



Johne's In Ruminants other than Cattle

The clinical presentation of paratuberculosis and performance of diagnostic tests varies among ruminant species. In sheep, goats, South American Camelids (SAC), and farmed deer, weight loss is the primary clinical sign with end stage diarrhea in roughly 20% of cases. Age at clinical onset can be as young as 6 months to 1 year of age to 8+ years of age.

Both Johne's culture and serologic test performance varies across species lines.

- The strains of *M. avium paratuberculosis* which infect sheep, and occasionally goats, differ from cattle strains in their culture requirements and cannot be cultured using routine bovine culture methods and Herrold's Egg Yolk Media.
- There are no licensed or validated Johne's ELISA assays for ruminants other than cattle in North America. In our experience, the AGID appears to be the most sensitive and specific serological test for Johne's in sheep and goats.

These differences in diagnostic testing and clinical presentation must be taken into account when designing herd programs for ruminants other than cattle.

Selected References:

All other ruminants: Stehman SM. Paratuberculosis in small ruminants, deer, and South American camelids. *Veterinary Clinics of North America, Food Animal Practice* 1996;12:441-455

Sheep:

Whittington, R. J., S. Fell, et al. (2000). Use of Pooled Fecal Culture for Sensitive and Economic Detection of *Mycobacterium avium* subsp. *paratuberculosis* Infection in Flocks of Sheep. *J Clin Microbiol* 38(7): 2550-2556.

Whittington, R. J., I. Marsh, et al. (1999). Evaluation of modified BACTEC 12B radiometric medium and solid media for culture of *Mycobacterium avium* subsp. *paratuberculosis* from sheep. *J Clin Microbiol* 37(4): 1077-83.

Whittington, R. J., I. Marsh, et al. (1998). Rapid detection of *Mycobacterium paratuberculosis* in clinical samples from ruminants and in spiked environmental samples by modified BACTEC 12B radiometric culture and direct confirmation by IS900 PCR. *J Clin Microbiol* 36(3): 701-7.

Whittington, R. J., L. A. Reddacliff, et al. (2000). Temporal patterns and quantification of excretion of *Mycobacterium avium* subsp *paratuberculosis* in sheep with Johne's disease. *Australian Veterinary Journal* 78(1): 34-37.

Goats:

Gezon, HM, Bither, HD, Gibbs, HC: Identification and control of paratuberculosis in a large goat herd. *Am J Vet Res* 49(11):1817, 1988

Milner, AR, Mack, WN, Coates, KJ: A modified ELISA for the detection of goats infected with MAP. *Aust Vet J* 66(9):305, 1989

Molina, A, Morera, L, Llanes, D: Enzyme-linked immunosorbent assay for detection of antibodies against MAP in goats. *Am J Vet Res* 52(6):863, 1991

Farmed Deer:

Collins, DM, Gabric, DM, de Lisle, GW: Identification of two groups of *Mycobacterium paratuberculosis* strains by restriction endonuclease analysis and DNA hybridization. *J Clin Microbiol* 28(7):1591, 1990

De Lisle, GW, Yates, GF, Collins, DM: Paratuberculosis in farmed deer: case reports and DNA characterization of isolates of *Mycobacterium paratuberculosis*. J Vet Diagn Invest 5(4):567, 1993

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Fawcett, AR, Goddard, PJ, McKelvey, WAC et al: Johne's in a herd of farmed red deer. Vet Rec 136:165, 1995

Power, SB, Haagsma, J, Smyth, DP: Paratuberculosis in farmed red deer (*Cervus elaphus*) in Ireland. Vet Rec 132(9):213, 1993

Stehman, SM, Rossiter, CR, Shin, S, Lein DH :Johne's Disease in a Fallow Deer Herd: Accuracy of Fecal Culture and Results of Environmental Sampling. *In press Proceedings of the 5th International Colloquium on Paratuberculosis, Madison WI, Oct., 1996.*

Camelids:

Miller, D. S., M. T. Collins, et al. (2000). Specificity of four serologic assays for *Mycobacterium avium* ss paratuberculosis in llamas and alpacas: a single herd study. J Vet Diagn Invest 12(4): 345-53.

Selected Websites: For Johne's discussions in ruminants other than cattle:

Australian Programs - <http://www.aahc.com.au/jd/maps/>

National Johne's Working Group - Small Ruminant Sub-committee at <http://www.usaha.org/njwg/njwgssmr.html>

Deer And Elk - <http://www.usask.ca/wcvm/herdmed/specialstock/>