

Herd Health Topics in Small Ruminants with Emphasis on Abortion Issues

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What are the problems?

- NAHMS Sheep 2001
- Diseases present (suspected or confirmed)
 - Johne's disease (1.6%)
 - Scrapie (1.2%)
 - OPP (7.1%)
 - Footrot (34.9%)
 - CL (20.4%)
 - Stomach or intestinal worms (74.0%)
 - Enterotoxemia/overeating (38.8%) – 66.9% are vaccinating nursing lambs
 - Other clostridial (11.9%)
 - Coccidiosis (30.4%)
 - Soremouth (40.0%)
 - Ringworm/Club lamb fungus (7.3%)
 - Bluetongue (4.2%)

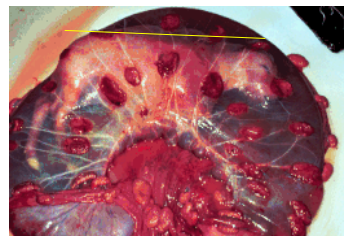
Abortion



- NAHMS 2001
 - >50.6% of all operations have had ewes abort in last 3 years
- 5% abortion rate expected, <2% excellent
- Dam may or may not be ill
- Need to submit fetus, placenta and blood from dam
 - Especially if multiples – submit all
 - Refrigerated on ice packs, not frozen
- Be prepared
 - 53% undiagnosed [Mueller et al, 2001]

Abortion – Useful Information

- When in gestation abortion occurred
 - Early, middle, late
- Fetal appearance
 - Obvious abnormalities
 - Size
- Dam health
 - Healthy or ill around time of abortion



Abortion - Causes

- Infectious: *Campylobacter*, *Chlamydia*, *Leptospira*, *Listeria*, *Toxoplasma*, Q fever, *Salmonella*, Border disease, *Brucella*, *Neospora*, *Mycoplasma*, Bluetongue, **Cache Valley**
- Dam illness, placental insufficiency, deficiencies in energy, protein, Vitamin A, phosphorus, copper, vitamin E/Se, manganese, iodine, inherited defects, teratogenic plants, stress

Abortion - Causes

- 211 goat abortions over 8 years (1991-1998)
[Mueller et al, 2001]
- 37% infectious
 - *Chlamydia psittaci*
 - *Coxiella burnetii* (Q fever)
 - These two represented 23% of all abortions
- Mineral deficiencies 4%
- Fetal anomalies 3%
- Leukoencephalomalacia 3%
 - Presumed to be from oxygen deprivation

	Fetus(es) deformed?	
	Yes	
	Dam systemically ill?	
Yes		No
BTV	Arthrogryposis?	
	Yes	No
	Cache Valley Virus	Border Disease
	Lupine	Campylobacter
	Astragalus	Veratrum
		Sudan

	Fetus(es) deformed?		
	No		
	Dam systemically ill?		
	Yes	No	
	Female jaundiced?	Fetus autolytic?	
Yes	No	Yes	No
Lepto	Listeria	Toxoplasma	Campy
	Salmonella		Chlamydia
	Brucella		Stress <small>(goats)</small>

Campylobacter

- “Vibrio”
- *Campylobacter jejuni* and *fetus*
- Reported in 8.8% of flocks, 53.7% confirmed [NAHMS Sheep 2001]
- Appears to be rare in goats
- Fetus may or not be malformed
- Dam may or may not have diarrhea
- CTC: 3 weeks prepartum or during outbreak
- Vaccine
 - Use 2-4 weeks pre-breeding
 - 15.5% of flocks vaccinate ewes [NAHMS Sheep 2001]



Chlamydia

- “Enzootic abortion”
- *Chlamydiophila abortus*, *C. psittaci*
 - Abortions reported in 8.5% of flocks, 43.6% confirmed [NAHMS Sheep 2001]
- Abortions, pinkeye
- Highly contagious
- CTC
- Sheep labelled vaccine
 - Vaccinate 60 and 30 days pre-breeding
 - Vaccinate 2-4 weeks pre-breeding thereafter
 - 7.6% of flocks vaccinate breeding ewes [NAHMS 2001]
- Zoonotic

Leptospira

- *Leptospira interrogans* several serovars
 - Dam ill, jaundiced
 - Fetus appears normally formed
- Abortions, infertility
- CTC
- Vaccine
 - Only cattle products are available
 - Very short-lived immunity
 - May use in breeding males and females
 - Prior to breeding, again at kid processing
 - 7.7% of flocks vaccinate breeding ewes [NAHMS 2001]
- Zoonotic



Listeria

- *Listeria monocytogenes*
 - Reported in 1.5% of herds, confirmed 82% [NAHMS Sheep 2001]
- Dam may or may not be ill
- Fetus usually not malformed
- CTC
- No vaccine available
- Zoonotic

Toxoplasma

- *Toxoplasma gondii*
 - Reported in 6.0% of flocks, confirmed in 26.2% [NAHMS Sheep 2001]
- May produce normal or mummified fetuses
- No treatment available
- No vaccine available
- Control cat populations
 - 74.1% of farms have outdoor cats
 - 90.1% of those farms, cats have access to stored feeds [NAHMS Sheep 2001]
- Zoonotic

