— February 19, 2019 —

Managing Internal Parasites:
Outsmart the Enemy

— Presented by —

Linda Coffey

NCAT/ATTRA

— Hosted by —

NCAT ATTRA SUSTAINABLE AGRICULTURE

FACT Food Animal Concerns Trust

Introductions

- **Food Animal Concerns Trust (FACT)** is a national nonprofit organization that advocates for the safe and humane production of meat, milk, and eggs.
- **Larissa McKenna**
  Humane Farming Program Director
  Email: lmckenna@foodanimalconcerns.org
  Website: foodanimalconcernstrust.org/farmer

- **FACT's services** for livestock and poultry farmers include:
  - Fund-a-Farmer Grants
  - Conference scholarships
  - Free webinars
  - Humane Farming Mentorship Program

FACT
Food Animal Concerns Trust

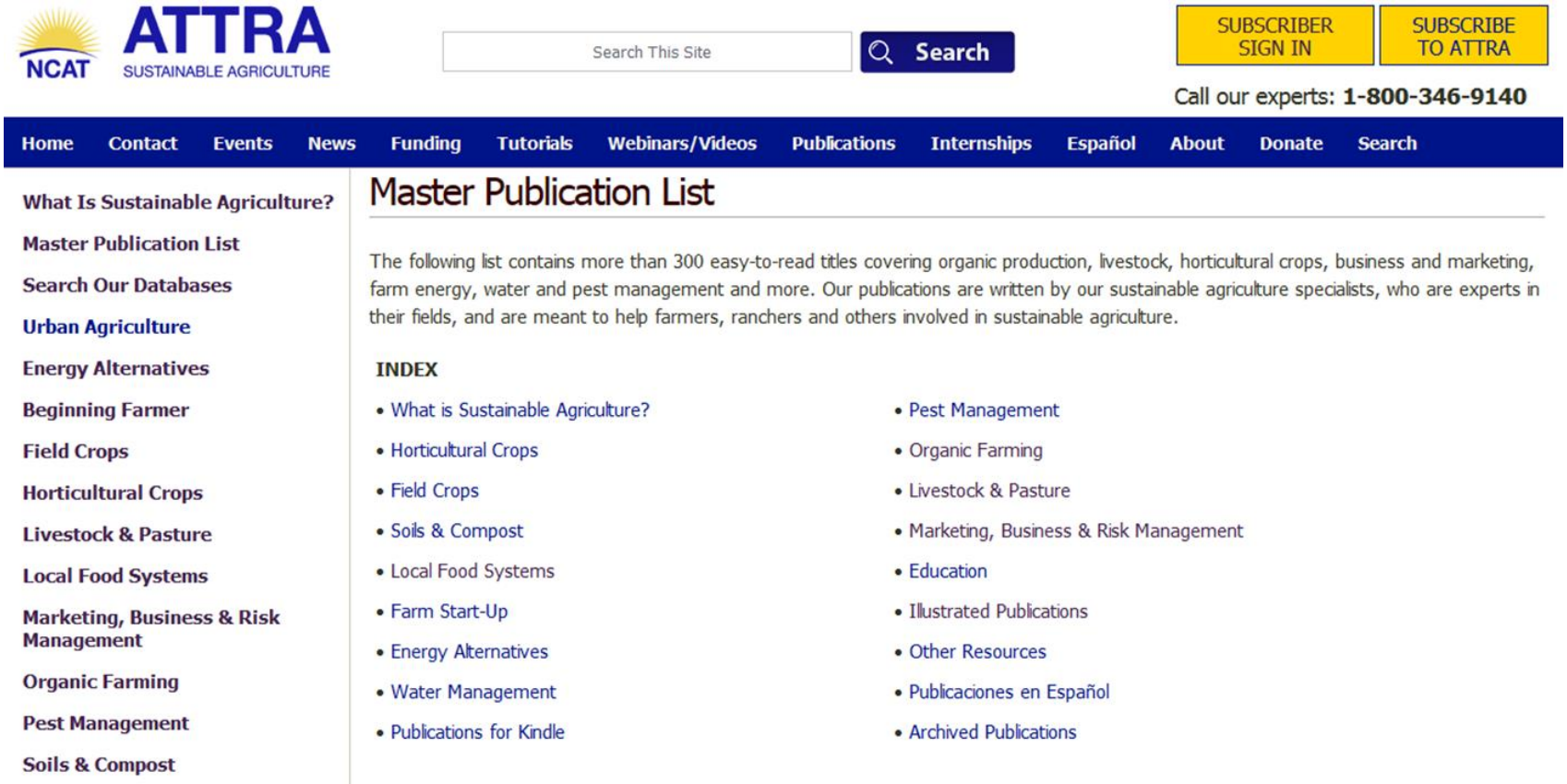
Introductions

- **National Center for Appropriate Technology (NCAT)** is a national nonprofit organization that advocates for small-scale, local, and sustainable solutions to reduce poverty, promote healthy communities, and protect natural resources.
- **Linda Coffey**
  Agriculture Specialist
