



Goat Newsletter

Cooperative Extension Program
Langston University

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

Spring 2019

From the Director's Desk



As usual, we are busy with research and the Goat and Hair Sheep Field Day. We have a research project underway examining pre-breeding nutritional plane and its effect upon reproductive rate and subsequent lambing in hair sheep. We are also preparing to initiate the several new USDA Capacity Building Grants that I mentioned in a previous newsletter.

You can read about the Field Day on page 3. This year our theme is Holistic Approach and I would like to dwell upon that for a moment.

According to the Merriam-Webster online dictionary (<https://www.merriam-web->

ster.com/), holistic is an adjective and has the following definition "relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts." Often, we, as scientists, are trained to study and investigate fine details and are molded into experts on very specific subjects. I don't think that this is necessarily bad. Understanding a problem, issue, or complication thoroughly is often the key to finding a solution. If I had a heart problem, I would not want to see a podiatrist nor would I want to consult an accountant if I had problems with my car. So specialization is good and we, as a society, benefit from it. However, specialization can limit us. I have noticed that when two people are specialized and share similar specialties then the majority of the time, they converse and exchange ideas amicably. However, when two people are specialized but do not share similar specialties then conversation can be strained and it is almost like they are speaking two different languages. I sometimes feel that way when our university tech people ex-

plain an issue with the internet or phone service. I am always relieved when someone deciphers the tech language for me.

These decipherers, I think, are the "big picture" people and there is great merit in being a "big picture" person. Being able to survey the situation from horizon to horizon is a gift. I enjoy pleasantly conversing with a "big picture" person. I know that whatever turn the conversation will take that my fellow conversationalist will be able to help fill in the gaps and the experience will be most enjoyable.

We have invited two "big picture" speakers for this year's Field Day, Ms. **Gianaclis Caldwell** and Dr. **Ann Wells**. These two speakers are unique in that they are specialists that also can see the "big picture." So either one of them will be able to plunge into the depths or walk with us in the shallows. I am very excited. I don't want to say much more because I want you to come to the Field Day and listen to and talk with our "big picture" specialists.

I hope to see you at the Goat and Hair Sheep Field Day.



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.

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The Cooperative Extension Program at Langston University, provides educational programs to individuals regardless of race, color, national origin, religion, sex, age, disability or status as a veteran. Issued in furtherance of Extension work, Act of September 29, 1977, in cooperation with the U.S. Department of Agriculture.

3rd National Goat Conference

In the Winter 2018 newsletter, we reported about the 3rd National Goat Conference, which was held in September 2018 in Montgomery, AL and hosted by Tuskegee University.

CONFERENCE PROCEEDINGS OF THE 2018 NATIONAL GOAT CONFERENCE



*“Building Towards a Sustainable Future
via a Healthy and Profitable Goat Industry”*

EDITORS

Olga Bolden-Tiller
Uma Karki

Drs. Terry Gipson, Steve Hart, and Roger Merkel presented at the conference. The proceedings of the conference have been published and an electronic copy can be found at https://docs.wixstatic.com/ugd/67d69e_327ca4bcd69404f9a7f45dcdee824a3.pdf.

You can read Langston University's contributions and all the other excellent presentations. The National Goat Conference is a multi-university affair and Langston University is always happy to serve with our fellow goat scientists.

The Goat Institute also has electronic publications including Goat Newsletter from Winter 2010 until present, research reports, and the Methods of Livestock Research on Smallholder Farms. All of these electronic publications can be found at <https://issuu.com/aigr/docs>.

Holistic Approach

Goat and Hair Sheep Field Day 2019

Our annual Goat and Hair Sheep Field Day will be held on Saturday, April 27, 2019 at the Langston University Goat Farm with registration beginning at 8:00 a.m. This year's theme will be *Holistic Approach* and our featured speakers will be Ms. **Gianaclis Caldwell** and Dr. **Ann Wells**.

