

Skin and Foot Diseases of Small Ruminants



Fiber Conference –
November 9, 2019

Learning issues



- to review the various nutritional, parasitic, bacterial, fungal, viral, and environmental skin diseases of sheep and goats
- to consider problems associated with shearing
- to address footrot, white line abscesses, and foot problems associated with over-feeding

Protein deficiency

- inadequate dietary protein leads to finer fiber and
 - slower growth/lower body weight
 - fewer hair follicles, lower fiber yield
 - poor immunity against diseases and parasites



Sulfur deficiency

- sulfur-containing amino acids, methionine and cysteine
- needed to make keratin
- can supply as inorganic sulfur if adequate energy and nitrogen in diet
- rapeseed and fish meal possible rumen bypass sources

Zinc

- trace mineral
- need ~50 ppm in diet but calcium interferes
- males need more zinc than females do

Zinc deficiency

- excess calcium or deficient zinc
- wethers and pets on lactating goat rations
- greasy, matted hair, deformed hooves
- thick crusts on pasterns, teats, face
- skin biopsy for hyperkeratosis and parakeratosis
- test with serum zinc – collect in trace mineral tube: serum Zn < 0.8 ppm



Zinc deficiency

- diagnosis also made by response to therapy
- avoid excess calcium
- genetic susceptibility
- feed supplement like TruCare Z/M



Copper deficiency

- may cause enzootic ataxia, anemia, poor immune function (parasites, mastitis), hair and wool changes, low fertility or stillbirths
- goats need more than sheep
- molybdenum and sulfur interfere
- Cu:Mo 6:1 to 10:1

Color and crimp

Before copper



After copper





Copper toxicity – fatal, especially sheep

Iodine

- deficient in NE, Great Lakes, Rockies
- consume more if close grazing (soil)
- goiters and stillbirths, lower viability



Iodine deficiency



Don't confuse w/ ectopic thymus

- prominent in well fed lambs and kids
- thymomas occur in old goats



Wool break from starvation or parasites



Wool break after grain overload



Wool slip

- housed sheep in winter
- shorn, then shed the stubble



Parasitic skin diseases

- lice and keds
- demodectic mange
- chorioptic mange
- sarcoptic mange
- ticks
- flystrike

Clinical signs

- pruritus - itchy
- rub, scratch, chew
- ragged fleece
- scratch at ears
- crusts
- nodules in skin
- anemia



