Winter 2021 – Volume 33, Issue 1

Hoof Print

The Small Ruminant Magazine

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Kentucky Sheep & Goat Development Office

University of Kentucky College of Agriculture, Food and Environment Cooperative Extension Service

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Kentucky State University Cooperative Extension Program

Hoof **Print** Magazine
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***Hoof*Print**: *The Small Ruminant Magazine* is a periodical to promote better animal health, husbandry, and knowledge among sheep and goat producers. ***Hoof*Print** is the joint effort of members of the sheep and goat industries and serves as a united voice for all small ruminant producers.

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Winter 2021 – Volume 33, Issue 1

Hoof **Print**
The Small Ruminant Magazine

ISSUE HIGHLIGHTS:

Special Features

News to Ewes

Health Management

Association News & More

Find the two Shepherd's crooks hidden inside the magazine and you could win a $50 gift card to Kalmbach.

To win you must be the first to email a screenshot of your finds to kyates@kysheepandgoat.org

PRESIDENT'S LETTER

Dear Shepherd:

You did it! You survived the strangest year in a century. You've participated in developing creative solutions to problems none of us imagined. Much of the world has gone virtual and, while we all miss the energy of meeting in-person, we've also discovered the advantages that come with not having to travel. The 2021 ASI convention is going to be online January 28-29. What a great opportunity to participate if you've never been able to go!

That old adage "cattle for the show, sheep for the dough" has never rung truer than in 2020. Overall, we've managed better than a lot of commodities. A lot of folks didn't breed, or might be sitting on wool, but demand and prices have remained steady and we're better able to retain stock than beef or poultry. As small producers, we've set an example to the big operations out West of how to sell our own products and not rely on a sole buyer. They've come to see the value in the resilience of heritage breeds and the craft market for wool. Whereas last year I heard folks say, "We don't need those small producers", they're now humble and eager to learn from us. Shepherds know there are two ways to direct a flock: leading in front or driving from behind. It is my fervent prayer that, as we enter a new year with some of the same significant challenges, you will make opportunities to lead at every level.

If you've ever faced an illness in your flock like barberpole, pinkeye, scours, or coccidia, you know the gut punch sensation of helplessness while you're waiting for treatment to affect a cure. The prayers you say in your head because you can't even form the words aloud, "Please let this be the last one. Please don't let the others catch it. Please don't let this one die." We have as much duty of care to our fellow humans as we do to our livestock.

Through the last year my family has been touched by COVID at every level. We have a brother who is an ER doctor, a friend who is a respiratory therapist, several friends and family members who are suffering long-term debilitation, and a few that have died. You know what comes next. I'm going to beg you to wear a mask because I want to see you smiling and healthy when this is over. I don't want to bury anyone else. Years ago my vocal coach would ask, "If it doesn't hurt, it doesn't cost anything, and it feels better, then why would you not do it?" I sure feel better knowing a very simple, painless act on my part may prevent other families from the ache of grief. Just as the freedom of owning sheep demands the responsibility of fencing and care taking, our freedom to go about our daily lives as we wish demands the responsibility of preventing harm to others.

We have a duty of care to our fellow humans, and to our stock. A fellow shepherd had to rescue 140 head whose owner died of COVID. He loved his flock, but they're in bad shape because he didn't have an emergency plan to keep them fed while he was in hospital or a plan for if he passed. Take the time now to make a dispersal plan on paper, a Flock Will so to speak. If you raise registered stock, is your emergency contact listed on their papers? Having a co-owner could make the difference between a $500 papered ram and a non-transferrable $100 for the same ram at a graded sale. Do you have an up to date flock book listing each animal's value, qualities, health records and sale price? Who should take charge of your animals? What do they eat and how often? Who should take care of your wool, your yarn stash, your livestock guardians, and transfer of records? If nothing else, your membership in this organization provides a network of sheep-savvy folks who are willing and able to assist if and when you need them. Make a few friends you can call at 3 in the morning, and let's all pray you never need to.

Throughout my tenure as president I've tried to buoy you up, to focus on what's going well for us. I hope I have been of service to you in some small way. As my final message, I share the following quote from Rhonda Byrne:

"Never let a day pass without looking for the good, feeling the good within you, praising, appreciating, blessing, and being grateful. Make it your life commitment, and you will stand in utter awe of what happens in your life."

It's a new day, a new year, and you get to choose what you do with it. I wish you success, health, and great satisfaction as a shepherd.

Warmly,
Madeline Rosenberg

Kentucky Sheep & Wool Producers Association

JOIN or RENEW TODAY!

Visit www.kysheepandgoat.org

KSWPA Membership Benefits

- Quarterly issues of HoofPrint Magazine plus the newly designed 2021 Sheep and Goat Management Calendar
- A unified voice for the sheep industry and representation on important state and national committees
- Assistance with new marketing opportunities such as The Kentucky Sheep and Fiber Festival and HoofTrader.com
- Receive a membership to the American Sheep Industry, our national lobbying, marketing and promotional support system.
- Support of various educational and youth activities

Name: _____ **Phone:** _____

E-Mail: _____

Address: _____ **City :** _____ **State:** _____ **Zip:** _____

Please enclose a check for $30.00 made out to KSWPA and mail to:
Kentucky Sheep and Goat Development Office
P.O. Box 4709, Frankfort, KY 40604-4709.

Breed: _____
Dairy ☐ Club Lamb ☐ Fiber ☐
Commercial ☐ Purebred ☐

Congratulations to the 2021 KSWPA Officer Slate!

KSWPA has a new Board of Directors! Congratulations to Patrick Angel! Since the early 1980s, Dr. Patrick Angel has operated a commercial sheep farm near London, Kentucky. He has raised Hampshire and Suffolk sheep and is now running a flock of Katahdin ewes on his hill land farm in Laurel County.

Patrick's grandparents immigrated from Romania where they were shepherds of the Tsurcana sheep breed in the Carpathian Mountains of Transylvania. They came to America at the turn of the last century to farm and raise sheep. Patrick, his wife Glenna and their five grown children and three grandchildren have followed the Angel family tradition of practicing conservation of the land by raising sheep and keeping honey bees.

Patrick is retired from the U.S. Department of Interior where he worked as a Soil Scientist and Forester across the eight Appalachian coal states. Prior to working with the federal government, Patrick worked for the University of Kentucky and the Kentucky Division of Reclamation. He has over 45 years of regulating the coal industry. He also has conducted extensive research on re-establishing healthy, productive forests on reclaimed surface mines.

Dr. Angel is a graduate of Hazard High School, Alice Lloyd College, and the University of Kentucky's Forestry and Wood Technology School. In 1972 and 1973, he graduated from Stephen F. Austin State University, Nacogdoches, Texas with a BS and MS in Forestry. He is also a 2008 graduate of the University of Kentucky, Lexington, Kentucky with a Ph.D. in Soil Science.

KSWPA Officer Slate for 2021- The following people were elected as officers to the board

KSWPA Officers 2020

President – *Richard Popham,* Meade County – richard@circlepkatahdin.com
Vice President – *Bill Decker,* Shelby County – bdecker@cisco.com
Secretary – *Sue Churchill,* Woodford County – thistlesend@gmail.com
Treasurer – *Dorothy Vale*, Jessamine County – valerdv@aol.com
ASI Representative – *Madeline Rosenberg,* Shelby Co. – madeline.ballyhoofarm@gmail.com

KSWPA Directors

- Patrick Angel, Laurel County – pangel9491@gmail.com
- Kathy Meyer, Bourbon County – 1tkmeyer@bellsouth.net
- Warren Adcock, Henry Co. – wadcock6307@hotmail.com
- University of Kentucky Representative: Matt Hamilton
- Harry Frederick, Monroe County – windingcreekfarmsKY@gmail.com

CALENDAR OF EVENTS

JANUARY

6-7	**Virginia Shepherd's Symposium - Online -** www.vasheepproducers.com or contact Scott Greiner at sgreiner@vt.edu.
11	**graded sale Richmond**
12	**Birth Management for Sheep & Goats (Part 1 of 4) -** Online - Commerce.cashnet.com/msu
13-14	**Dairy Sheep Association of North America's Online Symposium -** www.dsana.org
14	**graded sale Bowling Green**
16	**graded sale Springfield**
19	**graded sale West KY**
19	**Birth Management for Sheep & Goats (Part 2 of 4) -** Online - Commerce.cashnet.com/msu
20	**Basic Lambing Skills for the Beginning Shepherd -** Online - www.wisc.edu
25	**graded sale Richmond**
26	**graded sale Paris**
26	**Birth Management for Sheep & Goats (Part 3 of 4) -** Online - Commerce.cashnet.com/msu
28	**graded sale Bowling Green**
28-29	**ASI Annual Convention -** Online - www.sheepusa.org

FEBRUARY

2	**Birth Management for Sheep & Goats (Part 4 of 4) -** Online - Commerce.cashnet.com/msu
8	**graded sale Richmond**
11	**graded sale Bowling Green**
16	**graded sale West KY**
20	**graded sale Springfield**
22	**graded sale Richmond**
23	**graded sale Paris**
23-25	**2021 Novel Tall Fescue Renovation Workshop-** https://grasslandrenewal.org/
25	**graded sale Bowling Green**

MARCH

8	**graded sale Richmond**
11	**graded sale Bowling Green**
16	**graded sale West KY**
18	**KSU Third Thursday Field Day,** no registration required
20	**graded sale Springfield**
22	**graded sale Richmond**
23	**graded sale Paris**
25	**graded sale Bowling Green**
25	**2021 Novel Tall Fescue Renovation Workshop in Lexington, KY-** https://grasslandrenewal.org/

ALL DATES SUBJECT TO CHANGE

Kentucky Sheep & Wool Producers Association

KENTUCKY GOAT PRODUCERS ASSOCIATION

New Board of Directors members (pictured left to right):

- **Rochelle Boland-Heilers**
- **David Watson**
- **Vicki Watson**

2021 Board of Directors

Angie Downs, President
kygirlfarm@gmail.com, Marion County
Chris Stewart, Vice-President
cbstew06@hotmail.com, Lyon County
Beth Johnson, Secretary
Bethc.johnson@ky.gov, Boyle County
Kay DeMoss, Treasurer
kaydemoss1@windstream.net, Jessamine Co.
Rochelle Boland-Heilers,
rochbol@yahoo.com, Adair County
Dee Daniels,
dee.daniels71@gmail.com, Barren County
Christina Morris,
Blessedacreskikofarm@gmail.com, Christian County
Vicki Watson,
dvwatson@logantele.com, Logan County
David Watson,
dvwatson@logantele.com, Logan County

2020 KGPA Business Meeting Highlights

Congratulations to the following people who will serve as the 2021 KGPA Officers:

- President- Angie Downs
- VP- Chris Stewart
- Secretary- Beth Johnson
- Treasurer- Kay DeMoss

The following 3 people were elected to the board:

- Rochelle Boland-Heilers
- David Watson
- Vicki Watson

KENTUCKY GOAT PRODUCERS ASSOCIATION

JOIN or RENEW TODAY!

