

# *Mycoplasma bovis* and Primary Bovine Virus Diarrhea Virus Co-association in Chronic Pneumonia of Feedlot Cattle - a Histopathological and Immunohistochemical study

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## Introduction

Recently, multi-source feedlots in the prairie region of western Canada have experienced many cases of antibiotic resistant pneumonia, sometimes in association with multiple joint fibrinous arthritis. The lung lesions in these cases resemble those described in *M. bovis* infection.<sup>1</sup> We have also observed vascular lesions, positive by immunohistochemistry for bovine virus diarrhea virus (BVDV), in the heart and lungs of some cattle. A retrospective immunohistochemical and histopathological study was done of animals of this type was submitted to the Western College of Veterinary Medicine between January 1995 and December 1998. Our objective was to determine frequency of occurrence and distribution of *M. bovis*, BVDV, and *Haemophilus somnus* in lungs and hearts of animals with lesions typical of this form of chronic pneumonia.

## Material and Methods

All cases suggestive of the condition, submitted to the WCVM between January 1995 and December 1998, were reviewed. Of these, 48 were selected on basis of lesions compatible with *M. bovis* infection<sup>1</sup> and availability of tissue sections for review. Heart and lung tissues from these animals were examined by histology and immunohistochemical staining<sup>2</sup> for *M. bovis*, BVDV, and *H. somnus*.

## Results

*Mycoplasma bovis* was found in 44 of the 48 cases (91%), BVDV was present in 31 of 48 animals (64%),

and *H. somnus* was found in the hearts of 2 animals and lungs of 13 animals. Vascular lesions including vasculitis, perivasculitis and proliferative reparative changes were present in the hearts of 37 and lungs of 26 animals. BVDV antigen was found predominantly in vessel walls in the heart and lungs. The staining pattern for BVDV was not typical of that seen in persistently infected (PI) animals. *Haemophilus somnus*, as demonstrated by immunohistochemistry, was not associated with vascular lesions.

## Conclusion

This study supports an association between *M. bovis* and primary BVDV infection in this form of chronic pneumonia. Vessel injury in these cases is associated with BVDV. While the exact role of primary BVDV infection is unknown in the disease, it is plausible to attribute it to immunosuppressive effects of BVDV. The role of *H. somnus* is unclear, but it was not associated with the vascular injury. Cases of *M. bovis* pneumonia and/or arthritis should be thoroughly examined for underlying BVDV infection. Appropriate tissue samples should be obtained routinely to confirm or rule out BVDV infection.

## References

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2. Haines DM, Clark EG, Dubovi EJ: Monoclonal antibody-based immunohistochemical detection of bovine viral diarrhea virus in formalin-fixed-embedded tissues. *J Vet Diagn Invest* 5: 194-197, 1992.