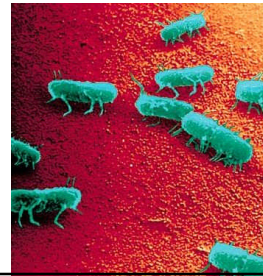


Q Fever

- *Coxiella burnetii*
 - Reported in 1.0% of flocks, 91.6% confirmed [NAHMS Sheep 2001]
- Fetus appears normal
- Dam may or may not be ill
- Agricultural fair [Sanford et al, 1994]
 - 5 goat herds with Q fever abortion storms, beginning 21 days after fair
 - 3 herds unaffected
- Environmentally resistant
- Zoonotic

Salmonella

- *Salmonella* spp.
 - Reported in 0.3% of herds, 76.8% confirmed [NAHMS Sheep 2001]
- Dam ill
- Fetus not apparently malformed
- Culture and sensitivity for treatment
- Zoonotic



Border Disease

- “The BVD of Sheep and Goats”
- Can do just about anything
- Fetus deformed

Brucellosis



- *Brucella abortus, ovis, melitensis*
 - Reportable disease to federal authorities
- Cannot detect outwardly in females
 - Females may be ill while aborting
- Bulls, rams, bucks
 - Testicles and epididymis may be enlarged
- Zoonotic

Neospora

- *Neospora caninum*
- Goat fetus report [Eleni et al, 2004]
- Case report in sheep abortion storm [Hassig et al, 2003]
 - 4/20 were *Neospora*
 - 3/20 were *Toxoplasma*
 - Also: *Chlamydia*, *P. multocida*

Mycoplasma

Bluetongue

- Fetus deformed - arthrogryposis
- Dam will be systemically ill
- Vaccine
 - Questionable efficacy
 - 0.6% of flocks vaccinate breeding ewes [NAHMS 2001]

Cache Valley Fever

- Fetus deformed – arthrogryposis
- Zoonotic
- Rare

“Other Infectious”

- Potentially includes bluetongue, Cache Valley, Border disease, Leptospirosis, Brucella, Neospora, Mycoplasma, etc.
- Reported in 5.6% of flocks, confirmed in 73.3% [NAHMS Sheep 2001]

Teratogenic Plants

- *Lupine* spp., *Astragalus* spp.
 - Deformed fetus – arthrogryposis
- *Veratrum californicum*
- Sudan grasses



Abortion – General Prevention

- Prevent exposure
 - Improve sanitation
 - Isolate aborting animals immediately
 - Decrease stocking density
 - Dispose of or *submit* all tissues
 - Quarantine of new animals
 - Depends on goals of enterprise
 - 14-30 days recommended
 - Stockyards – 4 weeks

Abortion – General Prevention

- Divide production groups
 - Separate pre- and post-partum animals
 - Separate maidens from purchased animals from mature flock
- Provide high quality feed and mineral
 - Feed off ground
 - Ensure good BCS
 - Supplemental feed for emergencies
- Limit rat, bird and cat access to animals and feed/water
 - Limit exposure to cows, hogs, dogs

Abortion – General Prevention

- Feed additives
 - Chlortetracycline
- Vaccines
 - Vaccinate 4 and 2m prepartum for *Chlamydia* and *Campylobacter*



ELDU in Feed of Small Ruminants

- **Veterinarian involvement.** Any extra-label use of medicated feed in minor species per this CPG requires involvement of a licensed veterinarian within the confines of a valid veterinarian-client-patient relationship. The veterinarian is expected to make a written recommendation for the extra-label use of medicated feed based on a recent diagnosis of an active disease for which no other drug treatment is approved.
- **Treatment only use.** Medicated feed may be considered for treatment only when the health of animals is threatened and suffering or death would result from failure to treat the affected animals.
- **No production use.** Extra-label use of medicated feed for production purposes is not allowed.
- **No feed reformulation or relabeling.** Once manufactured and labeled as approved for use in a major species, the feed cannot be either reformulated to meet nutritional needs of the intended minor species or relabeled as such.

ELDU in Feed of Small Ruminants

- **FDA Clarifies Extra-label use of medicated feed in minor species per CPG #615.11**
- May 4, 2007
- FDA's Center for Veterinary Medicine (CVM) is clarifying the Compliance Policy Guide (CPG) section 615.115 entitled, "Extra-Label Use of Medicated Feeds for Minor Species" in order to ensure proper use of medicated feed in minor species. CVM has received a number of inquiries relative to the proper use of the CPG. The inquiries have revealed some common points of confusion regarding the appropriate interpretation of the principles specified in the CPG.
- The following conditions, in addition to all other stipulations in the CPG, have to be satisfied in order to ensure proper use of medicated feed in minor species:

Abortion

- Diagnose
- Dispose
- Divide up
- Drugs



Good Management Practices

- The real goal is to reduce exposure to diseases
- Navel care and colostrum
 - Dip navels as soon as possible after birth
 - 10% of body weight in first 12-24 hours (1.5-2oz/1# body weight)
- Appropriate stocking density
 - Usually no more than 6-8 adults/acre

Good Management Practices

- Sanitation
 - Feed and water tubs, pens
 - Drainage of lots, foot trimming
 - Wounds
- Quarantine of new animals
 - Depends on goals of enterprise
 - Usually 14-30 days recommended
 - Check them last daily

Good Management Practices

- Separation of animal classes
 - Newborns and feeder animals
 - Pregnant animals and those with young
- Proper nutrition
 - Forage, protein, energy
 - Trace minerals