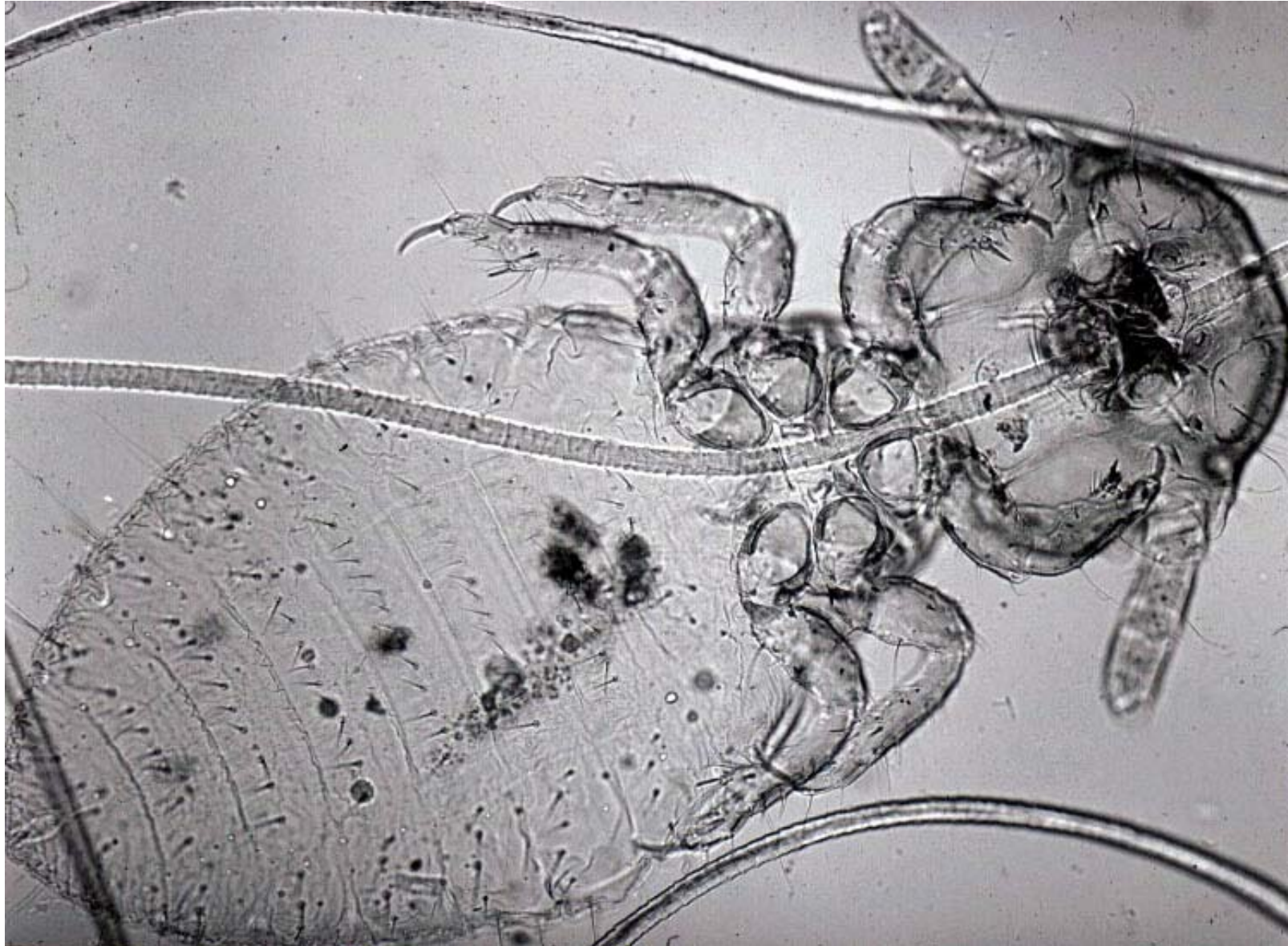
Lice and keds



Louse infestation



Bovicola (Damalinia) – biting louse







Linognathus sucking louse



Sucking lice can kill Angoras



Melophagus ked ("sheep tick")

