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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

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.

NDSU Veterinary Diagnostic Laboratory

Director's Corner

The end of summer was busy for the NDSU VDL as we prepared for an audit of our quality management system by the American Association of Veterinary Laboratory Diagnosticians (AAVLD).

An audit is required every five years to maintain AAVLD accreditation. Our last audit was in 2017; however, accredited labs were granted a one-year extension due to the COVID pandemic. Thus, this was the first audit conducted in the new NDSU VDL facilities, and with me as laboratory director.

Laboratory accreditation demonstrates that the NDSU VDL quality management system follows a rigorous set of standards on how the laboratory is organized, conducts business and performs tests. In essence, accreditation means that clients can trust our results.

Over the last 15 years, the NDSU VDL has continually improved its quality management processes. This has been largely accomplished under the direction of our quality manager, Dawn Walden, in collaboration with lab directors, section heads, technologists and support staff.

Stakeholders, such as regional and state veterinarians, producers and animal owners, as well as NDSU Ag Affairs faculty and staff have made this possible by using and/or promoting our services. Therefore, a huge thank you is due to **you, our client**, for helping to make the NDSU VDL the best full-service laboratory on the prairie.

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

Mystery Photo

An adult cat died under anesthesia.

What is the underlying cause?

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



(Photo by Dr. Neil Dyer, NDSU attending veterinarian and former VDL pathologist and director)

NDSU VETERINARY DIAGNOSTIC
LABORATORY
North Dakota State University

Calendar: Fall-Winter Closures

- November 10** – Veterans Day
- November 23** – Thanksgiving
- December 25** – Christmas
- January 1** – New Year's Day
- January 15** – Martin Luther King Jr. Day

New Faculty



Dr. Brett Webb
(Photo by Kelli Maddock, NDSU VDL microbiologist)

Laboratory submitters may have noticed a familiar name reappearing on NDSU VDL reports over the last two months. We are happy to share that Dr. Brett Webb has returned to the NDSU VDL as our remote veterinary pathologist.

Dr. Webb earned his DVM and Ph.D. at

Colorado State University, where he also completed his pathology residency. He first joined NDSU VDL as an anatomic pathologist in 2013 and became lab director in 2017. During his tenure, Dr. Webb was instrumental in planning and overseeing the building of our new state-of-the-art facilities, maintaining full AAVLD accreditation during the 2017 cycle, setting up the molecular diagnostic lab section, revamping the website, and developing the new laboratory information management system.

From his home in Wyoming, Dr. Webb will perform histologic evaluation of surgical biopsies and necropsy tissues, help train the veterinary resident and diagnostician, work closely with laboratorians, and be assigned other special projects as needed by the laboratory. Dr. Webb will also be onsite several weeks throughout the year to cover leave for the lab-based pathology team members and assist with quality assurance activities.

We are fortunate to have a remote pathologist with Dr. Webb's expertise, knowledge of laboratory processes, and familiarity with veterinarians, producers, and diseases affecting our region.

Disease Updates

Calf scours 2022-2023

Kelli Maddock, Tylise Graff, Sarah Gefroh and Quynn Steichen

Every year, the NDSU VDL performs hundreds of tests to investigate the cause of scours in calves. These tests include enteric cultures for bacteria such as *Salmonella* and *Escherichia coli* and PCR assays for bovine coronavirus (BCoV), rotavirus A (Rota), *Cryptosporidium parvum* (Crypto) and *E. coli* virulence factors (*Intimin*, *Stx-1*, *Stx-2*, *Stx*, *K99*, *F41*). In addition, fecal analysis is conducted in calves over two weeks of age to identify any parasites that developed after birth. These tests can be ordered for a single fee under the Neonatal Diarrhea Study. <https://www.vdl.ndsu.edu/tests/neonatal-diarrhea-study/>