  Email: lindac@ncat.org
  Website: www.attra.ncat.org

NCAT

- **NCAT manages** the ATTRA information service for farmers:
  - Free technical advice: 800-346-9140
  - Tutorials, videos, webinars, podcasts, online courses
  - Farmer-friendly publications

Topics we cover



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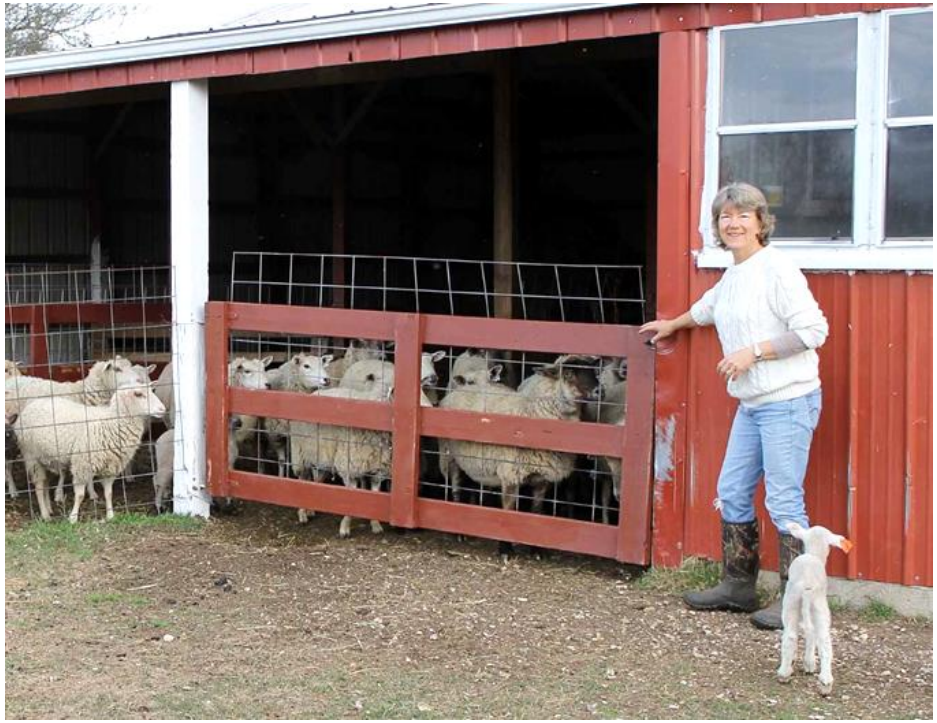
Our Presenter



Linda Coffey

NCAT/ATTRA and Maple Gorge Farm

Prairie Grove, Arkansas

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  - and the rest of the American Consortium for Small Ruminant Parasite Control (ACSRPC). We all benefit from their work, see: wormx.info


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Part 2: Outsmart the Enemy

Part 1: Know thy Enemy

Part 3: Attack the Enemy

Join us for all three to get the full picture!

Why go through all of this?

- Internal parasites are the worst health problem for small ruminants
- Parasites have adapted to our deworming medications

- Deworming medications were always a short term fix
- Knowledge is power!