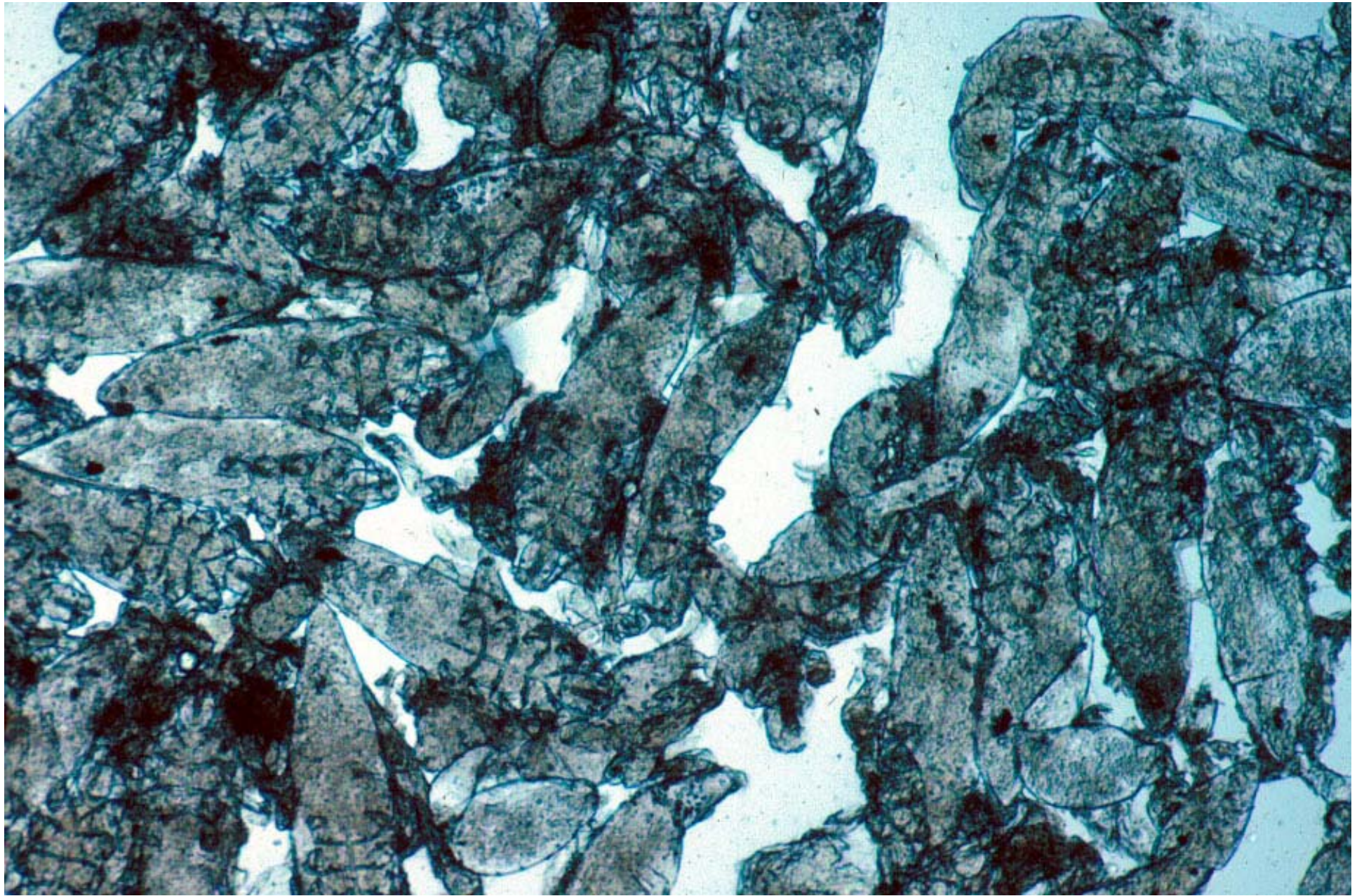




Demodectic mange

- *Demodex ovis*
- *Demodex caprae*
- cigar-shaped mites
- distend hair follicles – pea sized
- occasionally generalize
- topical amitraz, systemic avermectins





Chorioptic mange

- *Chorioptes ovis*
- *Chorioptes caprae*
- host specific according to some
- surface dwelling
- papules, crusts, erythema, alopecia
- lower limbs, scrotum, perineum
- lime sulfur, repeated eprinomectin or permethrin

Chorioptes on goat pastern



Diagnose mites from pedicels on pretarsi



Sarcoptic mange

- *Sarcoptes scabiei* in goats
- very pruritic
- head, then generalized
- hyperkeratosis, alopecia, crusting, fissures
- deep scrapings
- ivermectin subcut, eprinomectin orally



Sarcoptes mites

might come from pigs

Long, unjointed
pedicels





Ticks

- make small crusty lumps in the skin
- may find central sore where tick was or still is



Flystrike - Myiasis





Clip or shear around wounds

Clean area with dilute pine oil solution

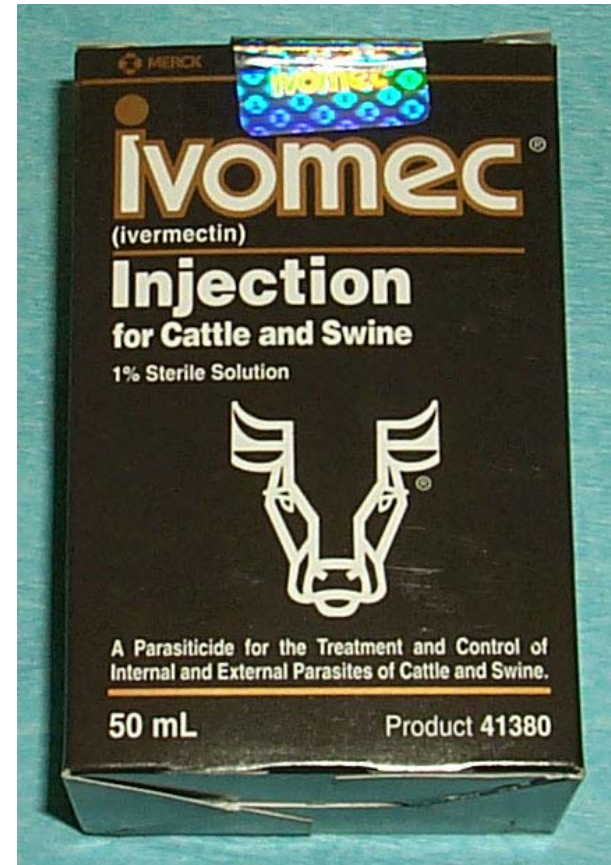
Apply permethrin

Antibiotics if much damaged skin

Dock lamb tails!

Treatment of external parasites

- shearing
- ivermectin if suck blood or burrow, nondairy animal
- goats 150-200% of sheep dose
- Eprinex® (dairy)
- permethrins – no milk WD
- flea powders
- lime sulfur



Most off label – involve your vet!