KGPA Membership Application

Your $30 membership includes:

- 4 issues of the *Hoof***Print** Magazine plus the newly designed 2021 Sheep and Goat Management Calendar
- A unified voice for the goat industry on the state and national level
- Representation on important committees such as the Check-Off and the Animal Care Standards boards
- Support of various educational and youth activities
- Youth Membership forms can be found at kysheepandgoat.org/KGPA.html
- **And much, much more!**

Name: _____

Address: _____ City: _____

State: _____ Zip: _____ **Breed:** _____

Club Lamb ☐ Fiber ☐ Dairy ☐

Phone: _____ **Commercial ☐ Purebred ☐**

E-Mail: _____

Please enclose a check for $30 made out to KGPA and mail to:

Kentucky Sheep and Goat Development Office
P.O. Box 4709, Frankfort, KY 40604-4709.

Mail form or Visit www.kysheepandgoat.org to join today!

Letter from the President

Hello Fellow Goat Producers,

As we begin a new year, the KGPA begins with new officers. Let me first introduce myself, I am Angie Downs from Marion County. I have been a goat producer for almost 15 years. My family and I raise and show goats for our county 4-H program.

This past year has been trying and has taken a toll on all of us, but there were some shining moments. NAILE 2020 went off without a hitch. Exhibitors from 38 states gathered in Louisville despite all the COVID restrictions and continued to prove that even with a pandemic, nothing will stop a showman.

Sales markets have continued to stay open and market prices have maintained, allowing producers to continue business as usual. And the restrictions did not stop us from hosting our Annual Producers Conference. Even though we could not meet in person, we spent the day together virtually, either by Zoom or Facebook. If anyone would like to watch the conference, it is available on our website under the Annual Producers Conference link.

I am excited to put 2020 behind us and begin to focus on the future! The board and I are ready to push forward and start representing the producers. We welcome all ideas, comments, and feedback from anyone, especially our members. We are hoping to be able to spend more time out in the state among fellow producers learning and getting to know each other in 2021.

If there is anything that you would like to see, hear or just want to get to know us better please do not hesitate to contact one of us! We are here to represent you the producers.

Cheers to a new and bright 2021!!!

Angie Downs
President, KGPA

CALENDAR OF EVENTS

JANUARY

11	**graded sale Richmond**
14	**graded sale Bowling Green**
14	**Jessamine County Goat Producers, 6:30pm,** Ag Learning Center Jessamine Co. Fairgrounds
16	**graded sale Springfield**
19	**Goats of Barren County, 6:30pm (CT),** Barren County Extension Office
19	**graded sale West KY**
25	**graded sale Richmond**
26	**graded sale Paris**
28	**graded sale Bowling Green**

FEBRUARY

8	**graded sale Richmond**
9	**Jessamine County Goat Producers, 6:30pm,** Ag Learning Center Jessamine Co. Fairgrounds
11	**graded sale Bowling Green**
16	**graded sale West KY**
16	**Barren County Sheep and Goat, 6:30pm,** Barren County Extension Office
20	**graded sale Springfield**
22	**graded sale Richmond**
23	**graded sale Paris**
23-25	**2021 Novel Tall Fescue Renovation Workshop-** https://grasslandrenewal.org/
25	**graded sale Bowling Green**

MARCH

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16	**Barren County Sheep and Goat, 6:30pm,** Barren County Extension Office
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20	**graded sale Springfield**
22	**graded sale Richmond**
23	**graded sale Paris**
25	**graded sale Bowling Green**
25	**2021 Novel Tall Fescue Renovation Workshop in Lexington, KY-** https://grasslandrenewal.org/

All dates are subject to change due to Covid-19.

KENTUCKY GOAT PRODUCERS ASSOCIATION

Letter from the President

Greetings from Tennessee.

Hope everyone made the most of 2020 and let's all hope and plan for some form of normalcy soon. Meanwhile, we just had our first ever virtual meeting and conference. From what I can tell it was a huge success. I want to thank the Board members who spent a lot of time working out the details and pushing through instead of taking the easy route and skipping a year. We held it over two nights and being virtual it allowed us to pull speakers from farther away than normal.

The first night we had Jeremiah Durbin, Soil Health Specialist with Tennessee Association Conservation District, give us some great information on taking and reading soil tests and how it relates to soil health and in turn benefits in our forages. Followed up by Dr Renata Nave Oakes, Assistant Manager wth University of Tennessee Forage Systems and Management, went through the most common cool and warm season forages in use in Tennessee and their value in a forage system for sheep. Clay Elliott with Purina gave a presentation on minerals used by sheep and an overview of the sheep products offered by Purina. We finished the evening with Tennessee Extension Agent Calvin Bryant. Calvin shows several different ways and software options to use in ration balancing that we can all download and use for free.

Our second and last night topped it all. We had an outstanding presentation by Susan Schoenian the Sheep & Goat Specialist from University of Maryland. Susan is one of the best when it comes to the details on parasites and parasite management in small ruminants. Also discussed were the new trends in dewormer protocols and the newly developed Bioworma. Following Susan, we had Dr Dahlia O'Brien the Small Ruminant Specialists from Virginia State University. Dr O'Brien shared with us how to do our own fecal egg counts. The final segment of our event was 3 of our local producers, Ben Neal, Bonnie Holman & Herman Radke on a panel to discuss their operations and what marketing approaches work best for them to maximize and grow their operations. Each producer had their unique situation and shared their secrets to success so that we could gain some knowledge from their experience.

Between sessions on our second night, we held our annual membership meeting. Not a lot to discuss with Covid cancelling most events during the year. We had an update from the regional ASI Rep Jimmy Parker who has been a great asset to the region and keeping us informed of the value of ASI membership. Every year we recognize two outstanding individuals and give them a plaque for their service. The Service award can go to anyone in the ag industry who has gone above and beyond to help the sheep industry in Tennessee. This year's award went to Jerry Lamb. The Ben Powell Shepherd's award has to be a member of TSPA and not a Director. This year the Ben Powell Shepherd's award went to Steve Officer. At the conclusion of our meeting Directors were elected for the coming year. This year Robert Walker, Dwight Loveday and Scott Keeler.

2021 Officers remain the same, Robert Walker, President, Debbie Joines, Vice President and Mark Powell, Sec/Tres.

Some statistics for our event, we had 96 people register, 12 States and 4 different Countries! 41 or the 96 counties in Tennessee was represented. 5,500 sheep were represented and 29 different breeds. Katahdins led the way with 39%

sheep producers association
www.tennesseesheep.org

2021 TSPA Board of Directors

President/ ASI Rep. – *Robert Walker,* Alpine, TN
robert.walker@westforkfarms.com
Vice President – *Deborah Joines,* Mt. Juliet, TN
djoines@utk.edu
Secretary/ Treasurer – *Mark R. Powell,* Watertown,TN
shepherdboy1@yahoo.com

2021 TSPA Board Members

- Thomas Greenlee, *Rutledge, TN* – jgreenl4@utk.edu
- Mark Shedden, *Knoxville, TN* – rmnps@bellsouth.net
- Dwight Loveday, *Louisville, TN* – hloveday@tennessee.edu
- Kevin Durett,*Cottontown, TN* – kevin.durrett@ymail.com
- Dennis Fennewald, *TN Tech*– dfennewald@tntech.edu
- Dee Wolters. *Culleoka, TN* – twolters@bellsouthnet
- Brandon Tavalin, *College Grove, TN* – tavalintails@gmail.com

followed by 39% traditional wool breeds and 19% Dorper and 18% other. It is fair to say with the great success of the event we will include live & virtual activities in the future.

If you have been approved for Tennessee Ag Enhancement cost sharing this year be sure to stay focused on the deadlines.

We are so fortunate to have the TAEP program in place for our producers. I catch flack from producers all over the country when I brag about my new equipment every year. Take advantage and max out if at all possible. This is a great program to increase your management tools, from hay barns, working systems, breeding stock, hay equipment, etc.

Hopefully 2021 we will be doing normal stuff again. Stay up to date with us on Facebook and our website. Stay warm and be safe.

Good luck and hope everyone has a successful lambing season.

