



Summer 2021, Vol. 5, No. 3

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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 laboratory has remained consistently busy throughout the summer months with our normal caseload, human COVID testing and additional case submissions from our drought-stricken region related to poor water quality and blue-green algae blooms. Many producers find themselves in a tough position with insufficient forages for winter feeding and persistent water issues, necessitating hauling water to livestock.

Other significant efforts at the laboratory this summer have been focused on the roll-out of a new laboratory information system that handles test orders, results, reporting and billing. As part of this system, we will have a new client portal – similar to our existing portal – that is capable of searching and viewing reports and invoices and downloading herd health test results. Because this will require creation of new accounts, more information will be sent out to portal users in the next few months as we get ready to go live this fall.

I hope everyone is having a restful summer and enjoying some of their favorite activities that have been put on hold during the past year and a half.

As always, please don't hesitate to contact us if we can be of service.

Sincerely,

Brett T. Webb, D.V.M., Ph.D., DACVP, NDSU VDL Director

Staff Changes



The NDSU VDL is excited to announce its first ever anatomic pathology resident, **Dr. Quynn Steichen**.

Dr. Steichen attended NDSU for undergraduate and graduate school prior to completing her veterinary medical degree at Kansas State University in 2017. She returned to North Dakota to do rural mixed-animal medicine and started her own practice, Larkota Veterinary Services, in 2018.

Throughout her career, Dr. Steichen has had a passion for food animal safety and food animal diseases. She enjoys being able to break down postmortem examination findings to her clients and discuss how best to address diseases in a herd. Following her dream to become a board-certified pathologist with emphasis on bovine diseases, Dr. Steichen started residency training this August.

Anatomic pathology residency is typically a three-year program that emphasizes training in general, gross and microscopic pathology in preparation for the American College of Veterinary Pathologists (ACVP) board examination.

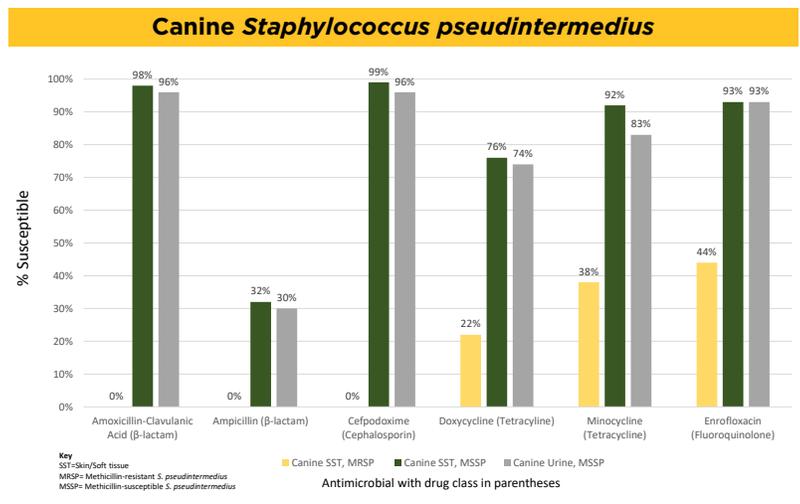
NDSU VETERINARY DIAGNOSTIC
LABORATORY
North Dakota State University

Disease Updates

Antibiograms are cumulative antimicrobial susceptibility test (AST) reports of bacterial isolates used to show current resistance and to compare trends through time. They are useful for monitoring antimicrobial resistance in a population and to help clinicians choose empiric therapy until an AST report for cultured bacterium is available from the laboratory.

However, antibiograms do not represent isolates from all patient populations and may vary greatly by geographic region or species. Thus, antibiograms are intended for use in conjunction with traditional culture and susceptibility testing and samples still must be sent to the laboratory for testing. To obtain reliable results, samples always should be collected prior to administering antimicrobial therapy.

The graph shows the antimicrobial data for canine isolates of *Staphylococcus pseudintermedius* cultured from urine (n = 46) or skin/soft tissue (n = 106) sources in 2020. Methicillin-resistant *S. pseudintermedius* (MRSP) data were analyzed separately from Methicillin-susceptible *S. pseudintermedius* (MSSP). MRSP data analysis is limited due to fewer than the recommended 30 isolates.