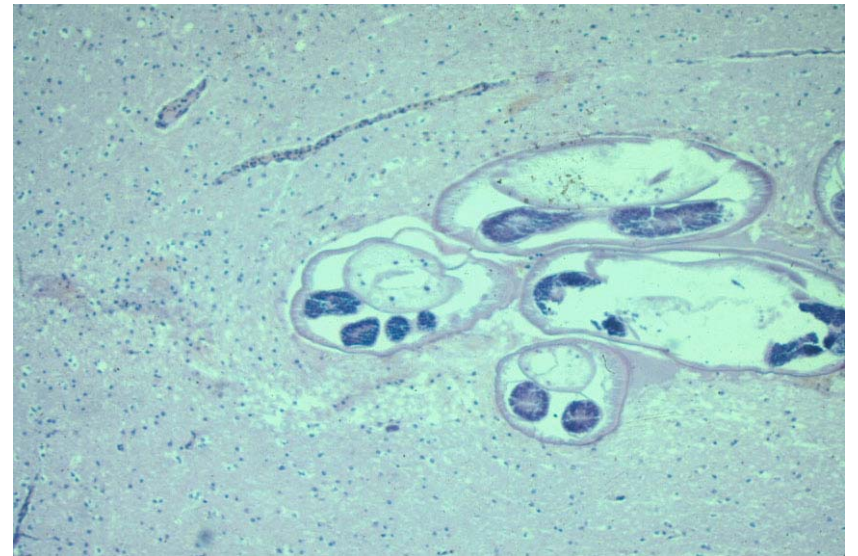
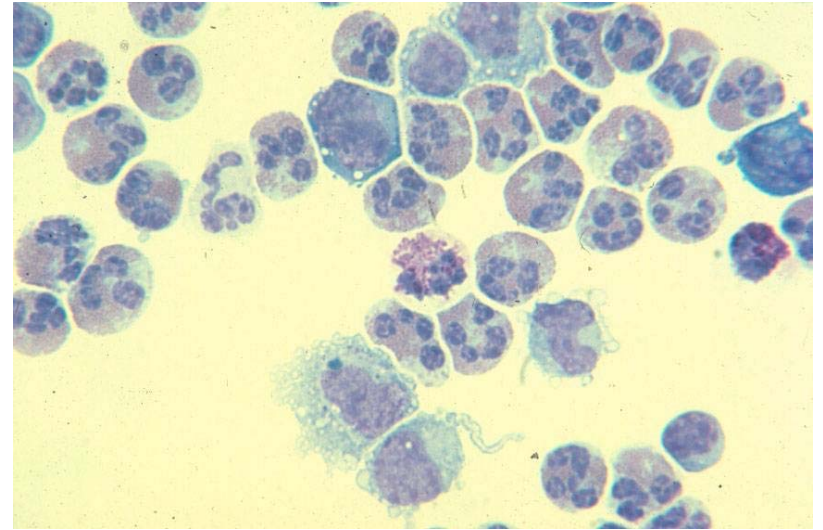


Backliner for louse control – off shears



P. tenuis skin lesions

- meningeal worm of the whitetail deer
- life cycle includes snail and slug intermediate hosts
- sheep and goats eat the snails
- spinal cord or brain signs
- some develop pruritus over single dermatomes







Treatment of *P. tenuis* in sheep and goats

- no controlled studies
- escalation of drug dosages
- ivermectin 0.3 to 1.0 mg/kg for 1-5 d
- fenbendazole 25 to 50 mg/kg for 1-5 d
- previously both simultaneously, less use of ivermectin now

Treatment of *P. tenuis* in sheep and goats

- anti-inflammatory drugs important
- corticosteroids if not pregnant:
dexamethasone 0.1 – 0.2 mg/kg daily for 3-5 d
- flunixin 1 mg/kg s.i.d. or b.i.d. for 3 d if pregnant
- beware meat withdrawals! - ~ 3 months

Staphylococcal dermatitis

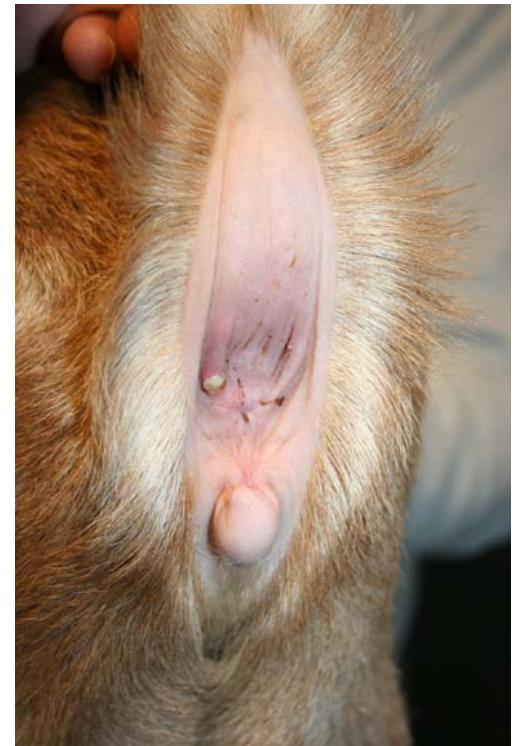
- coagulase positive hemolytic Staphylococci
- periorbital eczema in sheep
- udder lesions or generalized on goats
- *Staph aureus* secondarily infects any skin lesion on a sheep or goat
- systemic antibiotics if severe or generalized – penicillin or oxytetracycline 10 d
- Involve your vet to get correct diagnosis





Staphylococcal folliculitis

- transient pustules on lips, perineum, underside of tail of young animals
- follicular infection with hemolytic Staph
- cleanse, apply ointment (or maybe not – keeps skin too moist)



Dermatophilosis

- *Dermatophilus congolensis*
- crusty dermatitis where skin damaged by wet conditions
- “lumpy wool” in sheep
- “rain rot” like lesions in goats
- ears, lips, feet
- may be complicated by sore mouth virus





