

# **Control of Helminth Parasites in Cow Calf Operations in the Southern United States**

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A stylized silhouette of a mountain range in shades of teal, located in the bottom right corner of the slide.

# What are helminths? Why are they important?

- u Helminths are worms that live in the gastrointestinal tract or elsewhere in the body of cattle
- u Helminths may effect the normal functioning of the body so that the animal does not produce at its genetic potential
- u A few cattle will suffer disease (death), others do not grow, produce milk, or reproduce to their potential

# Numbers Count

- u **Parasitic disease is a numbers game**
  - A. A few = stimulate protective immune response
  - B. More = tolerated by most, economic loss in a few
  - C. Large numbers = clinical or economic loss
- u Different numbers for each parasite species
- u Different numbers for each class of cattle

# Factors That Contribute to Economic Parasitism in Cattle

- u Level of exposure by naïve cattle
- u Age of cattle
- u Breed and local environment
- u Season of calving
- u Age at weaning
- u Source of cattle and parasites
- u **Quality and quantity of feedstuffs**

# Perceived Parasite Problem?

- u Ill thriven cattle- ADR "ain't doen right"
- u "Elevated" worm egg counts
- u Lack of a "response" to anthelmintics
- u Compare to similar animals under similar conditions

# Are Liver Flukes Important?

- u **Only if your cattle have them**
- u Low numbers; Value of liver at slaughter
- u Medium numbers; Lowered reproductive efficacy both heifers and bulls
- u High numbers; Lowered feed efficacy, chronic poor doing cattle



*Fasciola hepatica*

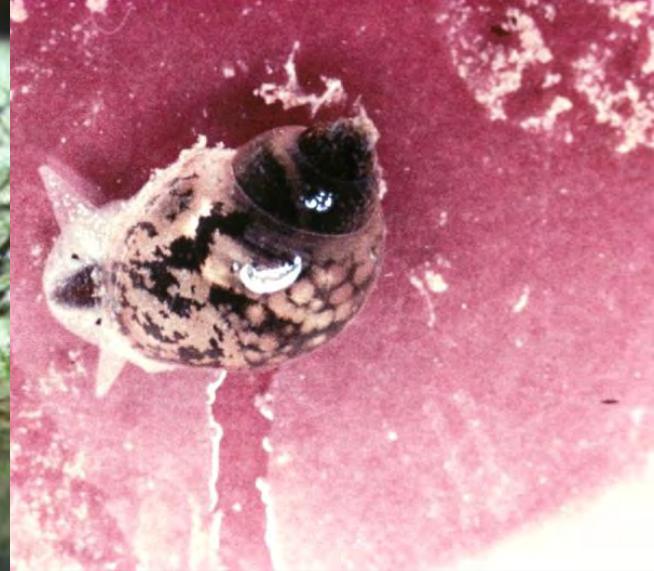


Common  
Liver fluke



# Liver Fluke Control

- u Flukes require specific snails (live in vegetation filled low water areas) to complete the life cycle
- u Fence off, drain snail habitats or only graze when snails are inactive (late summer)
- u Treat cattle in autumn; drugs only effective 4 months or longer post infection
- u Treatment is to protect snails



Lymnaea snail  
in habitat



# Gastrointestinal Nematodes

- u A related group of worms that live in the abomasum, small or large intestine
- u Each species makes its living in a different way and does different things to the host
- u All produce eggs which hatch in the fecal pat, and the larvae feed on bacteria, the larvae require one to two weeks to feed, molt and become infective
- u Infective larvae leave the fecal pat in water and ascend vegetation where they are grazed

# Worm

# Characteristics

<i>Ostertagia</i>	<ul style="list-style-type: none"><li>u Greatest economic importance</li><li>u Throughout US except far south FL, TX</li><li>u Arrested larvae</li><li>u <b>Calves and adults affected</b></li></ul>
<i>Cooperia</i>	<ul style="list-style-type: none"><li>u Young calf pathogen if <math>\geq 20,000</math> worms</li><li>u Mature cattle resist infections</li><li>u Tolerant of macrocyclic lactones Prolific egg-layer</li></ul>
<i>Haemonchus</i>	<ul style="list-style-type: none"><li>u Most prolific egg layer</li><li>u Voracious blood feeder</li><li>u Calf pathogen</li><li>u Bahiagrass or Coastal bermuda grass developed for <i>Haemonchus</i></li></ul>

