

# Wyoming State Veterinary Laboratory Newsletter – March 2010

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## MESSAGE FROM THE DIRECTOR

I'm sure all of you are engaged with helping our kids, many of whom will grow up to be farmers, ranchers, and yes, veterinarians. Who knows who will be the next generation of veterinarians, especially food animal veterinarians, for Wyoming? The following is reprinted with permission of Baxter Black from *On the Edge of Common Sense*.

### County Fairs, Why?

by Baxter Black

"Most people just don't get it," said Ron, bemoaning the urban politicians that continue to whittle away at funding for county fairs and the Ag Extension Service. "It's all about the kids learning real life."

To their misfortune, urban children have much less opportunity to connect with real life. They look at some farm kid working on his show steer every day for months. It is beyond their comprehension. "Why", they think, 'Would anyone want to waste their time in such a mindless pursuit?' and then they whip out their Game Boy and fall into a trance.

Thank goodness there are some politicians, corporations and influential associations that DO get it. As farmers and livestock raisers continue to decline in numbers, it is even more critical that parents, county agents, ag teachers, 4H leaders, scientists and teachers instill in the next generations the realities of life that farming depends on. Does America want to become a net importer of food in fifty years?

I appreciate Mrs. Obama's garden, Whole Foods specialty markets, organic and natural producers.

They have a niche market. But who is going to feed the other 99% of our burgeoning population, much less a hungry third world? Those kids, our kids who are fitting steers, doing chores, picking apples, showing hogs, driving the grain truck, learning to weld, riding pens, irrigating strawberries, managing a pasture, hosing the milk room, stacking hay and learning to read the sky are assimilating the mountain of knowledge that it takes to make dirt and rain into food.

Farm kids start learning the land and the livestock when they are old enough to carry a bucket. When they help with the daily chores they are practicing. It's like taking piano lessons or tennis lessons except what farm kids learn has a much more profound objective; feeding us all.

Our culture expends a great deal of effort on future NBA stars, astronauts, environmental lawyers, doctors, and political science majors. But for every 100 rock stars, Rhoades Scholars and Heisman trophy winners our country produces, we better make sure we spend enough to train at least two future farmers, so the rest of them can eat. That is the essence of the county fair.

Beneath all the fun, auctions, and show ribbons, the serious business of learning how to make a living off the land continues like an underground river.

The list of 'essential professions' is a short one. That's the reality of real life. Farm kids hold our future in their hands. They are in training to feed the world. And fair board members and county agents get it.

[www.baxterblack.com](http://www.baxterblack.com)

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On a similar note is a plea from Dr. Todd Cornish, faculty supervisor for the University of Wyoming Pre-Vet Club. "For the newsletter

could you please include a small blurb asking all of the DVMs in the state to consider offering their services or their time to the kids in the Pre-Vet Club?" "Potentially they could come to Laramie to give a talk about their experiences or they could host the kids for a wet lab (radiology, suture lab, surgery lab, sample collection, use of lasers, dentistry, herd health practices, whatever they want – hands on always better than didactic). Might be a nice way to get the vets more involved with the kids (some of whom would like to come back and practice here some day). They can contact me directly ([tcornish@uwyo.edu](mailto:tcornish@uwyo.edu)) if they have any interest."

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Those of you who have not been to Laramie might be shocked at the changing appearance of the Wyoming State Veterinary Lab. Yes, the new addition is taking shape. The first photo below is looking toward the southeast from Snowy Range Road. In the foreground is the portion of new construction housing bacteriology, virology, and the WGFD wildlife disease laboratories. To the south of these labs is the new BSL-3 addition.



The second is a view of the new construction taken looking to the northeast. The dock area for receiving deliveries and portion of the new building that will house specimen receiving and accessioning are in the foreground. Again, the taller addition in the background is the BSL-3

suite that will house in vitro labs and necropsy. We are scheduled to occupy new construction beginning in early June. Once this move is complete, renovations will begin in portions of



the existing building with project completion expected in September 2010. We are committed to maintaining existing services through this period of construction, interim move, and renovation with little down-time but there may be some inconveniences.

