

External & Internal Parasites of Beef Cattle

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- Pictures and mention of specific brands/trade names are for informational purposes only, and does not imply PVAMU's endorsement of any particular product.
- Product images from ValleyVet.com
- Parasite images, if uncredited, taken from Wikipedia.org



“No man is an island...”

No problem has an isolated cause!

- NUTRITION
- Housing/Shelter
- Sanitation
- Exercise/handling
- PREVENTION



Photo: Jamie Matzek

“Management” means...

- Program of work
 - When breed?
 - When sell? (bull vs. steer calves, etc.)
 - What to sell/what to keep? (heifers, feeder steers, “angry cows”, etc.)
- Vaccination program
 - What use, when give, how often?
- Nutrition program
 - What/When plant at different times of year?
 - When/How to supplement?
- Parasite strategy
 - Deworming
 - Fly control
 - Tick, lice, mite control



Don't assume everything is worms!

Diarrhea, skinny, poor-doers does not automatically means worms...

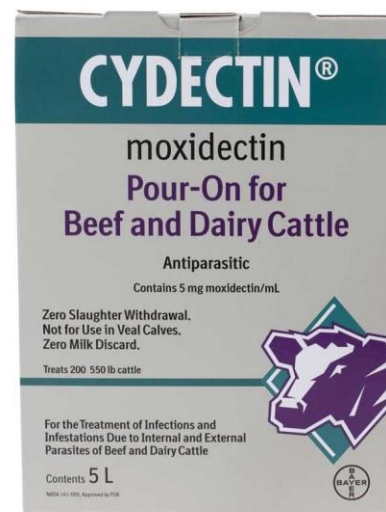


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External Parasites

- Flies
- Ticks
- Lice
- Mites



Flies

Biting

- Stable fly (legs, body, back)
- Horn fly (back, body)
- Black fly
- Horse fly



Image: www.newyorkupstate.com

Carrion/wounds

- Blow fly
- Screwworm (reportable)
- House fly



Image: www.grainews.ca

Burrowing

- Heel fly (cattle grub)



Image: vet.k-state.edu

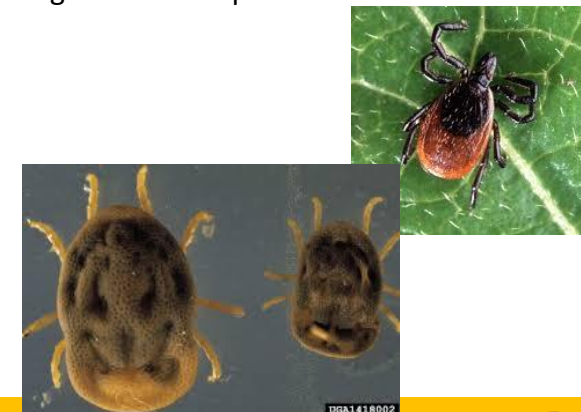
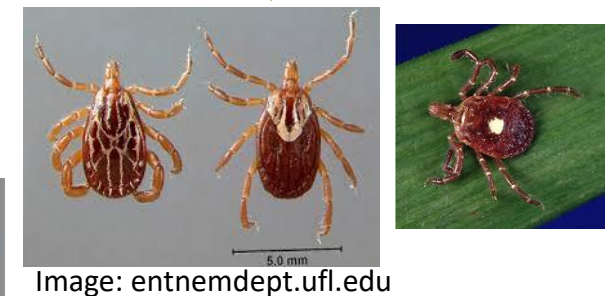
Control

- Keep animals away from manure/carcasses
 - Clean barns (remove waste and spilled feed)
 - Rotate pastures before heavily contaminated with feces
 - Remove dead animals, or isolate from others, in pasture
- Maintain environment to minimize cuts/wounds
 - Check for broken fencing, old posts, barbed wire, stray metal, etc.
- Chemicals:
 - Ear tags (apply to both ears)
 - Sprays, Pour-ons
 - Pesticide dust (back rubs, bags)
 - Minerals, Boluses (feed-through - disrupt maggot development in manure)



Ticks

- *Rhipicephalus (Boophilus) annulatus*, *R. microplus*
 - Transmit Texas Cattle Fever (protozoan *Babesia bigemina*)
- *Amblyomma americanum*, *A. maculatum* – **spring, summer, fall**
 - Transmits anaplasmosis, damages cattle hides
- *Dermacenter albipictus* - **winter & late fall**
 - heavy infestation leads to anemia, death
- *Ixodes scapularis* – **spring & winter**
 - Transmit Lyme Disease
- Ear tick - *Otobius megnini*
 - Lives in ear canal, causes discharge, pain, ear infections