Robert Walker
President, Tennessee Sheep Producers

TAEP program Dates & Deadlines

Event	Deadline
2020 Application Period	October 1-7, 2020
Request to Decline Funding - Livestock Equipment	March 1, 2021
Reimbursement Request - Livestock Equipment	April 1, 2021
Request to Decline Funding - Genetics	May 1, 2021
Reimbursement Request - Genetics	June 1, 2021
Request to Decline Funding - Dairy Solutions, Hay Storage, Herd Health, Row Crop Solutions, Livestock Solutions, Working Facility Structures, Poultry Grower, Producer Diversification	July 1, 2021
Reimbursement Request - Dairy Solutions, Hay Storage, Herd Health, Row Crop Solutions, Livestock Solutions, Working Facility Structures, Poultry Grower, Producer Diversification	August 1, 2021

Membership Application

TENNESSEE
sheep producers association
www.tennesseesheep.org

ANNUAL DUES: Adult: $30.00 Junior $10.00

If you are interested in a committee please select below:

_____ Wool
_____ Jr. Expo
_____ Production Education
_____ Publicity
_____ Youth
_____ Sale
_____ Membership/Revenue
_____ Annual Meeting

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

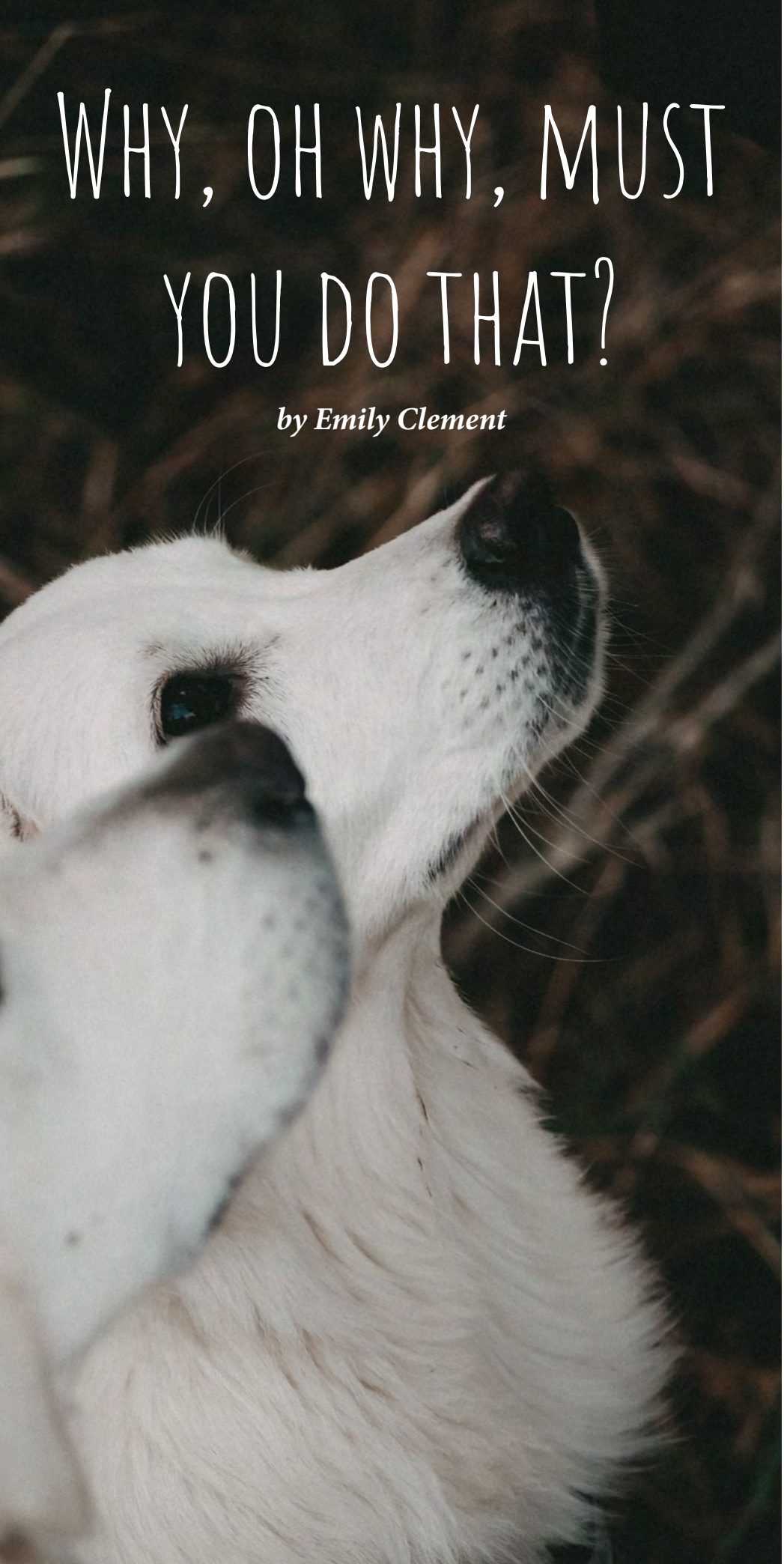
Phone: _____ E-Mail: _____

Breed(s) of Sheep: _____

Please enclose a check for amount made out to TSPA and mail to:
Tennessee Sheep Producer's Association
4233 Poplar Hill Road, Watertown, TN 37184

JOIN ONLINE TODAY!

Pay dues and join online at
www.tennesseesheep.org/joinonline.htm



Why, oh why, must you do that?

by Emily Clement

Good livestock guardian dogs (LGDs) are indispensable herd management resources for our sheep and goats. Their usefulness in that regard is never in question. The questions that perplex many LGD owners have to do with their bullheaded, odd, destructive, frustrating (bordering on infuriating) and sometimes really funny behavior that is different from any other breed of dog they have ever worked with. I wanted to help bridge the understanding gap, so I invited a panel of LGDs to a (somewhat lively and colorful) conversation to get some answers for us.

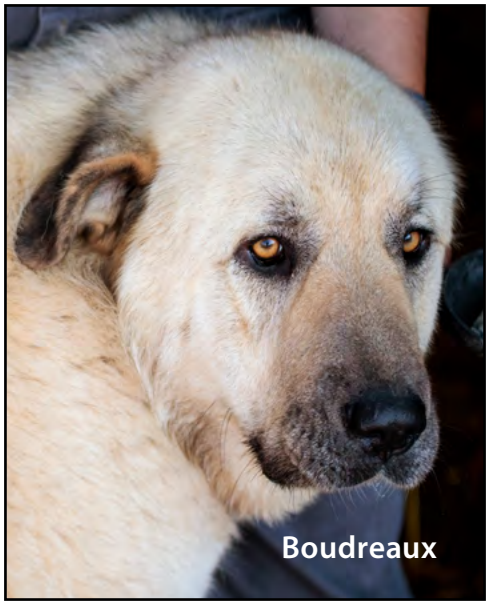
The following is a transcript of a fictional panel discussion with seven livestock guardian dogs. Boudreaux, Chief, Eddie, Moose, and Hebert (pronounced: Aay-bear) are full-time working dogs. Clyde is retired after 14 years of service with goats, sheep, and chickens. Lastly, our only gentlelady on the panel, Weasie" is primarily a household companion on a hobby farm in the city. She has livestock as pets, because she is spoiled. Let's get started, shall we?

Emily: Thank you all for being here today. I appreciate your willingness to come inside on this blustery day. I realize you would much prefer to be out in the elements. Your dedication to opening the dialogue between LGDs and their humans is noble. My hope is that this conversation will help us, the two-leggers who feed you, gain a better understanding of your behaviors that we do not understand— like the ones that nearly drive us crazy. I do not want to come off as accusatory or labeling your behaviors as "bad." I simply want to hear from you so we can gain insight into your motivations and possibly improve our relationships with our own guardian dogs.

Before we begin, a few housekeeping announcements and requests:

Please refrain from using your outside voices (that can peel the paint off


Eddie


Boudreaux


Clyde

the walls) and limit alert barking to if I give you an indication there is an actual problem.

I ask that we be respectful of each other, and allow only one panelist to speak at a time.

Lastly: Please do not knock the snack or water bowls over.

Again, thank you for being here. First question:

What is your response to humans saying that you are hard to train, bull-headed, and defiant?

Silence… All eyes look away, focused either to the side of my head, the ground, or at another dog. Like they didn't hear the question.

Emily: Okay. Moving on.

Emily: Why do you bark incessantly, especially at night?

General grumbling, one face palm, and some eye rolls.

Eddie: Such a common question. Because we work at night, ma'am. For hundreds of years, my people have kept livestock safe, at night, when their humans are sleeping. Like Santa Claus, predators know when you are sleeping, and they know when you are awake. We work when you are getting your beauty rest.

Boudreaux: Yes, I agree with Eddie. Think about it like this: If the barking is enough to bother and want us away from you, it has the same effect on predators. We use the tools we have to ward off any seen, unseen, or perceived (imagined) threat. We are well equipped to keep our charges safe using only these gifts.

Clyde: You should be grateful.

Emily: Anybody else have anything to add to this before moving on to the next question?

Moose: Did you ever think that there might be something out there or thinking about being out there? Come look before your start your "shhhush-ing." Then, you can thank me for either doing my job, or assure me, kindly, there is nothing to worry about. Sheesh!

Hebert: Sometimes, we are out working solo in a field, and need to sound like a lot more than one dog. It only makes sense. You stick us out alone to protect a whole herd against a pack of who knows what. I mean, what self-respecting dog wouldn't do that?

Emily: Okay, thank you for the insight. I will consider these things as I put my earplugs in at night. Next question:

Emily: Why won't you come inside?

Hebert: Why should I come inside? What is there to do in there that I need?

Eddie: It is really hot and stuffy in there.

Boudreaux: Outside I have everything I need. Inside I have to ask your permission for everything and share space and stuff with all your other little critters.

Chief: You don't need me inside. I have work to do outside.

