

Wyoming State Veterinary Laboratory Newsletter - July 2004

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MESSAGE FROM THE DIRECTOR

REVOLVING DOORS

The recent hire of **Dr. Gerry Andrews** into the veterinary sciences department is important. Dr. Andrews was hired as a combination researcher and teacher, and does not have a diagnostic component to his job. He is coming to us from USAMRIID where his background is with real or potential bioterrorist threats. We are hoping to interest Dr. Andrews on working with others in the department on brucellosis, specifically on studies related to immunity. His background is in other hot agents, such as plague. This will strengthen us in a topical and fundable area. He will be here in August

Less pleasant news is that **Dr. Alberto van Olphen** has decided to move to Florida. In the short time he has been here he has endeared himself to all, and his departure is a loss to our profession and the state. His wife was a faculty member in UW's College of Education and recently accepted an academic position in Florida. Alberto is following her back there. In spite of a university policy that faculty vacancies can only be filled after a complex petitioning process to the Powers that Be, in this case there will be exemption. We will shortly start a search for a replacement virologist. The process usually takes about a year since it involves a national search.

While news is still unofficial, the university okayed a departmental request to hire a DVM, PhD **epidemiologist**. We made this pitch for several reasons. First, we need someone as a bridge to veterinarians, the state veterinarian's office, public health and the USDA's area-veterinarian-in-charge when a large or unusual disease outbreak occurs. In the past, a pathologist and/or the laboratory's toxicologist were sent to such wrecks. That may continue as the situation demands. But access to a trained epidemiologist will strengthen our ability to quickly acquire and analyze field data. Second, the department has a responsibility to teach a medical microbiology program. A long-term goal has been to teach a course in the epidemiology of infectious disease to undergraduates. The new hire would meet that need. Again, the search will take perhaps a year to land the right person.

Our computer person, **Todd Bleifuss**, has also moved on. This creates a dilemma, as he developed in-house Web-based laboratory software that was near completion. For the past several months we operated both the old purchased system, and the new system under development. Until we get a replacement for Todd, we will revert to the older, purchased system. Once we have a person with the right skills, we will continue development of the Web-based system, which is called DATS. For the next few months, it will be called DRATS.

MESSAGE FROM DR. VAN OLPHEN TO WSVL CLIENTS

My family and I are leaving Wyoming. My wife Marcella accepted a job at the University of South Florida starting in August. It has been a pleasure to serve the producers and veterinarians of Wyoming for the past two and half years. I enjoyed giving talks at producer meetings. In fact I think it was one of the most productive parts of my work as a virologist at the WSVL.

I would like to give special thanks to those veterinarians and ranchers that helped me in trying to better understand many important aspects of the diagnosis and disease caused by BVDV by sharing their experiences, opening the doors to their ranches and letting me have samples for experimentation.

I also would like to thank my colleagues at the Vet Lab and the UW administration for the giving me this great opportunity.

Adios,

Alberto

RECENT CASES

RABID DOG IMPORTED FROM TEXAS TO WYOMING

Although endemic in Wyoming, rabies may also enter the state from elsewhere. A veterinarian in Johnson county had that experience in June when presented with an uncoordinated dog. The owner brought the dog into the state from Texas. The veterinarian treated the dog as potentially poisoned, which included contacting the animal's saliva when administering charcoal by syringe. The dog's condition deteriorated and he was euthanized. The head was shipped to the WSVL. A diagnosis of rabies was made the same day in Dr. Mills' laboratory.

Dr. David Barber from the Wyoming Department of Health did a rapid follow-up study. The WDH needed to determine who was in contact with the dog in order to establish who needed post-exposure prophylaxis. A key part of the puzzle was establishing whether the dog contracted rabies in Wyoming or Texas, since the latter eventuality widened the number of people who might need prophylaxis. The owner said that the dog regularly hunted skunks and had recently killed one in Texas.

