

Wyoming State Veterinary Laboratory Newsletter – August 2006

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MESSAGE FROM THE DIRECTOR

IF THE LEVEE BREAKS

In addition to testing animals for Wyoming veterinarians and owners, the WSVL is part of a consortium of state and federal laboratories that will be called into play if we have to deal with a high impact disease like foot and mouth disease. It is called the National Animal Health Laboratory Network (NAHLN).

It was established in 2002 largely in response to lessons learned from the FMD outbreak in the United Kingdom. The goal of the system is to have a group of laboratories that respond using standardized testing protocols for 8 major diseases that are considered a national threat to US agriculture.

The WSVL is now approved to test for three of these diseases: foot and mouth disease, classical swine fever, and highly pathogenic avian influenza. The goal is to ensure that Wyoming can help other states if and when they see an outbreak of these diseases - in other words, to provide surge capacity testing.

This summer two fellow NAHLN laboratories staged a demonstration to show that it is possible, through a combination of robotics, liquid array technology and information data systems, to process 1,000 samples/day for FMD and six look-alike endemic or foreign animal diseases, using two technicians. In fact the test involved testing for 17 viral signatures, some of them multiple strains of one virus.

So why should you, a busy veterinarian in general practice need to know this? Two reasons.

First, if we get into a national animal disease emergency, this laboratory is likely to be asked to assist in testing. This is particularly the case when it is one of the diseases for which staff and faculty are proficiency-trained to handle. It might mean we process samples from Florida or New York, or that we dispatch some of our people to the affected state to help out. This will have an effect on our ability to offer a full range of services to you on "routine" stuff. But in a national emergency, as part of our commitment to NAHLN testing, FMD has to take precedence.

Second, our participation means that we now have access to some high-end technology that has been developed by a partnership comprising Lawrence Livermore National Laboratory, the USDA's Foreign Animal Disease Diagnostic Laboratory at Plum Island, state diagnostic laboratories, and

the Department of Homeland Security. It puts us in a position to compete for federal dollars for additional laboratory space, technical and information technology support, and access to restricted reagents.

There is a particular need nationally for secure laboratory space (biosafety level 3; BSL-3). The last thing we need is for us to be handling tissues containing a hot agent and, after isolating it in the laboratory, having it get out of the laboratory. There is currently a dialog between the University of Wyoming and the Wyoming Government about how best to increase high security laboratory space, how much is needed, and how to pay for it.

Donal O'Toole

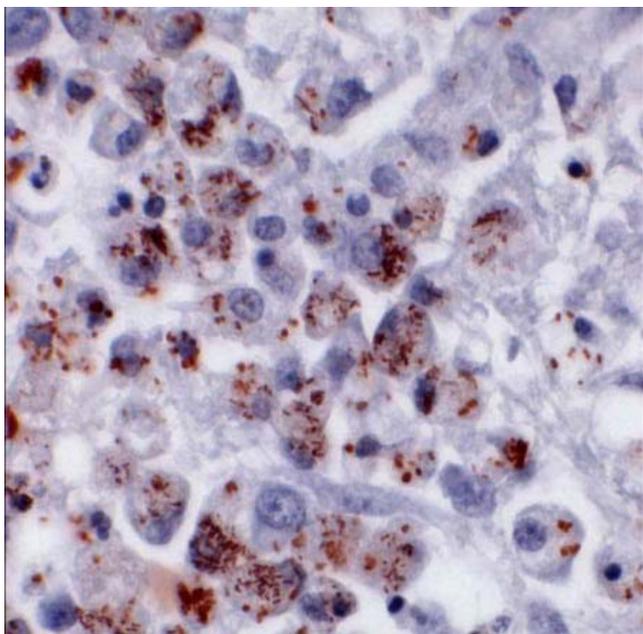
DIAGNOSTIC CASES OF INTEREST

Listeric encephalitis in herd of goats

We rarely see listeriosis in Wyoming, apart from occasional isolates from aborted fetuses.

We were presented with two Boer goats from a property in northwest Nebraska. An owner of 200 goats lost 10 adults over a 1 month period. The herd also had 5 abortions. Adult goats became recumbent and died after 1 - 4 days. The veterinarian submitted tissues, but not brain, from an earlier case to another laboratory. Findings were non-specific.

The presentation of two fresh carcasses gave us a better chance to establish the basis for the problem. Gross lesions in both were minimal. Histologically, both had localized suppurative meningoencephalitis in brain stem. Organisms were Gram-positive, and stained positive on immunohistochemistry for *Listeria monocytogenes*. The diagnosis was *Listeria* encephalitis.