ADGA Convention, 2003

- “Dewormers are the WORST way to manage internal parasites!” –Dr. D.G. Pugh, Auburn
- “There are no chemotherapeutic solutions to overstocking pastures or poor husbandry.” —Dr. Sharon Patton, UT
- “An ounce of prevention is worth a pound of Panacur.” —Dr. Sharon Patton, UT

Today we will cover:

- Pasture Management
- Immunity
- How to support the immune system
  - sanitation
  - nutrition
  - low stress
- How to assess the immune system

Parasite life cycle

- Parasite larvae ingested
- Adults make residence in the body
- Adults lay eggs
- Eggs passed in feces
- Eggs hatch and larvae move up blades of grass
- Animals ingest larvae (repeat cycle)

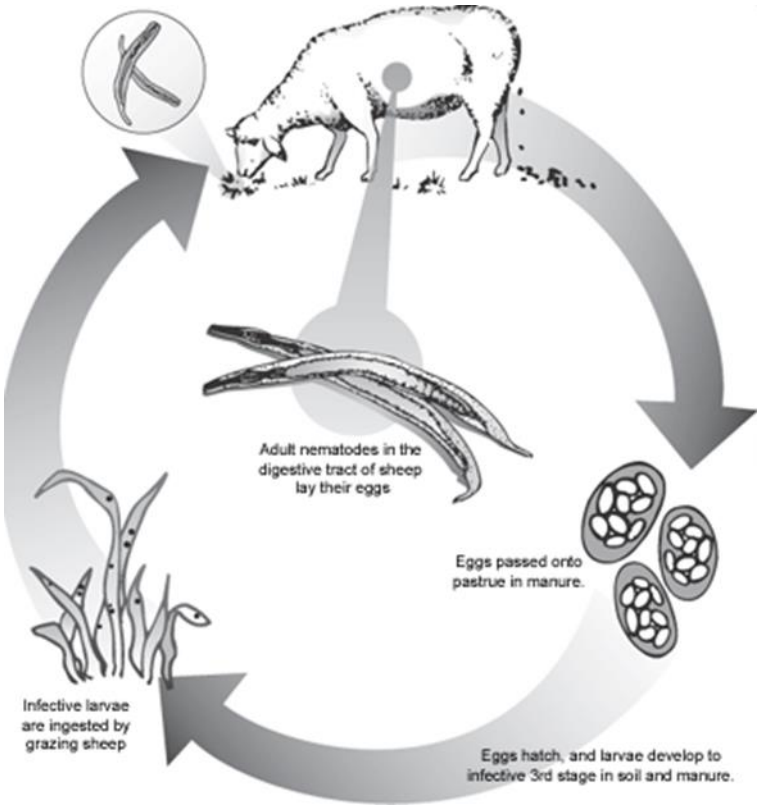
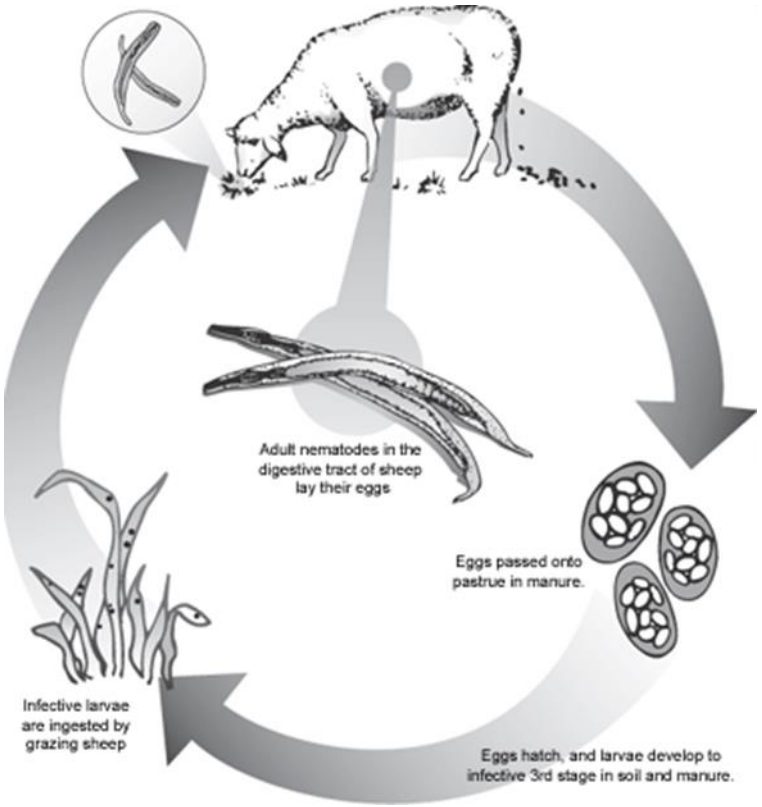