The dog had arrived in Wyoming 8 days earlier. Since arriving in the state, it was in contact with the owner's other 3 dogs and 6 people, in addition to the owner and the veterinarian. The dog and three in-contact dogs were rabies-vaccinated, but the rabid dog had received only one dose. He had not received a booster dose since he was a year of age.

Supplemental testing at the Texas Department of Health's Zoonosis Control Division identified the virus as the south-central skunk strain of rabies. This is a strain occurs in Texas but not Wyoming, where the only terrestrial form of rabies is the north-central skunk strain. Dr. Barber contacted the Texas Department of Health. Its people made sure that individuals in contact with the dog at the Texas end received appropriate treatment.

There are several lessons from this episode. If you are presented with a depressed dog, even if it is vaccinated for rabies, keep rabies as a differential diagnosis. If rabies is confirmed and the animal is a recent import, bear in mind that people from the importing state are at risk.

VESICULAR STOMATITIS - ON ITS WAY?

As its names suggests, VS is a vesiculating disease. It primarily occurs in cattle, horses and swine. The last two outbreaks in the United States were in 1997 and 1998. Because it is an internationally reportable disease due to a clinical resemblance to FMD, some countries have imposed restrictions on the movement of susceptible animals from affected states. USDA AVIC offices want to know immediately if you have an animal with VS-like clinical signs. Generally, the USDA prefers a foreign animal disease diagnostician (FADD) to take samples.

Currently VSV is present in TX, NM and CO. As of July 8, there were 50 VSV positive horses and 3 positive cattle on 25 premises. Colorado cases are in Las Animas and Douglas counties. If you want an update on what is happening, go to the USDA APHIS web site:

<http://www.aphis.usda.gov/>

and surf to the *Hot Issues* section. This is regularly updated and carries news on the movement of VS in the US.

If you see horses, cattle, sheep or goats with vesicular or ulcerative lesions of the mouth, lip or nostril, please report it immediately to the USDA area office (**Dr. Bret Combs 307 772 2186**) and/or the state veterinarian/Wyoming Livestock Board (**Dr. Jim Logan 307 777 7515**). Dr. Combs' office will make the call as to whether to send out a FADD to examine the animal and in-contacts directly, and to take samples. Laboratory confirmation is based on serology and (if present) examination of vesicular fluid or mucosal tags from ruptured vesicles. Samples should **NOT** be submitted to the Wyoming State Veterinary Laboratory. Instead they go to the National Veterinary Services Laboratory. If we receive the samples you have taken regardless, we inform Drs. Combs and Logan, who then have a down home chat with you. NVSL require a communication from the AVIC that he or she is aware that a veterinarian in their patch is requesting VSV serology. Tests are not run or reported to you until that occurs.

If you see horses or cattle with vesiculating lesions:

- Don't just assume it is VS and decide to spare your client the regulatory fuss of reporting it officially. There is a legal requirement to report all VS suspects. It's the AVICs call, not yours, as to who takes the samples. The reason is simple. Dr. Combs wants to spare you the possible embarrassment of being on CNN as the veterinarian who overlooked the first case of FMD in US cattle since 1929, and was responsible for its subsequent spread across the US
- Advise the owner not to move VSV susceptible species until a state or USDA animal health official contacts him or her.
- Advise the owner to separate affected animals from non-symptomatic animals.
- Clean and disinfect all personal materials, instruments, boots, equipment and vehicle.
- Wear gloves when handling affected tissues. VSV is transmissible to people, and causes a 'flu-like illness.

To reduce the risk of VS on properties:

- Control biting flies
- Keep horses stalled or under a roof at night to reduce exposure to flies.
- Keep stalls clean
- Feed and water stock from individual buckets.
- Disinfect borrowed equipment or tools prior to using them on your premise.
- Don't visit ranches under quarantine for VS. Wait until the animals' lesions have healed.

CANINE HERPESVIRUS ABORTION

A Cheyenne owner presented an elderly pregnant bitch for caesarian section. The veterinarian removed the litter, all of which were dead, and submitted a fetus to Dr. Cornish for necropsy.