Weasie: I do. I love being inside with my person. Sometimes, when I am really chatty, I have to stay outside. *All other dogs roll their eyes.*

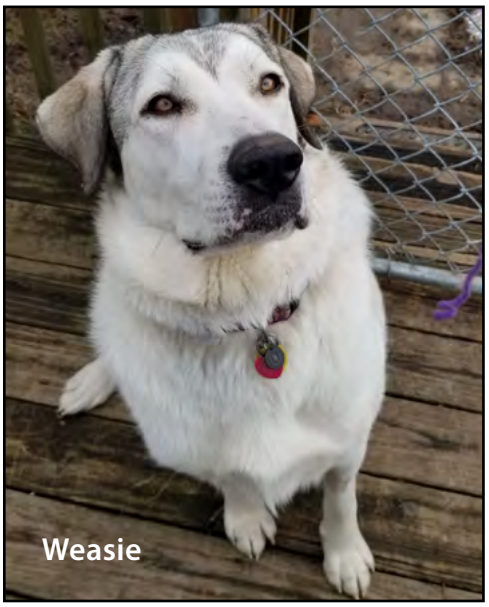
Emily: Why must you dig holes the size of China in the field, the flowerbed, the yard, and even in the house?

Chief: I will take this one. Ma'am, they are called bunkers, which even the military uses to protect people and supplies. We use them to dip down, be level with the ground and keep watch over our territory.

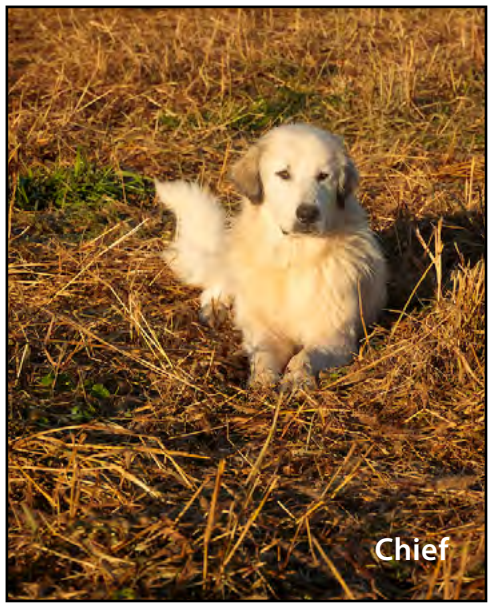
Moose: Hey guys… did you ever notice how cool and soft the ground is when you first excavate? But, I mean, yeah, we build them for safety! Safety, for sure.

Weasie: Sometimes, I just get overcome with this urge to just dig, dig, dig, dig, dig; and before you know it, I have my own cubby and lookout, all in one. Same for in the house, before I know it… oops, there is a hole (or three) in the couch.

Clyde: It is more comfortable for my old bones. No, I don't want a bed. A waste of hard-earned money, in my opinion.


Weasie


Hebert


Chief

Emily: What about leash walking makes you think it is okay to just lay down, like a 120 lb. sack of potatoes?

Eddie: Not to state the obvious, but… we are not pets. If we wanted to be leash walked, we would lose our LGD card.

Nods all the way around.

Emily: Why can't I train you with the same tactics I used to train my non-LGD dogs?

Crickets and all eye contact avoided. Emily repeats the question.

Boudreaux: Honestly, ma'am, we wonder the same about you. Some days, we just throw our paws up, confused as to what you don't understand about our need for reliability and consistency in your feeding, watering, fence checking. I can only do so much to keep the herd safe and calm, but when you are willy nilly with your times, anxiety happens. We just don't understand.

Emily: Why do you like to wear Eau de Skunk?

*Boudreaux***:** It is the warrior scent of our people. Catching a whiff of that on a dog lets you know they are strong and brave. They will not bow down, not even to the fiercest of striped animals.

Chief: I don't know that I necessarily *like* to wear it, but it is fun chasing the little buggers and making them so mad they start stinking. Then, before you know it, you stink too.

Clyde: It smells like pine trees— you know, nature, where we like to be.

Weasie: Huh? I don't even know what you are talking about. Sometimes, when my blankets are fresh out of the dryer, they need to be taken outside and freshened up a little. I don't know anything about Eau du Skunk.

Emily: Why does it seem that you are hearing impaired when I call for you, yet you can seemingly hear and go on an alert barking frenzy when a flea passes gas?

Chief: I think about what you could possibly want, and if it is of any interest to me. If it is, I will look your way and maybe come. If I think you are just calling for no reason, I will ignore you. I am not your trick pony.

Emily: Why must you dump your food bowl?

Boudreaux: *Looking around at others like they are crazy.* I don't do that. Why would I do that?

Eddie: My whiskers are sensitive; smooshing them in the bowl to rummage around for food is an overload of information for my brain. I choose to free my food from the confines of the bowl. It makes a more enjoyable meal.

Hebert: I like finding it later, when I want to eat. It is like my own game I can play with myself.

Clyde: I like to save some for later, kind of hide it. Just because it is a convenient time for you to give me food, does not mean I am hungry.

Chief: I don't like the way my collar bangs against the bowl. It is like trying to eat your meal with cymbals crashing in your ears. I dump the food; the problem is solved.

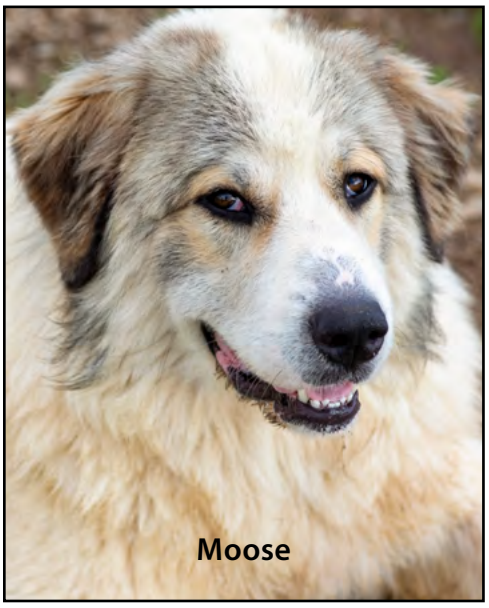
Emily: Anybody else have anything to add?

Weasie: Yes. I agree with Herbert. My two-legger sometimes puts my food in a toy so I have to work for it. He is right; finding food is fun!

Emily: Why do you wander further than you know you are allowed to go?

Crickets. Chief starts cleaning himself; Boudreaux gets up and stretches. No eye contact. Emily repeats the question.

Clyde: As the senior panelist, I will take this question to try and help you understand. You and I do not live by the same concept of boundaries. I set my boundaries based on predator threats. Okay, and maybe a girl in heat, on occasion. Your boundaries are based on things you see on a map. My people don't acknowledge the map.



Moose

Hebert: You mean outside the fences? Why do I go outside of the fences? Please, let me explain. If your fences were effective at keeping predators away, you wouldn't need me. You obviously need me. I am just doing my job. Why would I wait for the threat to come all the way to the fence before I act? Our people pride themselves on being prepared and proactive.

Weasie: I have to say I can't relate. I stay in my fenced yard. The only time I leave my yard is on a leash. I very rarely indulge my human with such willingness to take a stroll beside her like I am some Pomeranian.

Boudreaux: Ma'am, it is based on instinct and need. We are hired because of our instinct and independence. We are hard workers.

Chief: The guy the next road over leaves bowls of food out. Sometimes there are even cats there eating and you can chase and play with them. I take friends with me, occasionally. It is fun.

Emily: Why don't you play with dog toys?

Chuckles, giggles, a yip or two.

Weasie: I do. I love to chew on them and sling them around. I like to collect them in my bunker. Don't be confused; I am not going to retrieve a ball for you. My people don't do that.

Clyde: I will chew on a bone any day. Do you have any?

Eddie: I prefer things that used to be alive. This is how our people pay homage to the deceased.

Moose: We are resourceful; we make our own toys. The ones people have just don't smell right. We not only get to chase and play with the live critter, but we also keep playing with it even when we have tired it out and it doesn't play back anymore.

Emily: And finally… gosh darn it, why don't you want to snuggle?

Eddie: These are just my thoughts on the matter, ma'am: When you pin me down, what you call "snuggling," I cannot do my job effectively. I appreciate and enjoy your company, but I am happy to either sit ON you, sit BY you, or lean ON you. No wrestling holds allowed. I love it when you rub on me. More of that, less squeezing.

Moose: I will snuggle with you all day long! Well, except when something catches my attention. I guess what I am saying is, I like you, you can pet me, but I am out if duty calls.

Boudreaux: Belly rubs? Can you just be happy with rubbing my belly? I will let you rub all over my ears too, if you need to. I agree, though: no hugging and pinning down. That is asking for a wrestling match. I wouldn't want to hurt you.

Emily: I want to thank each of you for your willingness to share your insight with us two-leggers, to allow us to better understand just what exactly it is that is going through your mind. I know each of you are skilled and appreciated. You will find doggy bags with your scent on them, by the door. They have treats (that you probably won't eat) and a leash that you will probably refuse to use. Thank you for your time. Safe travels.

Emily Clement, MPA, LVT *is a licensed Veterinary Technician that has worked in the animal industry since 1994. Her experience spans from private veterinary practices, laboratories, shelters, to teaching veterinary technology. Emily holds a Bachelor of Science in Agriculture from Murray State University and a Master's of Science in Public Administration from South University. She lives in Louisville, Kentucky where she shares her hobby farm/ garden and home with goats, bees, chickens, an elderly potbellied-pig, and senior companion dogs. She currently works for Kentucky State University (KSU) with Dr. Ken Andries as a Small Ruminant Extension Associate and his Research Co-Investigator. The KSU Harold R. Benson Research and Demonstration farm houses the 200+ head meat goat herd that is utilized for gastrointestinal parasite research as well as grazing studies and extension demonstrations. Emily believes in the potential of education and enjoys empowering small farmers with the knowledge and resources needed to produce the highest quality and cost efficient product possible. She leads the Kentucky Small Ruminant Herd Assessment Program (KY-GHAP) which assesses the production goals of individual producers and their current situation to find resources and make written recommendations for better productivity and improved herd health. Her truth is: "if you take care of the animal, it will take care of you" regarding all animals; especially relating to production livestock. She can be reached at Emily.Clement@KYSU.edu.*

WAIKATO
MILKING SYSTEMS

by Lawrence Gullery

The number of goats being raised for milk production around the world continues to increase.