Image courtesy of: www.sheepandgoat.com

Parasite life cycle

- Parasite larvae ingested
  - While grazing
  - Near manure
  - Specific to host, mostly
  - Sheep, goats, camelids share; cattle and horses do not



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First line of defense

- Minimize the number of larvae ingested

Grazing tall forage

- Leave at least a 4” residue

Strip grazing

Graze annuals

Use browse

Multispecies grazing

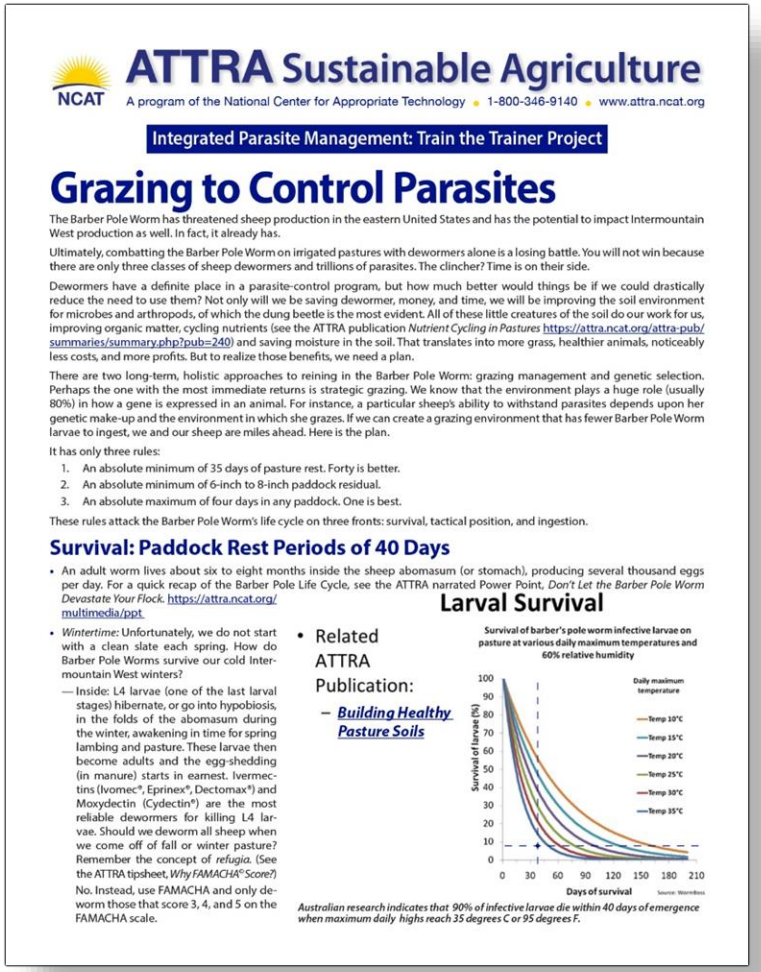
Sanitation

First line of defense

- Good sanitation
- Evasive grazing: ***leave 4***" of vegetation
  - Avoid majority of parasite larvae
  - Give the grass plenty of solar panels for fast regrowth
  - Protect the soil
- Evade larvae by using browse
- Multispecies grazing
- Annual crops
- Hay regrowth

Great resource

- ATTRA's Grazing to Control Parasites, by Dave Scott
  - attra.ncat.org/attra-pub-summaries/?pub=604



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Integrated Parasite Management: Train the Trainer Project

Grazing to Control Parasites

The Barber Pole Worm has threatened sheep production in the eastern United States and has the potential to impact Intermountain West production as well. In fact, it already has.

Ultimately, combatting the Barber Pole Worm on irrigated pastures with dewormers alone is a losing battle. You will not win because there are only three classes of sheep dewormers and trillions of parasites. The clincher? Time is on their side.

Dewormers have a definite place in a parasite-control program, but how much better would things be if we could drastically reduce the need to use them? Not only will we be saving dewormer, money, and time, we will be improving the soil environment for microbes and arthropods, of which the dung beetle is the most evident. All of these little creatures of the soil do our work for us, improving organic matter, cycling nutrients (see the ATTRA publication *Nutrient Cycling in Pastures* https://attra.ncat.org/attra-pub/summaries/summary.php?pub=240) and saving moisture in the soil. That translates into more grass, healthier animals, noticeably less costs, and more profits. But to realize those benefits, we need a plan.

