NDSU Veterinary Diagnostic Laboratory

Fall 2022, Vol. 6, No. 4

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

I hope you all were able to relax and rest through those last days of summer and are now having a bountiful harvest.

For me, there are never enough days with brisk cool air, colorful falling leaves, warm cider and companionship around a fire, and, of course, college football.

Looking back over the summer, things were surprisingly calm here at the NDSU VDL, despite being down two pathologists. The remote pathologists were essential in enabling me and the pathology resident, Dr. Steichen, to concentrate on disease and death-loss investigations. We are thankful for your patience during these last few months.

On that front, we have great news to share. Dr. Deborah Chong has joined the NDSU VDL faculty as the newest veterinary pathologist. Her arrival is perfect timing as animals will soon be coming in from pasture and case numbers will start to rise again.

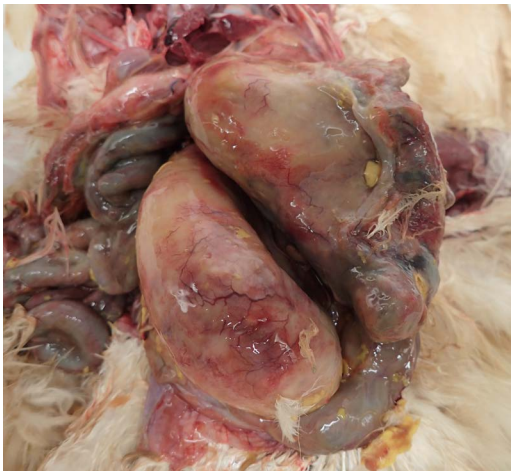
Be sure to check out the website frequently to stay informed of any changes during the upcoming months.

Best wishes on a happy and healthy autumn.

Sincerely,

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

Mystery Photo



(Photo by H Pecoraro)

This image is from the coelomic cavity of an adult layer chicken.

What is your diagnosis?

What other condition(s) may cause multifocal lesions in the coelomic cavity of adult female chickens?

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

NDSU VETERINARY DIAGNOSTIC LABORATORY
North Dakota State University

New Faculty

Dr. Deborah Chong is the NDSU-VDL's newest anatomic veterinary pathologist.

Dr. Deborah Chong
(Photo by Kelly Benson, NDSU VDL chemist)

After finishing her veterinary studies at the University of Sydney in Australia, Dr. Chong completed her anatomic pathology residency at Oregon State University. She comes to us with diagnostic experience in livestock, companion animals, wildlife, and exotics. Her studies have involved a vast array of animals, including marine mammals, domestic ruminants and wild cervids, rabbits, donkeys, echidnas, crows and lorikeets, and even black rhinos!

When not studying for board examinations, Dr. Chong enjoys outdoor activities, visiting libraries, bookshops, museums, and historic places, and drinking tea while reading a book/manga series or watching documentaries and anime.

We are very excited to welcome Dr. Chong to the VDL and can't wait to introduce her to new snowy adventures this upcoming winter.

Calendar: Fall-Winter Closures

November 11 – Veteran's Day
November 24 – Thanksgiving Day
December 26 – Christmas Holiday observed
January 2 – New Year's Holiday observed
January 16 – Martin Luther King Jr. Day
February 20 – Presidents Day

Disease Updates

Although summer months are typically when anthrax and tularemia are detected at the NDSU VDL, cases can occur into the fall months. In addition, the avian influenza outbreak that affected North Dakota during spring has returned with the fall bird migration.

Therefore, the NDSU VDL would like to provide an update on what to do if you suspect any of these diseases. As always, please refer to the website for sample collection and submission guidelines.

Anthrax – Fortunately, no anthrax cases have been reported this year. However, years of drought followed by heavy snow, rain and flooding could potentially cause anthrax spores to resurface in pastures, leading to anthrax outbreaks. These spores are very resistant to heat, cold, and most disinfectants and can survive in the soil for many years. Cattle, bison and sheep are particularly susceptible to anthrax infection. Disease is rapidly fatal and can cause high death loss in a herd. Vaccination against the disease is inexpensive and effective, but immunity to disease takes about a week to accomplish.

