NDSU Veterinary Diagnostic Laboratory

Spring 2024, Vol. 8, No. 2

In This Issue

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

www.vdl.ndsu.edu

Feedback is always welcome. Please feel free to send your comments or suggestions to ndsu.vetlab@ndsu.edu and specify "newsletter" in the subject line.

Director's Corner

Happy spring! The NDSU VDL made it through the winter with only one snow day thus far. What a difference from the last few years. I am eagerly looking forward to warmer temperatures and garden preparations.

In other exciting news, I am pleased to share that the NDSU VDL received full accreditation from the American Association of Veterinary Laboratory Diagnosticians (AAVLD) through December 2028.

As we continue our mission to provide reliable testing and diagnostic support to veterinarians, animal owners, producers and the public health sector, we are seeking ways to reach out to our clients to improve the services we offer. To that end, we hope to start a series of webinars on sample collection, antimicrobial resistance, and diseases of economic and public health importance to North Dakota. Stay tuned for details.

Feel free to reach out to us via the website www.vdl.ndsu.edu/ or email at ndsu.vetlab@ndsu.edu with any additional ideas you have for ways the NDSU VDL can provide more outreach to clients and producers.

Heidi Pecoraro, DVM, Ph.D., Diplomate, ACVP
NDSU VDL Director and Veterinary Anatomic Pathologist

Mystery Photo

An 8-year-old, male neutered domestic shorthaired cat with a history of hypercalcemia, constipation, chronic renal insufficiency, congenital heart murmur, congenital orthopedic anomalies and calcinosis cutis on the rear feet is examined for necropsy.

What is the underlying cause?

Visit the NDSU VDL website (www.vdl.ndsu.edu) to see the answers and read more about the case.

Adult cat. (Photo by H. Mitchell, NDSU VDL Diagnostician)

NDSU VETERINARY DIAGNOSTIC LABORATORY
North Dakota State University

Bench Notes

EIA (Coggins) testing – From March 1 to May 31, Equine Infectious Anemia (Coggins) ELISA testing will be performed daily.

Brucellosis testing – Abortion work-up in North Dakota cattle herds includes *Brucella abortus* BAPA testing if serum from the aborting dam is submitted with the fetal sample(s). To avoid hemolysis, serum should be removed from the clot and aliquoted to another tube prior to shipping.

HPAI in ruminants – Recently, a small ruminant in Minnesota and dairy cattle across the U.S. have tested positive for Highly Pathogenic Avian Influenza (HPAI). In cattle, the disease has not been fatal. The NDSU VDL can test mammalian samples for HPAI with the state veterinarian's approval and initiation of a foreign animal disease investigation. Please contact the state veterinarian's office for details.

Clostridium perfringens cultures – Requests for *Clostridium perfringens* culture will now require an accompanying enteric culture for an additional charge. This requirement is to ensure that the full diagnostic picture is evaluated as anaerobic infections are often accompanied by primary aerobic causes, such as *Salmonella* or other enteric pathogens. Visit our website for pricing and submission information.

University phone system – NDSU has converted the university telephone service to Zoom cloud-based technology to significantly enhance unified communications. As a result, the NDSU VDL will no longer have fax service.