Gianaclis Caldwell is the author of several books on cheesemaking and dairy topics, including *Holistic Goat Care*, *Mastering Basic Cheesemaking*, *Mastering Artisan Cheesemaking*, *The Small-Scale Dairy*, and *The Small-Scale Cheese Business*. She also contributed to *The Oxford Companion to Cheese* and writes for several magazines. Gianaclis speaks and consults on a variety of animal husbandry, dairy sanitation, and cheesemaking science topics in the United States and occasionally abroad. For a decade she was the cheesemaker at Pholia Farm Creamery (<https://pholiafarm.com/>) and specialized in aged, raw, goat milk cheeses. Pholia Farm continues to milk goats as well as hold several on-farm cheesemaking and goat management classes per year (<https://gianacliscaldwell.com/>).

Pholia (fo-LEE-a) Farm is owned by Vern and Gianaclis Caldwell. It is named after their two daughters, Phoebe and Amelia. The farm is located on 23 acres at the base of Elk Mountain in Jackson County, Oregon, about 10 miles outside of the town of Rogue River. The farm is part of 220 acres that Gianaclis grew up on. The does browse daily, weather allowing, on the 23 acres. Herd health is approached in the most holistic and natural way possible along with treating the animals with respect and love. The cheeses are named after local landmarks and are each distinctive in their processing, shape, and flavor. Since Nigerians are not seasonal breeders, as most goats are, half of the herd is freshened in the fall and half in the spring. This allows for a consistent supply of sweet, creamy milk and year round cheesemaking. The herd is small and the goats, being miniatures, are not large producers, but the milk is so unique in its components, that it makes for incredible cheese. Production is under 100 pounds of cheese per month and will always remain low. Pholia's motto since 2005 is: "If we can't remember the doe's name, we have too many goats."

Ann Wells graduated from Oklahoma State University School of Veterinary Medicine and has more than 25 years experience in livestock production, including producing and selling natural lamb and grass finished beef. Dr. Wells worked in private practice for eleven years and has worked for several sustainable agriculture organizations. While working for Heifer International, she researched parasite management strategies to reduce the need for anthelmintics. Currently, Dr. Wells operates two businesses, teaching and consulting about sustainable animal wellness plans under Springpond Holistic Animal Health, and producing and marketing grass-finished beef and lamb for Ozark Pasture Beef.

Operating a sheep and goat veterinary practice sparked her interest in complementary veterinary medicine. Her philosophy is to focus on the health of the animal through controlled grazing management and stress reduction techniques and strategies. She really feels that nutrition is the key to good health. Dr. Wells works with ruminant producers, large and small, helping them develop health management plans.

Ozark Pasture Beef (<http://www.ozarkpasturebeef.com>) is a partnership of farms that are all committed to producing beef in a natural, environmentally sustainable manner. Their web site states "Our beef and lamb is 100% grassfed and grass finished throughout their lives. We graze the cattle and sheep on lush, green grass, allowing for time and mother nature to provide us with a healthy, quality animal to produce quality beef for your family."

Adult Activities (afternoon session): In the afternoon session, participants will break into small-group workshops. There will be a total of thirteen workshops; however, participants will only have time to attend three.

The afternoon workshops include:

- *Tools for the Holistic Approach with Dr. Ann Wells.*
- *It's what's on the Inside that Counts: Exploring the Anatomy and Physiology of the Goat (Part I) with Ms. Gianaclis Caldwell (1:30 p.m.).*
- *It's what's on the Inside that Counts: Exploring the Anatomy and Physiology of the Goat (Part II) with Ms. Gianaclis Caldwell (2:30 p.m.).*
- *It's what's on the Inside that Counts: Exploring the Anatomy*

and Physiology of the Goat (Part III) with Ms. Gianaclis Caldwell (3:30 p.m.).

