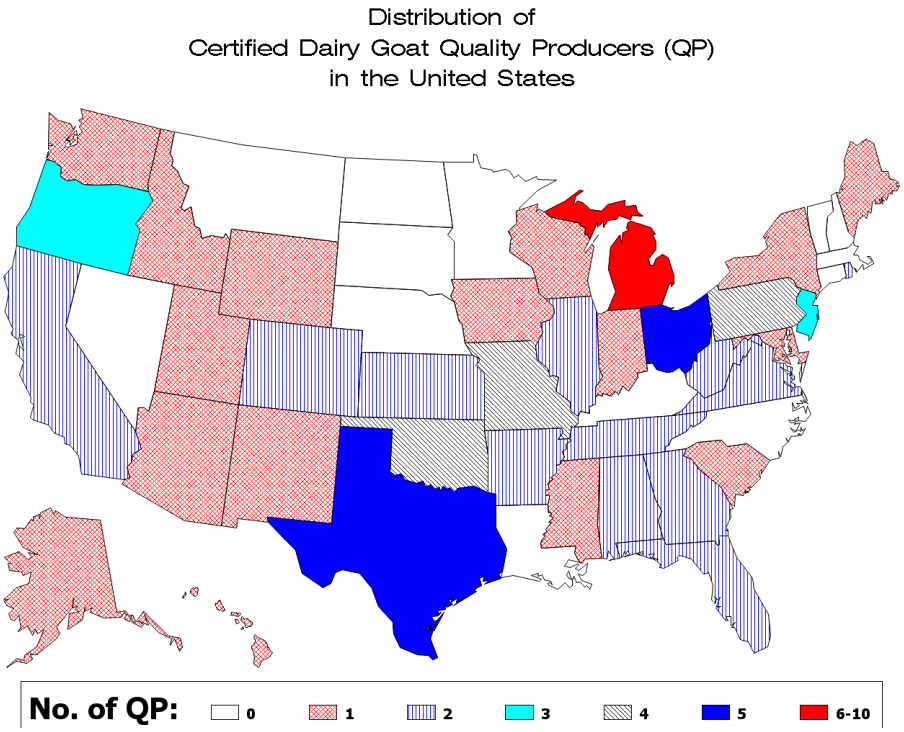
Steve Hart, Roger Merkel, and Terry Gipson
American Institute for Goat Research
Langston University, Langston, OK

Current demand for goat meat in the US outstrips domestic supply. There is great potential for industry growth in the meat and dairy sectors. Whereas fiber prices have improved, loss of animals and market resources, labor costs for shearing, and lack of animal genetic resources will prevent growth in the short term. As producers age, there is opportunity for new producers to enter the marketplace. Significant challenges exist, such as access to local markets and abattoirs, dewormer resistant parasites, and feed costs. Establishing goat feedlots can increase meat supply and industry commercialization. Technologies used for cattle will be expanded for use in goats with interconnected sensors collecting health and production data. The field of genetic improvement will change from current production testing to identifying superior animals at an early age using DNA analysis. A quality assurance program is needed to address animal welfare issues and promote consumption of domestic products to consumers.

Update on Dairy Goat Certification Course

Nearly one year ago, we unveiled the Dairy Goat Online Certification course (http://goats.langston.edu/Online Certification) and we are happy to report that 80 participants have been certified as Quality Producers (QP). To qualify for certification, a participant must successfully complete all of the 18 core modules and 7 of the 10 elective modules. The vast majority (76 of 80) of QP are from the United States.

Fore each module, the participant will first take a pre-test. Once the pre-test is scored, then the participant will have access the module content. If the participant scored less than 85% on the pre-test, then the participant will be required to take the post-test. The objective of the pre-test is to measure knowledge before reading module content. The objective of the post-test is to measure knowledge after reading module content. The participant has one attempt at the pre-test and an unlimited number of attempts at the post-test. The pre- and post-test scores of the 1,063 participants enrolled in the QP course can be seen in the table to the right. The modules are listed in Table-of-Content order and generally, participants follow this order but they have the flexibility to study the modules in any order. The average score for pre-test is 67.8% and the post-test is 97.5%. This is an average difference of 29.7%, a significant increase in knowledge transfer. For the 80 QP, the average time needed to complete the course is 54 days with a range of 3 to 322 days and a median of 27 days.



	Module	Pre		Post		Diff
		N	Score	N	Score	
Required	Introduction to Dairy Goats	1063	68.3	675	96.3	28.0
	Dairy Goat Quality Assurance and HACCP	622	60.1	419	95.5	35.4
	Biosecurity for Dairy Goat Producers	405	70.2	298	96.0	25.9
	Dairy Goat Herd Health: Procedures and Prevention	328	70.7	253	97.0	26.3
	Dairy Goat Herd Health: Common Diseases	295	71.8	189	96.7	24.9
	Dairy Goat Herd Health: Udder Abnormalities and Mastitis	234	69.9	142	97.0	27.2
	Internal Parasites of Goats	212	65.6	162	94.5	28.9
	Dairy Goat Management	202	71.9	148	97.8	26.0
	Kidding and Kid Rearing	230	68.1	171	98.0	29.9
	Dairy Goat Nutrition	194	60.9	146	96.1	35.2
	Lactation Overview, Milking Practices and Procedures	167	62.1	132	98.1	36.0
	Goat Milk Regulations	157	73.8	102	97.8	24.1
	Dairy Goat Facilities	151	61.1	116	98.2	37.2
	Milking Systems for Goats	141	53.8	116	97.5	43.6
	Dairy Goat Reproduction	143	64.6	104	97.3	32.6
	Practical Genetics for Dairy Goat Breeding	142	59.2	116	97.3	38.1
	Dairy Goat Herd Record Keeping	133	77.9	51	98.5	20.6
	Financial Management of the Dairy Goat Business	129	73.6	75	96.6	23.0
Elective	Biology of Goat Milk Production	103	65.8	74	97.6	31.9
	External Parasites of Goats	124	69.8	86	98.7	28.9
	Marketing Goat Milk and Goat Milk Products	106	84.2	21	99.4	15.2
	Legal Considerations in Dairy Goat Farming	73	75.9	18	97.6	21.7
	Goat Milk Products and Their Safety	95	70.0	68	98.2	28.2
	Goat Milk Cheesemaking	109	66.0	86	98.1	32.1
	Making Goat Milk Yogurt	103	73.6	72	99.3	25.6
	Making Goat Milk Soap	127	60.9	97	98.5	37.5
	Goat Mortality Composting	89	57.9	70	98.6	40.7
	Organic Dairy Goat Management	88	71.5	52	99.0	27.5

All of us at AIGR wish you a Happy (and safe) New Year!

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