There are two long-term, holistic approaches to reining in the Barber Pole Worm: grazing management and genetic selection. Perhaps the one with the most immediate returns is strategic grazing. We know that the environment plays a huge role (usually 80%) in how a gene is expressed in an animal. For instance, a particular sheep's ability to withstand parasites depends upon her genetic make-up and the environment in which she grazes. If we can create a grazing environment that has fewer Barber Pole Worm larvae to ingest, we and our sheep are miles ahead. Here is the plan.

It has only three rules:

1. An absolute minimum of 35 days of pasture rest. Forty is better.
2. An absolute minimum of 6-inch to 8-inch paddock residual.
3. An absolute maximum of four days in any paddock. One is best.

These rules attack the Barber Pole Worm's life cycle on three fronts: survival, tactical position, and ingestion.

Survival: Paddock Rest Periods of 40 Days

- An adult worm lives about six to eight months inside the sheep abomasum (or stomach), producing several thousand eggs per day. For a quick recap of the Barber Pole Life Cycle, see the ATTRA narrated Power Point, *Don't Let the Barber Pole Worm Devastate Your Flock.* https://attra.ncat.org/multimedia/ppt
- *Wintertime:* Unfortunately, we do not start with a clean slate each spring. How do Barber Pole Worms survive our cold Intermountain West winters?
  - Inside: L4 larvae (one of the last larval stages) hibernate, or go into hypobiosis, in the folds of the abomasum during the winter, awakening in time for spring lambing and pasture. These larvae then become adults and the egg-shedding (in manure) starts in earnest. Ivermectins (Ivomec®, Eprinex®, Dectomax®) and Moxydectin (Cydectin®) are the most reliable dewormers for killing L4 larvae. Should we deworm all sheep when we come off of fall or winter pasture? Remember the concept of *refugia.* (See the ATTRA tipsheet, *Why FAMACHA© Score?*) No. Instead, use FAMACHA and only deworm those that score 3, 4, and 5 on the FAMACHA scale.

Larval Survival

- Related ATTRA Publication:
  - ***Building Healthy Pasture Soils***

Australian research indicates that 90% of infective larvae die within 40 days of emergence when maximum daily highs reach 35 degrees C or 95 degrees F.

Parasite life cycle

- Parasite larvae ingested
- Adults make residence in the body
  - What they do depends on the species of parasite

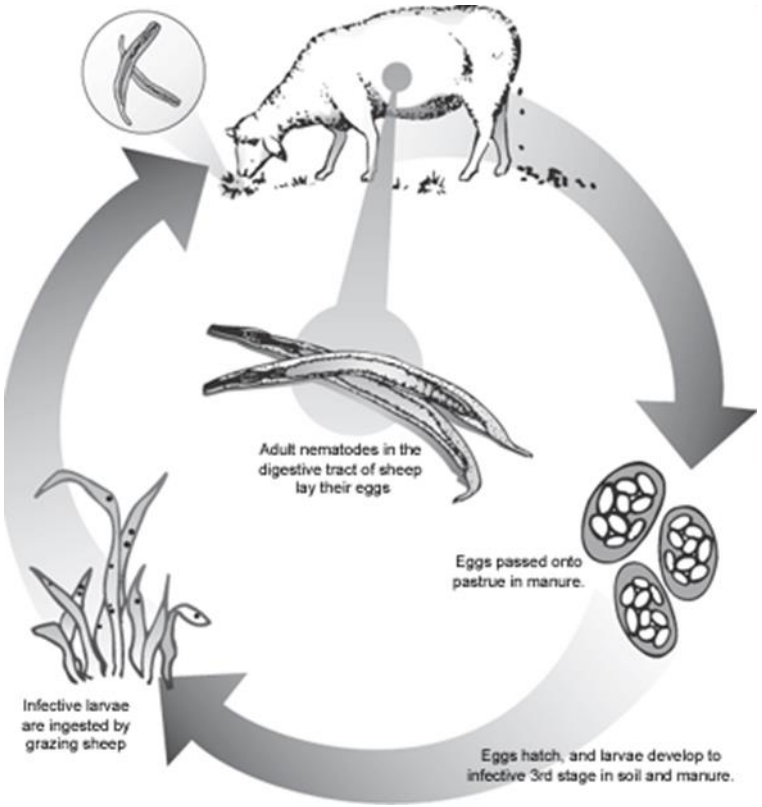

Image courtesy of: www.sheepandgoat.com

Second line of defense

- The immune system!
  - Animals that are
    - Healthy
    - Well-fed
    - Old enough
  - Resist establishment
  - Suppress egg laying
  - Help the animal tolerate the challenge

