# NDSU Veterinary Diagnostic Laboratory

Spring 2021, Vol. 5, 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 send comments, questions and suggestions to ndsu.vetlab@ndsu.edu (specify "newsletter" in the subject line. or call the laboratory at (701) 231-8307.

## Editor's Note

This was my first mild North Dakota winter since moving here in 2018. It certainly was a luxury not to shovel the driveway every morning or be buried under snow for five months straight.

However, with the mild winter has come a dry spring, which has been challenging to many producers and veterinarians. The pandemic also has created a unique set of issues for small and large animal practitioners alike. The NDSU Veterinary Diagnostic Laboratory remains committed to providing reliable testing and diagnostic support services during these difficult times.

Highlights from this issue include staff changes in the microbiology section, updated submission requirements for *Tritrichomonas foetus* PCR testing, information on blue-green algae in the region, a summary of scours data so far this year and mini case reports of common diseases diagnosed in uncommonly affected species.

In addition, Dr. Broughton has taken over the mystery photo section. I hope you enjoy his fabulous photography skills as much as I do.

Dr. Webb will return with VDL updates in the summer issue. Until then, I hope to connect with many of you at the North Dakota Veterinary Medical Association meeting in Medora this August.

**Heidi Lee Pecoraro,** DVM, Ph.D., Diplomate, ACVP
Veterinary Pathologist

## Dr. Broughton's Mystery Photo

The photo is from an aborted, 43-centimeter crown to rump (third trimester) Boer goat fetus.

What's your diagnosis? Underlying cause?


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

## Calendar: Summer Closures

July 5 – Independence Day | Sept. 6 – Labor Day

NDSU VETERINARY DIAGNOSTIC LABORATORY
North Dakota State University

# Staff Changes

**Sarah Gefroh** (Photo by Kelly Benson, VDL chemist)

After more than 40 years at the VDL, microbiologist **Darlene Krogh** has retired. Her replacement, **Sarah Gefroh,** MLS(ASCP)$^{CM}$, joined the NDSU VDL on May 17 as a diagnostic microbiologist in the Microbiology section. She earned her B.S. degree in Medical Laboratory Science (MLS) from North Dakota State University and spent more than 15 years as a medical laboratory scientist in a microbiology laboratory. Sarah has molecular diagnostics experience and has served as the microbiology education coordinator for an MLS program for 10 years. Sarah's experience and enthusiasm for learning will be invaluable as processes in the microbiology laboratory continue to evolve.

# Disease Updates

Scours season is in full force. Since January, a total of 128 scours samples have been submitted to the VDL for bacteria, viral and parasitic diseases. This is down from 220 cases submitted at the same time last year.

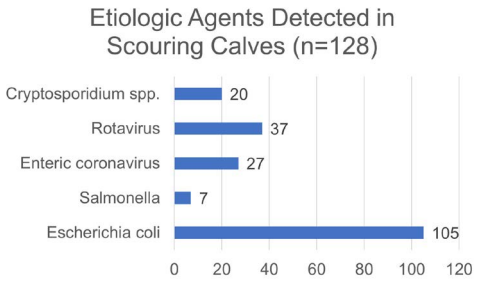
The percentages of the most common etiologic agents detected are similar for years 2020 and 2021, although *Salmonella* cases have increased slightly from 2% to 5%. Enteric coronavirus is also down from 38% in 2020 to 21% in 2021. Other causes of scouring, particularly in older calves, included coccidiosis (*Eimeria*) and cryptosporidiosis.

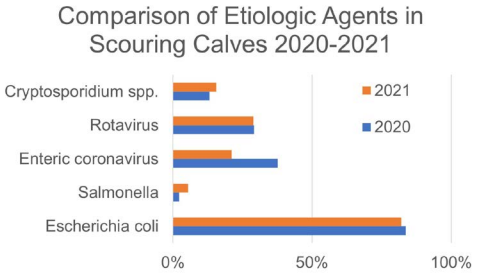
As in past years, *Escherichia coli* is the most frequent etiologic agent identified. All *E. coli* cases from scouring calves are tested for virulence factors by PCR. In 2020, Stx-II was detected most often in *E. coli* cases. Stx-I and Stx-II are associated with enterohemorrhagic *E. coli*.