- *Basic Herd Management –hoof trimming, body condition scoring, FAMACHA scoring, etc. with Dr. Lionel Dawson.*
- *What Processors Want – learn from a panel of Oklahoma meat processors concerning the type and weights of lambs and goats that they want.*
- *The Art of Cheesemaking with Dr. Steve Zeng.*
- *Nutrition for Health and Production - calculation of energy, protein and feed intake requirements with Dr. Steve Hart.*
- *DHI Training - supervisor/tester training for dairy goat producers including scale certification with Ms. Eva Vasquez.*
- *USDA/NRCS: Conservation programs with Mr. Nick Jones and USDA/FSA: Farm loans with Mr. Phil Estes (1:30 p.m.).*
- *USDA/WS: Wildlife programs with Mr. Kevin Grant and NRCS: Conservation programs with Mr. Nick Jones (2:30 p.m.).*
- *USDA/FSA: Farm loans with Mr. Phil Estes and USDA/WS: Wildlife programs with Mr. Kevin Grant (3:30 p.m.).*
- *Fitting and Showing for Youth and Adults - tips and pointers on fitting and show ring etiquette (this is a half-day afternoon workshop).*

Registration for the Goat and Hair Sheep Field Day is FREE but there is a \$10.00 per person charge for the lunch of barbecued goat and goat milk ice cream. You can bring your own lunch, if you desire. Regardless of lunch preferences, we ask everyone to pre-register.

Goat Field Day Program for Kids (Old Fashioned Fun): The Goat Field Day for Kids provides the opportunity for kids to explore and enjoy “old-fashioned activities” while their parent(s) participate in the Goat Field Day Program. With all of today’s technological gizmos, most kids are no longer exposed to the old-fashioned games and activities that shaped the imaginations and innate creativity of their parents and grandparents. The Goat Field Day for Kids is intended to challenge and enhance cognitive and social skills. The development of intellectual and socialization practices have been determined as prerequisites for helping children to learn complex concepts, enhancing their personal capabilities.

Cheesemaking Workshop: Our ever-popular goat milk cheesemaking workshop has been scheduled on Friday April 26, 2019 (the day before our annual Goat and Hair Sheep Field Day April 27). Mrs. Gianaclis Caldwell, Owner/President of Pholia Farm Creamery in Oregon, will be our distinguished Invited Instructor again for this year’s workshop. Mrs. Caldwell is an internationally renowned goat

cheese entrepreneur, creator, designer, marketer and author in the world of cheese. She has owned a dairy goat farm, designed farmstead cheese plants, and managed cheese operations in her unique and creative manners. She is the author of many popular cheese books, including “Mastering Artisan Cheesemaking: The Ultimate Guide for Home-Scale and Market Producers”, “The Small-Scale Cheese Business: The Complete Guide to Running a Successful Farmstead Creamery”, “The Small-Scale Dairy: The Complete Guide to Milk Production for the Home and Market”, “Mastering Basic Cheesemaking: The Fun and Fundamentals of Making Cheese at Home”, “Holistic Goat Care: A Comprehensive Guide to Raising Healthy Animals, Preventing Common Ailments, and Troubleshooting Problems”. She is an excellent instructor with vast hands-on experiences. She will share with us her rich background, personal experience and masterful skills in small-scale cheese manufacture, particularly goat milk cheeses. She will demonstrate basic principles and practical skills of making soft, semi-soft and hard cheeses using our own Grade “A” goat milk. Milk quality, cheesemaking facility and marketing strategies will also be discussed. This one-day hands-on workshop will be held in the Goat Pilot Creamery at Langston University. In addition, Mrs. Caldwell will be our Featured Speaker on “Holistic Goat Care” for the general session on the Field Day. There is a registration fee of \$80.00/person for the cheese workshop. Continental breakfast, break snacks, and lunch consisting of goat meat BBQ, sausage, stick, goat milk ice cream and cheeses, etc., will be provided. Only the first 15 registrants will be admitted. To reserve a seat, please contact me first and then send your personal check of \$80.00 to LU Ag Res. Sales (Attn: Dr. Steve Zeng, Department of Agriculture & Natural Resources, P.O. Box 1730, Langston, OK 73050). For more information, please contact Dr. Steve Zeng, Dairy Product Specialist, at (405) 466-6145 or steve.zeng@langston.edu.

