

# Wyoming State Veterinary Laboratory Newsletter – January 2008

## University of Wyoming

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### MESSAGE FROM THE DIRECTOR

Happy New Year! The faculty and staff of the WSVL hope each and every one of you had a great holiday season and we wish you the best for the coming year. This is also the time for New Year's resolutions. One of mine, that I hope to keep, is to get this Newsletter to you in a more timely fashion. We are going to aim at a quarterly publication, to you by the end of January, April, July, and October.

*New additions to the Newsletter.* Some individuals in the medical professions are embracing the concept of "One Medicine" or "One Health". There is really not that much difference, except for economics, between animal and human diseases, clinical and regulatory medicine, and the zoonotic infections. For this reason, I have asked Dr. Karl Musgrave, Wyoming Department of Health; Dr. Walt Cook, Wyoming State Veterinarian, and Hank Edwards, WGFD Wildlife Disease Laboratory to contribute to this Newsletter whenever a timely topic presents itself. Hopefully these contributions will become routine.

*Personnel News.* The Veterinary Sciences Department has just completed the search for a veterinary parasitologist to fill the vacancy created by Dr. Bill Jolly's retirement. Four excellent candidates were interviewed for the position and we are optimistic that we will be able to successfully negotiate with one of the individuals. In performing the searches, the Department seeks individuals who can contribute to parasitology diagnostic service including willingness and availability to consult with our clientele. Another key characteristic is the knowledge and ability to teach courses in medical and veterinary parasitology. Lastly, research productivity and creative use of diagnostic case materials to advance the knowledge of parasites and parasitic disease is an expectation. Faculty of the Department and WSVL excel in practical and applied research of immediate importance and value for the wildlife and domestic animals of Wyoming. The search to fill the fourth position for a veterinary pathologist also received new life in the last two weeks. Faced with the prospect of beginning a whole new search, a well qualified veterinary pathologist expressed interest and has applied for the position. We will be interviewing this candidate in the next few weeks. Hopefully, we will also be approved to begin a search to fill the vacant position of veterinary epidemiologist sometime this spring.

Although the work of a veterinary epidemiologist will not directly involve individual diagnostic cases submitted to the WSVL, epidemiological investigation will provide animal health scientists with needed valuable information concerning the occurrence, incidence and spread of disease in animal populations, both domestic and wild.

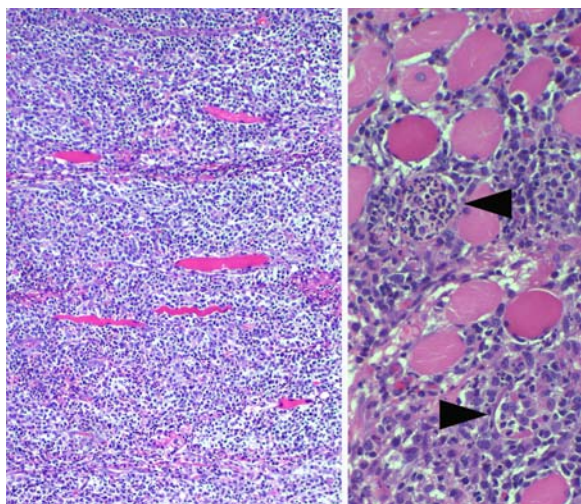
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## DIAGNOSTIC CASES OF INTEREST and LABORATORY NOTES

### Masticatory Myositis in a Collie

Dr. Warner McFarland was presented with a 14 kg spayed Border collie that had difficulty opening her jaw. He treated the bitch successfully with a 3-week course of prednisone. Two months later the problem returned. The right masseter muscle was swollen. A biopsy was taken and submitted to Dr. Cornish for examination.

Histologically there was a severe subacute myositis with myofiber necrosis and early fibrosis. Individual muscle fibers were invaded by neutrophils. In many areas, muscle was largely replaced by an intense chronic inflammatory exudate.