# What about *Ostertagia*?

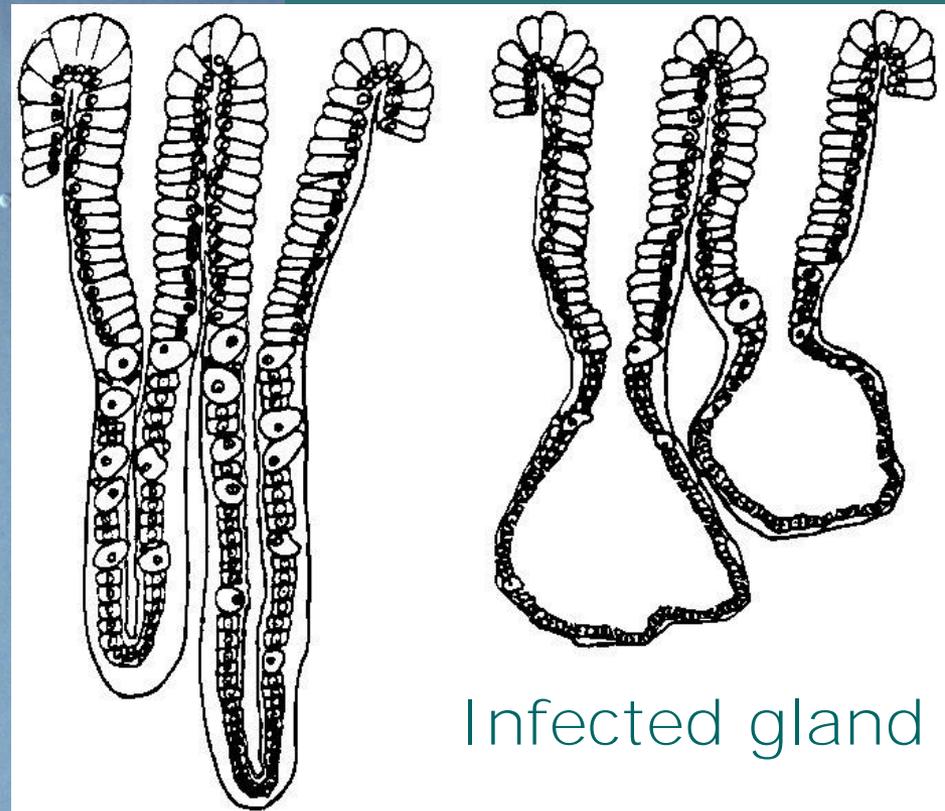
- u Temperate parasite, active in pastures late October until May in gulf coast
  - u Not present far south Texas, south of lake Okeechobee?
  - u Survives summer as arrested larvae in stomach glands
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- A decorative graphic at the bottom right of the slide, consisting of a silhouette of a mountain range in a teal color, matching the background.

# Why Is *Ostertagia* Important?

- u More damaging to Brahman type cattle
- u May cause disease in cows as well as calves
- u *Ostertagia* summer in the abomasal glands as inactive arrested larvae
- u Larvae are programmed to arrest by environmental clues
- u Larvae emerge from arrest in the autumn
- u Emergence of larvae causes damage to the abomasum