For information regarding the cheesemaking workshop, please contact Dr. Steve Zeng at 405-466-6145 (O), 405-404-5171 (M), or steve.zeng@langston.edu. For information regarding the 2019 Goat Field Day, please contact Dr. Terry Gipson at 405-466-6126 or terry.gipson@langston.edu.

You can register online for the 2019 Goat and Hair Sheep Field Day
<http://goats.langston.edu/goat-and-hair-sheep-field-day>



GOAT FIELD DAY

Saturday, April 27, 2019

Registration at 8:00 a.m.

Langston University Goat Farm

Registration for the Goat Field Day is FREE

For more information call (405) 466-6126

or register on-line at

<http://goats.langston.edu/goat-and-hair-sheep-field-day>

Bring your own lunch or you can Pre-Register for Lunch

**(BBQ goat, beans, potato salad,
refreshments, and goat ice cream; only \$10)**

INSTRUCTIONS FOR PRE-REGISTRATION (one form per person):

- 1.- Write your name, address, and telephone number below. Indicate if you will be registering for lunch.
- 2.- Select afternoon workshops from each time period to attend from the schedule on the back of this form.
- 3.- Write a check payable to "LANGSTON UNIVERSITY/RESEARCH SALES" for the amount, if registering for lunch.
- 4.- Mail this form and the check as soon as possible.

PRE-REGISTRATION FORM

NAME: _____ **TELEPHONE:** (____) _____

ADDRESS: _____

_____ **ZIP:** _____

Email: _____

(If you include an email address, you will receive verification of your registration.)

Registration for Goat Field Day is FREE; however, there is a fee for lunch. You may bring your own lunch.

Lunch Pre-Registration (Deadline April 20, 2019)

Adults (\$10.00 each) _____

Children (12 and under) (\$5.00 each) _____

TOTAL _____

Make checks payable to:

Langston University/Research Sales

Please mail this form and check to:

Agric. Res. and Ext. Prog.

Langston University

P.O. Box 1730

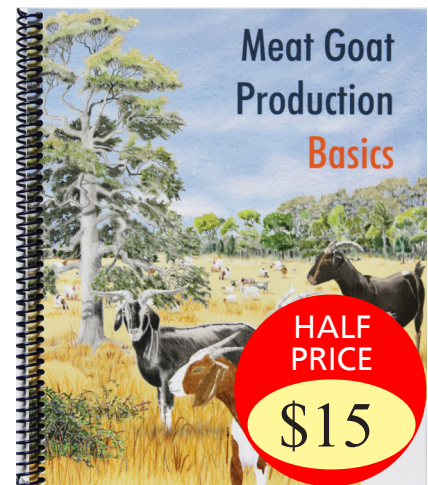
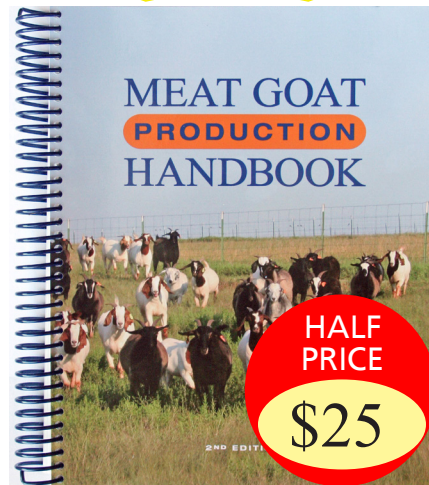
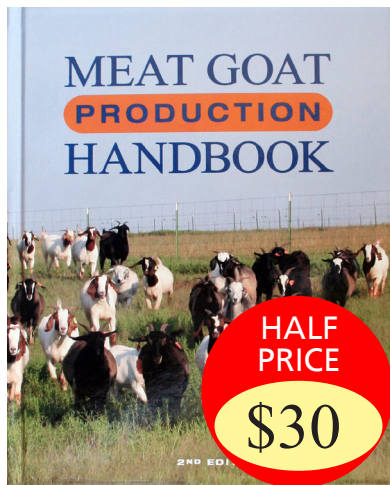
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ATTN: FIELD DAY