Data from the US Department of Agriculture's Census of Agriculture, shows dairy goat herds expanded faster than any other major livestock group from 2007-2017, in the US. The Asian-Australian Journal of Animal Science also reports new dairy goat industries are developing in countries which did not have a long goat milk tradition, such as China, the United States, and New Zealand. Rising consumer demand, strong prices and climate change are among the reasons more farmers are exploring dairy goat production.

New Zealand dairy technology company Waikato Milking Systems is turning its focus to the dairy goat and dairy sheep industries, to help farmers looking to upscale in the small ruminants market. In 2020, the company commissioned 14 dairy goat rotary milking parlors in China and in New Zealand it completed two goat rotary parlor installations and one parallel milking system. In the US, the company commissioned a 60-bail goat rotary for the Laughing Goat Dairy in Wisconsin, a project completed in April.

The milking plant includes the Waikato Milking Systems, NaviGate Dairy Management, which can collect milking data and generate reports on each animal to help the farmer make better decisions.

The Laughing Goat Dairy plant has the capacity to milk more than 600 goats per hour with just one person.

The plant is not the first in North America for Waikato Milking Systems. In 2017, it commissioned a 100-bail rotary for Richard and Wilhem Vendrig's Wilma Farms, in Ontario, Canada.

Waikato Milking Systems Small Ruminants Specialist Andy Geissmann, who has been involved in dairy goat projects in New Zealand, China and the US, said consumer demand was driving interest in the market. "We are seeing customers expand their taste pallet and there's more interest in goat cheese and goat milk being sold than before. This is a global trend. Most goat milk products are being processed into a blend for infant formula as well as niche markets for dairy products like skim milk and cheese. There are also some areas of the market where goat milk is being used for pharmaceutical products like health supplements."

Andy said there are several different dairy goat milk processors in the US and some farms are processing their own milk as well. "We know that customers are interested in the nutritional benefits of goat milk and

they are demanding to know more about how their dairy products are made. So that public awareness and the lower environmental footprint of dairy goat farming is providing an attractive preposition for farmers to enter or expand in the market."

Andy has worked in the international dairy industry for more than 20 years, initially in the bovine sector and has also been involved with small ruminant milking for the past 17 years. He now heads Waikato Milking Systems' efforts in the emerging dairy goat market. "Goats are very inquisitive animals and they are always on the go, they like to be up high to see what's going on. They are quite different animals from cows or sheep, so it's important to understand that when designing a milking parlor."

Andy led development of the Optima External Goat Rotary, which was designed for medium-to-high input farming. Key features include rubber matting on the deck, to make milking time more comfortable for the animals and to reduce noise and stress for the goats, so they feel at home in the milking parlour.

The rotary's unique cluster presentation arm ensures the cups and controls are at the optimal height so it's easy, fast and comfortable to use for the operator. The automatic headlocks ensure each animal remains in their own bails, reducing their ability to sample the other animals' feed, the headlock automatically releases at the end of the goat's turn on the rotary.

"We know goats like to investigate, and the main way they do that is with their mouths. The Optima rotary is fitted with stainless steel feed bins so the goats can't chew and cause damage, like they might do with plastic bins."

Stainless steel material features highly on the Optima, which ensures the plant's longevity, reduced wear and tear, lower maintenance costs and also makes it easy to clean even when exposed to effluent.

Andy said for those entering the dairy goat market, converting an existing bovine Herringbone or inline parlour, to a rapid exit goat milking system, can be a cost-effective option. Rapid exit systems are used widely around the world and known for their simple design and ability to maximise animal flow.

Waikato Milking Systems has converted a number of old cow parlors, into Agili Goat Rapid Exit systems. Unique features of the Agili include a self-indexing gate system for faster loading into the milking system. Its rapid exit gate can be released in sections, for best animal flow at the end of milking.

The rapid exit system can be equipped with either basic pulsation or with the Waikato Milking Systems, Milking Control Unit with integrated pulsator and a fully adjustable cup remover. Electronic Milk Meters and Dairy Herd Management will be future automation additions.

Andy has some advice for those thinking of entering the dairy goat market or those looking to upscale their current operation. "If you are new to dairy goat milking, make sure you gather an understanding of what the difference is between cows and goats, in terms of farm management practices. Get some advice on who the processors are in your area and what the options are for your farm's business plan. Think about what type of milking parlor might best fit your new venture and then come and have a talk to us in regards to the options. Our plants are manufactured in New Zealand but distributed to all of the major dairying countries of the world, designed for the specific needs of each farm."

Lawrence Gullery

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Growing the value of dairy

Clover Makes Fescue Better for Goats

by Michael Flythe

Goats give us a lot of flexibility in terms of forage that can be utilized. They can thrive on the most carefully established summer annuals and also do a good job with the honeysuckle in the fence row. However, most herds rely partly or entirely on grass. In Kentucky, our predominant cool season grass is tall fescue. Unless you renovate your pastures to establish other grasses, they will ordinarily have fescue, which has some advantages. Tall fescue is resilient and recovers from over grazing. It begins growing early in the spring and stays green through this time of year, which makes it popular for winter stockpiling. However, there is a problem with fescue. The common variety has a fungal endophyte, a symbiotic fungus that lives inside the tissues of the plant. The endophyte makes the grass hearty and resistant to pests, but it also produces a toxin that can harm the animals that graze on the common variety of tall fescue. The resulting condition is called fescue toxicosis.

Fescue toxicosis is a major subject of study at the Forage-Animal Production Research Unit (FAPRU; https://www.ars.usda.gov/midwest-area/lexington-ky/fapru/). FAPRU is a USDA-Agricultural Research Service laboratory at the University of Kentucky, College of Agriculture, Food & the Environment. Our interdisciplinary team of researchers works with research faculty and cooperative extension at UK to understand the basic biology of forages and the animals that rely on forages. We then use that basic knowledge to develop solutions for forage-animal producers. We have learned the major aspects of how fescue toxicosis works. We have also learned that goats and sheep are indeed susceptible, just like cattle and horses. Our team has also developed some management strategies to help with fescue toxicosis.

The main toxin in tall fescue is ergovaline. It is in the alkaloid family of plant compounds. Many plants make alkaloids and most of them are harmless, for example, flavors in kitchen spices. On the other hand, some are acutely toxic, like alkaloids in the poisonous yew plant. Ergovaline, at natural levels, will not cause acute toxicity from a single exposure, like yew. Instead, it is toxic over prolonged exposure as it accumulates in the animal. When the animal consumes toxic tall fescue, ergovaline builds up in the animal and causes a number of problems. The major problem is vasoconstriction, a decrease in the size of diameter of blood vessels. Blood flow decreases in the constricted vessels. In warm weather, the animals have difficulty dissipating heat and can become heat stressed. In the cold, the lack of blood flow to the extremities can lead to frostbite and gangrene in tail switches, ear tips and hooves (called fescue foot). Additionally, vasoconstriction of blood vessels in the gut causes animals to absorb fewer nutrients from the diet. FAPRU scientist, Dr. Jimmy Klotz, with researchers at Clemson University, recently showed that fescue toxicosis in pregnant ewes led to constriction of the umbilical blood vessels and lower lamb birth weights. Even marginal problems with toxic tall fescue can impact your animals, contributing to what has sometimes been called the "summer slump" in production.

There are a number of management strategies to deal with fescue toxicosis. Alternative forages can be maintained for pregnant ewes and does or animals in summer slump. Annual forages like sorghum-sudangrass, as explored at Kentucky State University, are a possibility (https://core.ac.uk/download/pdf/232573341.pdf). Warm season perennials, like bermudagrass, can also be established in our area. Alternative cool season grasses include orchardgrass, Kentucky bluegrass and novel endophyte fescue varieties. Novel endophyte fescue varieties have had the toxic endophyte replaced with one that makes little or no ergovaline. UK Forage Extension conducts extensive trials to show us which novel endophyte tall fescue varieties do well in our region (http://www2.ca.uky.edu/agcomm/pubs/PR/PR784/PR784.pdf).

Another solution worth considering is clover. It has long been observed that animals perform better on tall fescue when there is also clover in the pasture. The improvement has been attributed to "dilution", in other words, giving the animals something to select other than fescue so that they get less ergovaline. Research at FAPRU has shown that clover actually reverses vasoconstriction. Clovers and other legumes make a family of plant compounds called isoflavones that act as vasodilators; they open up blood vessels and increase blood flow. We showed the effect of isoflavones in an experiment with Spanish goat wethers. Carotid and forelimb arteries were monitored with an ultrasound to measure the diameter of the blood vessels. When the goats were given toxic fescue, the arteries constricted to as little as half their natural diameter. Red clover isoflavones restored the arteries to their natural diameter in less than 48 hours. Beyond the scientific measurements that we made, I was impressed by the appearance and behavior of the goats. When they went into fescue toxicosis, the goats became lethargic. They went off feed and became less responsive, less curious. I was amazed at how they bounced back on red clover isoflavones, even though they were still getting fescue alkaloids. They were back on feed, moving around and interested in interacting with people and other goats.

In further experiments, we determined that both red and white clover reversed vasodilation. There is not currently an isoflavone supplement on the market that is cost effective. However, the benefits can be achieved by feeding clover hay or grazing red or white clover. Red clover has about 5 times the isoflavone concentration of white clover, but it does not take much to work. FAPRU scientist, Dr. Brittany Harlow, was able to reverse vasoconstriction in steers with only 1 ounce of dry, ground red clover. In practical terms, as long as your goats are getting some clover every day, then their blood flow will be improved. Because such low levels of isoflavones are effective, it makes sense to focus on the agronomic concerns of clover. You want to have enough clover in the pasture so that it will not be grazed out before they rotate to a new

pasture. Goats can be very selective grazers. If there is less than a 20% stand, then it might all be gone before you are ready to move them.