# *Ostertagia ostertagi*

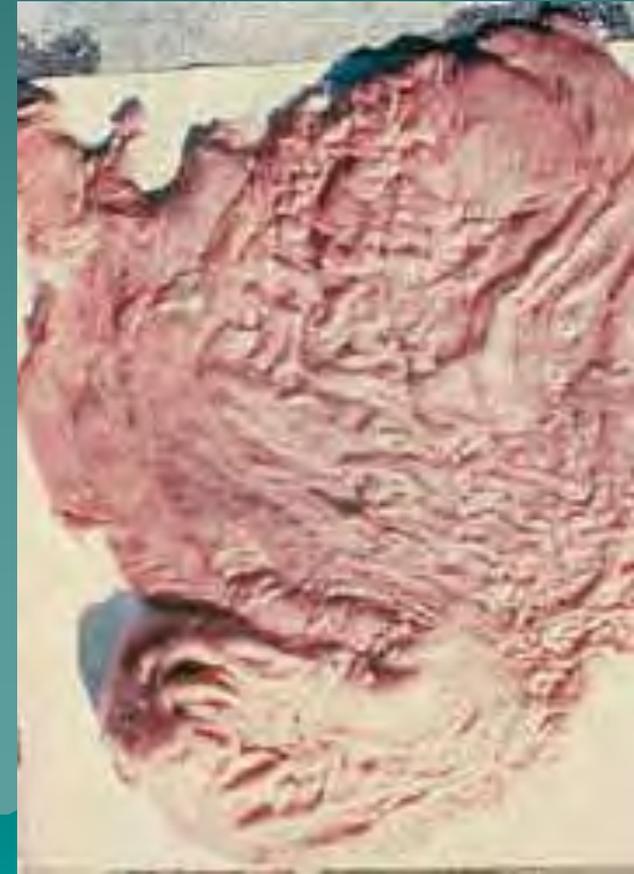
Small larvae (L4) deep in glands,  
Larger (adult worm) emerge from glands



Normal gland

# *Ostertagia* What Happens

- u Abomasal edema
- u Proliferation of bacteria in the abomasum
- u Fermentation in the small intestine
- u Fluid pulled into gut resulting in diarrhea
- u Dehydration
- u Primary digestion decreased
- u **Anorexia**
- u Depressed immunity



Which pasture has the most grass?  
Which animals had more worms?



treated

untreated

# *Haemonchus* spp

- u An important parasitic helminth of calves in tropical climates i.e. Florida April through November
- u Older cattle become resistant to and/or tolerant of infection
- u **Voracious blood sucker:** causes anemia and hypoproteinemias, may exsanguinate calves
- u Extremely fecund 5,000 to 6,000 eggs/female/day
- u Problem on high intensity summer grazing systems

Adult  
*Haemonchus* in  
Abomasum

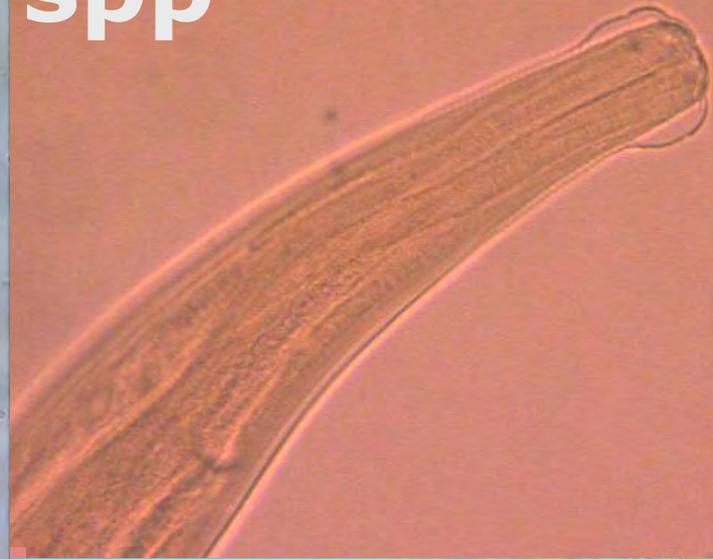
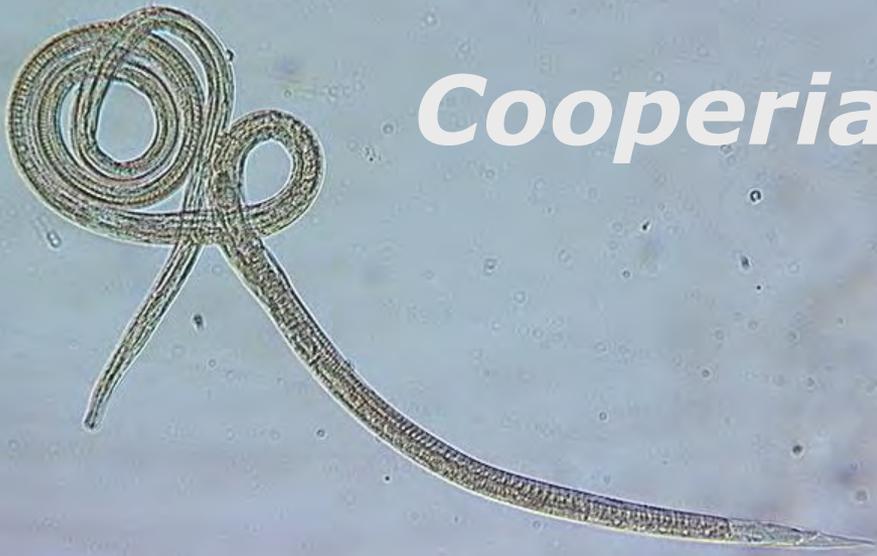