Dermatophilosis

- Gram stain of undersurface of fresh scabs for railroad tracks
- oxytetracycline
- lime sulfur
- drier environment
- zoonotic



Ringworm

- *Trichophyton* or *Microsporum*
- "club lamb fungus"
- show lambs after close shearing and frequent bathing
- circular, raised, moist to crusty lesions
- lime sulfur or 0.5% chlorhexidine or Lamisil athlete's foot
- clean pens and equipment with bleach



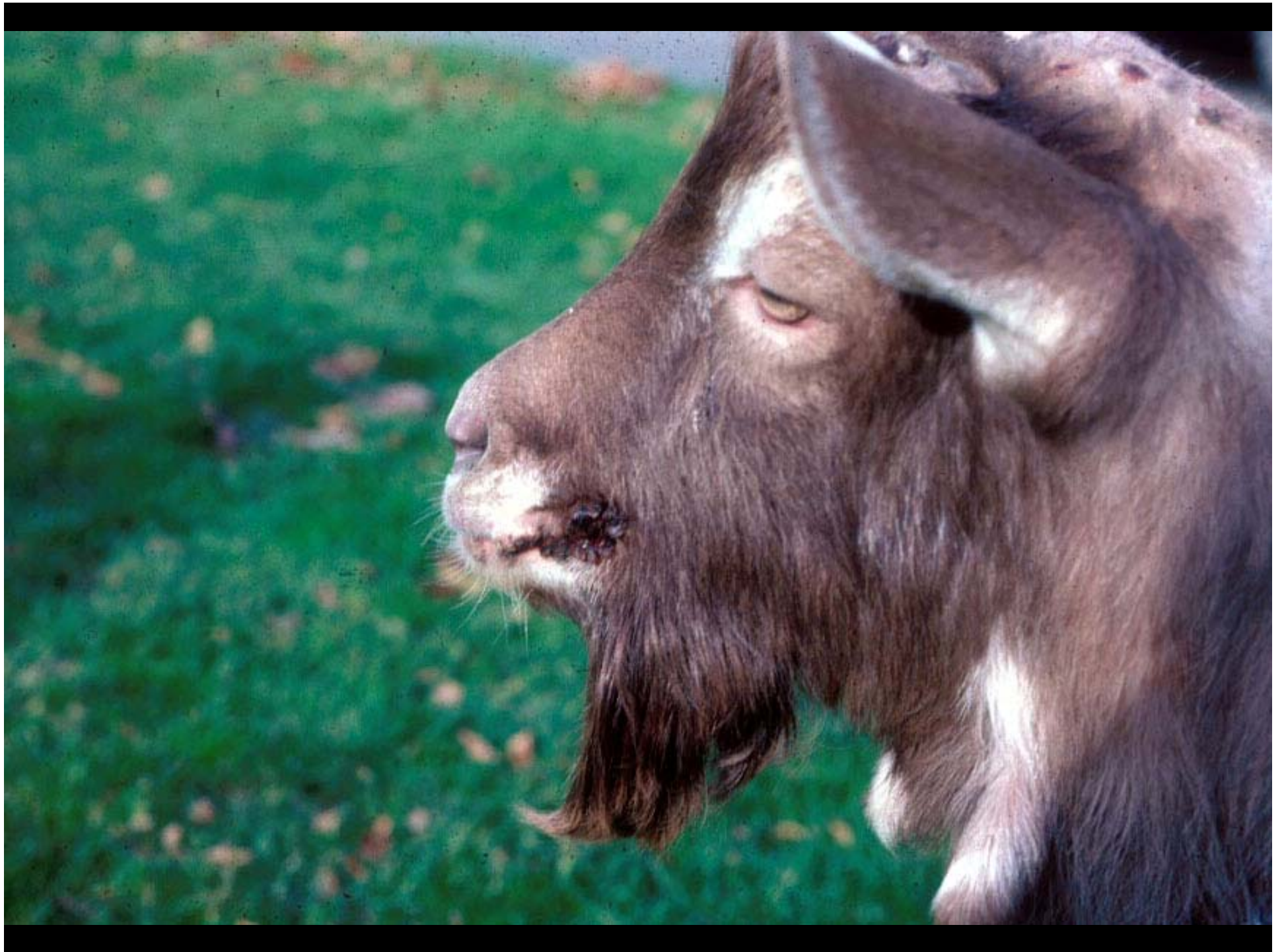
Photos courtesy of
Suelee Robbe-Austerman





Soremouth, orf, contagious ecthyma







Sore mouth - Clinical signs

- papules
- pustules
- crusts and scabs
- lips, face
- scrotum
- teats
- persist 4-5 weeks