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## INTERESTING CASES FROM WSVL AND OTHER TIDBITS

### Cats that present with swollen lymph nodes and fever: Keep plague/tularemia on your differential list!

Each year we see cases of plague in Wyoming cats, typically outdoor (hunting) cats. Most times these are recognized in the clinic and treated accordingly. Effective antibiotics are administered and the cats are not sent home until fever resolves. There is a good response to effective treatment when cats are caught early in the clinical course. When you see a cat that is febrile and has respiratory signs and/or enlarged lymph nodes (particularly submandibular lymph nodes): think **PLAGUE**, along with **TULAREMIA**. This was brought home to us

last week when we received the carcass of a cat that had been sick for 2 – 3 weeks with submandibular lymphadenopathy. It then died at home. The carcass was submitted after it was opened at the clinic by the veterinarian. The laboratory was requested to save the remains after the post-mortem for cremation and return of the ashes to the owner. Plague was not listed as one of the differential diagnoses.

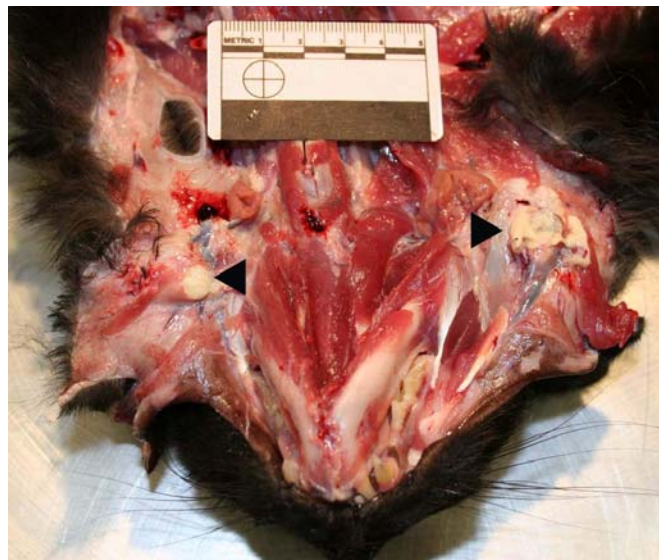


Figure 1: 6 year old castrated cat with *Yersinia pestis*-induced bilateral submandibular lymphadenitis (black arrowheads). Although the lymphadenopathy is modest, this sort of case presents some potential risk to you, your staff and the owner's family, particularly if the node ruptures through skin.

If you have a case of possible plague in a cat:

- Wear a face mask, especially if the cat has respiratory signs (pneumonia).
- Keep the cat in isolation at the clinic for initial stages of treatment
- **If the animal has swollen lymph nodes an aspirate is the sample of choice. Once the aspirate is obtained just cap the syringe and submit.** If one or more lymph nodes rupture, take a swab and submit it to the WSVL. Mark the box on the form that a zoonotic agent may be involved.

- Don't sent the cat home with the owner until after the animal's fever resolves
- If the cat dies, DON'T:
  1. Open the carcass in-house for a "look-see." By so doing, you expose yourself and your staff to *Yersinia pestis* (or *Francisella tularensis*). You increase the chances that we will not grow the organism in culture, due to contamination with other organisms. Generally, Dr. Mills can establish a diagnosis by fluorescent antibody staining, but it is helpful when we corroborate this with culture, which is the gold standard for confirmation.
  2. Send the carcass off for cremation by a private cremation service. If plague is on your differential list, the carcass needs to be opened in a biological safety cabinet by a pathologist and appropriate samples taken to rule out plague and tularemia.

Drs. Donal O'Toole/Ken Mills  
WSVL

### ***Haemonchus contortus* as a cause of emaciation and death loss in goats**

A producer in western Nebraska experienced death loss in kid goats. Goats became thin and died. Total losses according to the owner were 20% in kids (40/200). These were Boer goats intended for sale as meat. The producer ran a flock of sheep, as well as cattle, in addition to goats. The initial samples we received were fixed tissues. The only finding of note was serous atrophy of fat. One possibility was emaciation due to inadequate feed. The owner continued to see losses and brought in two fresh carcasses for examination. He mentioned that he wormed once a year, using an anthelmintic he got from his veterinarian. Grossly both kids

were thin with little body fat. The bone marrow was red and gelatinous, consistent with terminal emaciation. The only significant gross lesion was in the abomasum. It contained large numbers of thin 1.5-cm red-and-white nematodes on the mucosal surface. They were identified morphologically as *Haemonchus contortus*.