Another point to consider is that white clovers are perennial while red clovers need reestablishment every few years. The simplest way to establish clover in grass pastures is frost planting, broadcasting late in the winter when freeze/thaw will ensure good contact between the seed and the ground. Clovers are well known for their ability to fix nitrogen, but they do require medium to high levels of K and P and a soil pH of 6.1 to 6.7. Please see UK Forage Extension for more tips on establishing and managing clover: http://www2.ca.uky.edu/agcomm/pubs/agr/agr33/agr33.pdf

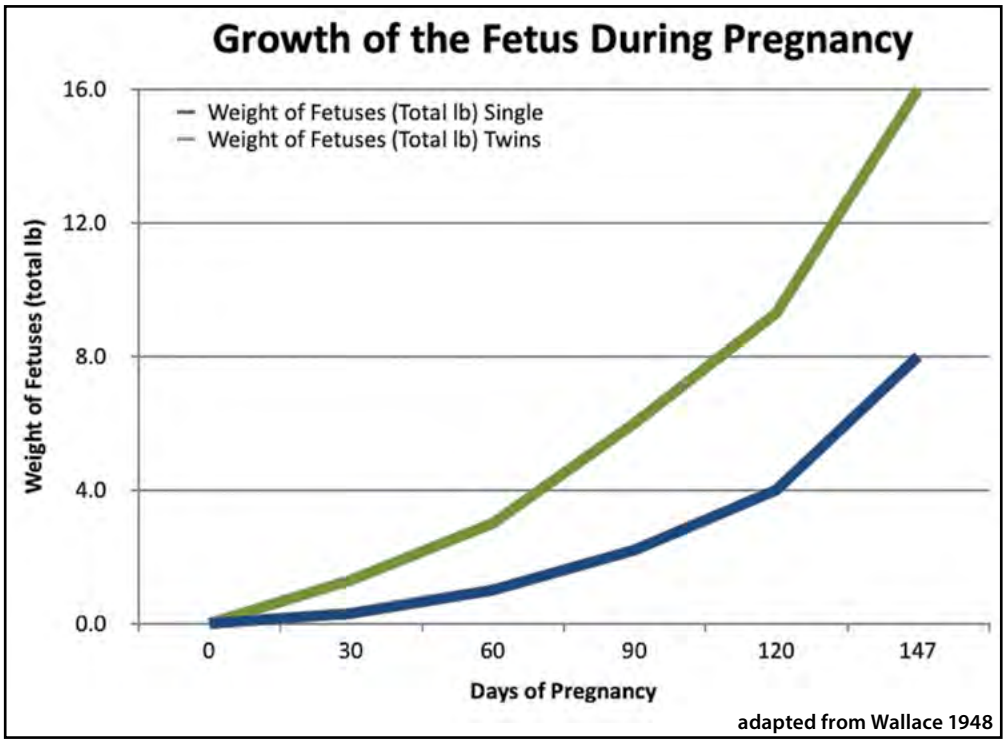
Clovers are not a magic bullet and there are some drawbacks. If a pasture has more clover than grass, then bloat is a possibility. Keep an eye out for bloat and be prepared to move the animals or put out supplements that treat bloat. The same isoflavones that reverse fescue toxicosis are also estrogenic. Sheep are particularly sensitive to estrogens. At this point we cannot recommend a safe level for developing ewes. Goats and cattle are less reproductively sensitive to estrogens than sheep. This is an area of research we are still working on, but it is still recommended to pull does and cows off of clover a month before breeding. In spite of these challenges, clover is a high-protein, highly-digestible forage that fixes its own nitrogen. The newly understood benefits of isoflavones makes clover a potentially useful tool for goat producers in Kentucky.

Dr. Michael Flythe *is the Research Leader of the Forage-Animal Production Research Unit, which is a USDA-Agricultural Research Service laboratory at the University of Kentucky. Michael is a graduate of Bridgewater College, located in Virginia's Shenandoah Valley, and his Ph.D. is from Cornell University. Michael and his family live and raise goats and laying hens in Jessamine County, Kentucky. michael.flythe@usda.gov.*

NEWS TO EWES

Is it Ketosis or Milk Fever?

by Dr. Donald G. Ely,
University of Kentucky



There are no more anticipated and exciting times in the life of a shepherd, even for a seasoned veteran, than an upcoming lambing season. Likewise, it is a much anticipated time for ewes, even for multi-parious ewes. On the other hand, the last 2 weeks of pregnancy, lambing, and subsequent lactation can be stressful times for both shepherds and ewes. How discouraging can it be when the best ewe in the flock, that is carrying twins, dies from ketosis or milk fever? The loss of three head at the same time is indeed a traumatic episode. Furthermore, did the ewe die from ketosis or milk fever? Not sure? And, why did the ewe contract ketosis or milk fever? This paper describes the causes of ketosis (pregnancy disease, pregnancy toxemia, lambing sickness, or twin lamb disease) and milk fever (hypocalcemia), as well as how to prevent them, identify symptoms, and treat them.

KETOSIS VS. MILK FEVER

Ketosis and milk fever are the two most common metabolic disorders (diseases) that affect ewes in late pregnancy and early lactation. Ketosis is the more common and can cause a high loss of ewes and lambs. These disorders initially appear similar: They can be triggered by similar factors and can occur together. Therefore, it is essential that early symptoms be identified correctly for treatment to be effective. If left untreated or not treated early enough, both can be fatal. So, prevention is far better than treatment.

CAUSES

Both are metabolic disorders (diseases) caused by inadequate nutrition. Ketosis is caused by an imbalance between energy supply and demand. It usually occurs in ewes that are 3 years or older as they approach lambing. The toxicity of ketosis is a result of insufficient carbohydrate (energy) metabolism in the last 4 to 6 weeks of pregnancy. Pregnant ewes that are too fat or too thin, carrying twins or triplets, and are fed diets deficient in energy or those containing low quality hay are the ones that usually develop ketosis. These are the ewes that are usually kept in a barn or lot during the last 4 to 6 weeks of pregnancy and, thus, have limited daily exercise. In contrast, ewes that have access to pasture and exercise in the same stage of pregnancy seldom encounter this disorder. However, they still must be supplemented with correct amounts of high energy concentrates (grains) to prevent ketosis. Do not depend on pasture forage alone to prevent this metabolic problem.

Typically, two-thirds to three-fourths of total fetal growth occurs during the last 4 to 6 weeks of pregnancy (**Figure 1**). Nutrient imbalance (primarily energy) and/or nutrient restriction (primarily energy) during this time are the instigators of ketosis. At the same time, nutrient imbalance/restriction can be the cause of light weight lambs at birth, unequal birth weights of twins and triplets, increased prenatal lamb losses, reduced mothering instincts, and subsequent lowered milk production. It is well established that ewes carrying a single fetus in late gestation (last 4 to 6 weeks) require 50% more daily energy intake than they required in early gestation (first 15 to 17 weeks). Ewes carrying twins require 75% more because of the dramatic increase in fetal growth (**Figure 1**). So, if nutrient imbalances/restrictions exist, dietary provisions can't keep up with the daily metabolic needs (requirements) of the pregnant ewes. This development may reduce the ewes' blood glucose levels, which prevent the liver from converting body fat stores to usable energy. When this occurs, ketone bodies (acetone, acetoacetic acid, and β-hydroxybutyric acid), which are normally metabolized to energy, accumulate in the blood. High levels of these ketone bodies are toxic. The adrenal glands and kidneys then respond by increasing cortisol production and reducing renal blood flow. Tissue changes in the brain, kidney, and liver are responsible for eventual death of toxic ewes.

The classic cause of the metabolic disruption of energy metabolism in the bodies of ketotic ewes is consumption of a low-quality diet of mature grass hay. Ewes that are overfat (body condition score 4+) or too thin (body condition score less than 2.0) may not consume adequate amounts of the hay because of its low palatability. Also, overfat ewes may not be able to consume enough of any roughage to meet their nutrient requirements because their uterus takes up more and more room in the body cavity as 2 or 3 fetuses grow during late gestation (**Figure 1**). Both of these scenarios prevent pregnant ewes from consuming

enough daily energy to meet their requirements. Then, they try to compensate by breaking down (metabolizing) their own body fat. When unable to do this correctly, toxic ketone bodies accumulate in the blood and kill both ewes and fetuses!

Milk fever, or hypocalcemia (low blood calcium), is a result of a calcium deficiency in the bloodstream. This metabolic disturbance usually affects the flock in outbreaks among pregnant and lactating ewes exposed to forced exercise, sudden deprivation of feed, grazing on green cereal grain crops, and/or consumption of a calcium deficient diet. Up to one-fourth to one-third of the flock may be affected at one time.

Hypocalcemia is typically caused by a sudden increased calcium demand placed on ewes by the rapid growth of fetuses (**Figure 1**) and the calcium demand for colostrum and milk production at the beginning of lactation. The milk fever syndrome, resulting from low blood calcium levels, is most often seen in 3 to 6 year-old ewes nursing twins in early lactation when both dietary calcium and energy requirements are higher than any other production period during the year. A low blood calcium level during the periods when calcium and energy requirements are highest may be a result of inadequate nutrition, even as far back as early pregnancy (during the first 15 to 17 weeks). Likewise, the shepherd may have calculated that rations to be fed would meet the ewe's daily requirement for both calcium and energy. But, there was not an anticipated sudden increase in calcium and energy demands to the level that ewes come down with milk fever.

Blood calcium regulation is controlled by the parathyroid and thyroid glands. Regulation is dependent on dietary calcium intake and absorption from the gastrointestinal tract and mobilization of calcium from bone. This mechanism makes tremendous adjustments to maintain blood calcium at the times of high demand for supply to fetal tissues, colostrum, and milk. Failure to do so, because of dietary deficiencies (calcium and energy), low calcium absorption rates or a sudden stress placed on the ewe, can result in milk fever.