Bacillus anthracis is the causative agent of the anthrax. This bacterium is a federal select agent, which is an organism or toxin determined to pose as a potential severe threat to public health and safety. In the case of anthrax, the disease is zoonotic, meaning it can be transmitted from humans to animals.

If there is sudden death in cattle or small ruminants and dark blood is draining from the nose, mouth or anus, **DO NOT PERFORM A POSTMORTEM EXAMINATION** and contact a veterinarian immediately.

Blood from the jugular vein should be collected and submitted to the NDSU VDL for anthrax polymerase chain reaction (PCR) testing. Always contact the laboratory prior to submitting a sample to ensure adequate staffing to rapidly test your sample.

Tularemia – There have been cases of tularemia detected in rabbits within one area of Fargo and in cats from the east coast this summer. Like anthrax, tularemia is caused by a bacterium, has the potential to infect animals and humans, and is considered a select agent.

The bacterium that causes tularemia, *Francisella tularensis*, can be transmitted by biting insects and inhalation or ingestion of the bacterial organisms from infected animals. Human to human transmission has not been documented. Natural reservoirs include small mammals such as mice, voles, rabbits and squirrels. Cats – both wild and domestic – are especially vulnerable to tularemia. Clinical signs may include fever, lethargy, inappetence and difficulty breathing.

If an animal is suspected of being infected with tularemia, lymph node aspirate is the preferred sample for PCR testing.

Highly Pathogenic Avian influenza – Highly pathogenic avian influenza (HPAI) is a foreign animal disease that was detected in many wild and domestic birds last spring and summer throughout the continental U.S. As birds migrate south to their wintering grounds, HPAI cases are expected to continue in North Dakota.

HPAI is highly infectious to domestic poultry. Thus, it is imperative to never mingle wild birds with backyard chickens, ducks, turkeys and geese. Dead and sick wild birds should be left where they are found. Any wildlife mortalities can be reported to the North Dakota Game and Fish at https://gf.nd.gov/wildlife/diseases/mortality-report. If backyard flocks experience sudden death or have sick birds, contact your local veterinarian.

Visit Defend the Flock (www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/avian/defend-the-flock-program) for resources on biosecurity and recognizing disease.

Mini Case Reports

Dr. Quynn Steichen, NDSU VDL veterinary anatomic pathology resident

This mini case report will focus on parasites commonly diagnosed at the NDSU VDL in small ruminants that can increase the prevalence of herd morbidity and mortality.

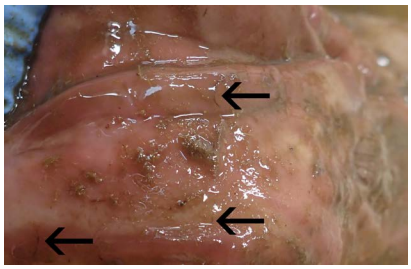
Haemonchus contortus is a nematode transmitted by grazing on pastures infected with the third larval (L3) stage, which is the infective form. When ingested, the L3 larvae migrate to the abomasum, mature to adult nematodes, and pass eggs through the feces. Within feces, they develop into L1, L2 and L3 stages, thereby infecting grazing pastures. In the abomasum, these are commonly described as "barber pole worms" due to the characteristic red and white, spiral pattern (left image).

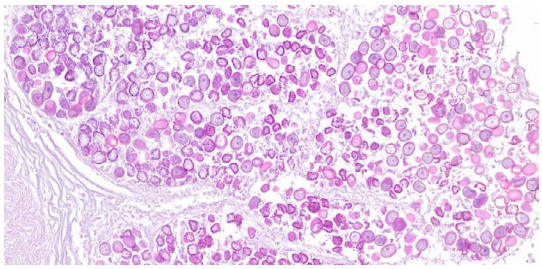
Clinical signs include anemia, primarily from the blood-sucking activity of the adult, decreased milk and fiber production, and decreased daily gain in young animals. Ultimately, this can lead to severe economic losses for producers and death of the animals. In North Dakota, the colder temperatures lead to a cessation of larval development (termed hypobiosis) during the winter months. High temperatures during the short summer months lead to rapid development of hypobiotic larvae, subsequently causing morbidity/mortality.