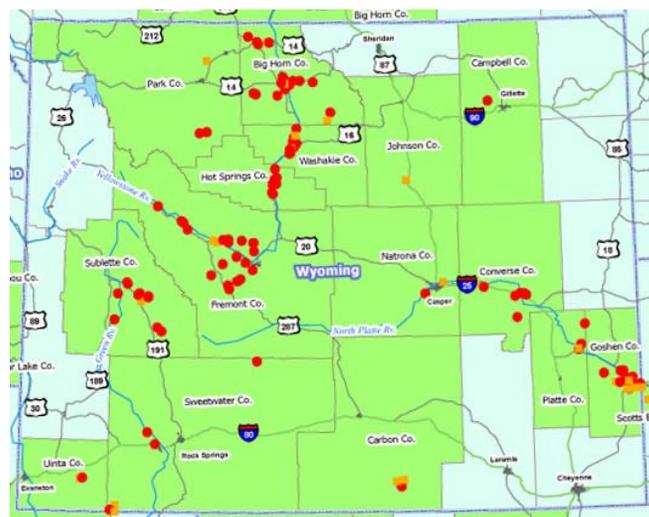
06G5110 - Immunohistochemistry preparation of brainstem of goat with listeriosis. Bacteria are present in macrophages.

Listeria monocytogenes is a common environmental organism found in the environment, as well as an opportunistic pathogen. A recent article in JAVMA looked at risk factors for the prevalence of the organism on properties in New York. It is most commonly associated with feeding improperly fermented silage (pH >4.0 to 5.0). It was a common organism in feces from cattle and small ruminants, particularly in winter (62.5% in cattle; 42.4% in sheep). Risks of infection are reduced when animals have access to pasture, and when bag rather than bunk silage is used.

Nightingale KK et al: 2005, Evaluation of farm management practices as risk factors for clinical listeriosis and fecal shedding of *Listeria monocytogenes* in ruminants. J Am Vet Med Assoc 227:1808-1814.

Vesicular stomatitis in Wyoming

It's back. As most of you know, 2005 was a banner year for vesicular stomatitis in Wyoming. There were 195 laboratory-confirmed cases in horses, and 57 in cattle.



Cumulative cases of VS in Wyoming for 2005. There is a close association with major riparian areas, including some cases in the Casper area, where VS re-emerged in 2006

On August 17, 2006, the National Veterinary Services Laboratories confirmed the first case of VSV in the nation for 2006. The disease was found in a 10-year-old Quarter Horse mare on a ranch near the Natrona/Converse county line. As of 28 August, there are 7 test-positive horses and 4 properties under quarantine. The disease is confirmed in two counties: Natrona and Converse. We've had no positive cattle to date. Additional cases are likely before we get a killing frost.

Vesicular stomatitis affects horses and cattle, less commonly pigs, and rarely sheep and goats. All diseases that cause blisters and sores of the mouth and/or feet are potentially serious. They should be reported to Dr. Combs in the Cheyenne USDA/APHIS office, and/or the state veterinarian. Such animals should not be moved unless proven to be free of an infectious disease.

Insects that breed in water are thought to be responsible for transmitting VS. Insect control may prevent the disease and is particularly important for animals kept near rivers and creeks. When we see VS, it tends to move along riparian areas, presumably because that is where vectors/natural hosts are. Preliminary investigation of the strain of VSV-New Jersey found in Wyoming suggests that it is close to strains of the virus that was circulating last year in Wyoming. In other words, the virus - at least during the winter of 2005-06 - is a Wyoming resident. How and in what VSV does this is poorly understood.

Last year other states and countries imposed movement restrictions on livestock leaving Wyoming once VS was confirmed. This is happening again. State animal health office phone numbers can be accessed from the Wyoming Livestock Board web site or by calling the WLSB office at 307-777-7515, Option 1. The USDA is now running a web page with weekly updates on the 2006 outbreak, and the WSVL and the Wyoming Livestock Board have current information on their web sites:

- <http://wlsb.state.wy.us>
- <http://www.aphis.usda.gov/vs/nahss/equine/vsv/>
- http://wyovet.uwyo.edu/Diseases/2006/vesicular_stomatitis.htm

Dr. Sato, the laboratory's epidemiologist, Dr. John Duncan with USDA APHIS VS, and several scientists with the Arthropod-Borne Animal Disease Research Laboratory in Laramie are interested in this outbreak, since it strongly suggests what many suspected for some time: instead of sweeping out of the southwest, VSV can overwinter in the US and recur the following year. You can contact Dr. Sato c/o 307 742 6638 if you have cases where the pattern of spread seems unusual.