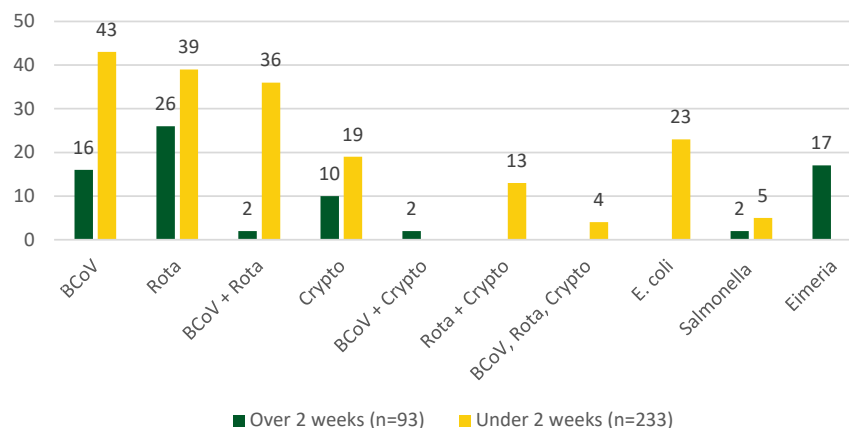
From March 2022 to mid-May 2023, the NDSU VDL investigated 217 calf scours cases containing 326 total samples. Of these cases, 149 were from North Dakota, 57 from Minnesota, nine from South Dakota and two from Montana. The majority (71.5%) were from calves less than two weeks old, and most of the samples were from beef cattle (86.2%).

For all age groups, enteric viruses were the most prevalent etiologic agent identified in scouring calves, followed by Crypto, bacteria such as *E. coli* and *Salmonella*, and coccidian parasites (*Eimeria* spp.), respectively. Multiple agents were often detected. *E. coli* virulence factors were detected in 9.8% of 233 *E. coli* positive samples. Similar to 2021, *Intimin*, associated with attaching and effacing *E. coli*, was the most commonly identified virulence factor (78%; n=18). Of the seven *Salmonella* isolates cultured, three were serotype Dublin, two were Newport, and Oranienburg and Monetevideo accounted for one case each.

Antimicrobials are not recommended as first-line treatment for scouring animals due to lack of treatment efficacy. Antimicrobial use in scouring calves causes prolonged diarrhea and shedding of viruses, parasites and pathogenic bacteria in the environment. In addition, antimicrobials also affect good bacteria in the gut, which may impact animal health and growth over time. Normal or healthy enteric samples contain a variety of bacterial flora that help aid digestion and absorption of nutrients while preventing the overgrowth of harmful bacteria.

Finally, because *C. parvum*, *Salmonella* spp. and *E. coli* can be transmitted from animals to humans, handwashing after working with animals, especially prior to eating, is critical.

Cause of Calf Scours by Age 2022-2023

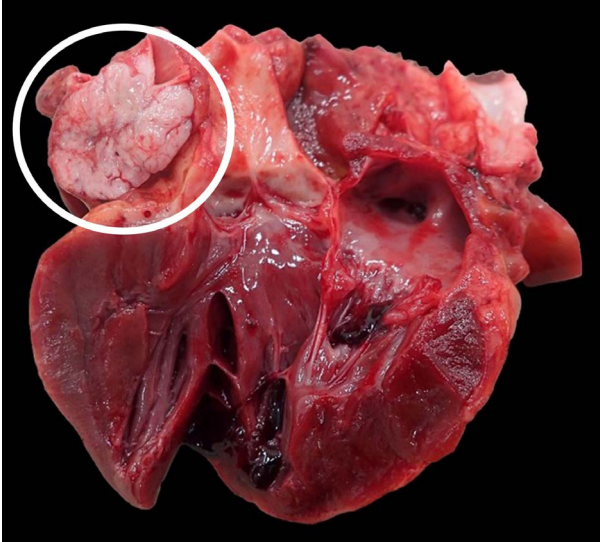


Mini Case Reports

Dr. Quynn Steichen, NDSU VDL veterinary anatomic pathology resident

The NDSU VDL received a 5-year-old male intact Boston Terrier canine with a one-month history of heart failure.

Grossly, in addition to ascites pericardial effusion and a small multilobulated liver, there was a 1.5 x 1.5 x 0.5 cm bulging multilobulated white firm aortic mass attached to the adventitia of the pulmonary artery (circled in image).



Chemodectoma in a dog. (Photo by Q Steichen)

Microscopic evaluation of the aortic mass revealed a pseudo-encapsulated, well demarcated, densely cellular neoplasm composed of polygonal cells arranged in nests and packets supported by a thin rim of fine fibrovascular stroma with lobules separated by a dense band of fibrovascular connective tissue. The neoplastic cells exhibited mild atypia. Immunohistochemistry for Chromogranin A, a neuroendocrine marker, revealed strong positive cytoplasmic immunoreactivity of neoplastic cells, indicating the tumor was a chemodectoma.