Calendar: Spring-Summer Closures

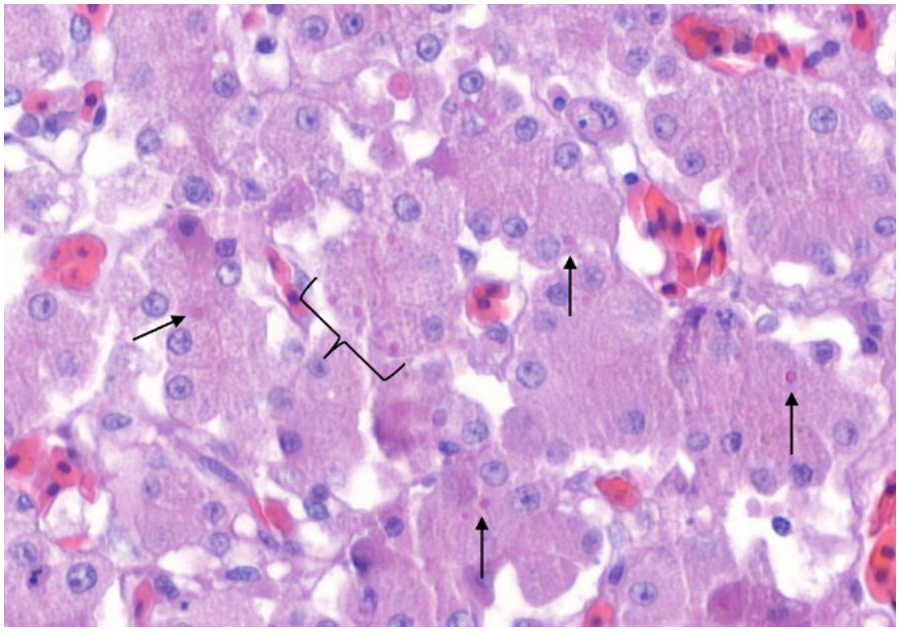
May 27 – Memorial Day
July 4 – Independence Day

Mini Case Reports

Dr. Quynn Steichen, NDSU VDL veterinary anatomic pathology resident

The NDSU VDL received a 2-year-old female albino boa constrictor for autopsy. The client had previously lost several other boa constrictors, all less than 2 years of age.

Postmortem examination revealed a slim body condition score with a slightly wrinkled neck and visible spine. The mouth had a large amount of thick, clear viscous fluid that extended throughout the entire gastrointestinal tract. Within the esophagus and stomach were multiple mucosal hemorrhages.



Liver from a snake with intracytoplasmic inclusion bodies (arrows and bracket) within hepatocytes. (Photomicrograph by Q. Steichen)

Histologically, throughout multiple tissues, epithelial cells contained small, intracytoplasmic, brightly pink inclusion bodies. These inclusions were most pronounced in the liver (see figure) but were also observed in the esophagus, brain, gastrointestinal tract and mouth.

Altogether, the inclusion bodies and the signalment of the animal are pathognomonic for boid inclusion body disease. This is a viral disease that is exclusively seen in captive boids, which includes boas and pythons. This is an easily transmissible and progressively fatal disease.

Clinical signs include central nervous system abnormalities, chronic regurgitation and loss of body condition. Secondary infections, such as bacterial, fungal or protozoal, are common and typically lead to mortality. There is no treatment for boid inclusion body disease.

In this case, the esophageal and gastrointestinal hemorrhages and the inflammation within the mouth were caused by secondary bacterial infections. In addition, the death of the other boa constrictors is most likely related to boid inclusion body disease.

Disease Updates

Neospora caninum Abortion

Dr. Heidi Pecoraro, NDSU VDL Director and Veterinary Pathologist

During the late winter and throughout the spring, the NDSU VDL's caseload is largely composed of abortion investigations. Cattle, small ruminant and equine abortions may be due to infectious diseases, genetics, nutritional deficiencies, toxic insults and/or environmental factors.

Infectious causes of bovine abortion observed most frequently at the NDSU VDL include infectious bovine rhinotracheitis or IBR (bovine herpesvirus-1); bacterial infections like listeriosis, salmonellosis, ureaplasmosis, and sporadic salmonellosis and escherichiosis; fungal infections that spread hematogenously from the dam to the fetus; and protozoal infections. Of the latter, *Neospora caninum* infection is by far the most common.

