NEWSLETTER

Spring – 2023

IOWA STATE UNIVERSITY
College of Veterinary Medicine

Veterinary Diagnostic Laboratory

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TONGUE TIP FLUIDS

(TTF) – PRRSV DETECTION

- For best herd sensitivity, collect tongue tips from as many dead piglets (>30) and rooms as possible.
- Use clean supplies to avoid sample contamination.
- Label samples with permanent marker.

SUPPLIES:

- ☐ Scissors and forceps
- ☐ Disposable plastic bag
- ☐ Conical tube
- ☐ Freezer (-4°F)

STEP 1 From dead piglets, collect 1 inch of tongue tips with the help of scissors and forceps.

STEP 2 Place a minimum of 30 tongue tips in a disposable bag.

STEP 3 Freeze the bag of tongue tips at -20°C, followed by thawing (freeze-thaw) immediately prior to submission.

STEP 4 Squeeze the bag of thawed tongue tips and place the fluid in a conical tube.

STEP 5 Ship the fluid to the VDL for PRRSV RNA detection by RT-qPCR. Keep samples refrigerated during shipment.

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Michelle Grabosch

Quality Assurance Specialist

Before joining the VDL in 2014, Michelle received degrees in Animal Science and Immunobiology from Iowa State and spent a few years in vaccine development in private industry. Upon arrival at the VDL , she took on supervision of the necropsy technicians and mailroom staff. Michelle spent significant time working with each VDL section and design crews to create a more streamlined front-end process and design a new mailroom space to meet growing needs. Always a team player, Michelle has served in various sections to keep the VDL running smoothly, including receiving samples, case entry, testing, case closure/billing, and helping with client phone calls.

In 2016, Michelle moved to the Quality Management Team to help prepare the VDL for our AAVLD accreditation and continues to work in quality today, where she considers herself blessed to work with such amazing people. Within the quality section, she approves section documents, maintains training records, and performs annual internal audits. She is also responsible for ensuring changes in test offerings at the VDL are handled in a timely manner and the changes are updated, not just internally, but also on the website and submission forms. Additionally, Michelle currently serves as a Biosafety Level 3 coordinator and manages the controlled substances for research use at the diagnostic lab.

Michelle and her husband of 12 years recently bought an acreage and enjoy spending time making improvements. When not at work, Michelle can often be found not sleeping thanks to two young kids. Despite often being tired, she enjoys spending quality time outside playing with her high energy kids and their two boisterous dogs.

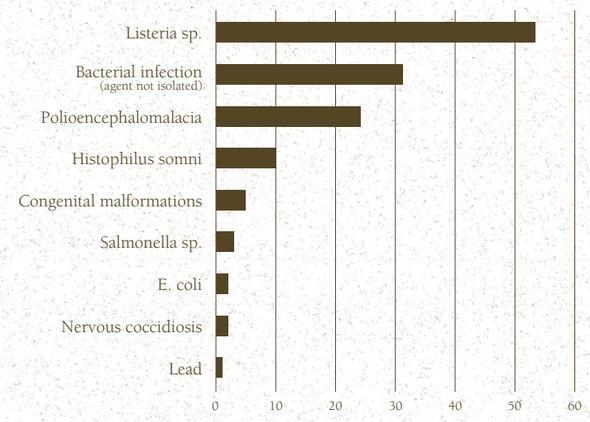
STAFF HIGHLIGHT

Diagnosis of Bovine Neurologic Diseases

Marta Mainenti, DVM, Diplomate ACVP, Clinical Assistant Professor, Diagnostic Pathologist, Iowa State University Veterinary Diagnostic Laboratory, College of Veterinary Medicine

Neurologic diseases commonly pose a diagnostic challenge for clinicians and diagnosticians alike. Recognition of neurologic signs clinically can be troublesome as other conditions like musculoskeletal disease and weakness can mimic similar signs. In those cases where a necropsy is performed, gross evaluation is complicated by the fact that macroscopic lesions are often not present, making targeted tissue sampling and diagnostic testing very difficult. For these reasons, a combination of signalment, clinical history, and gross and histologic evaluation can be very helpful in the diagnostic process of neurologic cases.