Chemodectomas are malignant tumors that arise from chemoreceptors. These specialized receptors are found throughout the body and are responsible for detecting and responding to changes in carbon dioxide, pH and oxygen tension to regulate respiration and circulation. In domestic animals, the most prevalent area for development of chemodectoma is the aortic body, although they are less frequently observed in the carotid body. The reverse is true for humans. There are predilections for aortic body tumors in male brachycephalic breeds (specifically Boston Terriers). Theories exist that chronic hypoxia, commonly observed in brachycephalic breeds, may be one reason for increased incidence.

Aortic and carotid body tumors are often presented as space-occupying lesions. This case is unique in that additional clinical signs and gross lesions were present for congestive heart failure including hydropericardium, ascites and passive congestion of the liver.

Other differentials for neoplasms at the aortic body include ectopic thyroid tumors, ectopic parathyroid chief cell adenoma, malignant lymphoma, hemangiosarcoma and thymoma.

References

1. Rosol TJ, Grone A. Endocrine glands. In: Maxie MG, ed. Jubb, Kennedy, and Palmer's Pathology of Domestic Animals. Vol 3. 6th ed. St. Louis, MO: Elsevier; 2016: 354-356.
2. Rosol TJ, Meuten DJ. Tumors of the endocrine glands. In: Meuten DJ, ed. Tumors in Domestic Animals. 5th ed. Ames, IA: John Wiley & Sons; 2017: 828-832

Bench Notes

EIA testing – As of October 1st, EIA (Coggins) testing will be performed Tuesdays and Fridays. Be sure to follow the USDA regulations for all EIA submissions. Any incomplete forms will be returned or incur a \$10 correction fee. The NDSU VDL submission guidelines page is online at <https://www.vdl.ndsu.edu/wp-content/uploads/2020/01/EIA-test-changes-1-15-20.pdf>.

Johne's PCR – Johnne's season has arrived. Please check the NDSU VDL website for testing information and read the submission guide at <https://www.vdl.ndsu.edu/wp-content/uploads/2023/08/Johnes-guidelines-2023.pdf> for examples of properly labeled specimens. Key points to ensure your samples are processed and tested in a timely manner include:

- 1 Label each sample clearly and consecutively starting with sample number "1."
- 2 Provide a typed and electronically submitted *Sample Identification Form* with sample numbers (1, 2, 3...) and animal IDs (e.g., Betsy, HT56, red tag 234).
- 3 Fill out separate forms if sending samples from multiple species; we cannot pool goat samples with sheep or cattle samples.

Please call the laboratory if you have any questions.

New pathology initiatives – For the first time in over a year, the pathology unit is fully staffed. With Dr. Heather Mitchell as the new veterinary diagnostician, the NDSU VDL plans on extending pathology services. Besides performing autopsies under Dr. Webb's guidance, Dr. Mitchell will provide diagnostic interpretation on some serology, molecular and microbiology reports; act as a liaison between the laboratory and clinics to help guide testing decisions; lead disease outbreak investigations; and assist with publication of this newsletter.

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Staff Spotlight

Dr. Quynn Steichen started her third (and last) year of veterinary anatomic pathology residency in August. Not only does Dr. Steichen perform postmortem examinations and read out surgical biopsies, but she also writes the mini case reports for the newsletter, presents pathology findings at local and national meetings, and is studying for her pathology board certification exam. The NDSU VDL is fortunate to have Dr. Steichen as part of our leadership and pathology teams.



Dr. Quynn Steichen

VDL Pathology Resident
(Photo by Kelly Benson,
VDL Chemist)

Would you rather be reincarnated as a cat or a dog? *Definitely, a dog*

What is the most used emoji on your phone?

Having three children that are six years old and younger, I constantly use the laughing emoji with the tears. They are always making me laugh and getting into shenanigans.

Who is the most interesting Disney character?

I have always loved Belle from "Beauty and the Beast" because reading books (like Belle does) is one of my favorite pastimes.

How would you describe your job to a 5-year-old?

I get to find out why animals get sick or die and try to help to make the rest of the animals stay healthy.

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