

NDSU Veterinary Diagnostic Laboratory

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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.

Note from the Interim Director

As we emerge from the busy spring season marked by calving, scours and animal movement, I want to acknowledge the incredible work of our region's veterinarians, producers and my fellow laboratorians in support of healthy herds. We appreciate your trust and partnership during these high-stress and high-impact periods of herd health management.

This issue marks my first note as the interim director. I am honored by the opportunity to lead the laboratory I have served for nearly 11 years. This position has traditionally been held by a veterinarian, reflecting the importance of clinical insight. While my background differs and is heavily weighted toward diagnostic test methods, I approach this role with commitment to collaboration, scientific rigor, patient focus and responsiveness to the needs of our stakeholders. I am fortunate to work alongside a highly skilled team of laboratory professionals, including Drs. Steichen, Webb, Mitchell and Mostrom, whose veterinary expertise continues to guide our work. I am grateful for the support and dedication of the entire team at the VDL.

During my time as interim director, I am focused on ensuring that our laboratory remains a trusted partner to veterinarians, producers and agencies across North Dakota. We are actively expanding our outreach efforts, updating our website, strengthening partnerships with state agencies and identifying new tests to bring to our state. Our mission remains grounded in delivering timely, reliable and affordable diagnostic services tailored to the unique needs of our state's animal industries and ecosystems.

I am also delighted to share that we are actively exploring diagnostic support for honeybees. Honeybees are a minor food animal species, and North Dakota is consistently the top honey producer in the United States. Portions of our grounds are being reseeded to host a pocket prairie. This pocket prairie will help feed the bees we are hosting this summer and will be both cost-effective and resourceful, as pocket prairies require minimal maintenance and are drought-tolerant. Follow our bee journey on social media!

Again, I appreciate your continued trust and partnership. As always, please contact the laboratory with any questions or concerns.

Kelli Maddock, DrPH, MS, MLS(ASCP)^{CM}M

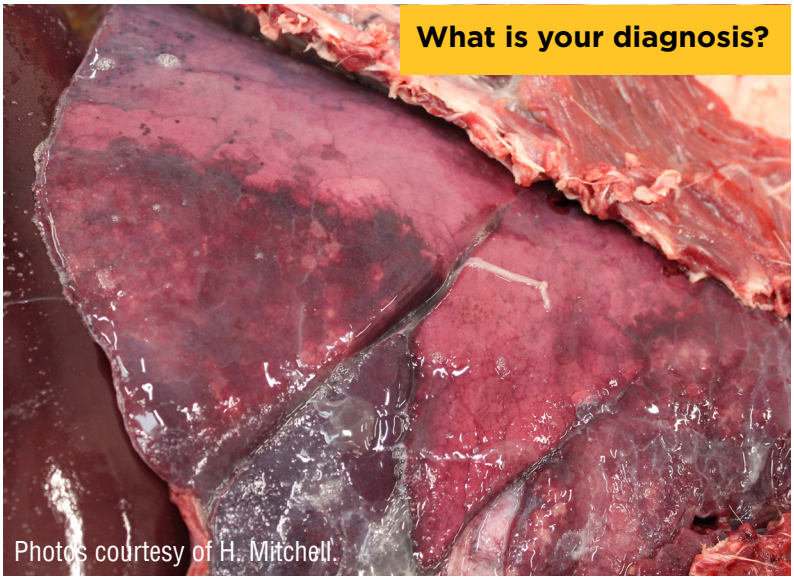
Calendar: Summer Closures

May 25 – Memorial Day
July 3 – Independence Day
September 7 – Labor Day

NDSU VETERINARY DIAGNOSTIC LABORATORY
North Dakota State University

Mystery Photo

A 1-year-old female Sanaan goat is examined. The goat was lethargic on April 29, 2026, with diarrhea. The goat herd has been vaccinated for clostridial diseases, poured with a pyrethrin product, and given an oral dewormer.



What is your diagnosis?

Photos courtesy of H. Mitchell.