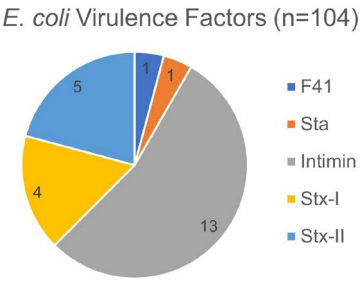
Thus far in 2021, Intimin, the virulence factor that causes attaching and effacing *E. coli*, is the most commonly identified virulence factor. K99 virulence factor has not been detected.

For salmonellosis cases, from a total of 14 animals, serotypes Dublin (n = 5), followed by Meleagidis (n = 3) and Cerro (n = 3), have the highest incidence. Meleagidis and Cerro have been associated with zoonotic disease.

**Etiologic agents detected in scouring calves from January through April 2021 (top). The 2021 percentage of common etiologic agents per total cases is compared with 2020 (middle). *E. coli* virulence factors identify Intimin, which is associated with attaching and effacing *E. coli*, as the most common pathogenic *E. coli* in 2021 (bottom).**




# Bench Notes

**Equine infectious anemia (EIA) forms –** The Serology Lab will be performing daily EIA ELISA testing through September. Remember that U.S. Department of Agriculture guidelines from October 2019 require that the laboratory must ensure all forms are complete and accurate. Specifically, all fields must be completed or indicate "not applicable."

The regulations limit the NDSU VDL's ability to correct form errors. In addition, only the most current VS 10-11 EIA form can be accepted. Before submitting samples, be sure to review the EIA requirements on our webpage (www.vdl.ndsu.edu/wp-content/uploads/2020/01/EIA-test-changes-1-15-20.pdf).

***Tritrichomonas* testing –** The submission requirements for *Tritrichomonas foetus* PCR have changed. The **"Individual"** or **"Pool (up to 5 in pool)"** boxes on the submission form **must** be checked for each submission. If neither is selected, the laboratory **automatically will test and charge samples as individuals.**

Please include the **collection date** on the submission form. Failure to include the collection date may cause delays in processing and testing of samples. We will not delay tests while waiting to hear back on the collection date.

Please remember, we **must receive the samples within five days of collection**; otherwise, we cannot test them because the chance for false negatives increases after five days. Also, samples **must** be received during business hours the day prior to the scheduled test day. On normal weeks, this means

— continued on page 3

# Mini Case Reports

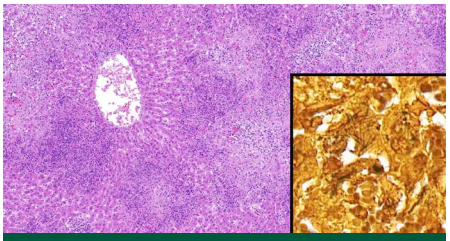
This issue's mini cases are focused on diseases not typically found in the species reported.

**Tyzzer's disease was the cause of death in a 3-week-old lamb** with a history of scours. Several other lambs from the flock had died after becoming lethargic and weak in the pelvic limbs. Gross examination findings of fluid- and gas-filled intestines and wet feces along the anus confirmed scours.

Microscopically, we also found a marked necrosuppurative hepatitis with linear structures forming a haystack pattern within the cytoplasm of adjacent hepatocytes. Similar areas of necrosis and inflammation were present within the myocardium. Silver stain highlighted the linear structures, consistent with *Clostridium piliforme*.

Infection with *Clostridium piliforme*, the causative agent of Tyzzer's disease, typically is associated with rabbits and laboratory animals such as mice, rats and guinea pigs, as well as foals. In the latter, Tyzzer's can be deadly (see the spring 2020 newsletter for a mini case report in a foal).

The disease is rare in cats, dogs and cattle, and occasionally reported in wildlife. Only one case of Tyzzer's has been reported in sheep – a 3-week-old lamb with copper toxicity (Scholes and Edwards. Vet Record. 2009;164(15):470-471). Except for elevated manganese, mineral levels were normal in this lamb. The other lambs were not autopsied at the VDL and their cause of death is unknown.



