FAMACHA
Parasite Monitoring System

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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"

Anemia

“Bottle Jaw”

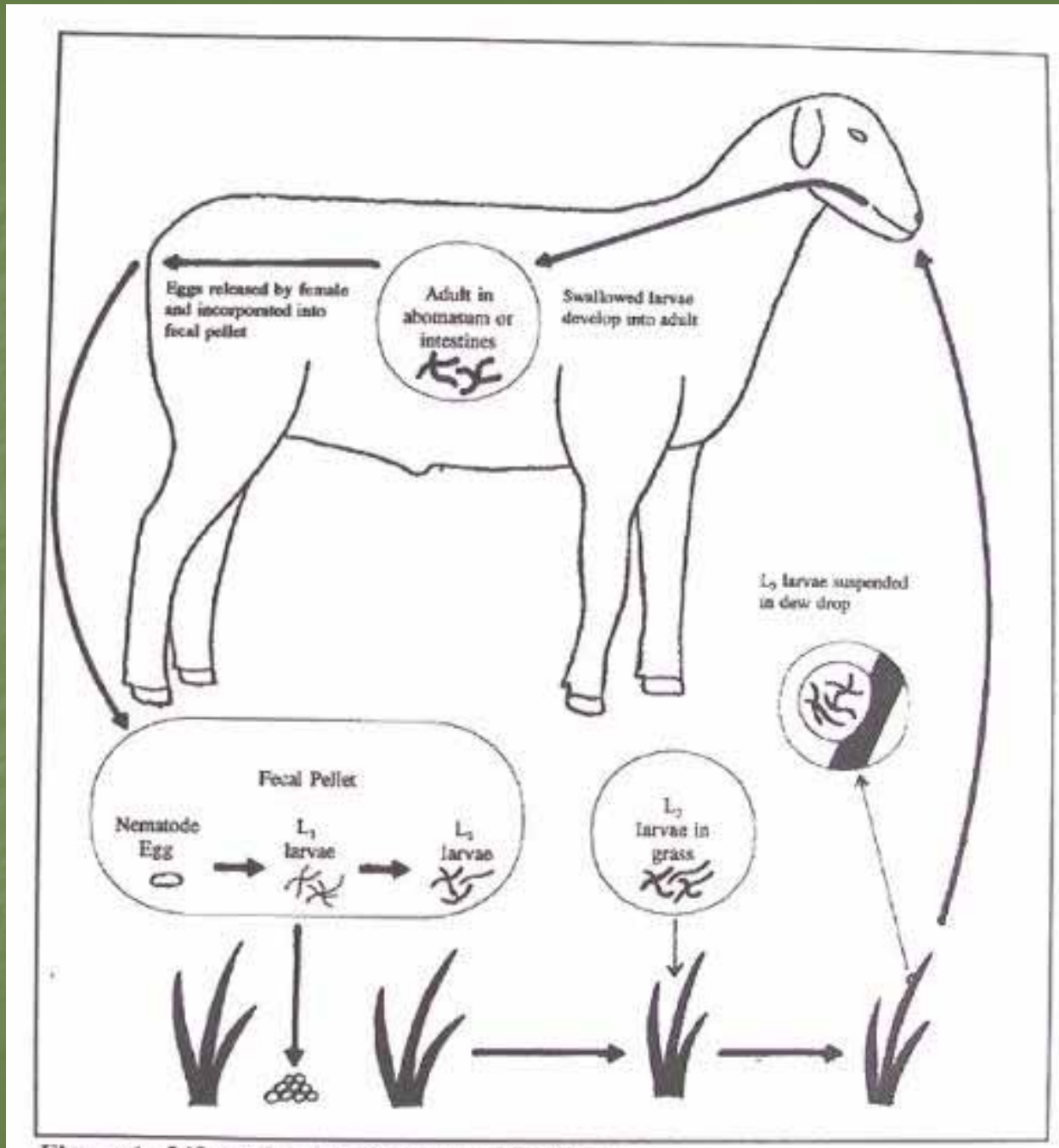
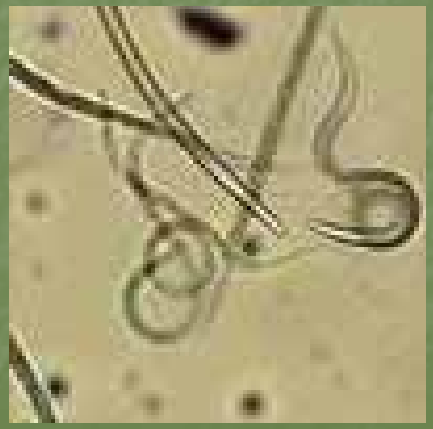
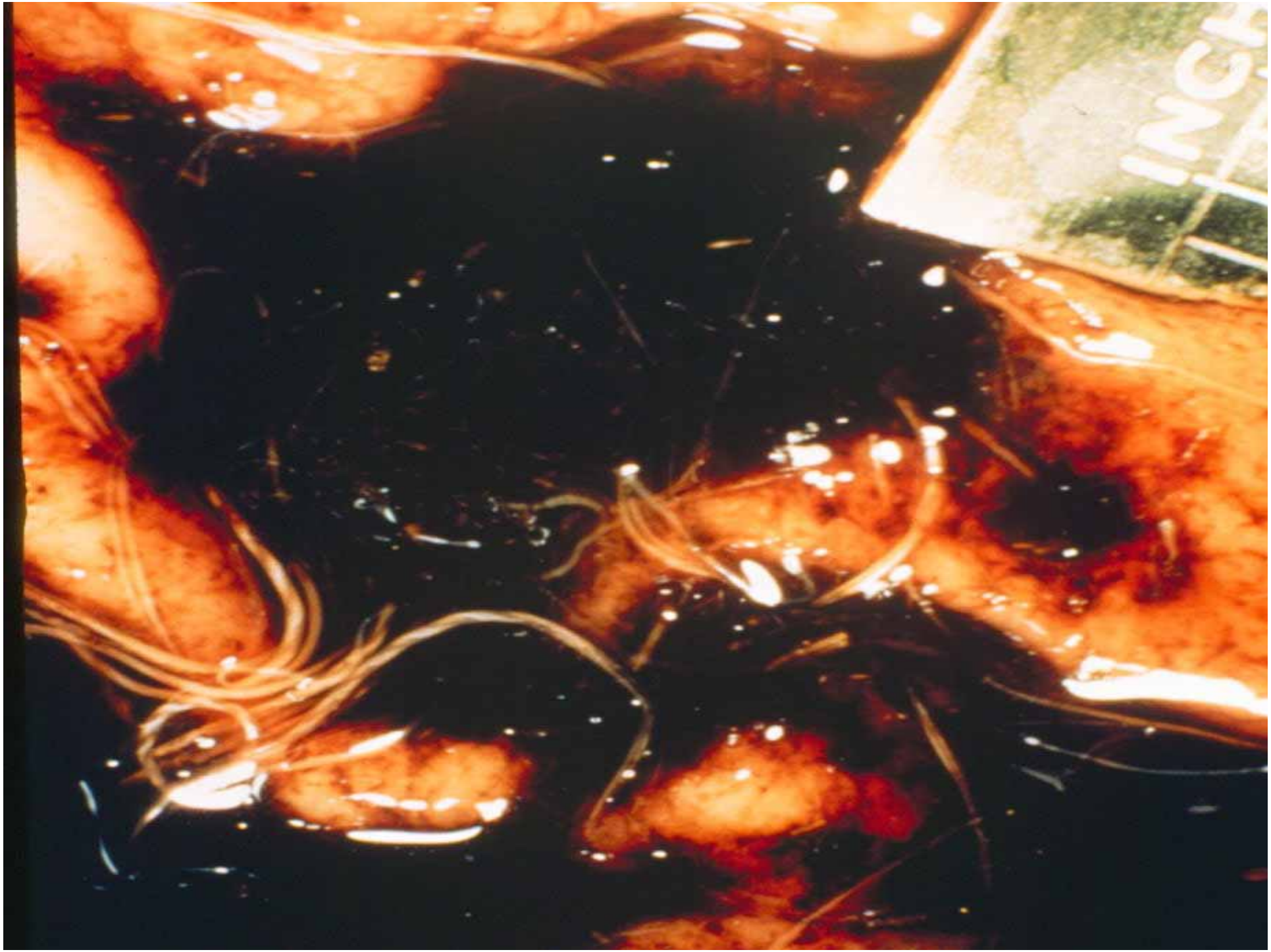