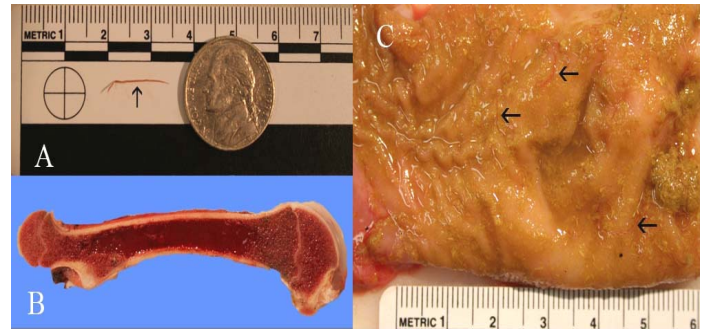


Figure 2. Haemonchosis in kid goats. A: Small size of nematode (arrowhead), compared to a quarter coin. B: Serous atrophy of fat in bone marrow, due to chronic anemia and protein loss. C: Inconspicuous appearance of nematodes in abomasum – some are pointed out by arrows. *H. contortus* is easy to overlook in the abomasum and its contents.

It remains to be seen whether the owner has an anthelmintic resistance problem in his herd and flock, but this remains a possibility. When he got the verbal report of haemonchosis, he remarked that weight gains in his lambs were poor. He did not see death loss in that group.

Some things worth remembering about *Haemonchus contortus*:

- It occurs in our area in spite of its need for warmth/humidity for larvae to develop and hatch from eggs on pasture. It can be a problem in the Red River Valley of North Dakota near Fargo, as well as in Montana. It is more typically seen in the southeast US.
- The same parasite infects and kills both sheep and goats.
- Males and females feed on blood, resulting in the characteristic spiral of red blood-filled gut along the white egg-filled uterus

of the female worm, and its name as the “barber pole worm”

- Presenting signs are anemia, weakness, emaciation/weight loss, and death. Typically you DON’T see diarrhea, and the appetite remains good.
- It is easy to overlook the adult parasites in necropsy, since they are small and inconspicuous against abomasal mucosa
- If you suspect *H. contortus* in a flock with few or no deaths, we cannot differentiate this parasite from other pathogenic species of small strongyles based on fecal examination alone; the eggs of *Haemonchus contortus* are indistinguishable from other less pathogenic strongyles. If the problem is big enough, consider submitting one or more representative thin, anemic lambs or kids for necropsy.
- When there is a problem with *Haemonchus contortus* and the owner has been using a good quality wormer, consider the possibility of anthelmintic resistance. This can be documented by collecting feces pre- and post-treatment. The percentage reduction can be calculated using the formula:  $\% = \frac{\text{pre-treatment fecal egg count} - \text{post-treatment fecal egg count}}{\text{pretreatment fecal egg count}} \times 100$ . A dramatic reduction should be seen if parasites are sensitive to anthelmintics.
- Some producers report that the only two anthelmintics approved for use in goats by the FDA (morantel tartrate; fenbendazole) are not fully effective for controlling infection in goats. Other anthelmintics can be used off-label under veterinary supervision.
- Other pasture management tools can aid in control such as mixed species grazing (alternating cattle with goats/sheep), using the pasture for hay (if practical) some time after the goats/sheep grazed, introduction of browse plant species (for

goats), and alternate the pasture with a short cycle crop, such as alfalfa.

### Reference

Fleming, S. A., et al. (2006). Consensus statement on: anthelmintic resistance of gastrointestinal parasites in small ruminants. *Journal of Veterinary Internal Medicine*, 20, 435–444.

Drs. Donal O’Toole and Chaoqun Yao  
WSVL

### Esophageal Stricture with Chronic Choke in a Horse

A 7-yr-old gelding was submitted to the WSVL with a history of chronic choking. At necropsy, the primary lesion was limited to a focal circumferential area of chronic esophageal ulceration 24 cm proximal to the cardia of the stomach. The esophageal muscularis at this site was thickened and fibrotic forming a stricture. Proximal to the stricture there was marked hypertrophic thickening of the muscularis for a distance of approximately 50 cm.