Canine dysautonomia

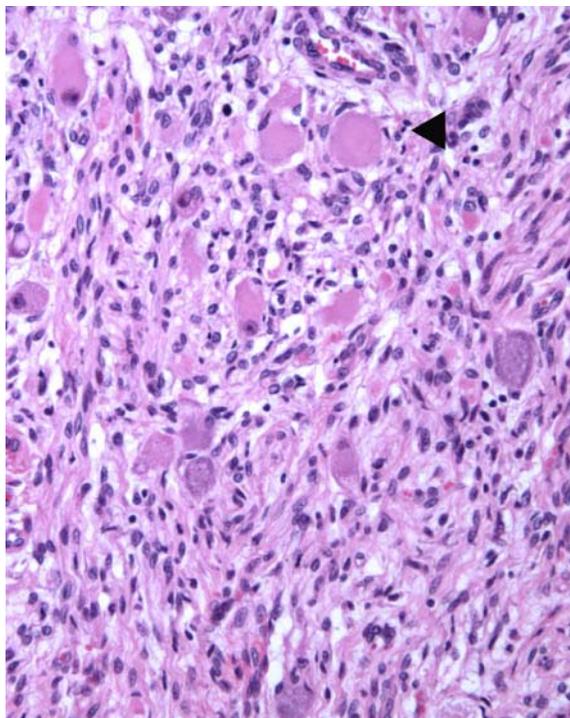
WSVL continues to see cases of canine dysautonomia. Most recently we had cases in very young dogs - 8 week old puppies. One was a Yorkshire terrier and the other was an 8 week old red heeler. The latter was presented with inability to bear weight on pelvic limbs, and lethargy, straining to defecate, and prolapsed third eyelids.

The heeler case illustrated that in some cases, the dying nerve cells are not limited strictly to the autonomic nervous system. There was also degeneration of large motor neurons in the ventral horns of cervical, thoracic, and lumbar spinal cord, which accounted for the dog's inability to bear weight on its pelvic limbs.

The cause of canine dysautonomia - toxic, infectious - is unknown.

Canine dysautonomia is not uncommon in Wyoming - but most of our cases are coming from a small number of practitioners who have a good eye for the condition. If you suspect you are seeing this disease, please contact Dr. Kerr in Torrington (if the dog is alive and the owners wish treatment attempted) or submit an entire carcass so we can dissect those

portions of the autonomic system and establish a diagnosis of dysautonomia.



WSVL #06C11072: Ceeliac ganglion from an 8 week old blue heeler pup. Most neurons in this field (arrowhead) are degenerate. An unusual feature in this dog was that motor neurons in the spinal cord were also abnormal.

Dr. Don Montgomery

Death by melon

A three year old domestic short haired cat ate a cantaloupe that had been doped with Golden Malrin® Fly Bait for fly control. The owner found the cat convulsing at 1:00. By 5:00 it was dead. There were no gross lesions at post mortem. The gastric contents contained significant amounts of methomyl, the active ingredient in Golden Malrin®.

Methomyl is a carbamate insecticide which inhibits acetylcholinesterase and results in overstimulation of neuromuscular junctions and parasympathetic nervous system. Signs include salivation, diarrhea, lacrimation, pulmonary edema, muscle tremors and convulsions. Treatment with atropine, sedatives and activated charcoal may be useful if started quickly enough.

Unlike many consumer grade insecticides, methomyl has a relatively high mammalian toxicity. It should never be used where there is any possibility of exposure to children that are held in high regard by their parents, or to pets.

Dr. Merl Raisbeck

Equine viral arteritis

Equine viral arteritis is rare in Wyoming. I am not aware of confirmed cases of abortion in the state due to the virus in the

past decade. Recently, multiple states reported cases of EVA or have premises under quarantine due to receipt of infected semen that was used for AI. To date there have been no confirmed cases of the disease in Wyoming. According to Dr. Walt Cook, one property in the state had mares that were inseminated with semen originating in New Mexico where EVA was confirmed. The WLSB tested two mares (a third moved out of state). Both mares were negative. A quarantine order placed on the property was lifted. Approximately 10 states received semen and have or had properties that were quarantined due to EVA.

