

Development of a serological diagnostic of Johne's Disease



Johne's disease, caused by infection with *Mycobacterium avium* subsp. *paratuberculosis* (MAP), affects domestic and wild ruminants and is responsible for major economic losses in the agricultural sector. Chronic granulomatous enteritis is a characteristic immunological manifestation of the disease, further, the presence of MAP in humans is associated with Crohn's disease and Type 1 diabetes in humans, highlighting a potential public health threat of Johne's disease as a potential zoonosis.

Unfortunately, diagnosis of Johne's disease is challenging and can take up to 6 months because mycobacterial growth is slow and animals shed low levels of bacteria intermittently. Further, detection of MAP-associated immunity is also difficult. In a recent study Hermida et al. developed a rabbit anti-deer polyclonal antibody for use in an in-house ELISA using protoplasmic antigen paratuberculosis (PPA) as antigen.

Rabbits were immunised with PPA, and immunity measured by direct ELISA using an anti-deer polyclonal antibody (pAbs) specific to PPA. The in-house PPA-ELISA test were standardized sera samples of deers previously classified as MAP positive or negative by faecal culture.

To achieve the best conditions, positive and negative sera were used with different concentrations of PPA, sera dilutions, anti-deer pAb dilutions and HRP-anti-rabbit IgG

dilutions. The performance of this assay was evaluated by comparing its results to an ELISA designed for the diagnosis of Johne's disease in cattle. Finally, 155 deer sera samples were assessed by the in-house PPA-ELISA.

The in-house PPA-ELISA showed a Se = 85.71 % and Sp = 88.89 %. The assay was able to identify 76.77 % of the deer in the suspected herd as positive. Results showed that the polyclonal anti-deer antibody produced could be used as a reagent in PPA-ELISA in both deer and other ruminant species, due to the cross-reaction obtained.

The development of this diagnostic test is a promising time and cost-effective alternative for faecal culture, to be used as a first scan in the evaluation of suspicious herds and the estimation of MAP seroprevalence.

Journal Article: Hermida H., et al., 2020. [Rabbit anti-deer polyclonal antibody applied to the diagnosis of *Mycobacterium avium* subsp. *paratuberculosis* in red deer \(*Cervus elaphus*\).](#)

Small Ruminant Research

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