*Masticatory myositis in a young spayed border collie that presented with difficulty opening her jaw. On the right, a longitudinal section of muscle shows intense infiltration by a mixture of macrophages, neutrophils and plasma cells. At left, individual muscle fibers are invaded by inflammatory cells (arrowheads).*

Masticatory myositis is a chronic sporadic immune-mediated myositis of masseter, temporal and pterygoid

muscles. A unique isoform of myosin (type 2M) elicits immune-mediated destruction, possibly by cross-reaction between some bacterial antigens and this form of myosin. Affected dogs have bilateral swelling of the jaw muscles, and exhibit sporadic attacks lasting 2 - 3 weeks. Dogs are reluctant to open their mouths, have difficulty eating, and may exhibit ptyalism. Exophthalmos, linked to enlargement of the temporal muscles, can lead to exposure keratitis and conjunctivitis. If untreated, dogs will have progressive destruction of these muscles. Terminally they develop a characteristic fox-like contour of the head.

Diagnosis is by clinical signs, evidence of sporadic attacks, histological evidence of myositis, presence of antibodies to type 2M myosin, and a good clinical response to corticosteroids. This dog had a titer of 1:4000 for antibodies to type 2M myosin, confirming the diagnosis.

Shelton et al: 1987, Canine masticatory muscle disorders: a study of 29 cases. *Muscle Nerve*. 10(8):753-766.

Drs. Donal O'Toole and Todd Cornish

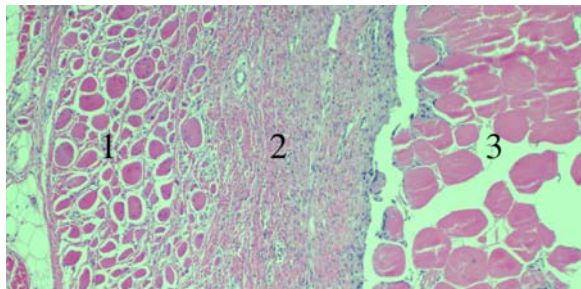
### Green Pectoral Muscles in Meat-type Chickens

Dr. Mel Fillerup was presented with green to dark brown friable muscle from one of four 16-week old Cornish chickens. The owners raised 38 chickens for personal consumption. Of these, 4 (10%) had abnormal muscles at slaughter. Fixed muscle tissues were submitted. There was abrupt transition from normal muscle to green-discolored muscle.

Histologically, sharply demarcated areas of muscle necrosis were present adjacent to normal muscle. At the margins of the areas of necrosis there was limited muscle regeneration. Affected muscle was walled off by young fibrous connective tissue. The walls of arteries and veins within infarcted muscle were inflamed and necrotic.

Deep pectoral myopathy (green muscle disease) was originally seen in turkey hens, but is also seen in up to 10% of meat type chickens, as here. Typically it occurs in birds after they have been excited and flapped their wings vigorously. Vigorous exercise results in a compartment myopathy. As a result of blood flow following exercise, there is increased pressure in the supracoracoid muscle, which lies between a thick aponeurotic sheath and the breastbone, cutting off the venous and arterial blood flow. The result is infarction of muscle.

Affected carcasses can be eaten and only affected pectoral muscles need to be trimmed out. The incidence of the disease, which is generally recognized at slaughter, can be reduced by less handling of birds, and by food restriction.



*Deep pectoral myopathy in a 16 week old Cornish chicken. At the margin of the supracoracoid muscle there is transition from atrophic and regenerating muscle (1) to fibrosis (2) to necrotic muscle which has undergone infarction (3).*

Dr. Donal O'Toole

### **Bluetongue Virus Facts and Sampling Information**

Bluetongue virus (BTV) is a transmissible, non-contagious arthropod-borne viral disease affecting domestic and wild ruminants. The virus is transmitted by small biting gnats, most often of the species *Culicoides variipennis* and is therefore limited to areas where these insects occur. In temperate climates such as Wyoming and surrounding states the infection is seasonal with disease appearing in late summer and fall. The insect vectors feed on blood of infected animals and then transfer the virus at subsequent blood meals to naive animals. Introduction of BTV can occur when an infected animal(s) is transferred to a locality where *Culicoides* occur. Bluetongue virus infects domestic sheep and rarely domestic cattle. Bluetongue also infects some species of wildlife including deer, pronghorn antelope and bighorn sheep in Wyoming.