The pup was autolyzed with no gross or microscopic lesions other than inhaled meconium. Fluorescent antibody examination revealed viral antigen for canine herpesvirus in liver, kidney and spleen. We did not isolate the virus. The presumptive cause of intra-uterine death was herpetic infection. Failure to isolate the virus was due to autolysis and the fragile nature of herpesviruses.

Canine herpesvirus is a commonly diagnosed cause of abortion, stillbirth and perinatal death in pups. Serosurveys are limited, but seropositive rates of around 30% are common. Some kennels have antibody prevalence rates as high as 100% without the development of disease in pups. Reproductive problems tend to occur when a naive bitch is infected during the last three weeks of pregnancy, or when pups are infected in the first two weeks of life. An infected bitch may have dead and/mummified pups in the same litter as live pups. Diagnosis of CHV is based on FA, virus isolation, typical multifocal necrotizing lesions (if the fetus is not too rotten), and PCR detection. A negative result can be due to inadequate technique rather than a truly negative

sample. No vaccine is available. The only recommendation is to expose naive bitches to presumed infected dogs prior to breeding.

We occasionally see CHV in puppies, but many dead neonatal puppies we are presented with have no etiological or morphological diagnosis. An estimated 75% of pup deaths occur in the first 3 weeks of life, the vast majority occurring in the first week due to physiologic, congenital/genetic, behavioral factors in the bitch, environmental conditions, bacterial septicemia, and CHV infection.

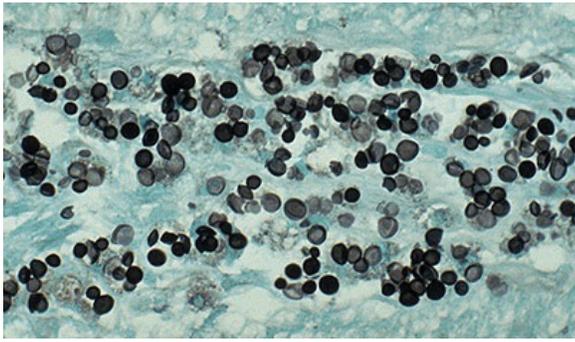
Asymptomatically infected dogs, or dams that had *in utero* infections, remain latently infected. The virus is excreted for ~1 week in nasal or genital secretions and, thereafter at unpredictable intervals over months or years. Latent infections may be activated by stress (movement to new quarters, introduction of new dogs) or corticosteroids. Latent virus, demonstrated by PCR testing, persists in the trigeminal ganglia, lumbosacral ganglia, tonsils, and parotid salivary gland. Once the virus enters a kennel, it spreads and causes asymptomatic infections - except in pregnant dams or very young pups from susceptible bitches, where infections of the fetus or newborn may occur.

FATAL CRYPTOCOCCOSIS IN WYOMING CAT

We don't recognize a lot of cryptococcosis in cats, but we have no shortage of pigeons. For that reason we should expect to see a case from time to time. We recently received the carcass of a 14-year old cat from the Cheyenne area. The cat developed lesions around the head, oral cavity and inguinal area, and died unexpectedly. We were asked to check for zoonoses.

Grossly Dr. Montgomery found no evidence of plague, the veterinarian's main concern. Instead there were cutaneous and oro-labial lesions, and chronic effusive pleuritis. Histologically there was disseminated fungal infection associated with thick-walled, cup-shaped yeast organisms typical of *Cryptococcus neoformans*. Fungal pneumonia and encephalitis were the proximate cause of death.

This systemic mycosis primarily affects the respiratory tract, CNS, eyes, and skin of cats, particularly the face and neck. The causal fungus, *Cryptococcus neoformans*, exists in the environment and in tissues as yeast. The type of *C. neoformans* most commonly associated with disease in cats is var. *gattii*, which glories in its origin in fowl manure, especially pigeon droppings. Transmission is by inhalation of spores, or contamination of wounds. In this case, this indoor cat was in a catfight some time earlier. Infection may have been introduced at that time. It is the most common systemic mycosis of cats.