Control

- Clear heavy brush and dense vegetation
- Dips
 - Vat dipping most effective for treating Cattle Fever ticks
- Sprays (must wet animal thoroughly)
- Ear tags effective against ear ticks
- Manual removal (livestock and humans!)
 - Grasp body with fingers, apply firm, gentle traction backwards until released



Eartags	Pour-on	Sprays
<u>CyLence Ultra</u>	<u>Permethrin S (Synergized Insecticide)</u>	<u>Co-Ral Fly and tick spray</u>
<u>Corathon</u>	<u>Atroban Delice Pour-on Insecticide</u>	<u>Catron IV</u>
<u>Dominator</u>	<u>Permethrin CDS Pour-on Insecticide</u>	<u>Permethrin II Spray Insecticide</u>
<u>Patriot</u>	<u>BRUTE Pour-on</u>	<u>GardStar 40% EC Livestock and Premise Insecticide</u>
<u>Double Barrel VP</u>	<u>Boss Pour-on Insecticide</u>	<u>Atroban 11% EC Insecticidal Spray</u>
<u>XP 820</u>	<u>Permethrin 1% pour-on cattle and sheep insecticide</u>	<u>Fly-Rid Plus</u>
<u>PYthon</u>		<u>Tengard SFR</u>
<u>PYthon MAGNUM</u>		
<u>WARRIOR</u>		
<u>Optimizer</u>	Source: "Livestock Veterinary Entomology" https://livestockvetento.tamu.edu/tick-insecticides/	
<u>GardStar Plus</u>		

Mites & Lice

- Lice are species-specific – one type of animal
 - 4 species suck blood
 - *Bovicola bovis* feeds on hair and skin
- Mites are equal-opportunists – burrow into skin, cause mange
 - *Demodex bovis*
 - *Sarcoptes scabiei*, *Psoroptes bovis*, *Chorioptes bovis* – REPORTABLE
- Symptoms: Itching/scratching, hair loss, dermatitis, allergic reactions, lumps under skin, nodules/pustules
 - Lead to anemia, weight loss, decreased milk production, damaged hide
 - Some mites serve as intermediate hosts for tapeworms



Image: www.beefmagazine.com

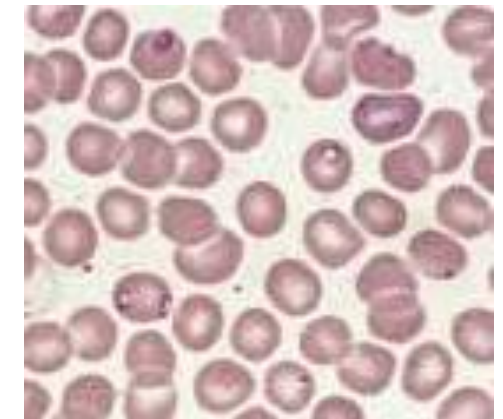
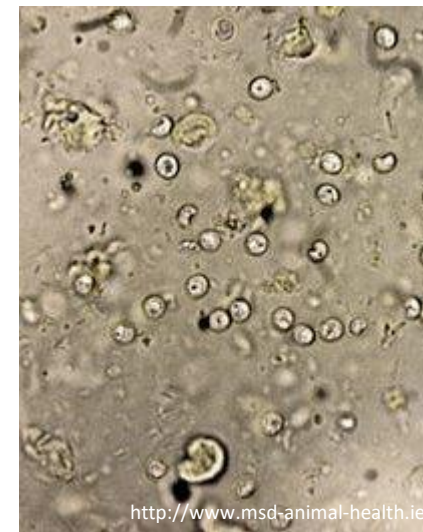
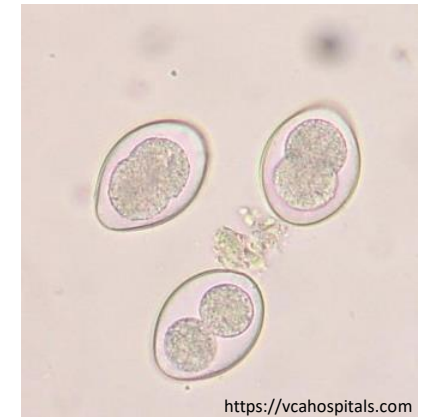
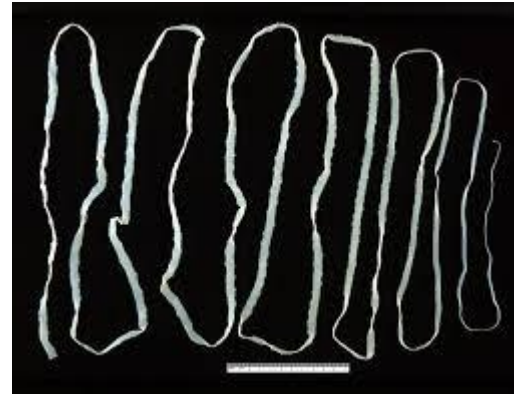
Control & Treatment