Because of the altered penicillin binding protein, MRSP are resistant to β-lactam antibiotics (for example, amoxicillin-clavulanic acid, ampicillin, cefpodoxime). In our canine population, we see an increased resistance to other antimicrobial classes when compared with our MSSP isolates. Isolates are presented as percent susceptible, with intermediate and resistant results considered not susceptible.

Full antibiograms for selected organisms and animal species are available at www.vdl.ndsu.edu/resources.

Bench Notes

Receiving – Remember to fill out submission forms completely. Veterinarian and owner's information should include full names and addresses. For best results and to avoid testing delays, signalment, history and the tests desired always should be included.

Shipping suspected select agent samples – We just confirmed our first anthrax case of the year. Remember, when shipping suspected select agents (anthrax, tularemia and plague), **do not place any other samples in the box**. If the sample is positive, all other samples in the same container will be destroyed. Be sure to call the laboratory and consult the select agent submission guide on the VDL website for packaging and shipping information.

Equine respiratory panel – The NDSU VDL now offers a viral and bacterial panel for equine respiratory diseases. The panel includes testing of nasal swabs for equine herpesviruses 1 and 4, influenza A and bacterial culture. The cost is \$100. Check out the Equine Respiratory Panel test page (www.vdl.ndsu.edu/tests/equine-respiratory-panel/) for more information.

Mycotoxin screens – The mycotoxin screen previously offered by the NDSU VDL has been expanded to include fumonisin B3, DAS, 15-ADON and 3-ADON. The price of this screen has increased accordingly to \$175. In addition, we offer a storage

and emerging mycotoxin screen for corn, grain, silage, forage, hay and dried distillers grains (DDG) that tests for alternariol, alternariol monomethyl ether, tenuazonic acid, cyclopiazonic acid, mycophenolic acid, penicillic acid, rugulosin, roquefortine C, penitrem A, citrinin, satratoxin G and H, gliotoxin, roridin E, verruculogen, beauvericin and enniatins (A, A1, B, B1). The DON (vomitoxin) panel previously offered is now only available by special request on selected sample types in numbers greater than 10 samples.

Heartworm testing – It is officially mosquito season and positive heartworm tests are on the rise. While the Snap 4DX test is used to detect antigen to *Dirofilaria immitis*, a modified Knott's test can identify microfilaria organisms within blood samples. The modified Knott's test, offered in the Clinical Pathology section, requires a minimum of 2 milliliters (mL) of EDTA whole blood. For the Snap 4DX test, serum is the preferred sample, although heparin or EDTA whole blood/plasma also is accepted.

Johne's sampling – Johne's season is fast approaching. Please see the new 2021-2022 submission guide for examples of proper sample submissions (www.vdl.ndsu.edu/johnes-submission-examples/).

Mini Case Reports

This issue's mini cases are focused on three exotic and wildlife diseases recently diagnosed at the NDSU VDL.

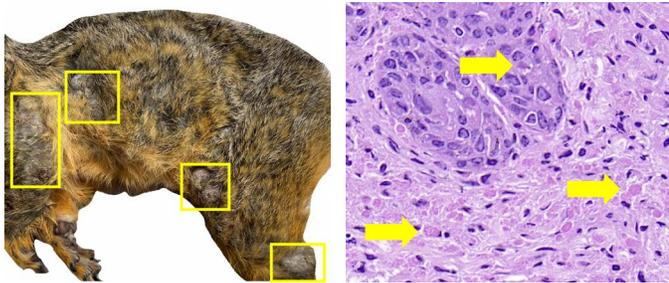
The first case is from an adult gray squirrel that was submitted for rabies testing. The squirrel appeared injured and had bit a human.

Rabies virus examinations were negative. However, grossly, we found multiple, well-demarcated, firm, irregularly round, crusted growths on the skin of the neck, trunk and limbs.

Microscopically, the skin lesions corresponded to proliferating spindle-shaped cells within the dermis that frequently contained large eosinophilic intracytoplasmic structures (inclusions). The overlying epidermis was severely hyperplastic with similar cytoplasmic inclusions within epithelial cells. We also saw marked crusting along the surface, as well as ballooning degeneration in the epidermis.