- Strong immune systems mean healthier animals ***and*** less pasture contamination. ***Win, win!***

Imagine

- Picture the healthy immune system as a strong fighter—*with karate moves!*
- Too many enemies at once can overwhelm it
- Give your animals a chance

A fighting chance

- Don’t let too many enemies come in
- Support the immune system with good nutrition
  - Give your fighter enough protein
    - Good pasture or browse
    - Soybean meal for lambs: ¼ pound
    - Protein tubs when pastures are too mature
    - A little alfalfa hay for new mothers

Nutrition

- Energy
- Water
- Minerals
  - Copper
  - Zinc

Diverse forage

High tannin forage

Browse

Legumes

Supplement sometimes

When to give extra support

- Young animals (don’t get immunity until 4 months or later)
- Lambs and kids at weaning time and when pastures are mature

When to give extra support

- Old animals
- Those that have been ill

Extra support for

- Periparturient animals (near birthing time)
  - Nutritional needs increase
  - Extra protein now helps suppress fecal egg numbers,
  - Lowering pasture contamination
  - Mothers will milk better
- Mothers feeding multiples

Support the Immune System

- Minimize the challenge:
  - Good grazing management, good sanitation
- Strengthen the animals
    - Good nutrition
    - Low stress (handling, environment)
  - Animal selection (breed tougher animals!)

Selection

- Why bother?
- Because selection is the ***best*** Long Term Solution to the problem of internal parasites!
- Selecting animals with low fecal egg counts lowers pasture contamination; and it is a heritable trait.

80/20 Rule

- 20% of your animals will be harboring 80% of the worms
- How do you know which animals are in fighting form, and which are harboring the enemies?

Four ways

- FAMACHA
- Five Point Check
- Fecal Egg Counts
- Production records? If you use an index.
  - Often, a high-producing animal will have more trouble with parasites due to nutritional stress.

Symptoms

- All internal parasites will cause:
  - low energy
  - lagging behind
  - low appetite
  - decreased digestion
  - slow growth
  - weight loss
  - lower production of milk, wool, or meat

Symptoms

- Barberpole:
  - also anemic,
  - may have bottle jaw
- Not barberpole:
  - also diarrhea (scours),
  - not anemic

FAMACHA


ww.wormx.info/wormtrappingfungus
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Five Point Check

- Assess your animal using your eyes and hands:
  - Eyes: use the FAMACHA technique and card to assess anemia
  - Back: feel for body condition score over the backbone and ribs.
  - Tail: is there evidence of scouring? Or is it clean?
  - Coat: shiny? Smooth? Or rough and dull?
  - (nose): I skip this one and look at energy/vitality instead

Five Point Check

Body condition score

Body condition score

Body condition score

Doing fecal egg counts

- Quantitative: McMaster's
- How to learn

Fecal Egg Counts are good for:

- Monitor pasture contamination (need a pooled sample, at least 10% of your animals)
- Test for dewormer resistance
  - In mid- to late-summer: to see if dewormers are working against barberpole (*Haemonchus contortus*)
  - Test a sample: deworm: 7-10 days later test again
  - Should have a 95% reduction in fecal egg count
- Find out which of your animals are resistant

DrenchRite® Assay

- Done at the University of Georgia
- Answers two questions:

  1) What parasites does my flock/herd have?

  2) Which drugs are effective on my farm?

