February 2015, Vol. 2, No. 1

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A newsletter about diagnostic trends at the laboratory, animal health topics, interesting cases and new test offerings.

www.vdl.ndsu.edu

We welcome comments, questions and suggestions. Please email us at vetlab.ndsu@ndsu.edu or call the laboratory at (701) 231-8307.

NDSU Veterinary Diagnostic Laboratory

This edition highlights some of the changes under way at the laboratory as we enter into the busy late winter/spring season.

Laboratory clients should have received our annual test offering/fee schedule that was mailed in mid-February. In case you have not received it, it is available on our website by clicking on the Tests tab, then "download fee schedule." You will be pleased to find most tests and fees have remained unchanged from the previous year, with a few notable and positive exceptions:

- Prices have been lowered on most PCR tests, including Johne's disease
- Pooled testing for *Tritrichomonas* now is offered
- Aerobic cultures have been restructured to include individual cultures for organisms that require special media and to separate sensitivities that now are offered as an individual test

We hope these changes will improve isolation of pathogens and ultimately save clients money by avoiding sensitivity charges on cultures that yield no growth or insignificant isolates. Please take a moment to review the changes detailed in this edition.

Beginning this spring, the laboratory will phase in new reports to replace our traditional word processor-generated reports. While the appearance of the new reports will differ significantly from our current ones, we hope you will find the readability and organization of data to be superior because they have been designed with a client's perspective in mind.

The annual continuing education event for veterinarians and technicians is scheduled for Thursday, May 21. I urge you to consider attending because we have planned an excellent program that will be of interest to small, mixed and large animal practitioners alike. Please save the date.

Finally, I want to remind everyone we sincerely welcome any comments you may have on the services we provide. Your feedback is critical to ensuring the laboratory is meeting the current and future needs of your practice. Please take a few minutes to contact us by phone at (701) 231-8307 or drop us a note on our website (www.vdl.ndsu.edu/contact).

Sincerely,

Brett T. Webb, DVM, PhD, DACVP
Veterinary Pathologist
NDSU Veterinary Diagnostic Laboratory

NDSU VETERINARY DIAGNOSTIC LABORATORY
North Dakota State University

Flat-rate, One-day Shipping for $7

The NDSU-VDL has contracted with UPS to provide a convenient, reduced-rate shipping option for our clients. As shipping times and costs have continued to increase for U.S. Postal Service packages, we feel this is the best choice for expedient shipping of samples to the laboratory.

- Flat rate – same price regardless of package weight
- Multiple shipping options – have the package picked up at your clinic, drop it off at a UPS location or give it to a UPS driver, all for no charge
- One-day ground shipping from any location in North Dakota and parts of western Minnesota, eastern Montana and eastern South Dakota
- Next-day air shipping is available for clients residing in other states for a flat rate of $15 (next-day air packages are limited to 5 pounds)

To purchase labels, please email your order to ndsu.vetlab@ndsu.edu or call (701) 231-8307. For more information and a map detailing transit times for other areas, please visit our website (www.vdl.ndsu.edu/images/uploads/page_files/UPS_Shipping_to_VDL.pdf).

Bacteriology Changes for 2015

Culture and susceptibility now will be charged separately for all cultures. Aerobic culture still should be requested for all basic cultures, including those for urine, ear, skin and tissue. Susceptibility testing will be run at the discretion of the laboratory or per the client's request based on the significance and predicted susceptibility of the isolate.

Certain types of bacteria require extra or special media for isolation (*Mycoplasma sp., Campylobacter sp., Listeria monocytogenes, Clostridium perfringens*, etc.). If you suspect one of these agents, please request the specific culture or indicate which bacteria are a concern on the submission sheet to allow for appropriate test ordering and media selection.

Finally, fecal culture is now a specific test and should be ordered for either large or small animal submissions.

Please direct any questions regarding cultures to Claire Miller, DVM, PhD, DACVM, VDL Microbiologist at (701) 231-8307.

Pooled *Tritrichomonas* Testing Now Available

Preputial washings from up to five bulls now can be pooled for testing. You must indicate on the submission form that you would like the samples pooled.

Samples will be pooled at the laboratory, and individuals in positive pools automatically will be retested.

The submitter is responsible for checking destination state requirements concerning pooling of samples for *Tritrichomonas* testing. The cost is $45/pool.

For more information, see the updated collection and submission guide (www.vdl.ndsu.edu/images/uploads/page_files/trichomoniasis_Feb_20152.pdf).