Bluetongue Virus (BTV) and the closely related Epizootic Hemorrhagic Disease Virus (EHDV) are members of the Reoviridae family within the genus *Orbivirus*. There are 24 serotypes of BTV worldwide; 5 in the U.S. with the most common being BTV17 in the Rocky Mountain region.

Clinical signs in domestic sheep include fever, salivation, mucopurulent nasal discharge, facial edema, oral

ulcerations/erosions, cyanosis, swelling and redness in the coronet band, lameness, muscle degeneration with stiffness, and depression. Pregnant ewes infected in the first trimester of gestation may abort. Ewes infected in the 2<sup>nd</sup> trimester may have lambs with teratogenic effects or newborns with neurologic abnormalities. When infected in the third trimester ewes generally have normal lambs carrying an immune response to the virus. Bluetongue virus causes 10-30% mortality in sheep. In wildlife the virus causes peracute hemorrhage and death. In cattle this virus occasionally causes signs similar to those seen in sheep, including abortion, but BTV is usually a sub-acute infection in cattle.

Samples of choice for diagnostic virus isolation (VI) in all species are whole blood (purple tops) from live animals or spleen, lung, and lymph nodes from post-mortem animals, including aborted fetuses. The VIs are set up once per week at the WSVL. The charge for VI with identification by monoclonal indirect fluorescent antibody is \$20.00.

Please call Dr. Nicky Bratanich 307-742-6681 ext. 161 or Jackie Cavender 307-742-6681 ext. 162 in the Virology Lab for additional information.

Jackie Cavender and Dr. Nicky Bratanich

### **Intestinal Mass Associated with Feline Infectious Peritonitis**

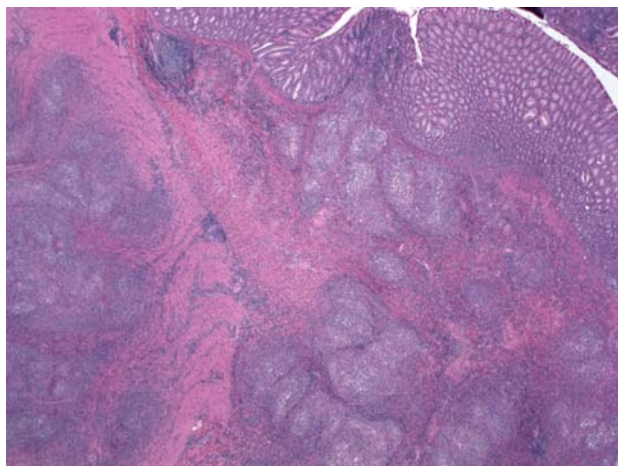
No matter how hard we try to keep current, there are some diseases or disease manifestations that fall through the cracks. We are all familiar with the common manifestations of clinical feline coronavirus types I and II infections: effusive and non-effusive (wet and dry) peritonitis (and pleuritis) as well as some of the less common syndromes of uveitis and meningoencephalitis, all due to inflammation of blood vessels in the respective tissues and organs. Even more uncommon is the localized intestinal form of FIP that can create a mass-type lesion.

Dr. Blair Gustafson examined a 14-month-old domestic shorthair cat for weight loss, inappetence, abdominal pain, and tenesmus with little fecal production. A 4-5 cm immovable mass was palpated in the mid-descending colon and visualized with ultrasound. A sample of large intestine was submitted to WSVL; rule-outs astutely included intestinal neoplasia and FIP-associated granuloma.

Microscopic examination of the sample revealed transmural thickening of the bowel by multiple and often



confluent pyogranulomas that extended into and distorted the mesentery. By immunohistochemistry, FIP viral antigen was detected in some of the granulomas.