SYMPTOMS

Symptoms of ketosis and milk fever in heavily pregnant ewes can be similar. Ketosis most often occurs during pregnancy whereas milk fever can occur during both pregnancy and lactation. Even though post-lambing symptoms will most likely be those of milk fever, it is important to be able to distinguish between the two disorders. The following is a progression of the typical symptoms of these metabolic disorders.

Typical Symptoms of Ketosis and Milk Fever

Disorder Progression	Ketosis	Milk Fever
Early and late symptoms	<u>Earliest signs:</u> 1. Separation from flock. 2. Apparent blindness but still alert. 3. Standing still when approached. 4. Running into objects when forced to move. 5. Pressing head against objects. 6. Lapping water. <u>Later stages:</u> 1. Marked drowsiness. 2. Tremors/spasms of head, face, and neck muscles. 3. Head pulled back or sideways. 4. Abnormal postures, elevation of chin (star-gazing). 5. Leg muscle tremors, incoordination, falling, convulsions. 6. May have a thick, yellowish, candle-wax like discharge from nose.	<u>Early and late symptoms:</u> 1. Stilted, proppy gait. 2. Muscle tremors, especially shoulder muscles. 3. Alert and struggles when approached. 4. Weak, staggering, goes down. 5. Once down, tends to stay down unless treatment is effective.
Recumbency (lying down)	1. Slow progression to recumbency 2 to 3 days after initial signs. 2. Profound depression or coma until death 2 to 6 days after onset of signs.	1. Rapid progression to recumbency over 3 to 4 hours. 2. Sternum recumbency, chin on ground or floor, head stretched out. 3. Legs stretched out behind is usual. 4. Watery nose discharge maybe. 5. Vaginal prolapse maybe. 6. Severe depression/coma. 7. Death within 6 to 24 hours without treatment. 8. Some cases linger up to 3 days.
Response to treatment	1. No response to milk fever treatment. 2. Usually poor even when given while ewes are still alert.	1. Rapid and good recovery after injection of treatment doses of calcium solutions, even in later stages. 2. Signs of recovery seen within a few minutes to half an hour after injection.

TREATMENT

Blood glucose levels must be increased if ewes with ketosis are to survive. Miracle recoveries cannot be expected, but intravenous infusion of glucose and oral administration of glycerin or propylene glycol (PG) at 4 to 8 ounces daily may save a ketotic ewe. The problem here is that PG reduces appetite even more than it may already be reduced, thus compounding the problem of low blood sugar levels. Taking lambs from the uterus by Caesarean section early in the course of the disorder may assist in recovery. But, the lambs are usually too immature to survive if they are taken 3 to 7 days before term. Another treatment, if the ewe lives long enough, is the oral administration of a half cup of molasses, with a quart of water, given 4 times every 24 hours. If the affected ewe will eat, provide her with the grain she was previously receiving plus alfalfa hay. Remember, she needs energy to increase her blood glucose levels. Any other treatment is simply "a shot in the dark" that may save a ewe once in a while. **Preventative nutritional management is more successful than treatment.**

In contrast to ketosis, response to treatment of milk fever can be rapid. Treatment is usually by intravenous infusion of 50 to 100 cc of calcium borogluconate solution (usually those prepared for milk fever in cows). Subcutaneous injection may be effective, but absorption is slower so it takes longer before the effects can be seen. Having on hand the equipment needed to infuse, maintaining a supply of calcium borogluconate solution, and having the proficiency to infuse are required if shepherds are to administer their own treatment. Otherwise, a veterinarian will be needed. **Like ketosis, preventative nutritional management will render more success than treatment.**

PREVENTION

If ewes become over-conditioned during the 15 to 17 weeks of early pregnancy, the high level of nutrition cannot be maintained during the last 4 to 6 weeks because the capacity of the rumen is reduced by the distended uterus. A shortage of critical nutrients (energy and calcium) associated with ketosis and milk fever can then occur. Under-conditioned ewes that enter the last 4 to 6 weeks of pregnancy may not consume enough feed to increase their body fat reserve, especially if the diet contains a large amount of low-quality roughage. If a concentrated energy source, like shelled corn, is fed, the energy requirement of ewes may be met. But, concentrates have limited amounts of calcium, which may make the ration deficient in calcium and result in low blood calcium levels causing milk fever. Therefore, performance of ewes in the last 2 weeks of pregnancy and early lactation depends on the nutritional management the shepherd imposes during the other 50 weeks of the production year. **Figure 2** illustrates how body condition scores (BCS) of ewes change during a production year. In reality, the BCS of ewes in the last 4 to 6 weeks of gestation are a function of how they were managed during maintenance, nutritional flushing, breeding, and early gestation. The situation that most producers face is that ewes coming out of lactation and entering the maintenance phase of production are relatively thin (BCS = 1.5 to 2.0; **Figure 2**). Generally, ewes gain weight and body condition after weaning lambs regardless of the nutritive value of the diet. The shepherd's responsibility is to keep ewes from becoming obese during this maintenance period by maintaining them on a low-quality hay diet or pasture until the next nutritional flushing/breeding phase. Other ewes may remain thin (1.5 to 2.0 BCS) during maintenance because they are "hard-doers", infested with internal parasites, or have responded negatively to management in other ways. Consequently, some ewes may be too fat (BCS = 3.0 to 3.5 or too thin (BCS = 1.5 to 2.0) as they leave flushing/breeding and enter early gestation (first 15 to 17 weeks). Ideally, ewes should have a BCS of 2.0 to 2.5 as they enter early gestation (**Figure 2**) and gain only enough weight in early gestation so they have a BCS of 3.0 as they enter the last 4 to 6 weeks of gestation. Unfortunately, the "easy-keeping", fatter ewes will likely continue to gain weight as fat, whereas the "hard-doers" will not change very much. The end result may be excessively fat (BCS = 4.0 to 4.5) or excessively thin (BCS = 1.5 to 2.0) ewes that are carrying twins or triplets when they are within 2 weeks of lambing. Irregular feeding caused by inclement weather, excessively cold weather, lack of exercise, or improper late gestation diets can trigger ketosis and/or milk fever. So, what can shepherds do to keep this from happening?

The fact that few cases of ketosis and milk fever occur when ewes are on pasture speaks to their ability to handle inclement weather, the exercise they get, and the

Figure 2

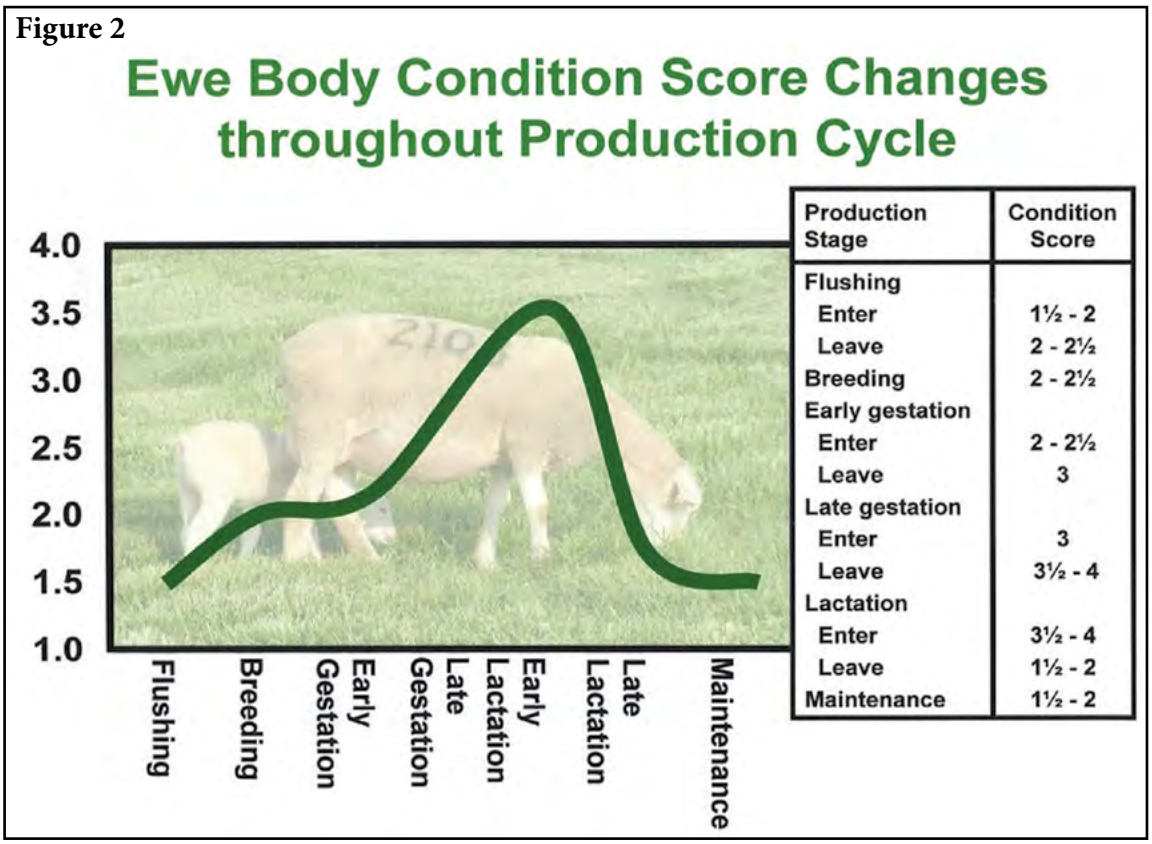


Table 1. Daily Early and Late Gestation Rations (lb/hd/d) for Ewes of Different Weights

Ewe wt., lb.	154		176		198	
Production phase[a]	EG	LG	EG	LG	EG	LG
Ration ingredient:						
Low quality hay[b]	3.4	-	3.7	-	3.9	-
Medium-quality hay[c]	-	4.0	-	4.0	-	5.0
Shelled corn	-	0.5	-	1.0	-	1.5
Cost, ¢/ewe/d[d]	10.2	29.0	11.1	35.0	11.7	46.0

