FAMACHA
Parasite Monitoring System

Brenda Postels
U of MN Extension Educator—Wright County
Abcidy Acres—Sheep and Goat Producer
**Haemonchus contortus**
(Barber Pole Worm)

- Sheep, goats, deer, exotic ruminants. Most important parasite in sheep/goats raised in warm/wet environments
  - Southern US, Caribbean
  - In much of Northern US primary problem
- Blood-sucking parasite
  - highly pathogenic
- anemia
- “bottle jaw”
“Bottle Jaw”

Anemia
Figure 1. Life cycle of Haemonchus Contortus
A Fresh Approach Is Needed

- Frequent application of dewormers is no longer a viable approach
  - Recipe-based approach to parasite control cannot be recommended
- Effective dewormers must be thought of as an extremely valuable and limited resource
  - A medically-based approach to therapy is required
- Reduced-chemical and non-chemical approaches are needed
Drug Resistance:

- The ability of worms in a population to survive drug treatments.
- Develops when dewormers are used and rotated too frequently and/or from "underdosing."
- Continued use results in a population of "super worms."
- Once resistance is established, dewormers can no longer be used effectively.
Where Do Resistant Worms Come From???

- Genetic diversity in parasite pop’ns is great
  - *Haemonchus contortus*
    - 5000 eggs per female per day
    - 300 female worms per animal
    - 30 animals → >1 billion eggs over 3 weeks
- “Resistant” worms exist within pop’ns prior to the introduction of a drug
What Causes Resistance To Anthelmintics ???

- Frequent Treatments
  - 3 treatments per year
- Treating and moving to clean pasture
- Under dosing
- Treating all animals at same time
What Does This Mean For The Small Ruminant Industry ???

- Anthelmintics can no longer be thought of as a cheap input to maximize productivity
  - Extremely valuable and limited resources
- Control of *Haemonchus* must be practiced with an eye to the future
- **Reality** = effective long-term control of *Haemonchus* will only be possible if anthelmintics are used intelligently with prevention of resistance as a goal
Components of a Smart Drenching Program

- Know the resistance status of the herd or flock
- Sound pasture management
- Keep resistant worms off the farm
- Administer the proper dose
- Utilize host physiology
- Selective treatment -- FAMACHA
Know the Resistance Status of the Herd or Flock

- Perform Fecal Egg Count Reduction Tests (FECRT)
- Repeat every 2 years
- When resistance is recognized in early stages
  - Drug can still be used
  - Must be managed appropriately
Diagnosis of Resistance

Fecal Egg Count Reduction Test (FECRT)

- labor-intensive
- costly for large number of animals

- Veterinarian
- Intervet offers FREE fecal analysis!
- DIY FEC
Recommendations For Pasture Management

- Decrease stocking rates
- Provide browse-type forage
- Use dilution strategies
  - mix 2 or more species on same pasture (sheep/goats with cattle or horses)
  - rotate pastures between different species
Do Not Buy Resistant Worms

- All new additions should be quarantined and aggressively dewormed upon arrival
- Deworm with 3 anthelmintics from different drug classes
  - moxidectin, levamisole, and albendazole upon arrival
- Should remain in quarantine for 10 - 14 days
  - Perform FEC to confirm that no eggs are shed
Proper Drug Dosage and Administration

- Ensure proper dose is delivered
- Goats metabolize anthelmintic drugs much more rapidly than other livestock
  - Goats require a higher dosage
  - Rule of thumb -- goats should be given a dose 1.5 to 2 times higher than for sheep or cattle
    - levamisole 1.5 X, All others 2X
- Administer all available drugs orally
  - Bioavailability of pour-ons tends to be poor
- Drugs should be stored properly
Use Proper Technique

- Proper technique when drenching ruminants is very important
  - critical that the full dose lodges in the rumen
  - drench should be delivered over the tongue into the pharynx/esophagus
  - if drench is delivered to the mouth the esophageal groove can be stimulated to close
    - significant drench bypasses the rumen
    - faster drug absorption, shorter duration
    - efficacy is reduced
Utilize Host Physiology to Maximize Drug Efficacy

- Once in the rumen, the duration of drug availability is largely dependent on the flow-rate of the digesta.
- Decreasing digesta transit leads to an increase in drug availability and efficacy.
  - Restrict feed intake for 12 - 24 hours prior to treatment.
  - Repeat dose in 12 hours.
Rotation of Anthelmintics

- No longer recommended in traditional fashion
  - High prevalence of resistance gives fewer alternatives
  - Rotation may not be best strategy
- Rather than rotation
  - Targeted treatment using different anthelmintics in different situations
- Must rotate between different drug classes
ANTHELMINTICS

Benzimidazoles
   Valbazen, Safeguard, Panacur, Synantic

Levamisole
   Tramisol, Levasol, Rumatel

Macrolides
   Ivomec, Dectomax, Cydectin, Epronex
The FAMACHA© system

- Named for its originator
  - Dr Francois “Faffa” Malan
  - FAffa MAlan CHArt
- Dr Jan van Wyk, Professor Gareth Bath
- Dr. Adriano Vatta, Dr. Tami Krecek
- Dr. Jørgen Hansen, FAO
FAMACHA