*The colon, mucosal surface top right, is thickened by many confluent pyogranulomas that extend through the submucosa, muscularis, and into the serosa/mesentery.*

In one study (CJ Harvey), 26 of 156 cats with a diagnosis of FIP had the localized intestinal form of disease. Clinical signs in these cats were predominantly protracted diarrhea and vomiting. All of the cats had a mass, initially interpreted as a neoplasm, at the ileoceocolic junction or in the colon.

Feline infectious peritonitis should be included in the differential diagnoses for localized mass-type lesions in the lower bowel, especially in cats less than two years of age. Thanks to all the practitioners who continually submit these interesting cases.

CJ Harvey, et al: An uncommon intestinal manifestation of feline infectious peritonitis: 26 cases (1986-1993). J Am Vet Med Assoc 209(6):1117-1120, 1996.

Dr. Don Montgomery

### **Diagnostic Testing for *Trichomonas foetus* – Options**

The WSVL offers two tests for *Trichomonas foetus*; one based upon the polymerase chain reaction (“PCR”) and one based upon conventional culture and microscopic identification. It currently looks like the State Veterinarian will approve the PCR test as an “official” test for *Trichomonas* control, thus it behooves veterinarians to understand the differences between the two tests and order appropriately. **It also means that submitters *must* specify which test they want when**

**submitting samples – “Culture” or “PCR”. The lab will no longer be able to assume which test is required if you don’t specify one or the other.**

Basically, PCR is a bit more sensitive (various sources cite 86-97%) than culture *when dealing with a single sample*. It is also much more specific than culture as it is based upon identifying *T. foetus* specific genes rather than upon the subjective judgment of a technician. The test is sufficiently sensitive to be useful for controlling *Trichomonas* at the *herd level* with a single scraping, *so long as all bulls in the herd are tested*. The main drawback to PCR is that it is considerably more expensive than culture (\$30 vs \$7) and takes an extra day to complete. It is also important to note that the test does not absolutely guarantee the absence of *Trichomonas* in any given animal. We have seen at least two samples in which PCR missed a *Trichomonas* infection which subsequent culture detected.

The current “gold standard” to rule out the presence of *Trichomonas* is culturing 3 successive samples. While individual cultures are not theoretically as sensitive as PCR, the probability of detecting an infection increases substantially with each successive culture to the point that 3 negative cultures represents a 99% probability that no *Trichomonas* is present. Thus, when you *really* need to be sure, or are dealing with an individual animal, this is probably still the better way to go. In theory, repeating the PCR on 3 successive scrapings should yield a similar improvement in detection, but would be very expensive.

As with any laboratory test, the results of either *Trichomonas* test are no better than the quality of the sample tested. Samples should be collected as specified in the Livestock Board certification workshops and should contain quality smegma, i.e. mucous, mucosal cells and miscellaneous secretory/excretory fluids from the prepuce of bulls or the vagina of cows. Large fragments of mucosal tissue, significant amounts of blood and/or fecal contamination significantly lower diagnostic confidence. Veterinarians opting for single-test PCR are encouraged to order culture media-loaded tubes or bulk quantities of culture medium for in-clinic tube loading, so that smegma samples can be directly inoculated during sampling of bulls/cows. Since both tests depend upon the presence of live organisms, anything that can be done to ensure the viability of the sample is effort well spent. Transport media should be cool (~15-20C) to slow metabolic activity, but under no circumstances should the sample be allowed to freeze. Shipping tubes should contain as little air as possible. The shorter the interval between collection and testing, the better the results. ***Samples for culture should be shipped to arrive by Friday morning. Samples for PCR***

*should arrive by Thursday morning to avoid unnecessary delay in processing.*

Contact Katie in the Diagnostic Parasitology lab at WSVL with questions: 307-742-8861 ext. 182.

Katie Bardsley and Dr. Merl Raisbeck

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**FROM THE WY DEPT of HEALTH**

**Reimbursement for Shipment of Rabies Specimens**

The Wyoming Department of Health (WDH) has made available funds to pay for shipping of rabies specimens for testing at WSVL. Funds were allocated for this purpose after several recent incidents where veterinarians were unable to charge animal owners for shipping of heads for testing. The veterinarians paid for shipping out of their own pocket. The WDH wants to ensure that shipping costs are not a barrier to rabies testing. Also, WSVL does not charge for rabies testing in order to encourage testing.