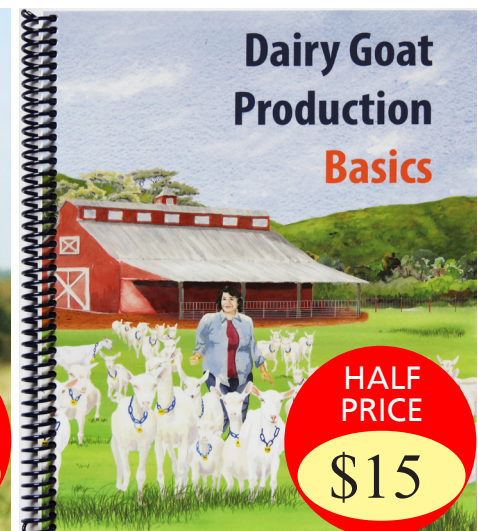
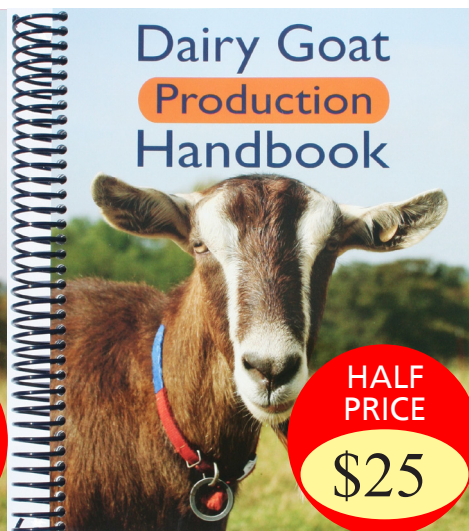
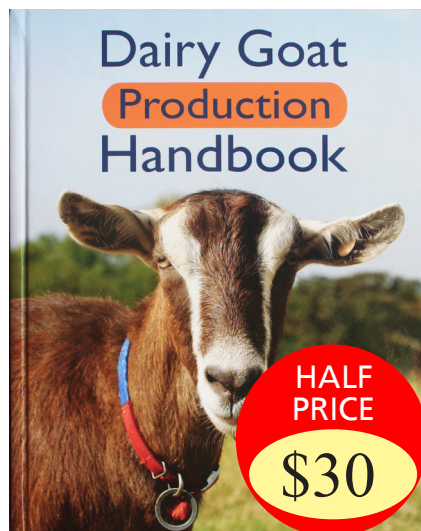
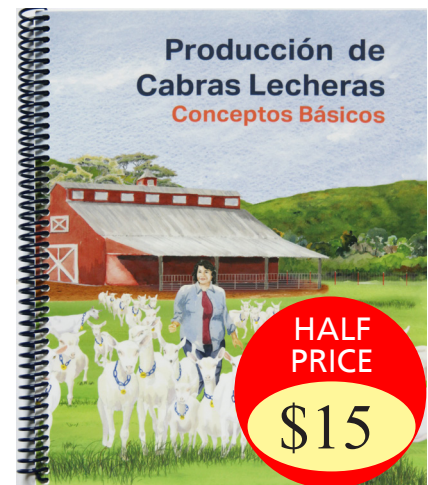
The Cooperative Extension Program at Langston University, provides educational programs to individuals regardless of race, color, national origin, religion, sex, age, disability or status as a veteran. Issued in furtherance of Extension Work, Act of September 29, 1977, in cooperation with the U.S. Department of Agriculture.

In compliance with the ADA Act, participants with special needs can be reasonably accommodated by contacting Dr. Terry Gipson at (405) 466-6126 at least five business days prior to the Goat Field Day.