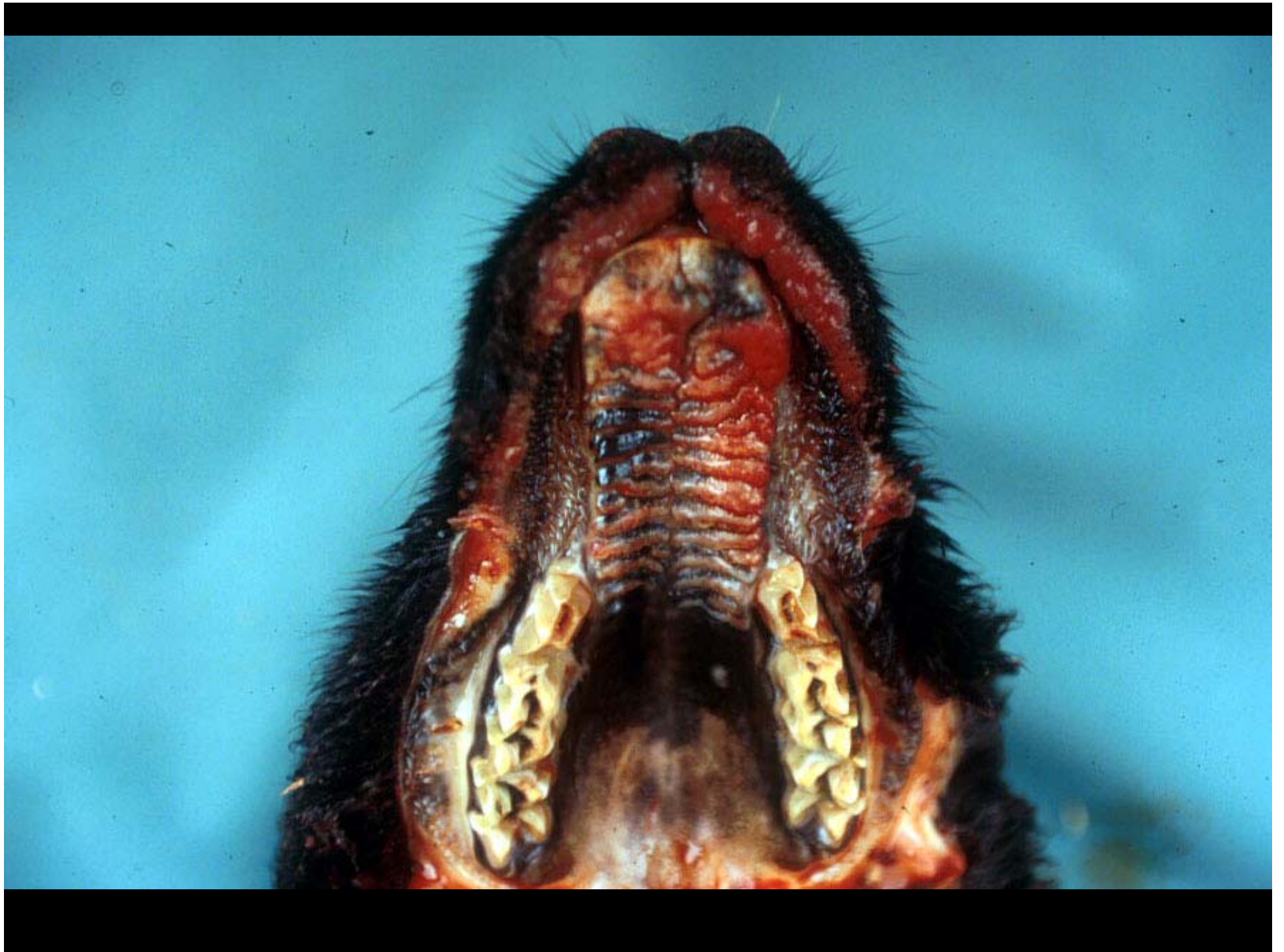
This doe needs antibiotics and a soft diet!

Clinical signs

- most serious on teat ends - mastitis
- starvation of kids
- lesions inside mouth









Note enlarged lymph node

Sore mouth treatment

- usually not needed
- systemic AB if internal mouth lesions or teats
- maybe WD-40
- **Zoonotic!!**
- wear gloves



Persistent orf in Boers



Is persistence due to a different virus strain or a genetic difference in the goat?





Laboratory testing: soresmouth

- usually not needed
- scabs for immunofluorescence
- PCR on scabs (new)
- serology documents exposure



Prevention and Exclusion

- closed herd
- inapparent carriers
- fomites
- pens at show
- vaccination if showing or endemic
- Colorado Serum Co & Texas vaccines
- autogenous (add AB)