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

Bench Notes

EIA (Coggins) testing schedule – The testing schedule for EIA (Coggins) testing will be Monday through Friday through Sept. 30.

EIA (Coggins) accession fees – An accession fee of $12 per case will be charged for all EIA submissions as of Feb. 17, 2026.

Johne's ELISA testing schedule – Johne's ELISA testing will be performed on Wednesdays from June 1 to Sept. 30. Samples must be received during business hours the day before scheduled testing to ensure inclusion in the test run.

Sample collection containers for Johne's PCR testing – Starting July 1, 2026, all fecal samples submitted for MAP/Johne's PCR testing must be sent in sterile, rigid, plastic, leak-proof, screw cap containers. Additional charges per sample will be applied if fecal samples are not sent in the proper containers. These containers can be purchased from a variety of suppliers, including Amazon, Consolidated Plastics, Uline, VWR, McKesson and many others. Consult our website for further information: https://www.vdl.ndsu.edu/7143-2/.

Brucella ovis testing – *B. ovis* testing is now available in-house.

***Francisella tularensis* (tularemia) PCR** – Whole blood is no longer an acceptable specimen for testing. We have updated this test and no longer accept EDTA whole blood, Q-tips or wood shaft swabs as sample types. Q-tips or wood shaft swabs can interfere with test accuracy. These samples will be rejected or reported with a disclaimer.

Mini Case Report

A Fictional Case of Possible Disease in Livestock Herd

Sarah Gefroh, MLS(ASCP)^{CM} SM^{CM}

A fictional scenario can often highlight the real-world challenges veterinary professionals face. The following fictional case depicts a scenario of a possible disease introduction into a livestock herd.

A producer recently purchased a group of bred Angus heifers from a neighboring state to expand his herd. No prior testing records were provided at the sale.

The group of heifers appeared clinically healthy at the time of purchase, with no signs of illness during transport or upon arrival to the farm. Within 6-8 weeks of arrival, two heifers aborted in the third trimester of gestation, one had a retained placenta and the remaining animals appeared normal. What testing would you prioritize and why? What herd-level concerns does this raise?

Appropriate testing would include an abortion diagnostic investigation of the two aborted fetuses and serological tests from the affected heifers to screen for antibodies to common abortifacient pathogens.

Numerous pathogens could be responsible for abortion outbreaks within a livestock herd. Among those is a pathogen called *Brucella abortus. B abortus* often moves silently between herds, as infected young cattle can appear completely normal. Once introduced, bacteria can reside in the reproductive tract of pregnant animals, leading to late-term abortions, retained placentas and reduced fertility. Animals can shed bacteria after abortion, exposing herd mates and any humans associated with the livestock.

North Dakota borders areas with wildlife reservoirs such as bison and elk that can carry *Brucella sp,* and even a single introduction event can lead to herd infection, quarantine, regulatory actions and potential economic losses. North Dakota has protections in place regarding animal import requirements from Brucellosis disease surveillance areas associated with the Greater Yellowstone Area in Montana, Idaho and Wyoming. The protection of our animal industry is vital to our agricultural economy.



NDSU

Diagnostic Serologic Testing for *Brucella sp* in Livestock

Heather Mitchell, DVM

Brucellosis remains a significant disease concern affecting livestock and the people who work with them, especially in countries and areas in which this organism is endemic. Several *Brucella* species — particularly *Brucella melitensis, Brucella abortus* and *Brucella suis* — can cause serious illness in humans, including undulant fever and complications affecting the musculoskeletal, cardiovascular and central nervous systems. Consumption of raw milk remains a major risk in endemic regions, while veterinarians, laboratory personnel, abattoir workers and livestock producers face occupational exposure risks.

In cattle, *Brucella* organisms preferentially colonize the reproductive tract, often causing few or no signs in young or nonpregnant animals. However, the consequences in adult animals can be severe, resulting in placentitis and abortions in females and orchitis and epididymitis in males.