- Use as guide to determine which animals to treat
  - Significantly reduces number of treatments given when compared with conventional drenching practices
  - Should significantly decrease the rate of development of anthelmintic resistance
Distribution of FEC in Goat Herds

Treating high 33% Greatly Reduces Daily Pasture Contamination With Eggs

- 33% of Goats
- 80% of Eggs

Over 1 Month: Pasture Contamination Reduced By: 5.7 Billion Eggs
Selective Treatment
FAMACHA
How Does FAMACHA Work ???

- Since primary impact of *H. contortus* is anemia, one can indirectly measure parasite burden (and need for treatment) by measuring anemia.
- Only useful where *H. contortus* is the primary parasite species.
The FAMACHA© System

- Eye color chart with five color categories
- Compare chart with color of mucous membranes of sheep or goat
- Classification into one of five color categories:
  - 1 – not anemic
  - 5 -- severely anemic
<table>
<thead>
<tr>
<th>Clinical Category</th>
<th>Color Classification</th>
<th>Hematocrit range (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>Red-pink</td>
<td>23 -27</td>
</tr>
<tr>
<td>3</td>
<td>Pink</td>
<td>18 -22</td>
</tr>
<tr>
<td>4</td>
<td>Pink-white</td>
<td>13 - 17</td>
</tr>
<tr>
<td>5</td>
<td>White</td>
<td>12</td>
</tr>
</tbody>
</table>
1) Place gentle downward pressure on eye with upper thumb

2) Pull down lower eyelid with other thumb

3) Read color of eye on mucous membranes of lower eyelid
- Examine in sunlight
- Open as shown - for a short time only
- Look at color inside lower eyelid
Always Use Card !!!

Compare eye color to chart
Other Recommendations for Proper Use

- Check both eyes
  - Score animal based on lowest eye score
- No ½ scores
  - Assign lower whole number score if unsure
- Do not hold eye open more than few seconds
  - Wait and retry in other eye
General Treatment Guidelines
When Using FAMACHA

- Treat goats and sheep in categories 4 and 5 with an effective anthelmintic
- If in doubt, score at paler category
- Do not use in isolation – use FECs, rotational grazing, strategic or tactical treatments
Integrating the FAMACHA© System

- If there are none in categories 4 or 5, then safe
- Re-examine two weeks later if in *Haemonchus* “season”
- In dry or cool times of year every 4 -6 weeks may be sufficient
  - Gain experience
  - Be careful
Integrating the FAMACHA® System

- If >10% of flock/herd in categories 4 and 5, consider treating 3s as well
- Change pastures if possible
  - Do not treat all animals before move
- Consider checking more frequently
  - 1X per week
Integrating the FAMACHA© System

- Examine especially animals which lag behind the flock/herd
- Check for animals with “bottle jaw” and treat these, regardless of whether they look anemic or not
Other Advantage of Selective Treatment (FAMACHA)

- Identify animals that need treatment most often
  - These are the ones contaminating the pasture for others in the herd/flock
  - Cull these and improve genetics of resistance of the herd/flock
- Resistance/resilience to parasites is moderately heritable (0.3 – 0.4)
Precautions

- Paleness or reddening of the eyes may have other causes
  - Other causes of anemia:
    - Other parasites
    - Nutritional deficiencies
    - Other diseases
  - Other causes of redness:
    - Environmental conditions
    - Other diseases
    - Infectious eye diseases
Precautions

- Only properly trained persons should apply the FAMACHA© system
- The card is an AID in the control of *Haemonchus* ONLY
- Maintain an integrated management-based worm control measures
- The system is best used by producers where back-up assistance is available from a veterinarian
Precautions

- FAMACHA is part of a total worm control program – not a replacement
- Maintain standard worm control measures:
  - Monitoring of fecal egg counts
  - Rotational grazing
  - Resting pastures (2 or more months)
  - Alternation of goats with cattle or horses
Precautions

- Lambs/kids and pregnant or lactating ewes/does need special attention
- Always score animals with the help of the chart, not from memory
- Replace card after 12 months’ use
Precautions

- System Sounds Simple
- If used improperly death of animals is a possibility
  - Cannot be used in a vacuum
  - Must take other factors into consideration in making treatment decisions
- Must know if anthelmintic used is effective
Where Do I Get FAMACHA Cards ???

- By request of Professor Bath in South Africa, only properly trained lay individuals can purchase the cards
  - Sanctioned Training Workshop
- Through a veterinarian
  - Vets expected to train themselves before training others
- Through extension agents who have received training
- Information at famacha@vet.uga.edu
Plan your Strategy
GOATS 4 SALE $30. EACH FREE

FRESH EGGS BROWN-WHITE & GREEN $1.00 DOZ