



Accurate diagnostics are key to implement the best strategies for prevention

You are invited to follow this series for contents related to Bovine Respiratory Disease (BRD), post-mortem and sampling techniques as well as relevant data of the main pathogens involved in the BRD complex.

Learn easy, practical and down-to-earth tips for diagnostics to help improve your preventative approach.



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Detect and Protect:

A Respiratory Postmortem in 10 Steps

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Introduction

In veterinary medicine, necropsy is the systematic postmortem procedure of dissecting an animal. It is carried out to investigate the possible causes of death, as it provides diagnostic information that in many cases cannot be obtained by clinical examination or other ancillary testing. In the context of livestock, where diseases frequently present as high-morbidity group phenomena, the postmortem examination carries critical epidemiological weight. Its utility extends beyond individual diagnosis. Postmortem examinations play a key role in guiding immediate herd-level therapeutic strategies and informing the implementation of targeted preventative measures against disease recurrence.

Necropsy in Bovine Respiratory Disease (BRD)

One of the most significant collective diseases in cattle is Bovine Respiratory Disease (BRD). This condition often occurs as epidemic outbreaks, primarily in young animals, and is associated with variable morbidity and mortality rates. It leads to considerable economic losses both in feedlots and in breeding or rearing herds.

BRD is usually infectious in origin, caused mainly by viruses and bacteria, but its onset is strongly influenced by environmental and management/stress factors that predispose animals to illness. A targeted necropsy technique is particularly useful in two situations:

1. Confirmed clinical diagnosis of BRD – when losses are clearly attributable to the syndrome. In these cases, the aim is not to determine the cause of death, but to identify the microorganisms involved in the outbreak.
2. Unexplained deaths with predisposing factors – when no clinical history is available, but housing conditions, stress, poor management, or herd history suggest respiratory disease.

Even if lesions are inconclusive, the necropsy must always be extended to other body systems. The macroscopic study of the lesions will provide veterinarians with immediate information that should be added to clinical and epidemiological observations, establishing a hypothesis on the aetiology of the case. Taking samples for subsequent analysis in the laboratory may confirm suspicions or reveal the presence of other microorganisms. Polymerase Chain Reaction (PCR) panels for common respiratory pathogens are recommended, including *Bovine Respiratory Syncytial*



BRD usually occurs in the form of "outbreaks" in young animals





Basic equipment for necropsy performance and sample collection.

Virus (BRSV), Bovine Herpes Virus 1 / Infectious Bovine Rhinotracheitis (IBR), Bovine Viral Diarrhea Virus (BVDV), Parainfluenza 3 (PI3), and bacteria such as *Mannheimia haemolytica*, *Histophilus somni*, *Pasteurella multocida*, and *Mycoplasma bovis*. For bacterial culture, aseptic collection is required; however, culturing has limitations, especially for fastidious organisms like *H. somni* and *M. bovis*, and is not applicable to viral detection. In essence, the technique proposed is designed to be a practical tool for veterinarians. It enables a rapid, scientifically sound field necropsy during a respiratory disease outbreak or on farms with chronic issues. Using only a basic instrument set, the procedure is simplified and time-efficient, ensuring that even veterinarians with limited specialized experience can perform a rigorous postmortem without disrupting their schedule.

It is adaptation to the clinical setting, making systematic necropsy easily integrated and repeated as often as necessary for effective diagnosis. This article only describes the technique. The assessment of the lesions and the interpretation of the laboratory results are subjects that will be dealt with in subsequent articles.

Before starting, ensure that the following basic equipment is available:

- Sharp knife (and sharpener)
- Scissors



Necropsy permits a macroscopic study of the lesions as well as samples collection for posterior analysis in the lab

- Small axe (optional, for older animals)
- Forceps
- Six sterile swabs (plastic handles, no medium)
- Two sample vials

The 10-Step Necropsy Technique (Performed in 10 minutes)

1. Position the carcass in left lateral recumbency: This prevents the rumen from obstructing abdominal access and facilitates thoracic examination.
2. Open the stifle joint: Examine the synovial capsule. A healthy joint contains minimal synovial fluid. If synovitis is suspected, collect synovial fluid for testing *Mycoplasma bovis* or *Histophilus somni*, as these pathogens tend to also colonize these tissues.
3. Dissect the right foreleg: Make an incision in the axilla while abducting the limb until the thorax is easily accessible.
4. Expose the trachea to the pharynx: Detach the trachea completely, including the pharynx, to enable removal of the entire respiratory tract.
5. Open the thoracic cavity: Make long intercostal incisions without damaging the lung. Cut along the sternum (using an axe, if necessary, in older cattle) and manually break the ribs to expose the thoracic organs. Observe the lungs, pleura (visceral and parietal), and any abnormal fluid.
6. Remove the respiratory tract: Completely remove the



respiratory tract, from the pharynx to the lungs. Place it on a clean surface which allows the organs to be manipulated easily.

7. Examine lung tissue: Using scissors, cut deep into the parenchyma at the boundary between healthy and diseased tissue. Repeat at 1–2 cm intervals. Take samples by scraping vigorously with the swabs inside each incision to detect the presence of viruses and bacteria. Small samples of affected tissue may be cut out and placed in a vial to be sent to the laboratory.
8. Inspect the pharynx: Check for abscesses or other pathological lesions.
9. Open the trachea to the bifurcation: Note the presence of any lesions and collect samples by rubbing vigorously with a swab that can be submitted for viral detection e.g., Bovine Herpesvirus -1 (IBR), which has a great affinity for this organ.
10. Examine the myocardium: Make several incisions

to reveal the presence of infarcts, abscesses or myocarditis, indicators of possible *Histophilus somni* infection. If this is suspected, samples can be taken with a swab for PCR.

Conclusion

This simplified necropsy method is designed for routine use during farm visits. It requires minimal preparation, adds little disruption to daily schedules, and provides valuable diagnostic information. Beyond its diagnostic role, necropsy is a powerful communication tool with farmers.

Seeing the lesions firsthand reinforces the seriousness of respiratory disease and highlights its economic impact, often motivating greater adoption of preventive and management measures.

References available on request