Figure 3. Chronic focal circumferential ulceration of the esophagus from a horse with a history of chronic choking.

From the owner’s perspective, there was no indication as to when, how, and why this lesion in the esophagus developed. Pathologists have traditionally viewed this type of discrete lesion as a locus where some foreign body has become

lodged. Pressure from esophageal constriction and the foreign body itself is believed to result in vascular compromise and ischemic damage to the esophageal wall.

Drs. Donal O'Toole and Don Montgomery  
WSVL

### **Colibacillosis due to attaching-effacing *E. coli* in a kennel with diarrhea/colic outbreak in pups**

A veterinarian in the Black Hills submitted the carcass of a puppy with diarrhea. The owner was a small scale breeder of Pomeranians and Shih Tzus. Of 19 recently born pups, 12 Pomeranians and 4 Shih Tzu dogs had died. Clinical signs were diarrhea, distended purple abdomens, weakness, and colic. A 504-g female Pomeranian pup was submitted for necropsy. The most striking finding was the presence of masses of round worms up to 8 cm in length throughout the small intestine (Fig. 4).



Figure 4: Large numbers of roundworms in small intestine of Pomeranian with diarrhea. This was interpreted as the major cause of clinical signs.

The worms were identified as *Toxocara canis*. Gut contents were brown and mucoid. They were probably the main problem in the kennel as this fit best with the clinical signs. Histologically, in addition to masses of ascarids in the lumen of the small intestine, mats of bacterial rods adhered to enterocytes (Fig. 5).

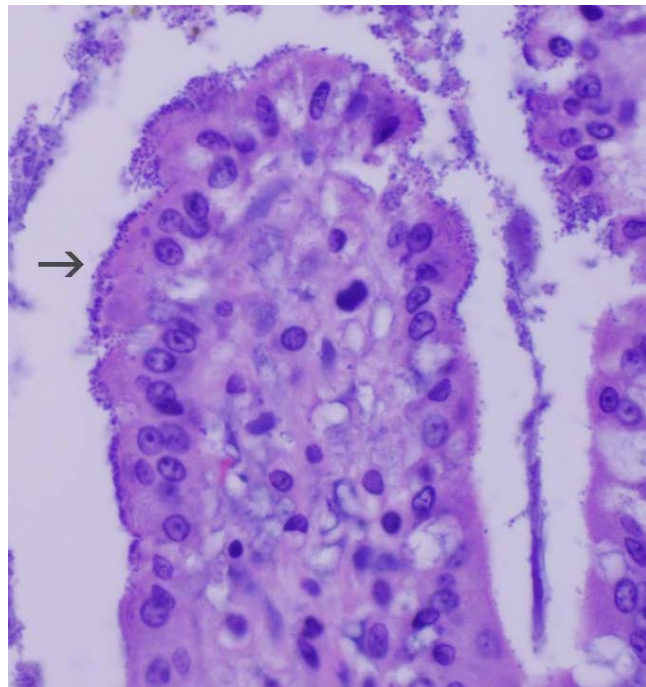


Figure 5: Mats of bacterial rods adherent to villous enterocytes. They were identified by PCR as AEEC based on the presence of the *eaeA* gene, which codes for intimin. It is likely they contributed to diarrhea in this pup.

Villi were short and atrophic. Culture and genotyping confirmed the bacteria to be an attaching effacing strain of *E. coli* (AEEC). The final diagnosis was heavy roundworm infestation compounded by AEEC colibacillosis. This is at least the second time we've found AEEC in a dog with diarrhea. As the name suggests, these are a group of *E. coli* with a particular ability to attach to enterocytes. Once attached, the AEEC disrupt the enterocyte cytoskeleton, leading to effacement of microvilli. Mats of Gram-negative rods on the apical surface of unhappy enterocytes is the characteristic histological lesion. Typically, AEEC in dogs are found in kennels and pet shops. Most commonly, AEEC bacteria in people are either enteropathogenic or enterohemorrhagic. Studies of canine AEEC are limited, but one retrospective Canadian study noted that infections occurred in young dogs (1.5 – 4.5 months old) and most had co-infections (distemper, coccidiosis, parvovirus, giardiasis). The most commonly reported affected breed in one study was the Pomeranian. Adherent organisms were found

consistently in small intestine. Many dogs also had AEEC in large intestine. It is likely that AEEC are pathogenic, and that most have features of enteropathogenic *E. coli*.