Cryptococcus neoformans in tissues from a cat (GMS preparation). Organisms are black and have a characteristic size and budding pattern.

Cryptococcosis is not zoonotic since the form of the organism found in tissues does not readily aerosolize. Finding clusters of the disease in animals can however act as sentinel for environmental exposure. In 2001, a veterinary diagnostic laboratory in western Canada recognized a rise in the number of cases of cryptococcosis from a regular 4 – 6/annum to 12 cases in a 6-month period. All cases were from the eastern side of Vancouver Island, and included cases in dogs, cats, livestock and porpoises. At the same time, the provincial human health laboratory recognized a spike in human cases of cryptococcosis. Biological surveys demonstrated that this was due to *C. neoformans* var. *grubii*, an exotic (Australian) form of the organism that occurs in the woody debris of eucalyptus trees. In Vancouver the organism adapted to infect the trunks of native tree species such as Douglas fir, alder, maple, and Garry oak. Recent molecular studies demonstrated that Vancouver isolates of *C. neoformans* var. *grubii* were unusually fertile, increasing the number of infectious organisms (basidiospores) and meiotic recombination events with the development of a more pathogenic strain.

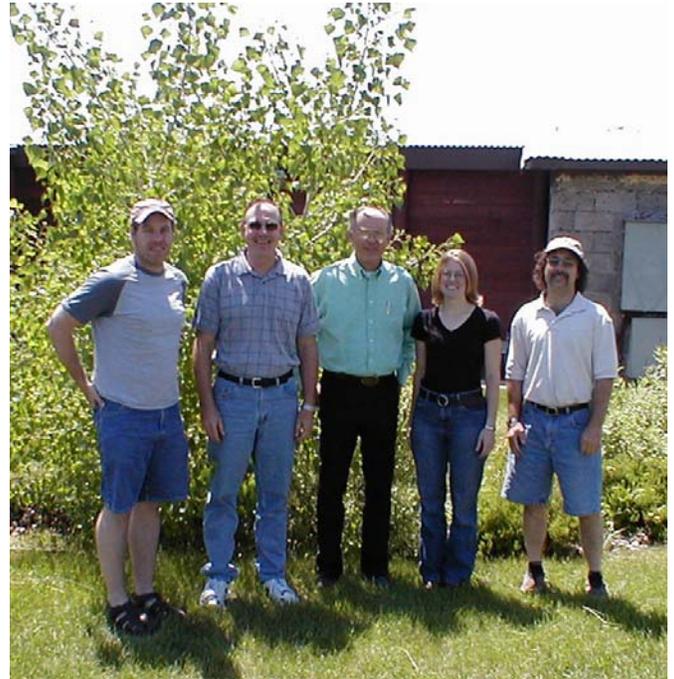
Cryptococcosis can be diagnosed by serology. It is treatable with amphotericin B, ketoconazole, itaconazole and flucytosine. Animals responding to treatment will show a good decline in titer. Failure of the titer to fall indicates that treatment is ineffective.

Craig S, Lester S, Black W, Fyfe M, Raverty, S, 2002: Multispecies outbreak of cryptococcosis on southern Vancouver Island, British Columbia. Can Vet J 43: 792–794

TEACHERS' WEEK IN THE LABORATORY

During the week of June 21-25 the Department of Veterinary Sciences hosted a hands-on experience in graphic veterinary biology for 4 high school science teachers from Gillette, Green River and Torrington. The purpose was to provide the teachers with knowledge and resources they need to mentor pre-college students with high interest and aptitude in animal-oriented biological sciences. The department's expertise and laboratory facilities, including necropsy/anatomy, histology, bacteriology, virology, parasitology and toxicology were put into action for the 4 participating teachers. Dr. Bill Jolley, the laboratory's parasitologist, coordinated the session. The teachers

participated in all of the aspects of diagnostic laboratory function over a four-day period. Participants earned continuing education credit for their efforts and provided very positive feedback on the experience.