- Maintain clean environment
- Avoid overcrowding
- Cull heavily-infested animals
 - source of infection to others
- Lice - systemic pour-ons, injectables, and oral products are effective treatments; dusts, powders and dips may require multiple applications
- Mites – acaricide compounds (e.g., permethrins)




Internal Parasites

- Roundworms
- Tapeworms
- Flatworms (flukes)
- Protozoa
 - Blood (e.g., Babesia)
 - Gastrointestinal
 - *Coccidia* spp., *Eimeria* spp.
 - *Cryptosporidium parvum*
 - Reproductive
 - *Neospora caninum*
 - *Tritrichomonas foetus*



Other causes of “poor doing”

- External Parasites
- Malnutrition
- Pneumonia
- Mastitis
- Footrot
- Grain overload (acidosis)
- Bovine Viral Diarrhea PI cattle
- Johne’s Disease



Run a
fecal!

Roundworms

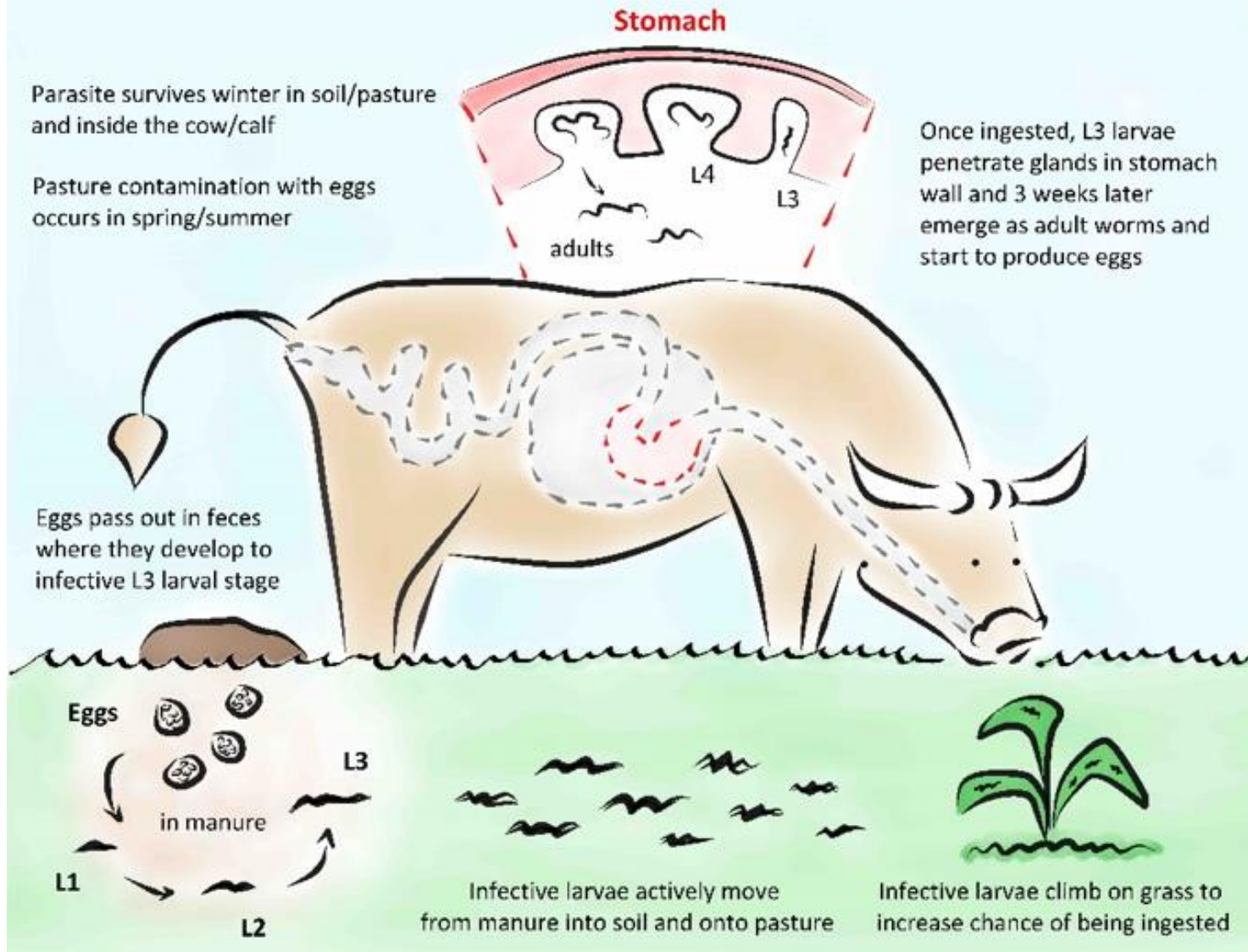
- *Haemonchus placei*, *H. smilis*.
- *Ostertagia ostertagii*,
 - Undergoes “hypobiosis”
→ hibernation inside animal
- *Trichostrongylus* spp.
- *Cooperia punctate*, *C. oncophora*
- *Nematodirus* spp.
- *Bunostomum* spp.
- *Strongyloides* spp.
- *Oesophagostomum radiatum*
- *Trichuris discolor*