EVA is a viral disease of horses that was first recognized in 1953. In spite of there being only one serotype, various biological strains of the virus exist. Some cause classical EVA, with or without abortion. Others induce little or no clinical illness apart from low to moderate febrile response. It is now accepted that many EVA strains are minimally pathogenic.

EVA causes abortion in mares, as well as a respiratory syndrome resembling equine influenza. Signs are:

- Fever up to 41°C lasting 2 - 9 days;
- A variable degree of anorexia and depression
- Leucopenia
- Edema, especially in distal parts of the pelvic limbs, but that may involve all four limbs
- Serous to mucoid nasal discharge associated with variable degree of rhinitis
- Supraorbital or periorbital edema with conjunctivitis of varying severity - so called "pink-eye";
- Unilateral or bilateral epiphora
- Photophobia, most frequently in horses with severe conjunctivitis
- Edema involving scrotum, prepuce and mammary glands
- Urticarial rash which may be localized and occur as small, discrete lesions, usually on cheeks, sides of the neck or pectoral region, or it may be generalized and present as a maculopapular rash.
- Abortion
- Fatal interstitial pneumonia or pneumoenteritis in newborn foals.

The disease is important from a breeding standpoint: the virus survives in semen for an extended period, and can be transmitted by artificial insemination. One reason that EVA is reportable in many states is the ease with which infection can be introduced into a herd via semen.

If you see a case you suspect might be EVA, please submit a red top tube for serology. If an animal is symptomatic, we can attempt virus isolation. There are PCR methods to detect the virus, but we do not have those methods up and running at present. Only if we have an indication that the virus is circulating in Wyoming will we implement a PCR test.

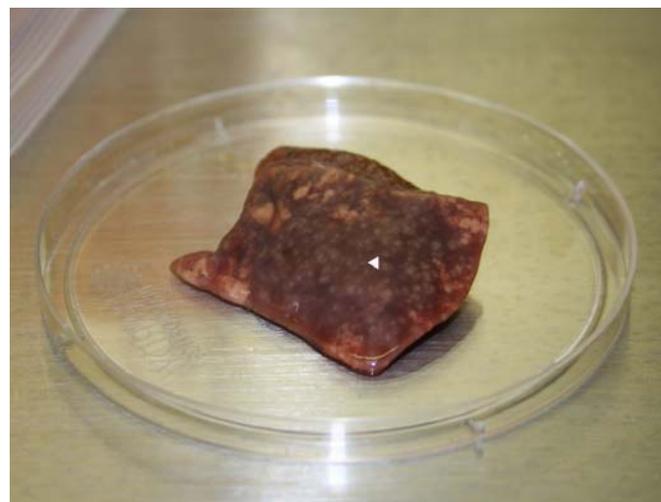
Fort Dodge makes two vaccines for EVA. If clients are keen to vaccinate, please remind them this will make horses serologically positive. At present there is no way to

distinguish a titer due to natural infection from one due to vaccination, unless they retain documentation that a vaccine was administered.

Tularemia in foals

Tularemia is most commonly seen in our laboratory in rabbits and beaver. But occasionally we see the disease in other species.

Recently the North Dakota diagnostic laboratory sent Dr. Mills' laboratory a sample of lung from one of two foals which died having developing peracute respiratory illness. Grossly the sample of lung was mottled with white foci throughout. Dr. Mills' cultured *Francisella tularensis*.



Sample of lung from a foal with tularemia. White foci (arrowhead) are areas of septicemic dissemination of the organism.

The agent of rabbit fever infects a wide range of animals, including >100 species of wild and domestic mammals, as well as people, 25 species of birds, and several species of amphibians and reptiles. In the United States, rabbits (particularly *Sylvilagus* spp) are most commonly infected and important in the transmission of *F tularensis* to humans. Ticks maintain infection throughout their life cycle.

In the United States, outbreaks in humans have been associated with contact with muskrats and beavers. In addition to contact with lagomorphs, sporadic cases are acquired through contact with squirrels, sheep, pheasants, and nonhuman primates. Epizootics have been reported in populations of voles (*Microtus* spp), beaver (*Castor canadensis*), and muskrat (*Ondatra zibethica*). Natural infection with *F. tularensis* has been recognized in wild-caught prairie dogs (*Cynomys ludovicianus*), marmosets (*Callithrix jacchus*), raptors, quail, mink and fox, and numerous other species.