Figure 1. Life cycle of Haemonchus Contortus





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

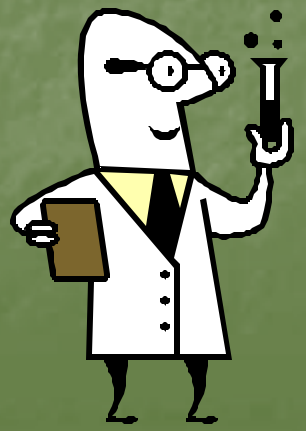
- Perform Fecal Egg Count Reduction Tests (FECRT)
- Repeat every 2 years
- When resistance is recognized in early stages
  - Drug can still be used
  - Must be managed appropriately

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 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

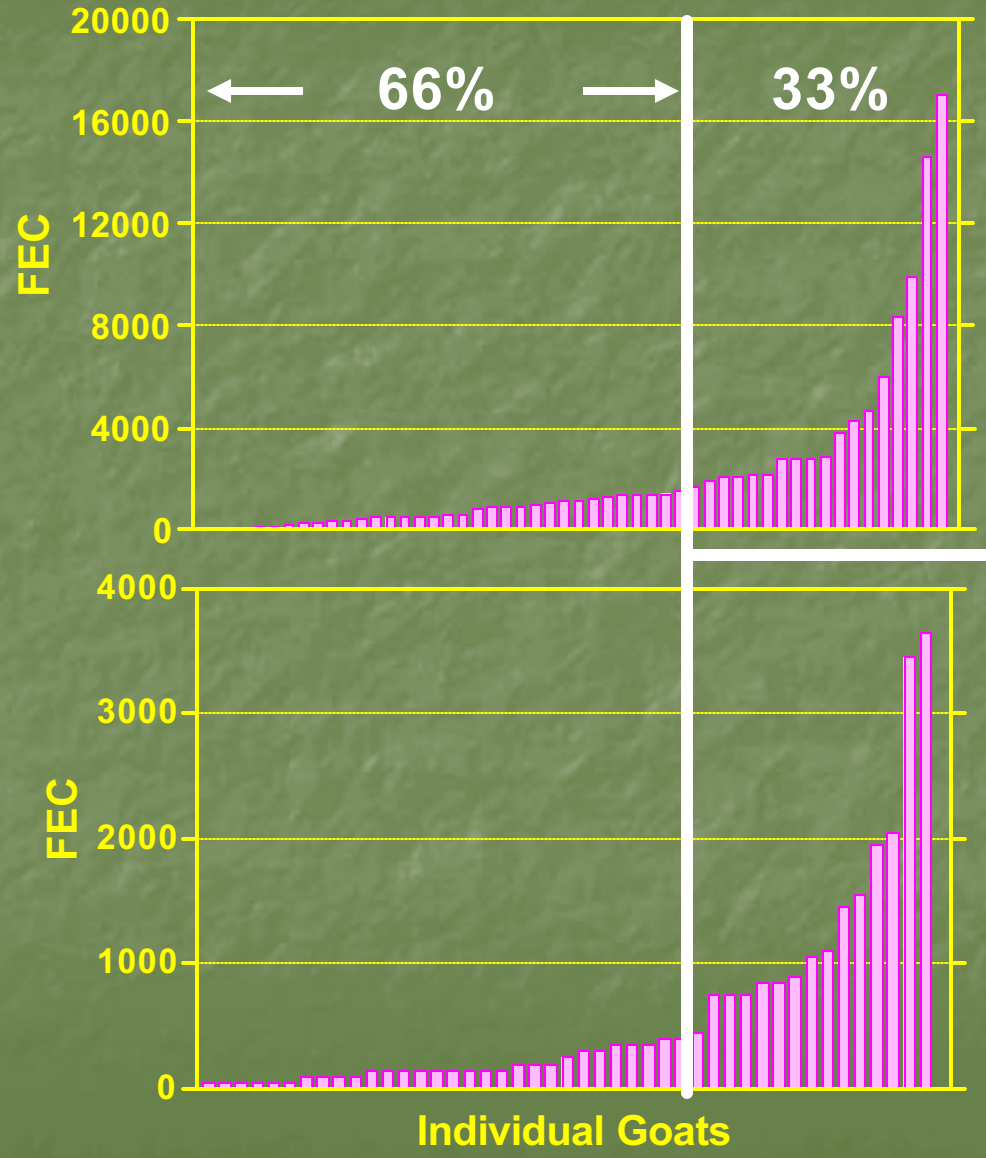
The FAMACHA© system

- 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

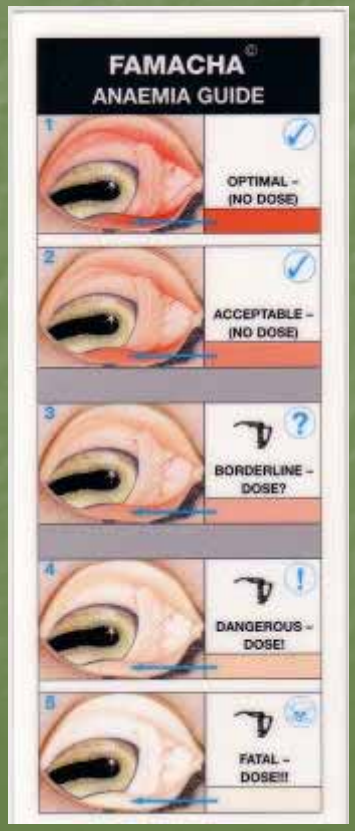
80% of Eggs

Over 1 Month: Pasture Contamination Reduced By:

5.7 Billion Eggs

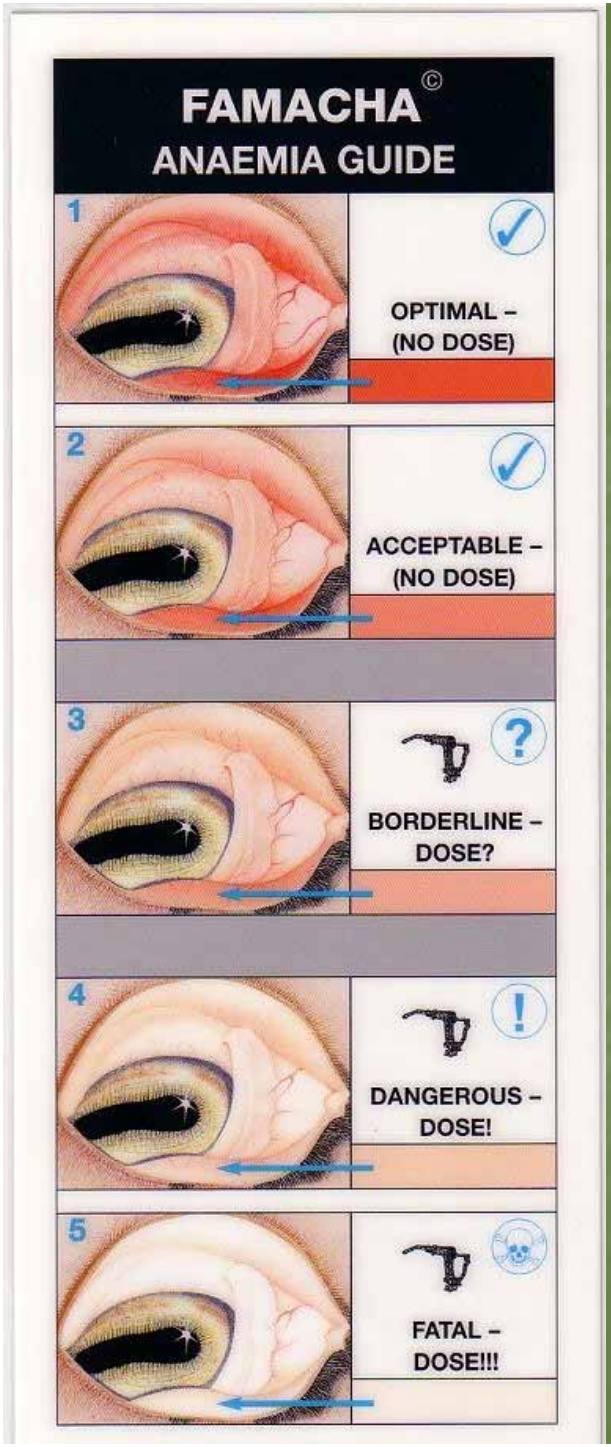
Selective Treatment

FAMACHA



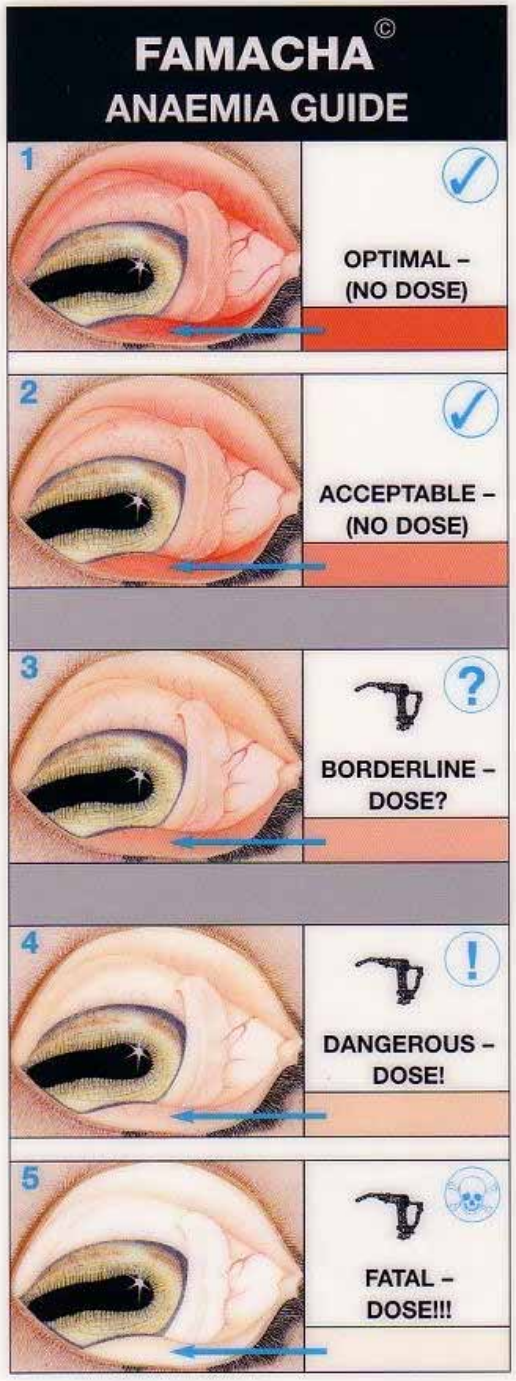
How Does FAMACHA Work ???