Eimeria sp. is a protozoan that is commonly referred to as coccidia or diagnosed as coccidiosis. The pathogenesis can be complicated but, ultimately, oocysts are passed in the feces and need to sporulate in the environment (range of 2-7 days). Sporulated oocysts are ingested by small ruminants, go through several developmental stages, and penetrate the large or small intestinal epithelial cells. Microscopically, we observe loss of surface epithelial cells, intestinal villous atrophy and complete crypt destruction (right image).

Due to the destruction of the intestinal epithelial cells, clinical signs often observed include diarrhea, which can be hemorrhagic, weight loss, dehydration and inappetence. In young animals, usually 2-4 months of age, this often leads to death.

Parasitism in small ruminants. Left image is from a sheep with haemonchosis. Arrows point to "barber pole worms" embedded in the abomasal mucosa. Right image is coccidial gamonts in the intestinal mucosa of a goat. (Photo by H Pecoraro and photomicrograph by Q Steichen)





Often, parasitic diagnoses can come as a surprise to the producer as the cause of death because deworming is being done on a regular basis. However, there is documented anthelmintic resistance. Therefore, blanket treatment of all animals is detrimental and even can be a driving force of resistance. Other management strategies include nutrition, pasture management, copper oxide wire particles, and genetic improvement. There is even research into nematode-trapping fungi.

We strongly recommend working with your local veterinarian to create and implement management strategies to help decrease parasite load.

References:

Arsenopoulos, K.V. et al., 2021. Haemonchosis: A Challenging Parasitic Infection of Sheep and Goats. Animals.11:363. https://doi.org/10.3390/ani11020363.

Chartier C. and Paraud, C. 2012. Coccidiosis due to *Eimeria* in sheep and goats, a review. Small Ruminant Research. 103:84-92.

Bench Notes

Equine infectious anemia (Coggins) testing – Starting October, Coggins testing will be performed on Tuesdays and Fridays. Daily testing will resume next March.

Johne's testing - Johne's season is here. Please see the website for a detailed and updated submission guide. The biggest change was detailed in the Summer 2022 issue. Improperly labeled submissions will be sent back in the queue, may incur extra processing charge, and can take up to four weeks to complete. Please do not hesitate to contact the VDL if you have any questions about submitting a case or interpreting results.

Digital cytology – Beginning Oct. 1, all cytology slides prepared from aspirates, fluid collection, swabs, scrapes and smears will be evaluated by a board-certified clinical pathologist using the Zoetis VETSCAN IMAGYST™. Blood smears can also be evaluated in context of a recent CBC and clinical history. Review submission criteria for cytology slides at the NDSU VDL website. There is even a link from Zoetis on how to prepare blood smears.

Emergency on-call services – Now that animals are coming in from pasture, reminder that there are emergency services available for high death losses that occur in herds over weekends and holidays. Autopsies will be performed on a case-by-case basis. To contact the NDSU VDL pathologist after hours, email ndsu.vetlab.path@ndsu.edu with details. Emails are checked frequently. For secure small animal and sample drop-off, there is a depository walk-in cooler located on the receiving dock that is available 24 hours a day, 7 days a week.

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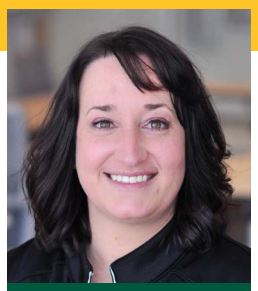
Staff Spotlight



Tylise Graff
(Photo by Kelly Benson, VDL Chemist)

The molecular diagnostics section has been kept busy the last few years. In addition to our regularly scheduled PCR assays, the NDSU VDL's molecular microbiologists have responded to North Dakota's testing needs during the COVID-19 pandemic and avian influenza outbreak. Meet one of these hard-working molecular microbiologists, Tylise Graff MLS (ASCP)^{CM}, who joined the NDSU VDL in January 2021.

What is your favorite holiday? *July 4th because it's in my favorite season*

Which beverage goes best with pizza? *Water or Dr. Pepper*

Would you rather be an Avenger or a Power Ranger? *Don't know much about either but the Avenger characters look tough*

If you could teleport anywhere, where would you go right now? *Private tropical island*

Which song do you remember most from prom? *Oh my gosh that was over 20 years ago!! Probably something by Destiny's Child or the Lady Marmalade song was pretty huge then.*

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