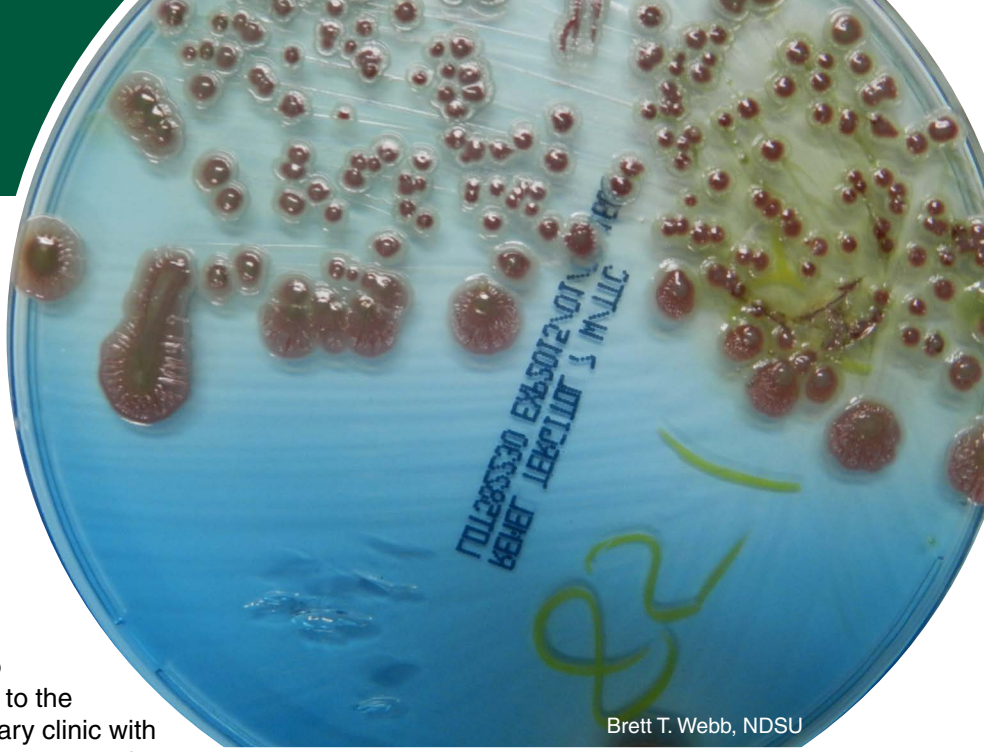
New Tests

New Tests	Price
Bovine Respiratory Coronavirus PCR	$40
This test can be added to the bovine respiratory multiplex that includes BVDV, IBRV and BRSV for an additional $15.	
***Coxiella burnetii* PCR**	$35
Pooled *Tritrichomonas* PCR	$45
(five preputial washes/pool)	

Noteworthy Cases

Providencia Alcalifaciens Enteritis in a Puppy

Neil Dyer, DVM, MS, DACVP


Brett T. Webb, NDSU

The body of a 12-week-old female Chihuahua/dachshund-cross puppy, rectal swab and vomitus were submitted to the Veterinary Diagnostic Laboratory at North Dakota State University. Clinical history included purchase at a local pet store one month prior; current vaccinations for distemper, parvovirus, kennel cough and parainfluenza; and deworming.

A subsequent fecal examination revealed no oocysts or ova. Two days before submission to the VDL, the animal presented to a local veterinary clinic with acute onset of diarrhea and vomiting, which progressed rapidly to death in seven hours. The puppy had been treated with subcutaneous fluids, dextrose and oral Nutrical®. An expired in-clinic parvovirus test was negative.

Gross necropsy revealed a mildly emaciated carcass with matting of the perianal region. The serosa of the entire small bowel was hyperemic, and the bowel lumen contained hemorrhagic contents. Cerebral cortex, cerebellum, brainstem, hippocampus, heart, lung, diaphragm, liver, kidney, spleen, pancreas, duodenum, ileum, colon and adrenal gland were sampled for histopathology. Sections of duodenum and ileum showed marked mucosal congestion with diffuse villous tip necrosis leading to loss of enterocytes and blunting of villi. Multifocal lymphoplasmacytic infiltrates were present in the submucosa and lamina propria. Fluorescent antibody examination of frozen sections of ileum was negative for canine parvovirus and canine coronavirus. EM examination of fecal material did not reveal viral particles. Culture of ileum yielded a heavy, pure growth of *Providencia alcalifaciens*.

Providencia alcalifaciens is a member of the Enterobacteriaceae family and usually considered a commensal in the human digestive tract. It has been implicated as a cause of human gastroenteritis as well. *Providencia* bacteria are considered opportunistic pathogens. They have been isolated from both humans and animals, as well as soil, water and sewage. In humans, *Providencia* has been found in urine, feces, blood, sputum, skin and wounds. In animals, *Providencia* infections have been associated with hemorrhagic pneumonia in piglets, neonatal diarrhea in dairy cows, enteritis in dogs, meningitis/septicemia in crocodiles and enteritis in chickens. In some of these cases, *Providencia* isolates have exhibited resistance to various types of antibiotics.