Dr. Bill Jolley (center) flanked by science teachers from Gillette (x2), Green River and Torrington.

The benefit for the department, the college of Agriculture, UW and residents of Wyoming is that it puts us all in closer contact with science teachers and their students, many of whom have high potential for success in veterinary or human medicine and related scientific fields. Interaction between everyone involved eases the efforts of communication and facilitates career selection and success. Members of the department frequently cooperate with high school students, parents and teachers interested in participating in the Wyoming State Science Fair, and showcasing career opportunities at county fairs and the Wyoming State Fair in Douglas.

We would like to offer this again next year, for college credit. If you know science teachers in your area that might be interested in spending time in a fast-paced, interactive exercise in veterinary/medical disease biology, please contact Dr. Bill Jolley at 307-742-6638 (leave message, if necessary), or willjo@uwyo.edu <<mailto:willjo@uwyo.edu>>.

Teachers with weak stomachs should not apply.

Dr. Bill Jolley

WNV UPDATE

As of 15th July, the laboratory tested 33 Wyoming horses for WNV, of which 26 were positive. At 79% positives, this means that veterinarians are getting good at

spotting suspect cases of the disease. So far there has been a single human case in the state, and that person recovered. We've tested 55 birds of which 2 (3.6%) were positive. As with the 2003 season, Fremont county is shaping up to be the one with most cases: 10/26 positives originate there (39% of the total).

Dr. Todd Cornish put together a presentation for the WVMA meeting, which Dr. Williams presented in Casper at the end of June. Todd pulled together data based on the 2003 season and will want to do the same thing again this year. To that end, please provide a full set of information on accession sheets for horses to be tested for WNV. This includes:

- Horse name/ID
- Owner's name
- Complete owner address (where horse is kept), including street, city, county, and zip code.

If we don't have this information, Dr. Cornish will contact you individually to get it. It is a lot easier when it is supplied with the original accession.

BROODER PNEUMONIA IN PHEASANT GAME FARM

A game farm recognized deaths in pheasant chicks aged 4 days older and above. Signs were non-specific: birds became weak and dumpy-acting, and then died. Losses occurred at a rate of 30 – 45/night. Seven chicks were submitted for necropsy to Dr. Cornish. Grossly some birds had pinpoint white foci in the lungs and air sacs. The birds had granulomatous fungal pneumonia and air sacculitis, with concurrent bacterial infection.

The most common cause of fungal pneumonia in chicks is aspergillosis. The fungus grows well at room temperature and above. Litter and nest materials (peat moss, peanut hulls, sawdust, peat, bark and straw) can be contaminated with spores. There is no cure for infected birds but spread can be controlled by better ventilation and adding fungistat to the feed. Avoidance is by thoroughly cleaning and disinfecting the brooding area between broods, use of clean litter, and avoiding the use of sawdust or wet wood shavings.

BRODIFACOUM-POISONING IN A IN A DOG

Brodifacoum is a potent second-generation vitamin K antagonist rodenticide that is sold over the counter with the trade name *Havoc*, and to professional pest controllers in a more concentrated form under the name *Talon*. It is the most widely used rodenticide in the United States. It is attractive to pest controllers because it comes as a ready-to-use grain-based bait and as weatherproof blocks. It is potent relative to other vitamin K antagonists (acute oral LD₅₀ in rats is 0.27 mg/kg for brodifacoum vs. 58.0 mg/kg for warfarin) and a single dose is lethal to rodents. Animals can be killed acutely and chronically, and it is more toxic to target species (rats and mice) than non-target species (people, dogs and cats). In

a recent study of acute unintentional exposure of children to brodifacoum over 4 years (1993 – 1996) by the American Association of Poison Control Centers, there were 10,762 cases of exposure in which 67 (0.6%) had clinical evidence of coagulopathy. Fortunately, there were no deaths. But it can still kill dogs if owners or pest control people are remiss.

