

Medical and Surgical Approaches to Common Small Ruminant Conditions

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Sick Sheep Seldom Survive

-My dad

Small Landholder Considerations

- They don't have a production calendar
- They are usually hobby or cash-flow business
 - May have lots of disposable income or very little
- Do not pay attention to / don't know about drug residues
- Independence
 - Tend to be the extremes
 - Want to "be a farmer"
- Lots of educational opportunities
- Live on the internet

NAHMS Goat Producer Survey 2009

- "Very important" or "Somewhat important" source of information
 - Other goat producers: 67.8%
 - Veterinarian or other paid consultant: 64%
 - Internet: 52.8%

NAHMS Goat Producer Survey 2019

- 49.7% consulted a DVM vs. 39.5% in 2009 survey
- Why?

- 57.9% emergencies
- 46.8% routine work
- Why not?
 - 82% No DVM needed
 - 8% Too expensive
 - 6% Local DVM doesn't know goats
 - 2% No DVM

Nutrition

- Keep it simple
 - Protein, forage, trace minerals, water
 - Intake can only be 100%
- Feed the feed and mineral that has your animal's picture on it
 - Follow the label
- What is a cup?

Guessing Weights

- Estimating feed weights
 - Estimating 1# of commercial camelid pelleted feed
 - Less than 1/3 of attendees were accurate within 0.25#
 - Veterinarians averaged 0.67# (0.25-1.25#)
 - Owner/breeders averaged 0.71# (0.13-1.75#) [Anderson, Ohio State U.]
- Estimating animal weights
 - Underestimate goat weights 65.2% of the time

- Within 10% only 36.6% of the time
- Prior livestock experience had no effect [Gibbons et al 2015]

Small Ruminants

- “CDT”
- *Clostridium perfringens* types C&D with tetanus
 - Goats achieve short-lived immunity to epsilon toxin
 - Adults: 1-2 doses/year
 - Ideally 4-6 weeks prior to start of kidding/lambing

[Uzal 1998, Blackwell et al 1983]

- Rabies
 - Sheep label

Parasite Control

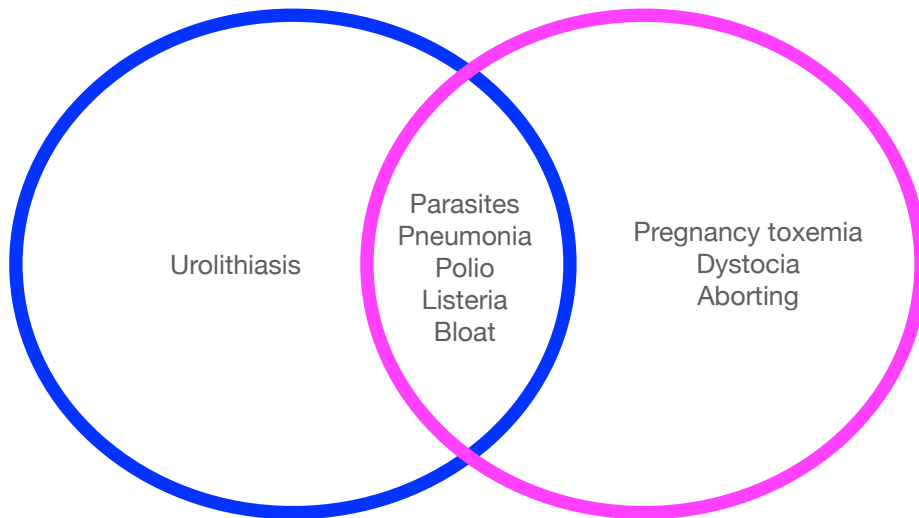
- Parasites are purchased
- Must leave some animals untreated for refugia
- Often do not have the land to rotate
- Often overstocked
- Protein and trace mineral nutrition critical
- Moving away from scheduled deworming in all species
- No reason not to be doing fecal egg counts in small herds
 - I *heartily* discourage clients from doing them themselves
- *Haemonchus* and other trichostrongyles, *Nematodirus*, coccidia
- Individual identification

- FAMACHA scoring
 - Treat 4s & 5s, plus thin 3s
- McMaster's or MiniFLOTAC EPG for sheep and goats
- Repeat q 1-2 months and *write it down*
- *Prepare client for culling of sheep and goats*
- *Drylot, rotational grazing*
- Drugs: go to wormx.info Topics -> Deworming -> Charts
- Look at non-pharmacologic control
 - Copper oxide wire boluses - effective [Schewizer et al 2016, others]
 - Nematode trapping fungi (BioWorma) - effective [Terrill et al 2004, others]
 - Lespedeza - effective [Min et al 2005, others]
 - Diatomaceous earth - no effect [Bernard et al 2009, Osweiler et al 1997, Fernandez et al 1998, McLean et al 2005]

When they get sick

Drugs and Small Ruminants

- Most drug use is extra label



- Fall under MUMS
- Use FARAD
 - Anticipate an extended withdrawal

FARAD Digest for SRs

Martin KL, et al. Extralabel drug use in small ruminants. *J Am Vet Med Assoc* 2018;253(8):1001-1009.