Based on the history of this case, it seems likely that the puppy became infected through contact with a human handler at the pet store, what is referred to as an anthroponotic infection. The stress of the new environment may have suppressed the puppy's immune system to the point that *Providencia* was able to colonize the small intestine and cause a fatal enteritis.

Submission Tips

Because abortion season already has begun, we want to stress the importance of submitting a complete set of fresh and formalin-fixed tissues. **The most important tissue we can receive for evaluation is the placenta.** Submissions that include the placenta are typically twice as likely to result in a definitive diagnosis as submissions without the placenta.

Specimens to include:

- Fresh placenta, brain, thymus, heart, lung, liver, kidney, spleen, abomasal fluid and any tissue with a suspected lesion
- Maternal sera
- Formalin-fixed placenta, brain, thymus, heart, lung, liver, kidney, spleen, conjunctiva, adrenal gland, skeletal muscle and any tissue with a suspected lesion

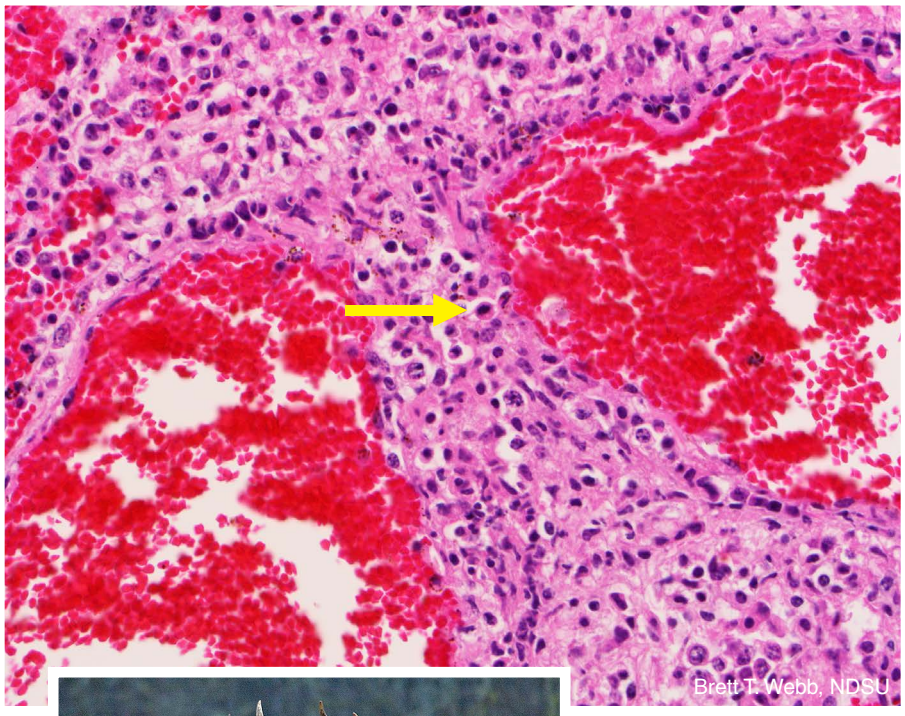
Malignant Catarrhal Fever in a Bull Elk

Fresh and formalin-fixed tissues were received from a 3.5 year-old captive bull elk that was found dead without prior clinical signs. During the postmortem examination, the practitioner reported observing extensive hemorrhages scattered throughout the small intestine, colon and lungs.

The primary histologic finding in the submitted tissues was lymphocytic vasculitis of small to medium-sized vessels of the lungs and gastrointestinal tract. Extensive necrosis of the colonic mucosa was present. Interstitial to perivascular and periportal lymphocyte and plasma cell aggregates were observed in the kidney and liver, respectively. Ovine herpesvirus -2 DNA was detected in lung tissue by PCR.

Malignant catarrhal fever is a fatal disease of ungulates with a complex and incompletely understood pathogenesis. It is caused by infection with ovine herpesvirus -2 or alcelaphine herpesvirus-1, which are host-adapted gamma herpesviruses that cause subclinical or inapparent infection in sheep and wildebeests, respectively. Infection in nonreservoir ungulates induces a proliferation of predominately CD8+ T lymphocytes, which accumulate in a variety of tissues. It is postulated that these virus-infected lymphocytes induce vasculitis due to dysregulated cytotoxic activity.