(Photo: cal.vet.upenn.edu)

Fecal exam does not differentiate!

Life Cycle of the Cattle Gastrointestinal Parasite *Ostertagia ostertagi*



Illustrated by Matilde Tomaselli

Image: <https://www.beefresearch.ca/research-topic.cfm/internal-parasites-50>

Treatment & Control

- **Timing matters** – deworm when:
 - coming out of “hibernation”
 - point of life cycle in animal (L3-L4 stage)
- **Do NOT** rotate dewormers – promotes drug resistance
 - Use one until it stops being effective, then switch **classes**
- Check fecal 10-14 days after treatment to make sure dewormer is effective
 - Best strategic use of fecal exam
 - <85% kill rate indicates resistance; <65% kill rate is severe resistance



Drug classes

- Benzimidazides
 - “white dewormers” – fenbendazole, albendazole
 - e.g., Safeguard[®], Panacur[®], Valbazen[®]
- Macrocyclic lactones
 - ivermectin, moxidectin, eprinomectin
 - e.g., Ivomec[®], Cydectin[®], Eprinex[®]
- Imidazothiazoles
 - Levamisole
 - e.g., Prohibit[®], LevaMed[™]
- Avoid using “long-acting” formulations – promote resistance



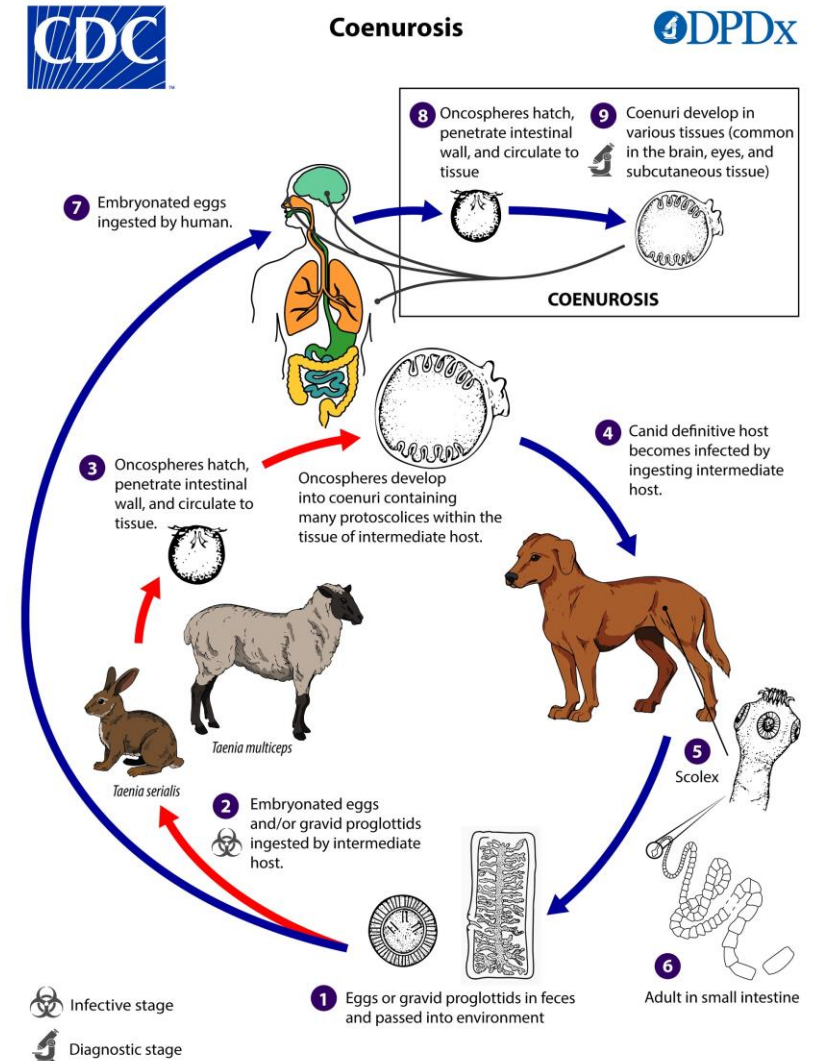
Tapeworms

- *Moniezia benedeni*
- Pastured cattle, calves more likely affected
- Poor gain, emaciation, possible death

- *Taenia hydatigea* (“coenurosis”) – dogs & wild carnivores spread
 - Canid sheds eggs, cow eats eggs, embryo burrows into intestines to bloodstream, large “bladder” of eggs develops in abdominal cavity
 - +/- Dullness, fever, loss of appetite, death in cattle (intermediate host)
- *Taenia saginata* – spread through human feces,
 - Human sheds eggs, cow eats eggs, embryo translocates and encysts in cow muscles (intermediate host), human eats beef (definitive host)
- ZOOONOTIC

Control & Treatment

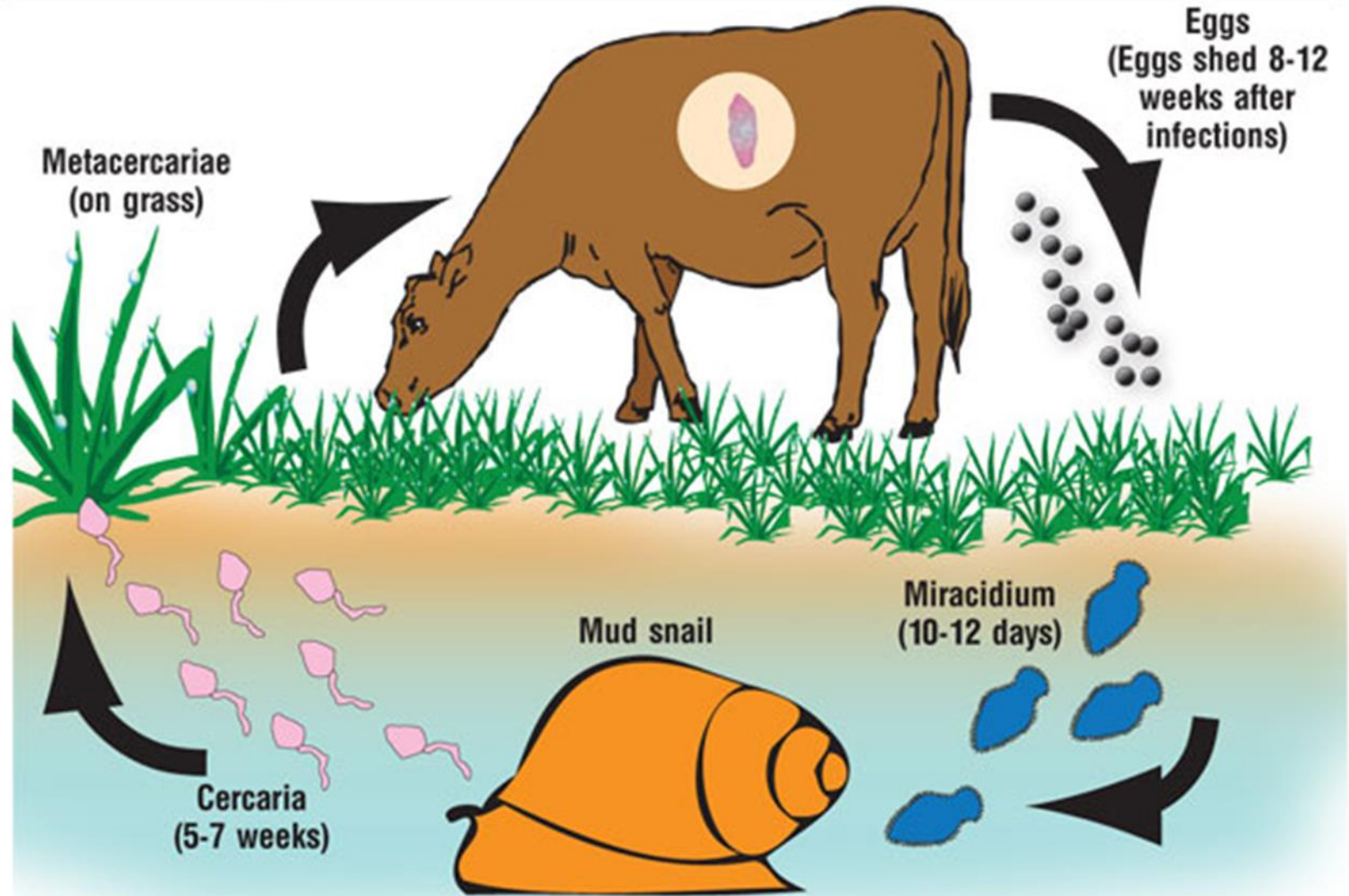
- Fenbendazole, albendazole
- Use 2x labeled dose
- Coenurosis
 - Deworm your working dogs!!
 - Praziquantel
 - Don't let them eat dead carcasses in fields