To obtain reimbursement for shipping charges, Veterinarians can mail an original receipt to the State Public Health Veterinarian at the address below. Shipping can be by USPS, UPS, Fed Ex or any other legitimate shipping vendor.

Veterinarians can also contact their County Veterinarian (CV) or Regional Veterinary Coordinator (RVC) to arrange for shipping of specimens. The CV and/or RVC will ship the specimen for the veterinarian at no charge. Contact information for CVs and RVCs can be obtained from the State Public Health Veterinarian.

Packaging and shipping of specimens should follow Wyoming State Veterinary Laboratory Guidelines that are posted on their website at <http://wyovet.uwyo.edu/Samples.asp> or can be obtained by calling 307-742-6638. Free shipping containers can also be obtained from the Laboratory

This program is voluntary. If veterinarians want to continue to pay for shipping costs themselves or charge the customer, they are still free to do so.

Karl Musgrave, DVM, MPH  
State Public Health Veterinarian  
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**FROM THE WYOMING STATE  
VETERINARIAN'S OFFICE**

**Trichomonas Testing Rules and More**

As mentioned in an article by Dr. Raisbeck and Katie Bardsley, the Wyoming Livestock Board has adopted amendments to the Chapter 15 Trichomoniasis Rules. These rules now go to the Attorneys General's office and Legislative Service Office for review. Subsequently we anticipate that they will be signed by the Governor's office. Thus we expect them to be in effect within a few weeks. A link will be posted on the Wyoming Livestock Board's website (<http://wlsb.state.wy.us/>) when they have been signed.

The new rules allow a single PCR test to be used in place of three cultures for trichomoniasis prior to a change of ownership if the PCR is conducted on all test eligible (nonvirgin) bulls. It is not a requirement that PCR be used, just another option for producers that need to test all their bulls and don't wish to sample them three times. A similar option is available for producers wishing to lease out bulls.

Another change is that these new rules will require that veterinarians collecting samples for trichomoniasis get recertified to do so every 5 years beginning July 1, 2009. Several veterinarians were recertified at the WVMA winter meeting. Dr. Jolley has agreed to work with Dr. Logan and myself to offer additional certification courses throughout the state prior to July 2009. We also plan to work with the new parasitologist at WSVL to continue offering periodic certification courses. Dr. Raisbeck also mentions how critical a quality sample is for diagnostic reliability. The new rules give WSVL the authority to disqualify a sample if it is not a high quality sample (i.e. contains too little smegma or contains too much blood).

One of my big concerns in trying to maintain an adequate regulatory program is the lack of veterinarians practicing food animal medicine, particularly in more rural areas. When I talk with Wyoming-born veterinary students and recent graduates interested in practicing mixed or food animal medicine, most express a sincere desire to return to the state. But, most can not afford to practice food animal/mixed animal medicine in Wyoming due to their student loan debts. The average

student loan debt for new veterinary graduates is now over \$100,000.

Several years ago the state legislature recognized that it was difficult to attract physicians, dentists and other human health professionals to rural Wyoming, and part of the reason was the student loan indebtedness of these professionals. Consequently, legislation was passed to forgive student loan debts of these professionals under certain conditions.

Recognizing that a similar crisis exists with regard to food animal veterinarians, Representative Dan Zwonitzer (R., HD 43; Laramie County) has sponsored a bill patterned after the physician and dentist student loan repayment statutes. Like those statutes, this bill requires a minimum 3 years practicing in Wyoming and an employer match of 25%. Both programs require agency (Wyoming Department of Health, or Wyoming Livestock Board) rules to determine the specific allotment of funds, and both programs will help alleviate the shortage of health care providers in underserved areas of the state. If you support this concept, talk with your local legislators and encourage them to vote for the bill.

Dr. Walt Cook  
Wyoming State Veterinarian