Several agents and conditions can cause neurologic disease in cattle which include viral, bacterial, and parasitic infections, bovine spongiform encephalitis (BSE), neurotoxic plants or compounds, deficiencies, hypoglycemia, salt toxicosis/water deprivation, anatomic malformations, and rarely hereditary conditions. According to the database of bovine diagnostic cases at the ISU VDL from the last 3 years, neurologic disease represents the 6th most common diagnosis, and Listeria sp. infection represents the cause most commonly identified in submissions that also include histopathology (Figure 1).



▲ Figure 1: Most common causes of neurologic disease diagnosed in cattle at the ISU VDL from 2020 to 2022 (n=131) This chart only includes diagnostic cases in which histologic evaluation was also performed.

As a general concept, identification of the morphology and location of the lesions is extremely important in the diagnostic process. However, this may be more difficult in neurologic cases as lesions are most commonly microscopic rather than macroscopic, making histopathology an essential tool in necropsies. In some cases, gross lesions may be present and extremely valuable such as in some cases of bacterial meningitis, pituitary abscesses, polioencephalomalacia (Figure 2), and anatomic malformations. Some diseases may cause quite characteristic microscopic lesions (e.g., listeriosis, histophilosis, malignant catarrhal fever), whereas in other cases the same type of lesion may be shared by different causes warranting for additional testing (e.g., cases of polioencephalomalacia). It is also important to mention that tissue sampling plays a critical role in neurologic cases as some etiologies have predilection for specific sites within the central nervous system (CNS). For example, rabies, listeriosis, and BSE are typically restricted to the caudal portion of the brain (cerebellum, brainstem), while polioencephalomalacia and salt toxicosis typically affect the cerebral cortex. For this reason, submission of the whole brain including cerebrum, cerebellum, and brainstem is highly recommended and evaluation of the spinal cord or vertebral column would also be necessary if a spinal lesion is clinically suspected.

▲ Figure 2: Cross sections of bovine cerebrum with polioencephalomalacia. In the image on the left, the black dotted lines outline suspect areas of necrosis within the cortical lamina. In the image on the right, such areas display strong green fluorescence under exposure to ultraviolet light (Wood's lamp). Image courtesy of Dr. Alyona Michael.

ANNOUNCEMENTS:

Upcoming University Holidays:

Memorial Day ——— Monday, May 29th

Independence Day —— Tuesday, July 4th

HATS will be receiving drop-offs until 4 pm on Monday, May 29th.

HATS will be closed on Tuesday, July 4th.

Diagnosis of Bovine Neurologic Diseases Continued

Clinical history and signalment are also immensely valuable in the formulation of differential diagnoses as well as in the interpretation of laboratory testing, such as age of the animals, type of production system (dairy vs beef; pasture vs feedlot), morbidity and mortality rates, type of neurologic signs (e.g., blindness, circling, paddling, ataxia, depression), treatments or vaccinations performed, and presence/absence of other clinical signs in the herd (e.g., respiratory, cardiovascular, or reproductive).

Finally, a variety of laboratory testing for viral, bacterial, prionic diseases and salt toxicosis (sodium analysis) can be performed on CNS samples. Toxicologic testing can be performed on a variety of samples such as liver, serum, feed, water, or ocular fluid depending on the analyte (e.g., lead, sulfur, ammonia/urea, selenium, copper, arsenic, nitrate/nitrite, vitamin A). Inclusion of fresh and fixed samples of other organs like lung, heart, liver, spleen, kidney, and intestine is also beneficial for those diseases that may affect the CNS in conjunction with other systems. As some diseases may have a restricted location within the CNS and rabies and BSE testing require a specific anatomic segment that should also be bilaterally intact, submission of the entire fresh brain may help avoid invalid samples and submission of the whole head can help prevent accidental post-mortem bacterial contamination and loss of brain's integrity during transportation. If you wish to have further assistance or have any question on samples collection, submission, and testing, please feel free to contact the ISU VDL at 515-294-1950 or visit https://vetmed.iastate.edu/vdl/diagnostic-tests/.

Questions?

Please contact ISU VDL Client Services
515-294-1950 —— isuvdl@iastate.edu