Vaccination introduces disease to farm



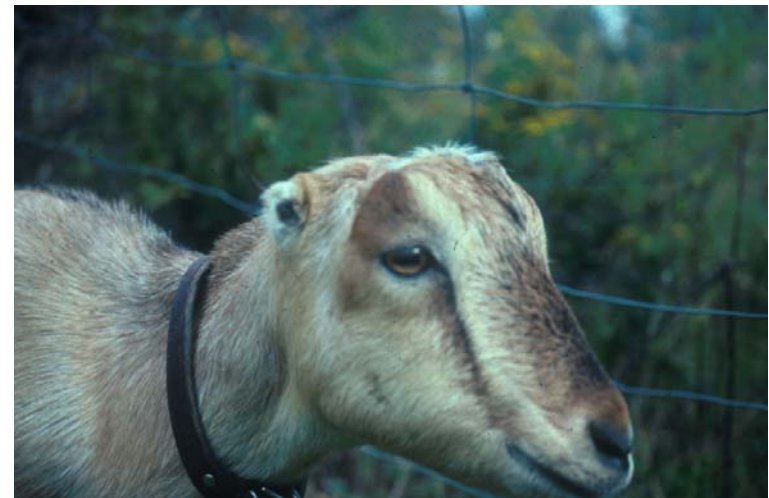


Sore mouth vaccine
"take" on underside
of tail

Avoid inside of thigh
in lactating animals

Frostbite

- ears shortened because not dried soon enough in winter
- not a LaMancha!



Photosensitization

- photodynamic agent in blood
- preformed toxin = primary
- phylloerythrin from liver disease = secondary
- remove from sun and poisonous plants





Sunburn



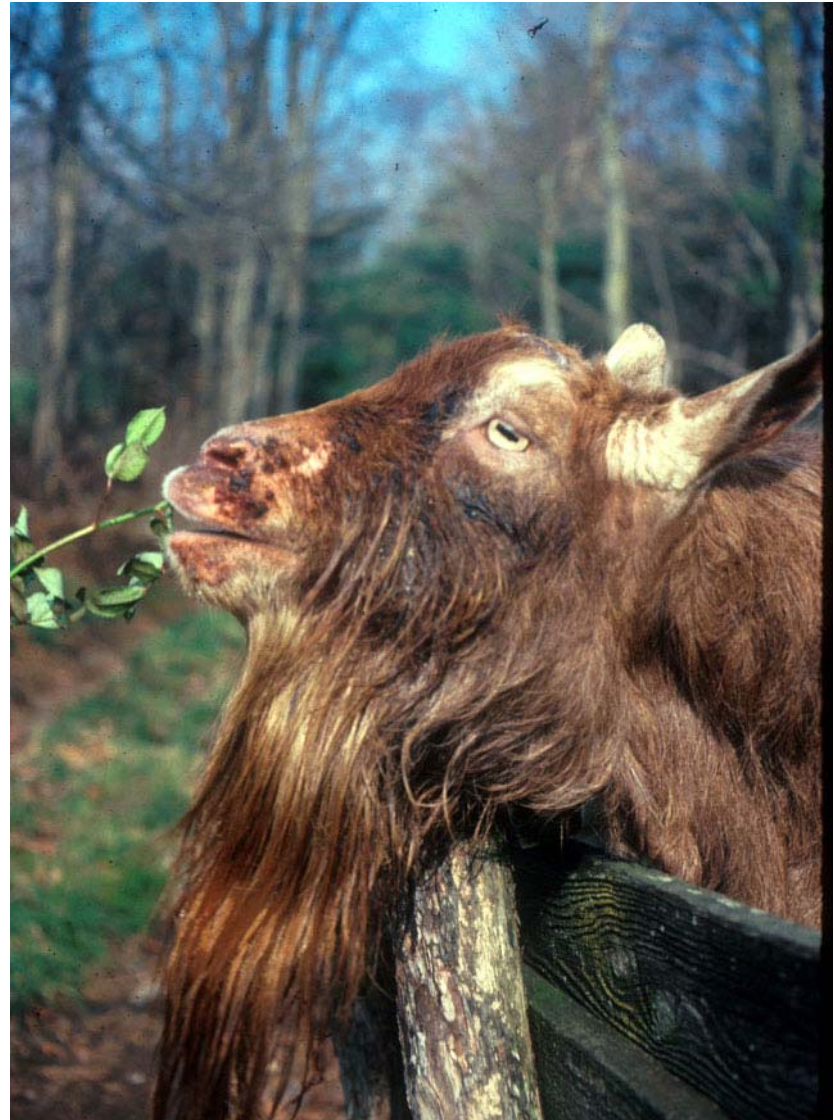
Warts, Papillomas

- warts on face of young goats benign
- contagious and serious on udder of light-skinned Saanens
- may regress, reappear next lactation, transform into squamous cell carcinomas
- mastitis, flystrike



Urine Scald

- bucks in the breeding season
- face and front legs
- bag balm



Shearing problems

- finding a shearer for Cashmere, Angora goats
- treat shearer well, coordinate flocks
- explain need to shear if sell animal
- skin nicks
- introduction of diseases on shearer or equipment – caseous lymphadenitis, footrot