In North American squirrels, intracytoplasmic inclusion bodies within proliferating spindle cells in the dermis are consistent with squirrel fibromatosis. This disease is associated with squirrel fibroma virus, a *Leporipoxvirus* that is similar to rabbit fibroma virus or rabbit fibromatosis.

Squirrel fibromatosis causes cutaneous and, less commonly, visceral nodules that often regress through time. It is typically not fatal, although it can be concurrent with other infections and systemic diseases that lead to death. Species affected include the eastern gray, western gray, red and fox squirrels.



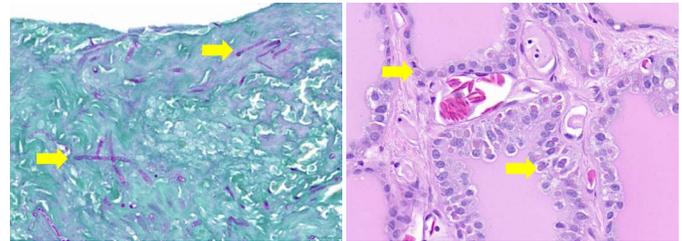
Fibromatosis in a North Dakota squirrel. LEFT: Discrete skin growths highlighted by yellow boxes. RIGHT: Microscopically, there are proliferating spindle cells in the dermis that often contain cytoplasmic inclusion bodies noted by yellow arrows. (Photo by L. Broughton; photomicrograph by H Pecoraro)

Chryso sporium anamorph of *Nannizzopsis vriesii* (CANV) was diagnosed in the skin biopsy from a 2-year-old female bearded dragon which had multiple proliferative skin lesions.

Microscopically, beneath the diffusely hyperplastic epidermis, were dense aggregates of macrophages and lymphocytes with fewer plasma cells and granulocytes. No etiologic agents were noted on H&E stain.

However, using Grocott's methenamine silver (GMS) stain, hyphae with semi-parallel walls, irregular septation, branching and terminal swellings were observed. The fungal culture was positive for *Chryso sporium*, a keratinophilic filamentous fungus commonly isolated from the environment.

CANV infection in reptiles and snakes can be seen generally in skin, subcutis and skeletal muscle; however, it also can become systemic and deadly in some species. Husbandry, nutrition and immune status of the animal may contribute to susceptibility. Responses to treatment are variable.



LEFT: CANV in a bearded dragon. GMS stain highlights hyphae within areas of inflammation. RIGHT: Inclusion body disease in the thyroid tissue of a boa constrictor. Large cytoplasmic eosinophilic inclusions are noted. (Photomicrographs by H Pecoraro)

Inclusion body disease was the cause of death in a 13-year-old female Colombian red-tailed boa constrictor. The snake was one of 12 that had died from the collection.

Gross examination revealed multiple raised, tan, ovoid plaques along the roof of the oral cavity and the larynx. The other tissues were unremarkable.

Under the microscope, we found frequent intracytoplasmic eosinophilic inclusion bodies within epithelial cells of the liver, pancreas, kidneys, stomach and thyroid gland, as well as within lymphocytes.

This is consistent with Boid inclusion body disease, which is caused by reptarenavirus (a reptile-associated arenavirus). This disease, as the name suggests, affects boas. However, pythons also can become infected and die.

Clinical signs of inclusion body disease are typically chronic regurgitation, anorexia and CNS signs. This disease often has concurrent tumors or infections. In this case, the stomatitis observed grossly was likely a secondary infection due to the immune compromised status of the snake.

Dr. Broughton's Mystery Photo



What's your diagnosis?
What are the key features of this condition?

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

NDSU Veterinary Diagnostic Laboratory

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Calendar: Summer-Fall Closures

Sept. 6 - Labor Day
Nov. 11 - Veterans Day

Nov. 25 - Thanksgiving Day

Staff Spotlight

Ms. Sandy Erickson has been with the NDSU VDL for 35 years. She manages grants, budgets and overall expenses for the laboratory. We are super grateful to Sandy for making sure our bills are paid and for keeping the lights on!

What is your favorite Olympic sport?
Gymnastics

If you could instantly become an expert in something, what would it be? Painting (art)

Are you an early bird or night owl? Early bird

You're going to sail around the world, what's the name of your boat? The Adventure

What is your favorite meal to cook and why?
Pasta – love the different sauces you can use with it



Sandy Erickson
(Photo by Kelly Benson,
VDL chemist)



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

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