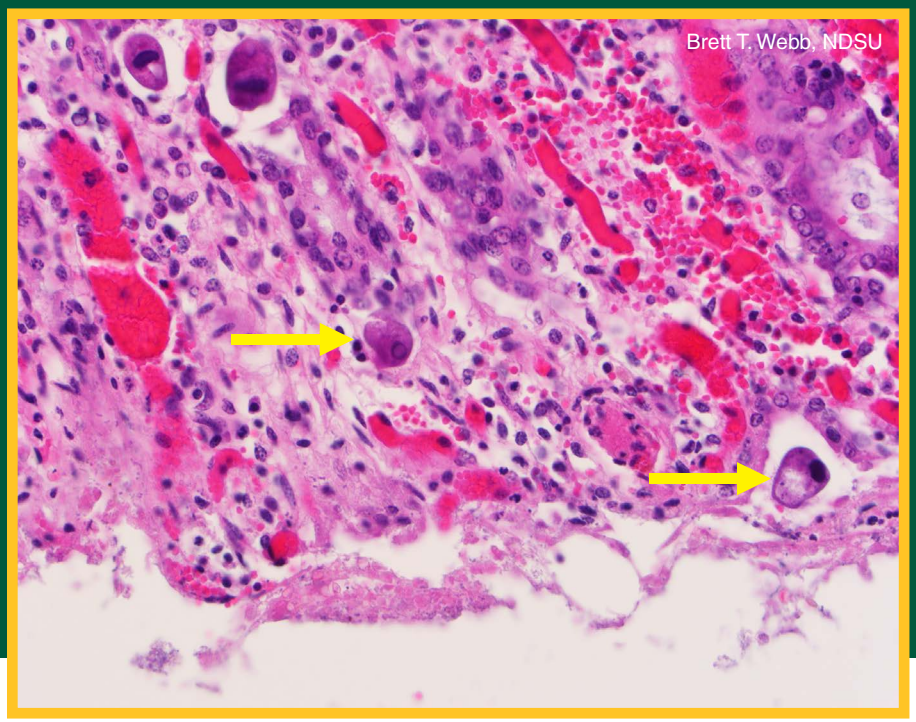
Commonly observed lesions and clinical signs in cattle include corneal edema with ocular discharge, nasal discharge, ulceration of the muzzle and buccal cavity, depression and diarrhea. Antemortem diagnosis can be achieved by PCR testing of nasal swabs or tissue samples in conjunction with compatible clinical signs.



Photomicrograph of pulmonary vasculitis with medium to large lymphocytes invading vessel walls. Occasional mitotic figures are observed in the inflammatory cell population (arrow).

Diagnostic Laboratory Calendar

Friday, April 3, Good Friday - laboratory closed
Thursday, May 21 - annual CE for veterinarians
Monday, May 25, Memorial Day - laboratory closed
Friday, July 3 - Independence Day - laboratory closed



Multiple *Balantidium sp.* protozoa (arrows) invade the colonic mucosa, which is covered by fibrinocellular debris.

Balantidium sp. Colitis in a Quarter Horse Filly

A 6-month-old Quarter Horse filly was presented for necropsy after being found dead. The animal was reportedly normal the previous evening at the time of feeding. With the exception of diarrheic feces covering the perineum, no external abnormalities were observed.

The principal gross lesion was moderate, diffuse thickening of the colonic and cecal mucosa, whose surfaces were markedly reddened and partially covered by small flecks of fibrin. A few adult Ascarids were found in the small intestine. The remaining organs and structures were unremarkable.

Histologically, the large intestinal mucosal surface was denuded and covered by fibrinocellular debris admixed with rare mixed bacteria. Scattered epithelial necrosis was present throughout. Large numbers of 25 to 45 µm in diameter, circumferentially ciliated protozoa were present on the surface, in small ulcers and occasionally within the lamina propria. Low numbers of inflammatory cells consisting primarily of eosinophils and lymphocytes were present within the lamina propria. Histologic lesions of significance were not observed in other tissues.

Aerobic culture of the large intestine showed mixed growth in moderate numbers, along with moderate numbers of *Clostridium perfringens*. No *Salmonella sp*. or other probable pathogens were observed. PCR for *Lawsonia intracellularis* was negative.

Balantidium sp. are commensals of the large intestine in many different species. Swine are the reservoir for *Balantidium coli* and infections are typically asymptomatic, although occasional disease is observed in this species. *Balantidium coli* is a zoonotic pathogen of humans in whom it causes persistent diarrhea and occasionally life-threating colitis. Exceedingly little is known about *Balantidium sp*. infections in horses as only a few case reports exist.

The features of this case suggest Balantidium sp. can result in severe infections in horses. The isolation of *Clostridium perfringens* likely reflects overgrowth of normal flora in this case as lesions consistent with Clostridial colitis were not observed. The source of infection in this case is unclear as the filly had no known contact with obvious reservoir species such as pigs.

Cover photo by Brett T. Webb, NDSU

Contact Information

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For more information on this and other topics, see **www.vdl.ndsu.edu**