**Attend the Goat and Hair Sheep
Field Day and enjoy the ½-price
handbook sale!!!**



These **sale prices** are valid
only on April 27, 2019 and
only at the Goat and Hair
Sheep Field Day.



Cooperative Extension Program
Langston University
P O Box 1730
Langston, OK 73050

Phone: 404 466 6107

Fax: 405 466 6177

Greetings Goat Field Day Participants:

The Langston University E (Kika) de la Garza American Institute for Goat Research provides the opportunity for children ages 5-14 to attend the **Goat Field Day for Kids Program** while their parent(s) participate in Goat Field Day workshops and seminars, **Saturday, April 27, 2019.**

Participants will engage in developmental games that influence cognitive thinking and innate capabilities. They will also partake in physical activities such as basketball, volleyball, dodgeball and jump-rope to emphasize the importance of establishing physical fitness habits at an early age. It is intended that these concepts will cause them to understand the dynamics of cognitive thinking and the value of strengthening physical and socialization skills while having "old-fashioned fun."

Please complete and return the **Goat Field Day for Kids Program Registration Form** along with your Goat Field Day Registration Packet. **Be sure to check their Participation Status indicated on page 2.**

If you have questions or concerns, you may contact Shirlene Hurte at (405) 466 6107 or shurte@langston.edu. We look forward to supporting your Goat Field Day experience.

Sincerely,



Shirlene Hurte, Extension Specialist
Cooperative Extension Service
4-H Youth Development

4-H Fun Facts

History

4-H, the current informal, educational program that promotes youth development began between 1890 and 1900. The educational climate of that decade saw educators for the first time recognize the needs of young people; educators began to stress that education should meet those needs. Then progressive educators in town and city schools also introduced nature study into the curriculum, and school gardens attracted attention in many places throughout the country. Rural educators, in response to a demand from farm people, introduced subjects that taught boys and girls to understand and appreciate rural life while emphasizing rural opportunities. College educators in the late 19th and early 20th centuries were reaching beyond the campus to teach. Agricultural college professors in nearly all states were organizing “farmers’ institutes” meetings to bring the latest scientific agricultural information to farmers and their wives. College educators soon recognized the need to also provide some agricultural instruction for farm boys and girls as well as instilling an appreciation for life in the country.



Source: <http://www.extension.iastate.edu/4h/page/history-4-h>

The 4-Hs

Head, Heart, Hands, and Health are the four Hs in 4-H, and they are the four values members work on through fun and engaging programs.

- **Head** - Managing, Thinking
- **Heart** - Relating, Caring
- **Hands** - Giving, Working
- **Health** - Being, Living

The 4-H Pledge

I pledge my head to clearer thinking,
My heart to greater loyalty,
My hands to larger service,
and my health to better living,
for my club, my community, my country, and my world.

4-H Mission

4-H empowers youth to reach their full potential, working and learning in partnership with caring adults.

4-H Vision

A world in which youth and adults learn, grow and work together as catalysts for positive change.



Langston University 4-H Youth Development
Informed Consent, Voluntary Waiver, Release of Liability & Assumption of Risks Form

FORM 1



American Institute for Goat Research
E (Kika) de la Garza
Goat Field Day Program For Kids
E. L. Holloway Agricultural Research Education and Extension Center
Enrollment Form
April 27, 2019

PLEASE TYPE OR PRINT

Name of Student

Last

First

Middle

DOB

Month Day Year

Age

Race

Optional

Gender

☐

Male

☐

Female

Grade

2019

Name of School:

PLEASE READ THIS DOCUMENT CAREFULLY BEFORE SIGNING. THIS IS A LEGALLY BINDING DOCUMENT. THIS FULLY SIGNED FORM MUST BE SUBMITTED BY A PARENT OR LEGAL GUARDIAN BEFORE ANY CHILD IS ALLOWED TO PARTICIPATE IN THE ABOVE REFERENCED PROGRAM/CAMP/EVENT SPONSORED BY 4-H.