# Who is *Cooperia*?

## small intestinal parasite

- u Eggs passed in the feces of cattle less than a year of age are predominantly *Cooperia*
- u Stimulate early resistance by calf to infection
- u Causes disease in calves (diarrhea) if 20,000 or more worms in the small intestine
- u May be resistant to macrocyclic lactones
- u Importance? Dairy calves, light weight stocker calves; probably so!  
Others; probably not!

***Cooperia* spp**



Small intestine calves



# Why use Anthelmintics? (drugs that kill worms) Who do we treat?

- u Why

- 1) To save lives
- 2) To increase profits
- 3) To protect pastures

- u Who

- 1) Those cattle which contribute most to pasture contamination
- 2) Suffering from disease

# How Often Should I Deworm My Cattle?

- u **Where do you live?**
- u South: late spring early summer
- u Kill arrested *Ostertagia*, the most important parasite, before it causes damage
- u Aid in getting through a period of adverse conditions i.e. entering winter
- u **What is the stocking density?**
- u The higher the density the higher the exposure

# Geography Climate Parasites



high rainfall > 32 inches annual rainfall, parasites  
low to medium > 16 inches, few parasites  
very low rainfall depends on range, few if any

# Stocking Rate /Density



# Who Should I Deworm?

- u **Cows or calves?**
- u Cows; As geography and management dictate
- u Calves; When you treat cows if more than 200 lbs and at weaning
- u **First calf heifers and bulls if nothing else in herd**

# Does It Matter Injectable, Pour-on, or Oral?

- u Injectable: long residual effects, injection site reaction
- u Pour-on: quick easy, must be absorbed
- u Oral: drench or feed, adequate dose for each animal
- The most effective is the method that gets the proper dose to the target worm with the least stress on the cattle and the owner

# What About Generic Dewormers?

- u Injectable or oral; similar
- u Pour-on; Same drug / different carrier
- u Most generic pour-on do not have the efficacy as original formulation
- u Do you buy dewormers from the same folks that make protein enhanced dog food, flavor enhanced toothpaste or children's formula?

# Should We Rotate Dewormers?

- u Not unless we are after different worms
- u **Rotation of dewormers does not slow down the onset of resistance of worms to the products used**
- u Rotation of drugs is logical but research studies indicate that resistance occurs to all the drugs in the rotation used during a grazing year faster than if drugs are changed as they fail

# Should The Drug Differ for Cows and Calves?

- u When calves are suckling the same products should serve both
- u At weaning; calves have *Cooperia* rare in cows
- u A white drench (benzimidazole) a better choice for *Cooperia*, not most other worms

# Do Anthelmintics Always Work In Cattle?

- u *Cooperia punctata*, primary culprit for resistance in calves
  - Economic importance?
  - Calf just needs to get older
- u *Haemonchus* populations resistant to both macrolides and benzimidazoles on intensely grazed permanent pastures by naïve calves
- u Resistance undocumented in cow calf herds in North America

# What is the Best Dewormer?

- u The one that works on **your ranch** against **your worms** in **your cattle**
- u University professors, drug company sales reps, feed store managers, county agents, neighboring ranchers or internet blogs **don't have a clue!**

# How Do We Know if an Anthelmintic Works on a Farm

- u Treat some animals don't treat others slaughter and look for worms in the GI tract 1 to 2 weeks later
- u Determine if there are worm eggs present prior to treatment and then compare the number of eggs present 2 to 4 weeks later; Fecal Egg Reduction Test

# Fecal Egg Reduction Test (FERT)

- u An indicator of efficacy
- u Best done in younger cattle
- u Mean difference of fecal egg counts in a population at treatment and 2 to 4 weeks later
- u Uneven distribution of egg counts
  - 20% of herd has 80% of eggs
- u 20 individual fecal samples at random or 10 individually identified samples
- u Identify the genera of worms both before and after treatment