- See: www.wormx.info/drenchriteassay

Resistance vs. Resilience

- **Resistance** – animal is able to stop internal parasites from establishing, and/or can suppress egg production
- **Resilience** – animal is able to tolerate a parasite burden and remain apparently healthy in spite of infection

Resistance vs. Resilience

Status	Fecal egg count	Anemia	Symptoms of Infection
Resistant	low	no	no
Resilient	May be high	no	no

Challenge

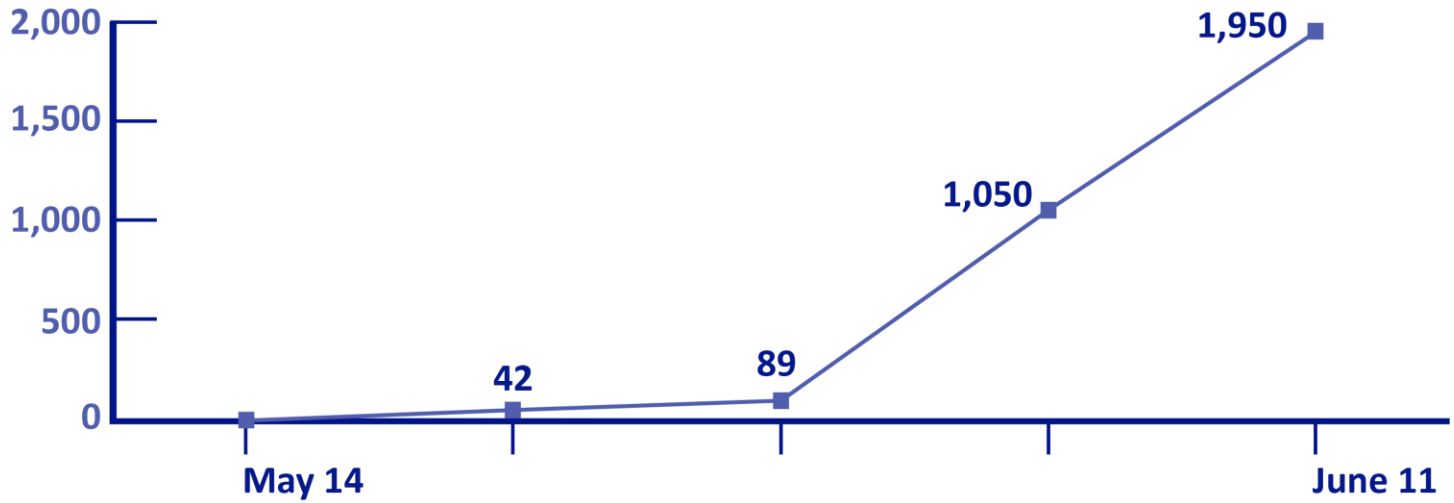
Challenge level	Fecal egg count	Anemia*	Symptoms of Infection
No challenge	low	no	no
Challenge plus susceptible	high	yes	yes
Very high challenge, even strong immune systems	high	yes	yes

*Assuming barberpole worm

Dr. Shulaw, Ohio

- Egg-to-egg under ideal conditions: 21 days for barberpole (*H. contortus*)
- FEC average: beginning May 14 and ending June 11

  0; 42; 89; 1,050; 1,950



Variation in a group

- Dr. Shulaw: Another study; 46 lambs averaged 3,800 eggs per gram (epg):
  - But 21 in the group had under 1,000 epg, and the top 4 had over 20,000 epg each!! Two animals had 0 epg.
  - ***One*** fecal egg count would not tell the story
  - Which animals do you want to keep on your farm?

Why you must manage grazing

- Dr. Shulaw:
  - Samples were collected 30 days after deworming a group of lambs
  - Average fecal egg count greater than 2,000 epg
  - Because they had continued to graze a contaminated pasture!

Selection

- Rams or bucks, especially:
  - Resistance: low fecal egg counts
  - Resistance or resilience: FAMACHA or Five Point Check or high animal performance
  - ***In the face of challenge***

Selection

- National Sheep Improvement Program has EBV for Katahdin and Polypay

Breeds

- There are breeds with known resistance
- But remember, even animals with good immunity can be hit with too much challenge