I, the undersigned, wish for my Child (hereafter "child") to participate in the above referenced youth program (hereafter "program") on the date(s) and location(s) indicated above and, in consideration of my child's participation, I hereby agree as follows:

I acknowledge, understand and appreciate that as part of my Child's participation in the Program there are dangers, hazards and inherent risks to which my Child may be exposed, including the risk of serious physical injury, temporary or permanent disability, and death, as well as economic and property loss. I further realize that participating in the youth program may involve risks and dangers, both known and unknown, and have elected to allow my Child to take part in the Program. Therefore, I, on behalf of my Child, voluntarily accept and assume all risk of injury, loss of life or damage to property arising out of training, preparing, participating, and traveling to or from the Program.

I, on behalf of my Child, hereby release Oklahoma 4-H, Langston University (hereafter "LU"), its Board of Regents, Administration, Faculty, Staff, Student Leaders, the Program Staff and all other officers, directors, employees, volunteers and agents from any and all liability as to any right of action that may accrue to my heirs or representatives for any injury to my Child or loss that my Child may suffer while training, preparing, participating and/or traveling to or from the above indicated event. This agreement is binding on my heirs and assigns.

In the event of an accident or serious illness, I hereby authorize representative of LU to obtain medical treatment for my Child on my behalf. I hereby hold harmless and agree to indemnify LU from any claims, causes of action, damages and/or liabilities, arising out of or resulting from said medical treatment. I further agree to accept full responsibility for any and all expenses, including medical expenses that may derive from any injuries to my Child that may occur during his/her participation in the Program. **I furthermore understand that an accident insurance policy carried by American Income Life <http://www.americanincomelife.com/> who-we-serve/4H-insurance #A Plan, if any will provide only minimum coverage.**

This RELEASE shall be governed by and construed under the laws of Oklahoma. I agree that any legal action or proceeding related to this RELEASE, or arising out of any injury, death, damages or loss as a result of my Child's participation in any part of the Program, shall be brought only in Oklahoma.

This RELEASE contains the entire agreement between the parties to this agreement and the terms of this RELEASE are contractual and not a mere recital. The information I have provided is disclosed accurately and truthfully. I have been given ample opportunity to read this document and I understand and agree to all of its terms and conditions. I understand that I am giving up substantial rights (including my right to sue) and acknowledge that I am signing this document freely and voluntarily and intend by my signature to provide a complete and unconditional release of all liability to the greatest extent allowed by law. My signature on this document is intended to bind not only myself and my Child but also the successors, heirs, representatives, administrators, and assigns of myself and my Child.

DATE OF EFFECT: I agree to the terms listed until such time that I am asked to complete a new or revised Consent Form.

Parent/Guardian (PRINT)

Parent/Guardian Signature

Date:

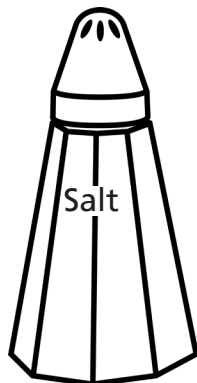
2019

OVER ►

Research Spotlight

Brackish Water.