Foot Rot



Etiology

- synergistic anaerobes
- *Dichelobacter nodosus* survives maximum of 7 (4) days on pasture
- *Fusobacterium necrophorum*
- skin damage from water maceration
- transmission if warm ($>10\text{ }^{\circ}\text{C}$) and wet
- infections persist in winter

Clinical signs – Virulent foot rot

- interdigital dermatitis
- break in skin-horn junction axially
- sole undermined
- foul odor
- misshapen foot
- grazes on knees
- maggots





Clinical signs – Benign foot scald

- nonprogressive
- remains interdigital
- less lame
- mild strains
- resistant breeds
- drier conditions
- benign and virulent strains remain interdigital in goats



Clinical diagnosis

- tip up, lightly trim and examine all 4 feet
- separate into infected and uninfected bands
- recheck "clean" sheep frequently

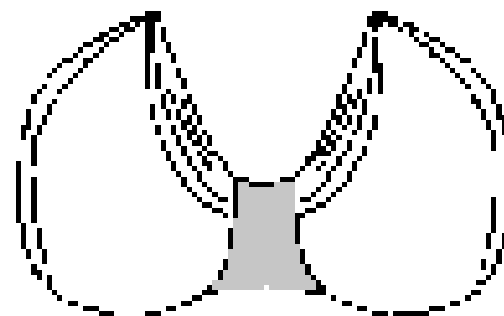




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1



2



3



4



5

Treatment

- foot trim may be harmful!
- foot bath 10% zinc sulfate weekly
- add wetting agent
- one hour soaks
- systemic oxytetracycline
- control in wet season
- eradicate in dry season - trailermycin

J Vet Intern Med 24:420-4255, 2010

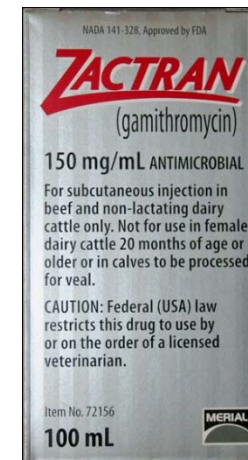


Herd Eradication

- 5 point Plan from the UK – Cull, Quarantine, Treat, Avoid exposure, Vaccinate
- herd treatment with macrolides from Europe
- single injection of gamithromycin (Zactran) at 2 cc per 110 pounds SC – meat WD?
- tulathromycin (Draxxin)? approved in Canada at 2.5 mg/kg (6 mg/kg better)



<http://www.fwi.co.uk/livestock>



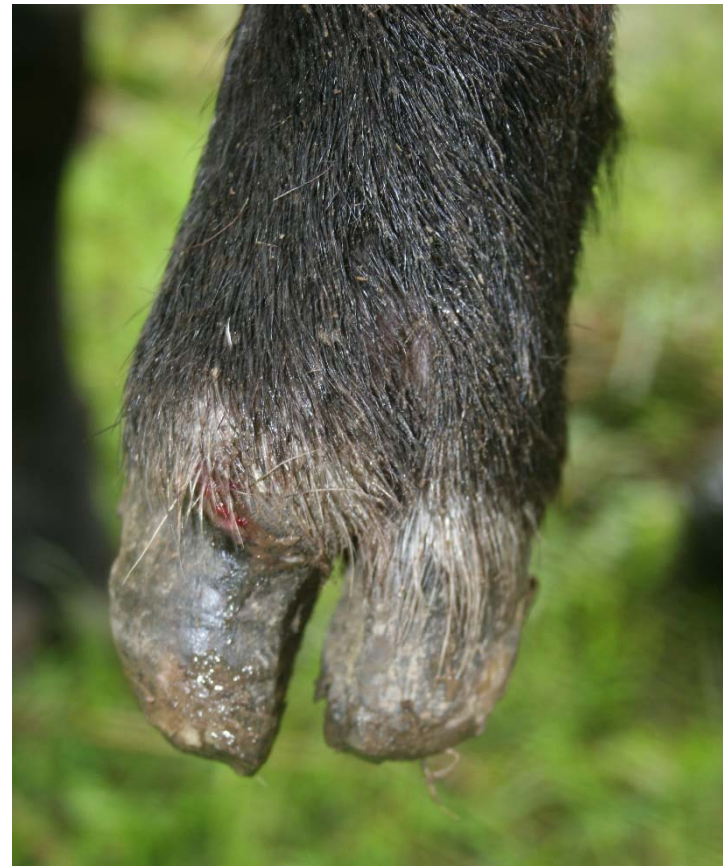
Prevention and Exclusion

- do not buy!
- quarantine 4 weeks
- trim, treat as if infected (oxytet)
- run with small band for first wet season
- sterilize trimmers
- cull chronics, deformed feet
- no vaccine available



White line abscess, toe abscess

- infection enters through puncture of sole or damaged white line
- acutely very lame
- one foot
- breaks at top of claw



Laminitis

- long blocky foot
- wall separation – must trim to top of crack