Dr. Williams was presented with a dog from Laramie that had been brought to a veterinarian with hemorrhages of the sclera and subcutis. The dog developed central nervous symptoms and was euthanized. A large amount of blood flowed from the mouth after the dog died. Another dog in the area had shown similar signs two days earlier. Gross changes were typical of anticoagulant poisoning: multifocal hemorrhage in skin, subcutis, muscle, pericardial sac and meninges. Blood flowed from the carcass during the post-mortem examination.

An anticoagulant screen was performed for warfarin, chlorphacine, pindone, coumarfuryl, bromadiolone and brodifacoum in Dr. Raisbeck's laboratory. He confirmed brodifacoum in liver at a concentration of 2 ppm.

Vitamin K₁ and supportive therapy are used to treat small animals for anticoagulant intoxication. Vitamin K₁ can be given orally or subcutaneously but there will be a delay in effect of several hours. If the animal is in a crisis, transfusions of blood or plasma should be conducted as soon as possible and vitamin K₁ is given subcutaneously (5.0 mg/kg) followed by oral administration in 12 hours. In stable cases of intoxication, oral vitamin K₁ is given at 2.5 -5.0 mg/kg every 24 hours for at least a week or until clotting indices return to normal.

HORSES WITH RASPY REARS!! PINWORMS

Horses, mules and donkeys frequently harbor pinworms that cause more or less discomfort to their hosts, depending on wormload and sensitivity of individual animals. These worms live in the large intestine of your equid, causing little or no harm or discomfort, until time for the female worms to discharge eggs. Gravid females migrate to the anus, exit their beloved hosts via the rectal sphincter, deposit a huge mass of adhesive eggs, and try to return to the privileged environment of the colon.

The goo discharged with the eggs causes various degrees of itching on skin of the perineum. In response, the irritated equine rubs its rump on posts, rails, doors, manger beams, trees or anything else of the right height and accessibility, usually resulting in abrasion of skin and depilation. This picture is nothing new to veterinarians and owners of horses, especially those with horses in confined facilities such as stables. The facilities where infected horses have little range access tend to concentrate the eggs, which embryonate quickly to infectious stage, and get into feed, water and by other sources, access the mouths of the resident animals. Consequently, wormloads increase quickly.

Do not expect to find pinworm eggs in feces! Cellophane tape should be used test the rump (sticky side down) of horses suspected of being infected. After swabbing, place the tape (sticky side down) on a microscope slide and view it at 10 X with a compound microscope. If present, the ova are obvious.

Treatment should be easy and straightforward, with all of the high potency dewormers available to today's horse lovers, right? Unfortunately, some of the anthelmintics lack the punch needed to whip the lowly whipworm, probably because of resistance due to repeated use of a particular favorite for control of strongyles, tapeworms or other, more sinister creatures. If an avermectin has been used for 2 or more years, and symptoms indicative of pinworm infestation don't seem to improve immediately after administration, it may be prudent to switch to a benzimidazole, a phenylquanidine or an organophosphate, any of which, if used in an appropriate dose, should clear the worms temporarily. Freezing, drying, heat and steam cleaning of facilities on which the eggs are plastered are some of the methods used to decontaminate facilities that are egg-laden.

Dr. Bill Jolley

ANOTHER *B. ABORTUS* COW

You should all have heard by now: the laboratory picked up another cow infected with *B. abortus*. This cow was in the Jackson area. She was detected when a 105-cow commuter herd was tested in advance of going to summer grazing in Idaho. She was the only positive in the group. Dr. Combs will work with the owner to see if he is willing to depopulate the herd. The immediate consequence is that this sets the clock back - the earliest the state will be able to get its Class Free status back will be July next year.

The cow was euthanized and samples of lymph nodes and other tissues submitted to NVSL in Ames, IA. Wild strain *B. abortus* biovar 4 was isolated from her tissues, so there is no question about her status. It is likely, but not proved, that infection originated in wildlife. This increases the importance of the Governor's brucellosis coordinating committee coming up with sound management practices to minimize the risks of brucellosis in Wyoming cattle.

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