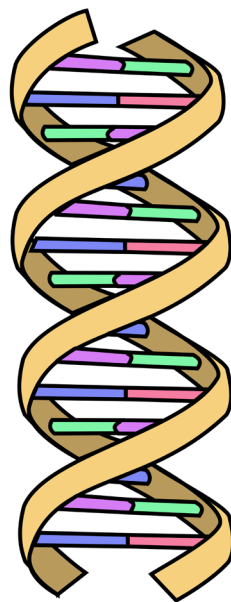
A study was conducted to evaluate effects of the level of a brackish water source (5596 mg/l total dissolve salts; TDS) and higher levels of TDS through addition of NaCl on feed intake, digestion, and heat energy in growing Boer goat wethers (GRO-G) and mature Boer (MAT-G) and Katahdin sheep wethers (MAT-S). Five GRO-G (22.1 ± 2.50 kg), five MAT-G (52.2 ± 4.99 kg), and five MAT-S (65.5 ± 4.17 kg) were assigned to three simultaneous 5×5 Latin squares with 3-week periods. Treatments within squares were ad libitum intake of fresh water (0-BRW), 50% fresh water and 50% brackish water (50-BRW), 100% brackish water (100-BRW), 100-BRW plus 3450 mg/l NaCl (Low-SLW), and 100-BRW plus 6900 mg/l NaCl (Mod-SLW). Total water intake was not influenced by TDS level with GRO-G or MAT-S but increased linearly with increasing TDS for MAT-G (952, 1087, 1284, 1192, and 1372 g/day for 0-BRW, 50-BRW, 100-BRW, Low-SLW, and Mod-SLW). Organic matter (OM) intake or total tract OM digestion were not influenced by water treatment. Intake of metabolizable energy (ME) decreased linearly with increasing TDS for MAT-G and MAT-S and increased linearly and changed quadratically for GRO-G. In conclusion, increasing TDS concentration in drinking water had effects on intake and digestion that differed among animal types, with ME intake of growing goats more adversely affected by increasing brackish water level compared with mature small ruminants because of decreased digestibility. Conversely, decreases in ME intake for MAT-S with increasing TDS primarily related to decreasing feed intake, with relatively small effects for MAT-G associated with the Mod-SLW treatment.



Yirga, H., R. Puchala, Y. Tsukahara, K. Tesfai, T. Sahlu, U.L. Mengistu, A.L. Goetsch. 2018. Effects of level of brackish water and salinity on feed intake, digestion, heat energy, ruminal fluid characteristics, and blood constituent levels in growing Boer goat wethers and mature Boer goat and Katahdin sheep wethers. *Small Ruminant Research*, 164, 70-81. DOI:10.1016/j.smallrumres.2018.05.004.

Genetics of Parasite Resistance.

The effect of Ovar-DRA and Ovar-DRB1 genotypes on faecal egg count (FEC) was determined in sheep and goats infected with *Haemonchus contortus*. One hundred and forty-three sheep from 3 different breeds (St. Croix, Katahdin and Dorper) and 150 goats from three different breeds (Spanish, Boer and Kiko) were used. Parasitological (FEC), hematological (packed cell volume) and immunological (IgA, IgG and IgM) parameters were measured. Sheep populations showed a higher FEC and humoral response than goat breeds. Genotypes were determined by high-resolution melting assays and by conventional PCR. For Ovar-DRA, sheep and goats carrying the AA genotype showed significant lower FEC than AG and GG genotypes. The additive effect was found to be 115.35 less eggs per gram of faeces for the A allele for goats. For Ovar-DRB1, only in sheep, the GC genotype was associated with low FEC. The additive effect was 316.48 less eggs per gram of faeces for the G allele, and the dominance effect was 538.70 less eggs per gram of feces. The results indicate that single nucleotide polymorphisms within Ovar-DRA and Ovar-DRB1 could be potential markers to be used in selection programmes for improving resistance to *Haemonchus contortus* infection.



Estrada-Reyes, Z. M., Y. Tsukahara, A.L. Goetsch, T.A. Gipson, T. Sahlu, R. Puchala, Z. Wang, S.P. Hart, R.G. Mateescu. 2018. Effect of ovar-DRA and ovar-DRB1 genotype in small ruminants with haemonchosis. *Parasite Immunology*, 40(6) doi:10.1111/pim.12534.

Editor's Note: 5596 mg/l is approximately ½ tea-spoon of salt in one cup (8 oz.) of water, which is the generally recommended salt water gargle for a sore throat.

Goat and Hair Sheep Field Day 2019

Holistic Approach

You can register online

<http://goats.langston.edu/goat-and-hair-sheep-field-day>



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Langston University

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