Serological tests indicate exposure to *Brucella* species but have limited ability to identify the organism to the species level. Buffered *Brucella* antigen tests (Rose Bengal test, buffered plate agglutination test), fluorescence polarization assay (FPA) and the complement fixation test (CFT) are suitable tests for screening of livestock species, camelids, equine, elk, moose, deer and swine. However, no single serological test is appropriate for all animal species nor all epidemiological situations. Any positive serological screening test should be confirmed with an established confirmatory or complementary test method. The following information will highlight *B.abortus/suis* test method for livestock used at the NDSU VDL for screening and discuss the complementary tests that are often used at the National Veterinary Services Laboratory (NVSL) in Ames, Iowa, to confirm positive results.

Buffered Brucella Antigen tests (BAPA, Rose Bengal) – The NDSU VDL utilizes the Buffered Acidified Plate Antigen (BAPA) test to detect antibodies to *B. abortus* and *B. suis* in cattle, bison, cervids, equine, camels, elk, moose, deer and pigs. This assay, developed by the NVSL, is a rapid agglutination test performed on an etched glass plate using an acidified buffered antigen. Laboratory personnel must take a federal proficiency test to perform this test. The procedure serves as a presumptive test for IgG1 and IgG2, with the low antigen pH helping to minimize IgM interference. A positive result — agglutination — is indicated by clearing or partial clearing of the fluid phase as antigen-antibody complexes form. A negative result appears as a uniform serum-antigen mixture with no visible agglutination.

Fluorescence Polarization Assay (FPA) using tubes – This test is often used as a complementary test to confirm positive results for other *Brucella* serological tests. This test method uses glass tubes of reaction buffer mixed with individual sets of negative controls, positive controls and sample serum. A series of incubations and intensity readings is taken for each sample.



istockphoto.com

Conjugate is added, incubation occurs and sample readings are taken again. At this point, the mean of the negative control is used to evaluate the subsequent samples. Results are displayed as milipolarization units (mP) and mean negative mP (Delta mP). A sample is considered negative when the mP reading is less than 10 mP above the negative control mP reading (Delta mP < 10). A sample is considered suspect if the mP reading is 10-20 higher than the mean negative control mP reading (Delta mP 10-20). A sample is considered positive if the mP reading is greater than 20 above the mean negative control mP reading (Delta mP > 20).

Complement fixation test (CFT) –This test is often used as a complementary test to confirm positive results for other *Brucella* serological tests. This test is complex, using titrations, multiple incubations and a series of controls to produce titer equivalents for evaluation. CFT consists of the reaction stage and the indicator stage. In the reaction stage, antigen, serial dilutions of serum and complement are combined and incubated. After incubation, sensitized sheep red blood cells are added as indicators of a reaction. If the serum contains antibodies to the antigen, the antigen-antibody complex forms, and complement is bound to the complex. If serum does not contain antibodies to the antigen, complement will be free to lyse the sensitized red blood cells. The CFT result is based on the percent hemolysis of the sensitized red blood cells. CFT is usually very specific but less sensitive than the Rose Bengal test and ELISA, particularly for swine. A sample with less than a 1+ reaction at the beginning dilution is reported as negative. A sample with a 1+ or higher reaction at the beginning dilution (1:10) is considered positive. The endpoint titer is also reported, which could be higher than 1:10.

As surveillance and control efforts continue, serological testing remains a cornerstone of herdlevel screening. However, no single test is universally appropriate across species or epidemiological settings, and crossreactivity — such as that caused by *Yersinia enterocolitica* O:9 — can complicate interpretation. Positive screening results must therefore be confirmed using established diagnostic strategies to ensure accurate identification and effective disease management.

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Staff Spotlight

Emily joins the VDL as our new diagnostic microbiologist, bringing in more than eight years of hands-on research experience in microbiology and molecular biology. She has developed laboratory protocols, processed and analyzed diverse sample types, and contributed to multiple scientific publications throughout her career.

Emily holds a master's degree in microbiological sciences and a bachelor's degree in biochemistry and molecular biology, both from NDSU. She's excited to support the VDL's mission and contribute to highquality diagnostic services for our veterinary partners.



Emily Webb

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