- 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



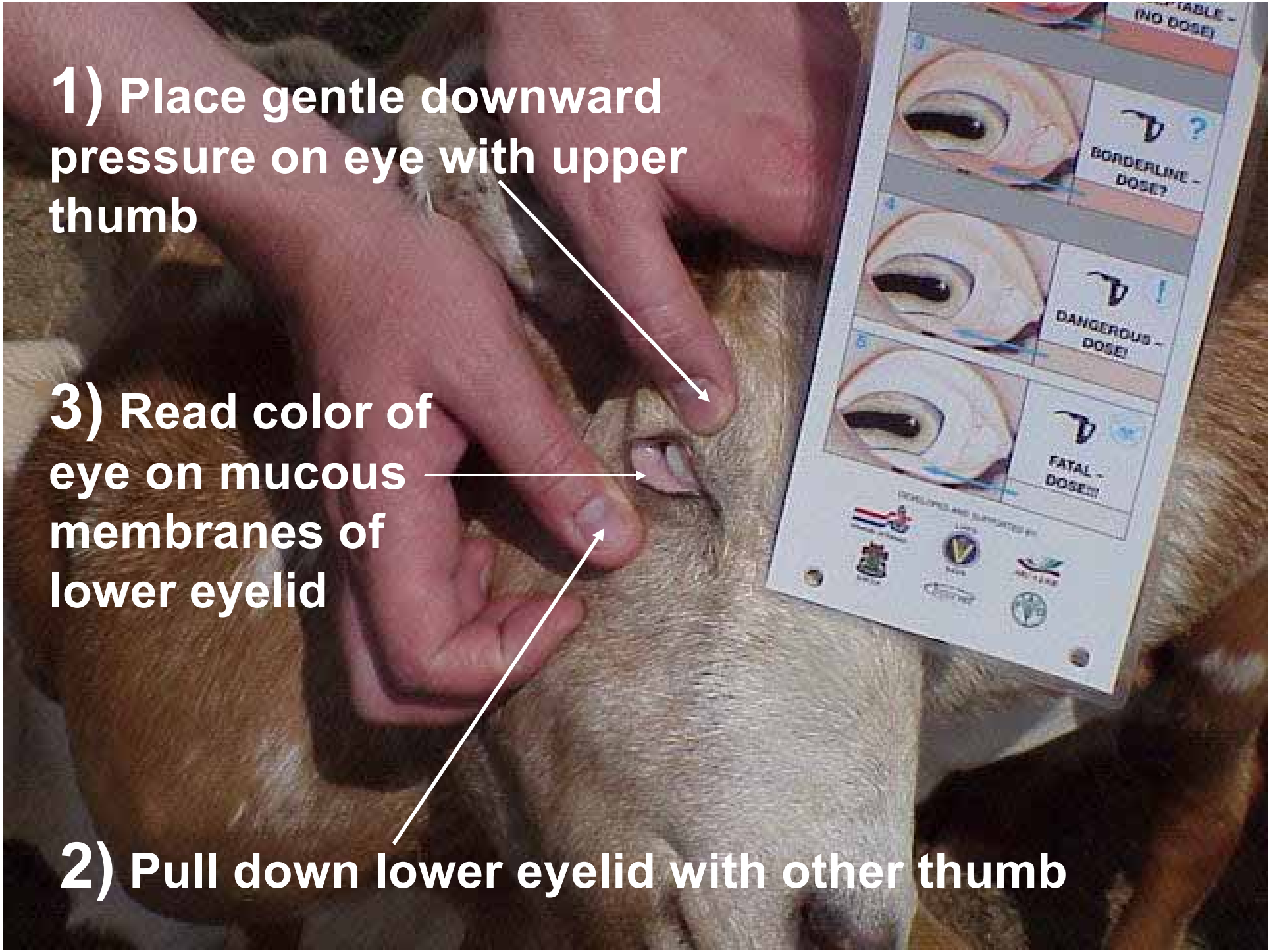
The FAMACHA© System

- 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

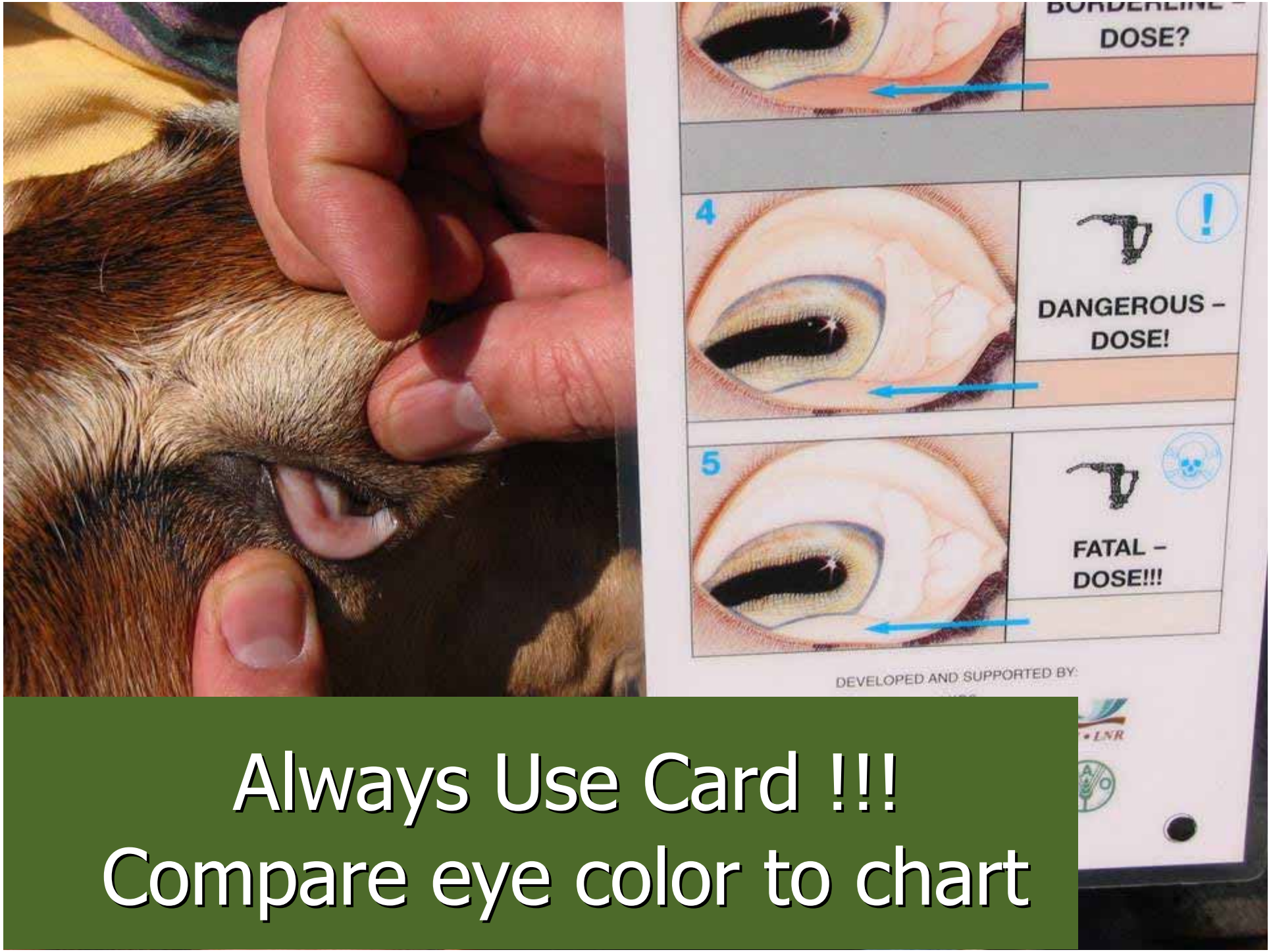


Clinical Category	Color Classification	Hematocrit range (%)
1	Red	28
2	Red-pink	23 -27
3	Pink	18 -22
4	Pink-white	13 - 17
5	White	12


DANGEROUS DOSE!
FATAL DOSE!!!


1) Place gentle downward pressure on eye with upper thumb
3) Read color of eye on mucous membranes of lower eyelid
2) Pull down lower eyelid with other thumb
BORDERLINE - DOSE?
DANGEROUS - DOSE!
FATAL - DOSE!!!

- 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