Flukes

- *Fasciola hepatica*
- *Fasciola magna*
- Adults live in bile ducts
- 2-3 mo!! to mature
- Anemia, weak, poor weight gain

Figure 1. Life cycle of liver flukes

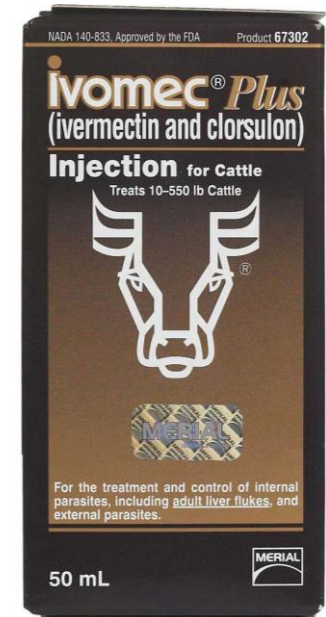


Source: National Animal Disease Information Service (UK)

Image from: <https://www.beefmagazine.com/health/liver-flukes-expand-range-26-states>

Control & Treatment

- Transmission mainly February through July
 - Pasture contaminated for 2 months after grazed!
- Timing: when fluke is in animal
 - Clorsulon (Curatrem[®])
 - Ivermectin/clorsulon (IvoMec Plus[®], Alverin Plus)
 - Albendazole (Valbazen[®]) – reduces numbers, but doesn't clear
- Control snail exposure:
 - No EPA-approved molluscicides
 - Design drainage where possible (check re: wetlands)
 - Minimize use of wet pastures, fence off wetland areas



Resistance is REAL!

- Can't depend solely on chemicals
 - Consider ALL the parasites' life-stages
 - Establish "refugia"
 - **DO NOT rotate dewormers**
- Non-chemical control methods
 - Copper Oxide Wire Particles
 - High-tannin forages
- Pasture management
 - Rotational grazing, co-grazing
- Adequate plane of nutrition

- **DO NOT use pour-on as drench!**
(would you drink bug spray?)



Image: <https://hayandforage.com>

Chemicals will not “cure” bad management!