# Evaluation of Worm Numbers

## Fecal Egg Counts

- u Somewhat linear correlation between level of infection by **adult worms** and egg count
- u Species vary in fecundity
  - A few *Haemonchus* produce more eggs than an abomasum full of *Ostertagia*
- u Some worms damage host as larvae others as adults
- u Larvae don't produce eggs

# When Should Fecal Egg Counts be Performed?

- u More than a month following the onset of grazing in pasture by at risk animals so the parasites picked up early will be reproducing adult worms
  - u When cattle appear to have possible nematode associated disease
  - u At the time of anthelmintic treatment and again in two to four weeks to estimate drug efficacy
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# Worm Eggs that Look the Same

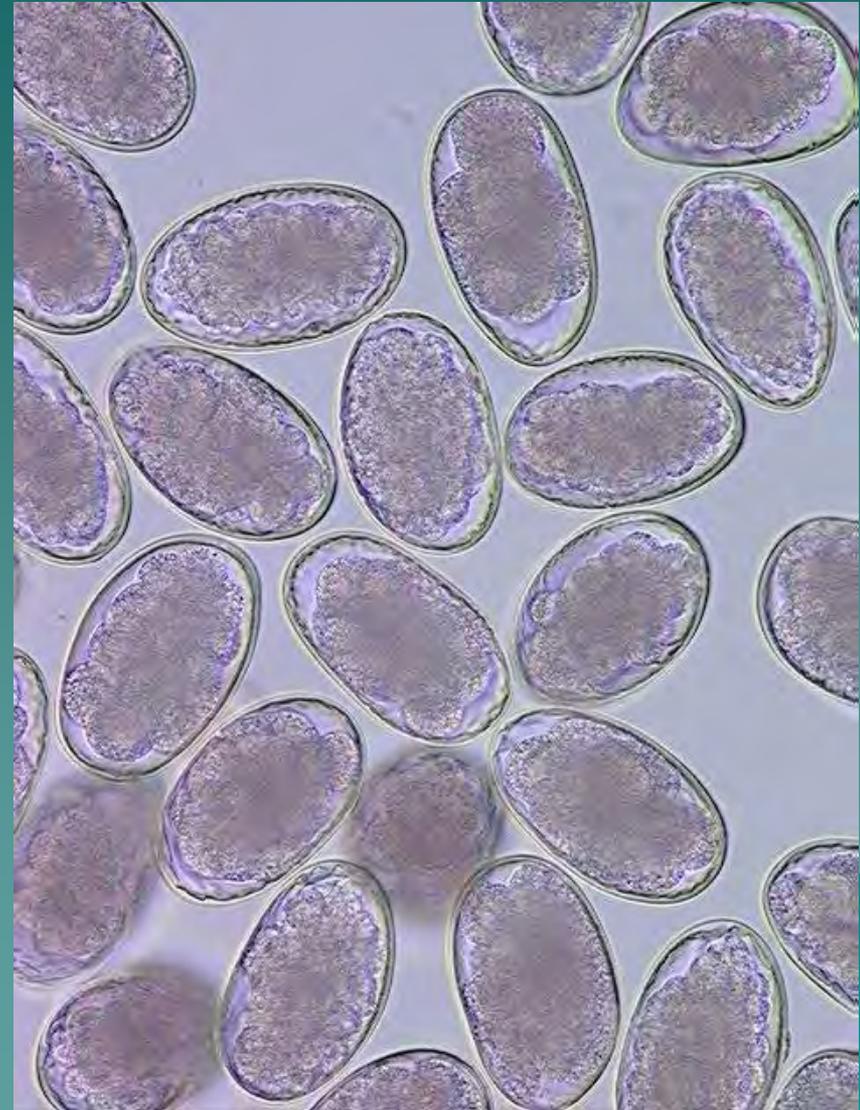
*Cooperia*

*Haemonchus*

*Oesophagostomum*

*Ostertagia*

*Trichostrongylus*



# How Do We Differentiate Among Worm Eggs?

- u Geography, time of year and class of cattle will give you an idea of which parasite species are there
- u Larvae hatch from eggs develop to the infective stage, infective larvae may be differentiated
- u Genetic testing sensitive but limited laboratory availability