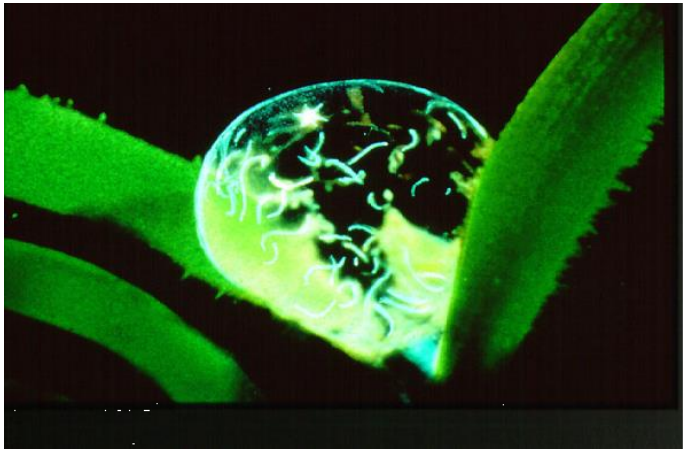
Breeds

ATTRA Publications

- *Tools for Managing Internal Parasites in Sheep and Goats: Animal Selection*
  - attra.ncat.org/attra-pub/download.php?id=398
- *Simple Genetic-Selection Strategies to Manage the Barber Pole Worm*
  - attra.ncat.org/attra-pub-summaries/?pub=603

Parasite life cycle

- Adults lay eggs
- Eggs passed in feces
- Eggs hatch and larvae move



Third line of defense

- First - minimize ingestion
- Second - support the immune system
- Third - ***Move away*** from the contamination
  - In summer: Within 4 days to avoid ingesting new batch of larvae from eggs dropped on day 1
  - Don’t come back to that pasture for at least 35 days: longer is better. Give the larvae time to hatch and die: in summer, 60 days is good.

How to extend rest time

- Multispecies grazing
- Use land off the farm
  - Noxious weed control for hire?
  - Help groom your neighbor's pastures
- Plant some annuals to provide clean pasture
- Cut a hay crop and let it regrow, then graze
- Remember to ***always*** leave at least 4" residue

Terry Hutchens blocks for goats

- Block 1 – winter annuals
- Block 2 – browse
- Block 3 – perennial pastures
- Block 4 – summer annuals
- Block 5 – perennial legumes
- Idea is to provide great nutrition while also avoiding contaminated areas. Each of these is rotated: manage the grazing, See ATTRA's Managed Grazing Tutorial for a great course.

Winter annuals

- Plant in the fall, graze in early spring

Block 2: Browse

- No more than 1/3-1/2 of the leaves taken, and then rest till next year!

Block 3: Perennial pastures

- But graze first with cattle, or cut for hay, and let regrow. That way you avoid larvae from last fall.

Summer annuals

- For example: corn, soybeans, sunn hemp, sorghum sudan grass: let them get tall, leave 6-8" residue so it will regrow if it rains.

Block 5: Perennial legumes

What might work for you?

- The system just described probably won't work for your farm.
- But part of it might! Think about your farm goals and resources, and plan your own grazing system to avoid parasites ***and*** provide good nutrition.

What if

- Your pastures are always too short?
- Then you are overstocked. Address the root cause of the problem.
- If your farm goals and resources allow, you may consider pen feeding to avoid internal parasites. Factor in economics. Remember the bulk of the diet must be forages.

Summary

- First line of defense: Limit exposure
- Second line of defense:
  - Support the immune system
  - Select the strongest animals
- Third line of defense: Move away from the contamination before eggs hatch, and stay away to give the larvae time to die…to limit exposure
- Pasture management + animal selection = winning!

D. G. Pugh, continued

- "Deworming is the ***worst*** way to manage parasites!… …but often we have to resort to it."
- When prevention is not enough, then we resort to treatment. Come back next week to hear about that!

Resources

- www.attra.ncat.org
  - Go to “Livestock” and find the sheep and goat section
  - Check out videos from Dave Scott
- www.wormx.info
  - American Consortium for Small Ruminant Parasite Control
- www.luresext.edu
  - Langston University
- www.sheepusa.org/Growourflock_Resources_EducationalWebinars
  - American Sheep Industry

Homework

- Use the assessment on the back of “Tips for Managing Internal Parasites” to see how many prevention strategies you are currently using.

- Decide which new ones you will use this season. Read ATTRA’s “Managing Internal Parasites in Sheep and Goats” and “Managing Internal Parasites in Sheep and Goats: Success Stories.”

Questions & Answers

Please type your Q's into the chat bar

Photo: Uwharrie Farm in NC

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- Upcoming webinars
  - **February 26:** Internal Parasites Part 3 – Attack the Enemy
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