Cats and dogs can also be infected - this year we have confirmed tularemia in one cat, and we also had a laboratory positive case last year. Clinical illness is more common in cats. Dogs can serve as reservoirs for the organism or as maintenance hosts for the tick vector. Of livestock, sheep

are most commonly affected. Several years ago, during a bad tick year, we saw two outbreaks of abortion in flocks due to tularemia

Recently a woman contacted the laboratory to get information about diseases that might be transmitted by cat bite. Her mother, a resident of southern Wyoming, was recently bitten by a cat. She developed an infection of her hand and it was not responding to treatment. Eventually one finger was amputated. Laboratory personnel suggested she have the hospital personnel culture or otherwise check the wound for plague and tularemia. This demonstrated that the wound was infected with *F. tularensis*. APHIS Wildlife Services has since submitted wildlife carcasses from within a mile of the area where the woman was bitten to determine whether local rabbits are infected.

Death due to PHF in a horse in NE Wyoming

Potomac horse fever is due to the rickettsial agent *Neorickettsia risticii*. Symptoms of PHF are depression, anorexia, fever, dehydration, laminitis, abortion and watery diarrhea. The best treatment is administration of tetracycline early in the course of the disease. There is no truly effective vaccine available.

A horse originating in the Cody area was submitted to a veterinarian in NE Wyoming with acute watery diarrhea. After a clinical course of 48 hours, the horse died. Samples of feces were positive by PCR for PHF.

Every summer we see a small number of cases of PHF. The disease tends to be endemic in specific riparian areas. Most cases occur in July - September.

Recent work in Ohio and California indicates that horses are accidental hosts of this rickettsial agent. If this research is accurate, it suggests that the life cycle is complex. It involves big brown bats (*Eptesicus fuscus*), little brown bats (*Myotis lucifugus*), and an intestinal fluke that parasitizes their gut (*Acanthatrium oregonense*). Infected fluke eggs may be the principal mechanism where by *N. risticii* ends up in bodies of water, in aquatic insects - and horses.

Studies using PCR demonstrate that *E. risticii* can also infect bats, since the agent has been found in blood, liver and spleen. It is not clear whether it causes disease.

If you have a horse that you suspect has PHF, the best samples to submit to us are FECES and EDTA blood. We have had our best success making a diagnosis from feces.

Donal O'Toole/Ken Mills

Forensic cases

Last week we received two cattle that required forensic workup. Fortunately, we got the entire carcasses, the police involved with the case were present, and we spoke to the owner. It allowed us find out what law enforcement was looking for, and obtain an accurate history.

Please - if you have cases that have legal potential, arrange to send us carcasses, and put us into contact with whichever agency is investigating the episode. The worse scenario is when a veterinarian decides to do the work up in house, and sends us pieces of tissue without indicating that the case is legal, or the gravity of the case.

WNV

WNV at least in animals and birds has been quiet in 2006 - one of the few benefits of the drought. Summary information on WNV is on the WDH web page, with weekly updates on positive people, horses and birds:

<http://www.badskeeter.org/detections.html>

As of 25 August 2006, we have had 7 positive horses to date: in Campbell (1), Fremont (4), Natrona (1) and Park (1)

We had 15 positive birds to date this year: in Campbell (4), Fremont (5), Goshen (1) Natrona (2), Park (2) and Platte (1).

On the human side, the WDH reports 12 cases, with 10 of those in Fremont County.

REGULATORY CORNER

Brucellosis testing

Fall is just around the corner, and that means the brucellosis sample load will increase substantially. We are a high volume lab and need all samples to be in order, easily identified, and matched up to their paperwork. Samples should be in good condition and may require ice packs or insulation from the heat. Please don't mail samples on Friday as they may float around in the postal system over the weekend, resulting in hemolyzed blood. Samples do not always get here in one day (U.S. mail or UPS).

We accomplish same day results (99.99%) and mail all results the same day. Please ask your clientele to plan appropriately for return time on results. Sample transit and returned results via mail usually require 5 working days. We cannot possibly fax all brucellosis results. Please be selective when asking for that type of delivery. During the busy season we are sometimes bombarded with phone calls. This decreases our ability to accomplish our diagnostic tasks. Please include required return information with submissions.

We mail out shipping supplies separately from the necropsy lab. Our mailers come in two varieties. The brucellosis mailers contain 40 tubes per inner box and are mailed within an outer box. We also offer a small Styrofoam mailer that can hold 5 tubes. This box is placed inside a white sleeve, which should then be placed inside a large envelope. Paperwork should be placed inside the envelope and not the small white boxes.

If you need any of these supplies, please call the regulatory serology lab 742-6681 ext. 142.

Rebecca Wills

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