Diagnostic Testing & Sample Collection in Production Animal Medicine

MegAnn Harrington BS, CVT, VTS (PAIM)

VetTechPrep

Using the wrong swab or media can impede pathogen detection and culture. For bacterial culture, it's essential to use the appropriate equipment. Avoid using Mycoplasma or viral transport media which contain antimicrobials and may inhibit the growth of the bacteria. Instead, use specific bacterial culture swabs that contain media.

Aerobic bacterial culture swabs contain transport media that help prevent the sample's desiccation. These swabs are ideal for submitting bacteria samples for identification, PCR testing, culture, and antimicrobial sensitives. The most common commercially available aerobic swabs are Amies or Stuart's transport media. Culture swabs should be shipped immediately to the lab on ice.

Anaerobic culture swabs contain charcoal media. These swabs are best for sampling foot rot lesions. The most common commercially available anerobic swab is the Cary Blair. Culture swabs should be shipped immediately to the lab on ice.

Viral transport swabs contain a special antimicrobial media that will inhibit the overgrowth of bacteria. These swabs are most reliable when submitting for viral testing as well as mycoplasma PCR and culture. Viral/mycoplasma swabs should ship immediately to the lab on ice.

Polymerase chain reaction (PCR) testing identifies the presence of a virus or bacteria's DNA or RNA. PCR is highly sensitive and specific testing that can confirm the actual presence of an organism. Results are reported with a numerical value followed by the letters Ct. The cycle threshold or Ct value is the number of cycles before the virus or bacteria is detectable. A low Ct value indicates a higher level of pathogen present.

An **enzyme-linked immunosorbent assay (ELISA)** is an immunological test used to measure antibodies, antigens, and proteins in serum, plasma, tissue, or milk. Results are often reported as detected or negative.

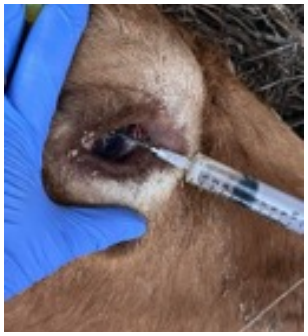
Antibody testing is used to assess a patient's immune response to disease exposure. The antibody titer test is commonly performed on serum. In order to determine the clinical significance of a titer result, a second "paired" sample must be tested in 2 to 3 weeks. When comparing the two samples, a rising titer of at least 2 dilutions can be consistent with acute infection. A falling titer of at least 2 dilutions could indicate the patient is clearing the infection.

Histopathology is when a pathologist studies the disease of tissues microscopically. These tissues require fixation. Tissues submitted for histopathology should be thinly sliced and placed in formalin. Avoid freezing these tissues as it will make the sample quality undiagnostic.

CONTINUE READING →

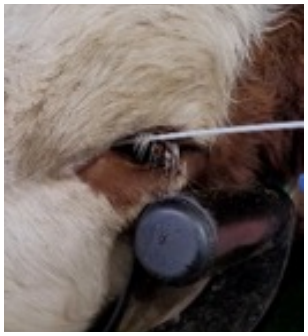
Necropsy

Provide all relevant patient history and details on lab submission forms. Aseptically collect large samples of normal and abnormal trachea, lung, liver, spleen, kidney, GI tract, lymph nodes, joint fluid, brain, etc. to send to the diagnostic laboratory. Collect an aqueous humor sample to test for heavy metals and nitrates in production animals. Pack all samples on ice and submit them to the laboratory immediately.



Milk Sample Collection

Use the near, near, far, far method to avoid contamination and aseptically collect milk samples to perform a California Mastitis Test or to collect milk for bacterial culture. Utilize aerobic culture media for laboratory submission. Chill samples immediately or freeze if there is a delay in shipping.



Keratoconjunctivitis Sample Collection

Using an aerobic culture swab and viral transport media, collect samples by placing the swab in the medial canthus of the eye, allowing tears to soak into the swab. The best samples will come from cattle in the beginning stages of disease. Once eyes have ulcerated, diagnostic sample quality declines. Do not freeze samples, ship immediately on ice. Don't forget to label samples and double bag them to prevent leaking in transport.

Deep Nasopharyngeal Swabs

This sample is taken using double-guarded equine uterine swabs inserted into the nares to obtain a deep pharyngeal sample. This method prevents contamination of the sample from the dirty nares since the swab is guarded until the pharynx is reached and the swab is advanced through the end of the sheath. The swab is vigorously rubbed against the pharynx before being replaced into the sheath and removed from the patient. Two swabs must be collected if submitting samples for viral/mycoplasma and bacterial identification. Diagnostics such as PCR, bacterial culture, and virus isolation may be performed on the samples.