[a] EG = first 15 to 17 weeks of gestation; LG = last 4 to 6 weeks of gestation.
[b] Late bloom to mature grass.
[c] Boot stage for grass, mid-bloom for legume.
[d] Low quality hay at $60/ton; medium quality hay at $120/ton; shelled corn at $6.00/bu

correct late gestation diet they consume. In reality, however, these ewes usually don't carry as many twin and triplet fetuses or become as fat as those maintained in more confined areas during early and late gestation. An analysis of the scenarios when ketosis or milk fever might occur points to the 15 to 17 weeks of early gestation management as the key to prevention. Ewes must not become over-conditioned or under-nourished during this 15 to 17 week period. **Table 1** shows some daily early and late gestation rations that, theoretically, should prevent both disorders if ewes are in recommended BCS (**Figure 2**) when they enter each production stage. The amounts of hay and corn that make up each ration will meet the daily requirements for protein, energy, minerals, and vitamins for ewes of each weight class. However, a complete mineral mix that contains vitamins A, D, and E should be available ad libitum, as a safety factor, every day of the year. The low-quality hay fed in early gestation should be replaced with pasture, if available. Pasture can also replace the medium-quality hay for late gestation, although this may be the time of the year when pasture forage becomes unavailable (December/January). Of particular importance in this table is the principle of feeding low-quality hay (or pasture) in early gestation and medium-quality hay (or pasture) in late gestation. There is no reason to feed medium-or high-quality hay (or pasture) if ewes are in correct BCS (**Figure 2**) as they come out of maintenance, nutritional flushing, and breeding phases. Note that low-quality hay (or pasture) intakes increase as ewe weights increase. Ewes in late gestation require more medium-quality hay (or pasture) than low-quality hay in early gestation because of increased fetal growth (**Figure 1**). Ewes weighing 154 and 176 lb require the same amount of hay, but different amounts of shelled corn, in late gestation. The corn supplementation reduces the chances of encountering ketosis and/or milk fever. Feeding the rations in **Table 1** to ewes in correct BCS should also produce a feed cost savings because the highest quality hay (not shown in table) is saved for the lactating ewes.

SUMMARY

Planning ahead is the key to the prevention of ketosis or milk fever. Centered in this planning is the knowledge of body condition scores of ewes in relation to their annual production phases. Once these scores are established, quality and quantity of feed required to maintain them in each phase can be determined. Nutritional management in maintenance, flushing, breeding and early gestation has a profound effect on late gestation performance. Following these guidelines established for body condition scores and feedstuff quality and quantity for production efficiency will concurrently provide preventative nutrition for ketosis and milk fever.

Dr. Donald G. Ely, *Professor in the Department of Animal and Food Sciences at the University of Kentucky*

"One Hoof & A Nose"

by Jessy Shanks, Small Ruminant Specialist
Department of Animal Science, University of Tennessee

You're at the barn at feeding time and a ewe you've been watching for a few days has decided that now is the time to go into labor. About an hour goes by and it's apparent that she is in the first stage of lambing, just getting ready and hopefully dilating her cervix. You continue your chores and decide that those lambs aren't coming within the hour.

A tactic that is often underused is to leave her alone for a while. After all privacy is usually the preferred status of females in labor. After about an hour, she is now laying down and actively pushing, again you give her some time to see how she progresses. It's now been an additional 30 minutes and she isn't making any headway with getting these lambs out. After a quick exam, you see that one hoof and a nose is sticking out.

According to the ultrasound by your veterinarian 2 months ago, this particular ewe is pregnant with twins. So, you automatically fear that one leg is from one lamb and the nose from another. Gloves are found, you tie the ewe up, and prepare to find out what is going on. After some exploration you find that this is exactly what you were afraid of.

This is problematic for several reasons, but the most obvious reason is because of physics, both of these lambs cannot come out at once. The birth canal is fairly narrow, and her body just will not allow it. Another problem is that she has already been in labor for a few hours. So, you know your time is running out. You then ask yourself, just when do I need to call the veterinarian? This is a common question that I get from producers. My answer typically starts with, you call the veterinarian when you feel that you need to, or you know your limitations have been exceeded. It's all about your comfort level and ultimately achieving the

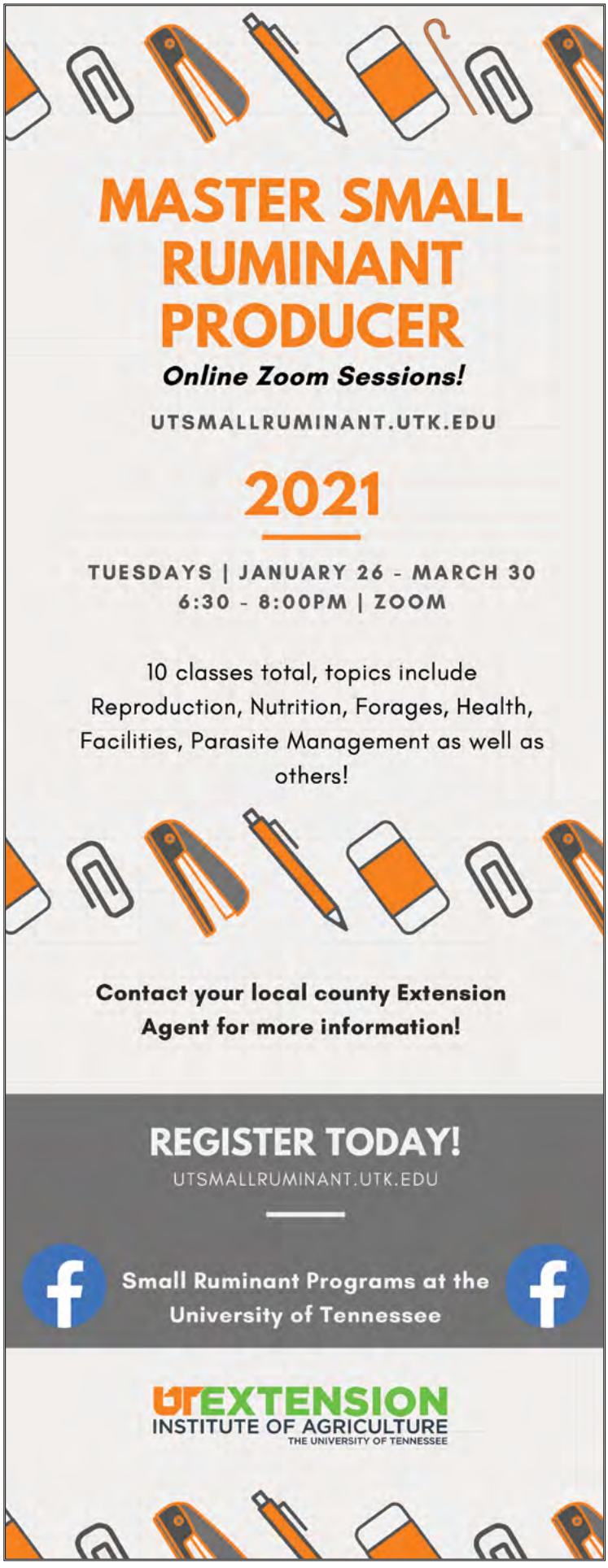
goal of getting live lambs or kids out of the equation, along with a healthy ewe/doe.

It is extremely important to have an established relationship with a veterinarian in your area prior to lambing/kidding season. This relationship is invaluable for livestock producers because veterinarians help us keep our animals healthy, while also helping to maintain a safe food supply. A veterinarian that knows you and your animals is also more likely to be able to assist in emergency situations because that is part of the veterinary client patient relationship (VCPR). Your veterinarian has an intimate working knowledge of your farm and your animals. In the case above, this producer needs to know what his/her limitations are as far as assisting with lambing. I talk to some producers that are squeamish and I talk to some that don't mind all the blood, urine, and feces that can accompany a difficult birth. If you feel comfortable with trying to deliver the lambs or kids then go ahead and try.

My rule of thumb for myself is to always palpate when I suspect a difficult birth. Do this with GLOVED hands (no exceptions here!) and plenty of lube. I use a palpation sleeve and a latex glove on top for grip. When palpating I visualize what I am feeling inside the ewe and then try to move the lambs into position from that image I create in my mind. Your goal is to get them in position so their head and both front legs can be pulled out first. Imagine yourself diving into a swimming pool type of position. Most of the time with plenty of lube, and some external assistance from my husband, I can get most lambs out. The difficult decision you must make as a producer is when do you stop trying and call the veterinarian? Do you try for 15 minutes and give up? Or do you try for 6 hours and end up with dead lambs and a dead ewe? Without question you do not try for 6 hours, that would be crazy, right? However, if I palpate a ewe and know within 15 minutes that this lamb is huge and she needs a c-section, then I'm going to call the veterinarian right away. The quicker a c-section is done, the higher the probability that you will end up with live, healthy lambs/kids. It all depends on what situation you have and what your level of comfort is with trying to assist. If you don't have a veterinarian within 3 hours of you, then you better get comfortable quickly with pulling and delivering lambs/kids.

Refer to the decision tree graphic shown here that I created to help you make the decision of should you call the veterinarian or not. This is only to be used as a rule of thumb and not absolute scientific fact, but it might help to have it handy during lambing or kidding season. I will say I have never regretted calling my veterinarian in the case of a difficult birth. Has it always resulted in live lambs? Not necessarily, but at the end of the day I knew that I had done everything within reason to ensure that the ewe and lamb/lambs had the best possible chance. If you have any questions, please contact your Extension agent, local veterinarian, or myself at jharri50@utk.edu or 865-974-4160.

Jessy Shanks *is the Small Ruminant and Youth Programs Specialist at the University of Tennessee, Knoxville. Jessy raises Southdown and Dorper sheep with her husband and daughter just below Knoxville. Her background is in reproductive physiology and she enjoys teaching producers and youth about small ruminants in any way possible.*



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