Work with veterinarian to design program specific to your farm:

- Biosecurity
 - Quarantine new arrivals
 - Deworm as necessary, then dry lot for 3 days to let worms pass, before placing on pasture (i.e., reduce contamination)
- Avoid overstocking pastures
 - Too many animals/acre = more shedding, less forage available
- Avoid overgrazing pastures
 - Too long on one pasture = eat more worm larvae
 - Remember, worms can crawl up 3-4” on grass blade, so graze no lower than 3-4”



Protozoa

- Babesiosis
- Coccidiosis
- Cryptosporidiosis
- Neosporiasis
- Trichomoniasis



Image: www.blogs.cornell.edu

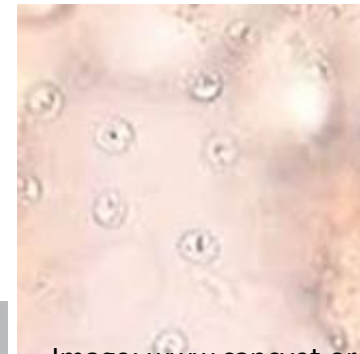


Image: www.capcvet.org

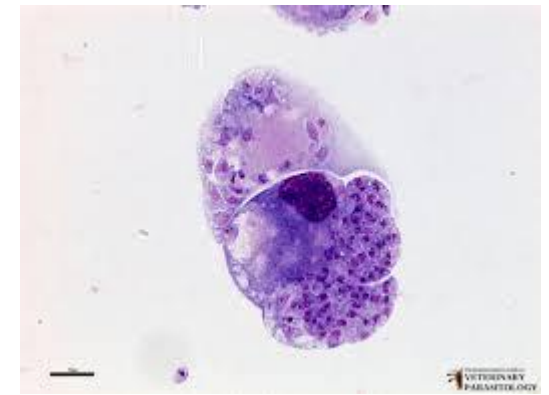


Image: www.veterinaryparasitology.com

Coccidia



- *Eimeria zurnii*, *E. bovis*
- Enteric form – watery diarrhea +/- blood clots, poor-doer, rough coat
- Nervous form – thrashing, bloody stool, “star-gazing”
- Calves, animals with poor immune systems most affected
- Fecal exam finds cysts (very hardy!)
- Prevent by reducing stress, feed off the ground, good sanitation
- Control with medicated feeds, isolate sick when possible
- Coccidiostats: amprolium (Corid[®]), decoquinate (Deccox[®]), lasalocid (Bovatec[®]), +/- monensin (Rumensin[®])

Cryptosporidium parvum

- **ZOONOTIC**
- Usually affect calves 1-4 weeks old
- Loose, watery stool +/- blood, mucous – shed oocysts
- Straining to defecate
 - may lead to rectal prolapse
- Highly contagious, spread to other calves **& humans**
- NO treatment except supportive care
 - Isolate sick calves
 - Maintain clean environment



Reproductive disorders

- *Neospora caninum*
 - Late-term abortions
 - Canids shed eggs, cattle ingest
 - No treatment, only try control/prevention
- Trichomoniasis
 - *Tritrichomonas foetus*
 - Sexual transmission
 - Lives in penile crypts
 - Lives in cervical folds
 - Cow “didn’t settle”, returns to heat
 - No treatment
 - Vaccine with limited efficacy for cows ONLY
 - Cows can clear after 1 or 2 repro cycles
 - Bulls **never** clear!

Aw, man!



Read and follow label directions

- The Environmental Protection Agency (EPA) establishes tolerances for pesticide (e.g., pour-on, spray) residues in agricultural commodities intended for human consumption.
- The Food & Drug Administration (FDA) establishes tolerances for medication (i.e., injectable dewormers) residues in animals and their products intended for human consumption.
- Follow the manufacturer's label recommendations concerning safety restrictions, ***dosage***, and ***application***.
- Both agencies require producers to **observe all label-specified withdrawal intervals** to avoid illegal residues in meat or milk.



Useful References

- Texas Animal Health Commission:
 - www.tahc.texas.gov
 - https://www.tahc.texas.gov/animal_health/feverticks-pests/
- <http://agrilife.org/livestockvetento/files/2010/10/Managing-External-Parasites-of-Texas-Cattle.pdf>
 - Dr. Sonja Swiger, Texas A&M AgriLife
- <https://livestockvetento.tamu.edu/tick-insecticides/>
- <https://edis.ifas.ufl.edu/vm089> - Liver fluke control in Beef Cattle
 - U of Florida IFAS Extension
- *Georgi's Parasitology for Veterinarians, 9th Ed.*
 - Bowman, DD, ed. Saunders Elsevier. 2008

Thank you!

Please don't hesitate to ask questions....

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