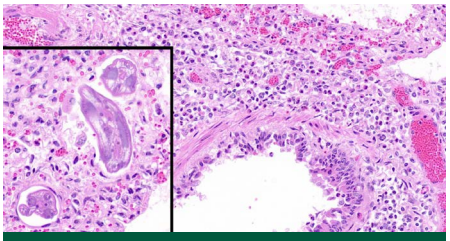
**Tyzzer's in a 3-week-old lamb. We found marked necrosis and suppurative inflammation randomly throughout the liver. Black linear structures are noted within hepatocytes on silver stain (inset).** (Photomicrographs by Heidi Pecoraro)

**Ascarids were noted in a 5-month-old Holstein calf lung** with a history of respiratory signs in a herd of recently purchased calves. Two calves died and 10 others were ill. In-field autopsy revealed dark areas in the lung lobes, but no fibrin or fluid. Other organs were normal.

On histology, within one lung section, the alveoli and airways contained moderate numbers of eosinophils and histiocytes admixed with some edema and fibrin, along with multiple cross sections of nematode larvae. The larvae measured 50 to 70 microns in diameter and had prominent lateral alae and lateral cords.

The features of this case are consistent with verminous pneumonia. However, the larvae were not typical of *Dictyocaulus viviparus*, a trichostrongylid nematode. Instead, the lateral alae and lateral cords were more consistent with ascarids, such as *Toxocara vitulorum* or *Ascaris suum*.

*Toxocara vitulorum* generally is found in tropical and subtropical regions, although we've seen a fairly recent case report of the organism in Iowa beef calves (Chelladurai et al. Vet Parasitol. 2015;214(1-2):96-99). *Ascaris suum* has been reported in cattle housed in areas contaminated with pig feces. In any case, pulmonary ascarids are unusual and additional studies to determine prevalence may be warranted.



**Ascarids in the lung of a 5-month-old Holstein calf. We found eosinophilic and mononuclear inflammation expanding alveolar spaces and surrounding large airways. Cross sections of nematode larvae are noted in areas of inflammation (inset).** (Photomicrographs by Heidi Pecoraro)

samples must be received by 5 p.m. on Monday to be tested on Tuesday and by 5 p.m. on Wednesday to be tested on Thursday.

**Cyanobacteria –** With continued drought conditions in the region and rising temperatures, toxicology staff share a reminder to monitor water sources for the presence of blue-green algae. Drinking water from stagnant ponds and dugouts during hot, dry weather can cause sudden death in animals. This water can contain certain species of cyanobacteria, commonly known as blue-green algae.

Blue-green algae often occurs in stagnant ponds or dugouts with elevated nutrient levels, forming large colonies that appear as scum on or just below the water surface. The formation of toxic blooms is unpredictable. Learn more about blue-green algae (cyanobacteria) identification offered by the NDSU VDL at www.vdl.ndsu.edu/tests/water-blue-green-algae-cyanobacteria-id/.

**Rabies submissions –** For all neurologic cases, please submit **whole fresh brain**. Not only are full cross sections of unfixed brain necessary to rule out the rabies virus, but other infectious or neoplastic diseases may be detected by comparing both hemispheres. Please remember: **When diagnosis of CNS disease is the goal, keep the brain fresh and whole!**

## Bench Notes

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# Staff Spotlight

If you have called the VDL, you may have spoken with Amanda Ferguson, a licensed veterinary technician and the VDL's information processing specialist. Amanda answers submission questions, helps process samples in receiving, backs up necropsy and clinical pathology with her technical skills, and keeps the pathologists' reports in order. For this issue's Staff Spotlight, we asked Amanda some questions she doesn't typically get when answering the phones.

**Have you ever met anyone famous?** No, but I would love to meet Reese Witherspoon.

**If you could try any food, what would it be?** Conkies, a traditional dessert from Barbados.

**Favorite ice cream flavor?** Mint chocolate chip

**What superpower would you most want?** To be able to heal others.

**What is your favorite animal joke?** What time does a duck wake up? At the quack of dawn!

**Amanda Ferguson**
(Photo by Kelly Benson, VDL chemist)

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## Contact Information

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