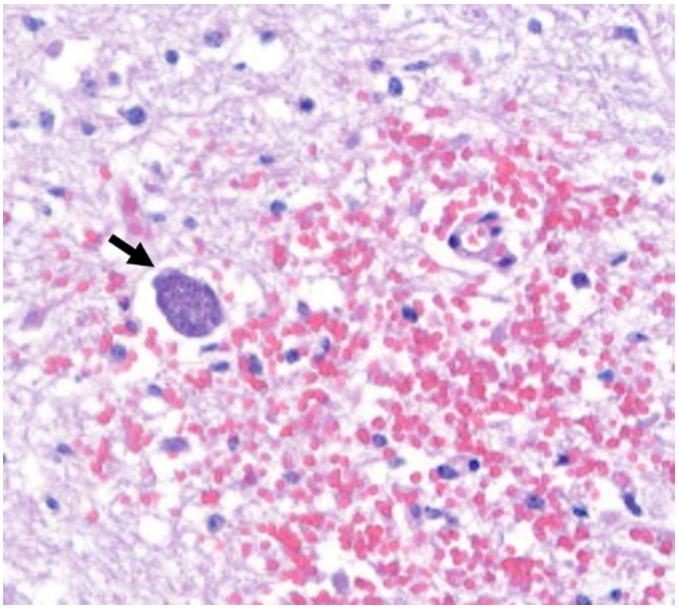
Neospora caninum causes second trimester abortion in cattle worldwide, though abortion can occur any time after the third month of gestation. Canids, such as dogs, coyotes and wolves, are the definitive hosts for *Neospora caninum* and shed the parasite in feces. Transmission to intermediate hosts like cattle occurs by ingestion of oocysts in soil and water.

Most *Neospora caninum* infections do not end in abortion. Surviving heifers infected congenitally can become carriers, spreading the parasite to the next generation of offspring. There are no treatments or vaccines for *Neospora caninum*. Infection can, therefore, be maintained within the herd indefinitely without appropriate interventions.

Aborted calves may be mummified. Ascites and anasarca can also be observed. Microscopically, encephalitis, myocarditis, glossitis and interstitial nephritis are noted. Inflammation in the brain and muscle are occasionally associated with one or more 30-100 um cysts containing numerous ~8 x 2 um structures. (See figure.)

Besides evaluation of tissues, the NDSU VDL offers two other *Neospora caninum* testing methods. PCR detects the organism in fetal tissues, while serology is useful in determining if there are antibodies present in maternal sera.

Over the last year, NDSU VDL pathology and serology services have diagnosed more cases of *Neospora caninum* than in past years. This could be due to increased infections in North Dakota herds or greater awareness of the disease and thus increased test requests. In any case, NDSU VDL pathologists have diagnosed neosporiosis in both sporadic abortion and abortion storm cases in herds throughout the state.



Brain of bovine fetus containing a *Neospora caninum* cyst (arrow) surrounded by blood and inflammatory cells. (Photomicrograph by Q. Steichen, NDSU VDL pathology resident)

As a reminder, for abortion work-ups, submission of whole animals with placenta and maternal sera are best. However, if field samples are sent to the laboratory, be sure to include the following:

1. fresh brain, heart, lung, liver, kidney, spleen, abomasal fluid, thymus, thyroid, lymph node, fetal eyeball/vitreous humor (for nitrate analysis), placenta and any tissue with a suspected lesion;
2. formalin-fixed placenta, brain, thymus, heart, lung, liver, kidney, spleen, conjunctiva, adrenal gland, skeletal muscle and any tissue with a suspected lesion;
3. feed and water; and
4. maternal sera (acute and convalescent).

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Staff Spotlight

Day in the Life — Dawn Walden

Dawn has been serving as the quality manager at the NDSU VDL for the past 17 years. Her role is crucial in ensuring that the protocols and tests used for diagnostics are accurate and dependable. Having an accredited quality management system emphasizes the importance the NDSU VDL places on providing excellent veterinary diagnostic care and reliable results for all cases submitted to the lab. She has been instrumental in helping the NDSU VDL earn and maintain full accreditation with the American Association of Veterinary Laboratory Diagnosticians. One of Dawn's favorite quotes is "To improve is to change - to be perfect is to change often" – Winston Churchill.

Dawn Walden
NDSU VDL Quality Manager
(Photo by K. Benson, NDSU VDL Chemist)

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