Discussion on medicated feeds, amprolium, ceftiofur, fenbendazole, florfenicol, flunixin, meloxicam, oxytetracycline, penicillin, tulathromycin, intramammary preparations

Other Antimicrobial Notes

- Extralabel use of **cephalosporins** in food-producing animals **prohibited** *except*:
 - Extralabel use by **indication**, when used at the **labeled dose, frequency, duration and route of administration** approved for that species and production class
 - Food-producing **minor species are excluded** [21 CFR 530]
 - Naxcel is labelled
- **Tilmicosin**

- Labelled for sheep, fatal for goats
- **Fluoroquinolones**
 - Extralabel use prohibited
- **Penicillin procaine**
 - Increased dosage from label, extended withdrawal
 - Avoid subcutaneous use
 - Conflicting data on withdrawal in sheep and goats
 - FARAD cannot recommend with confidence
 - Test milk and urine

ELDU in Feed of Small Ruminants

“...However, when there are **no approved treatment options** available and the health of animals is threatened, and suffering or death would result from failure to treat the affected animals, **extralabel use of medicated feed may be considered** for treatment of minor species. Because of the need to have therapeutic options available for treatment of minor species, and to help ensure animal safety and human food safety, FDA is issuing this revised CPG to provide guidance to FDA staff with respect to factors to consider when determining whether to take enforcement action against a veterinarian, animal producer, feed manufacturer, and/or feed distributor for the extralabel use of OTC and VFD medicated feeds in minor species. In general, the **Agency will not recommend or initiate enforcement action against the veterinarian, animal producer, feed mill, or other distributor when extralabel use is consistent with this document...**”
[CPG 615.115]

Sedation/Anesthesia - Combined IM

- Sheep - xylazine - pulmonary edema [Celly et al, 2009]
- Option 1 safer for sheep & live fetuses
 - 0.1 mg/kg butorphanol
 - 0.2 mg/kg midazolam
 - 2-4 mg/kg ketamine
- Option 2
 - 0.1 mg/kg butorphanol

- 0.1 mg/kg xylazine
- 2-4 mg/kg ketamine

Routine Local Analgesia

- Toxic dose of lidocaine is 5-10 mg/kg
- Disbudding - meloxicam 60 minutes prior
- Dehorning
 - Block 2 sites per horn
 - Follow up with NSAID
- Tail docking
 - Hot dock as babies - same as controls [Graham et al 1997]
 - Caudal epidural 20ga x 1" 0.5mL lidocaine in 3-5 day old
 - NSAID

Lumbosacral Epidurals

- C-section, urolithiasis, hindlimb fracture
- 1mL/ 15# (7kg) of 2% lidocaine

Analgesia

- Flunixin 1.1-2.2 mg/kg SID-BID
- Meloxicam 2mg/kg then 1mg/kg SID - EOD
- Morphine 0.05 - 0.1mg/kg SC q 4-6-8 hours
- Gabapentin 10-15mg/kg PO BID

Reproduction

- Lots to think about before inducing

- Goats are CL dependent throughout pregnancy
 - Dinoprost 5-10mg or cloprostenol 100ug/45kg
 - Dexamethasone 10-15mg to prepare kids
- Sheep more like cattle - move from CL to placenta
 - Dinoprost or cloprostenol
 - Dexamethasone
 - Combinations will abort/deliver in 12-24 hours
- Estrus synchronization, advanced reproductive techniques
 - Performance is not an allowable ELDU condition
- Dystocias
 - Vaginal wall is VERY THIN
- Abortions
 - Lots of zoonotic causes
 - Q fever, Chlamydia, Lepto, Listeria, Brucella, Cache Valley

Big 5 Multispecies Farm Issues

- Copper
 - Pig, poultry, horse, cattle feeds/minerals around small ruminants
- Ionophores
 - Horses, camelids
- Grains
 - Various grinds by species; acidosis, urolithiasis

- Alfalfa
 - Urolithiasis, especially in miniature breeds of goats
- Avermectin-class dewormers
 - White-footed herding breeds

Recommendations

- Go out there
- Charge by the hour
- Give them some internet sources you trust
 - Extension publications, sites, books
- Take every opportunity to teach
- Handouts, written protocols
- Herd health/vaccine reminders

When to Call The Veterinarian

- Go to LargeAnimalCE.com
- 'Courses'
- Scroll down to Course 26