### ***References***

Beaudry M, Zhu C, Fairbrother JM, Harel J: 1996, Genotypic and phenotypic characterization of *Escherichia coli* isolates from dogs manifesting attaching and effacing lesions. *J Clin Microbiol* 34(1):144-148.

Drolet R, Fairbrother JM, Harel J, Hélie P: 1994, Attaching and effacing and enterotoxigenic *Escherichia coli* associated with enteric colibacillosis in the dog. *Can J Vet Res* 58(2):87-92.

Donal O'Toole/Ken Mills  
WSVL

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## **FROM THE WYOMING DEPARTMENT OF HEALTH**

### **Wyoming Volunteer Registry for Veterinarians**

The Wyoming Department of Health in collaboration with the Wyoming Livestock Board has created a registry to collect contact information from veterinarians who may be willing and able to assist in a State animal emergency response situation. Registration does not obligate the veterinarian to volunteer. Registration only means that, at the time of an incident, the person registering may be contacted to see if he or she is available to assist. Veterinarians can register by going to <https://vol.wyoming.gov> or by contacting me at the phone number or e-mail address below. I will get the necessary information from you and place the information into the registry for you. The registry has the option to enter a broad variety of information that may be useful in selecting volunteers during an emergency response such as specialty, foreign animal disease training, etc. This more detailed information is purely optional and we will accept

volunteers who are more comfortable only providing contact and license information. Registration will make a veterinarian eligible for a variety of training opportunities offered both within Wyoming and at the national level. One of these training opportunities is the Agricultural Emergency Responder Training that is offered several times a year in Anniston, Alabama at the FEMA Center for Domestic Preparedness. Contact me or take a look at <http://cdp.dhs.gov/resident/agert.html> for more details. Also, while supplies last, anyone registering will receive a "Go Bag" that contains personal protective equipment and other supplies that may be useful in responding to an animal emergency response incident.

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## **FROM THE WYOMING LIVESTOCK BOARD**

### **Contagious Equine Metritis Testing**

As many of you know, the USDA's National Veterinary Service Laboratory (NVSL) has confirmed 22 stallions as positive for *Taylorella equigenitalis* (none of these stallions are from Wyoming). To document the prevalence of Contagious Equine Metritis (CEM), USDA APHIS Veterinary Service has developed a CEM National Testing Project. The goal of this project is to test 3,000 stallions for CEM from around the United States. USDA/APHIS will pay the laboratory testing costs for this project (horseowners must pay their veterinarian to collect the sample). Participation in the project is voluntary.

Each state has sampling targets; the target for Wyoming is to sample 22 active breeding stallions. An active breeding stallion is one that was used for live breeding or artificial insemination in 2008 or 2009. There are some restrictions on which stallions are eligible for the testing and accredited veterinarians must have prior approval from the APHIS-VS Area Veterinarian in Charge or the Wyoming State Veterinarian prior to sampling any stallions under this project.

Sampling consists of taking three swabs from each stallion to be tested: one from the fossa glandis, one from the urethral sinus and one from the distal urethra. These swabs are then sent to NVSL or an approved CEM laboratory (note: WSVL is not CEM approved) with an accompanying VS form 10-4 for each stallion sampled. Swabs and transport media are provided at no cost by APHIS-VS. Stallions should not be on antibiotics at the time of sampling or within the previous 7 days.

Horse owners may be interested in this project so they can advertise that their stallion is CEM-free. They need to be aware that if any stallions test positive he will be placed under quarantine and must undergo a treatment regimen and retested to prove he is CEM-free. APHIS will pay all costs for this treatment and retesting for stallions that test positive under this project. No more than 50% of the stallions or 20 stallions total from any one premise may be tested as part of this project.

Any veterinarian who has Wyoming clients interested in participating in this project should contact the State Veterinarian's or the Cheyenne APHIS office to get approval to do the sampling and to get a copy of the full protocol.

Dr. Walt Cook  
Wyoming Assistant State Veterinarian