Johne's disease in farmed deer

Will Johne's disease become an economically important disease in farmed deer in New Zealand? A recent report from Scotland has shown that under certain conditions Johne's disease can be a major clinical problem in farmed deer.

Johne's disease, caused by Mycobacterium paratuberculosis, has been present in cattle and sheep in New Zealand for over 50 years. Initially, the infection in sheep occurred only in the South Island, especially south and mid Canterbury. However, over the last 20 years there has been a steady increase in the number of infected flocks in the North Island. In the North Island Johne's disease has been prevalent in dairy cattle since the beginning of the century. The considerable trade in live animals, including the unrestricted movement from M. paratuberculosis-infected herds and flocks, has resulted in the organism becoming widespread in cattle and sheep in New Zealand. This spread has important implications for deer farming. Although cattle or sheep are rarely run together with deer, they are often used for pasture control on deer farms. As a result it is highly probable that there have been numerous opportunities for deer to become infected with M. paratuberculosis. The ability of M. paratuberculosis to survive for many weeks in the environment enhances the probability of infection spreading to farmed deer. The slow emergence of Johne's disease in sheep flocks in the North Island indicates that it may take a similar 20-year time period for the disease to emerge as a widespread problem in farmed deer.

The diagnosis of Johne's disease in deer is complicated by the similarity of lesions induced by Mycobacterium bovis and members of the Mycobacterium avium complex to those caused by M. paratuberculosis. In contrast to the situation with Johne's disease in cattle and sheep in New Zealand, necrosis is a feature of lymph node lesions of many deer infected with M. paratuberculosis. Hence a definitive diagnosis of Johne's disease in deer can only be made by the isolation of M. paratuberculosis. Since 1985, the date of the first isolation of M. paratuberculosis from New Zealand deer, 25 bacteriologically confirmed cases have been identified (Table 1). All these cases have occurred in red deer (Cervus elaphus).

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These figures need to be interpreted with considerable caution since they are understandably an under estimate of the true incidence of *M. paratuberculosis* infection in New Zealand farmed deer. In some possible cases of Johne's disease, with considerable caution since they are logical diagnosis. The reporting of suspected cases has come from clinically normal deer identified at meat inspection as having lesions similar to those caused by *M. bovis*. For the last 2-years, all suspect tuberculous lesions from gut-associated lymph nodes have been cultured for *M. paratuberculosis*, as well as other mycobacteria, such as *M. bovis* and members of the *M. avium* complex. *Mycobacterium paratuberculosis* was subsequently isolated when culturing was repeated using media supplemented with mycobactin which is required for the in vitro growth of this bacterium. Since 1989, 17 of 22 of the bacteriologically confirmed cases have come from clinically normal adult animals, especially the fading elk syndrome, it is likely that the reported figures do correctly reflect a very low incidence of clinical Johne's disease in New Zealand farmed deer. An intriguing observation from both Scotland and New Zealand has been the occurrence of clinical Johne's disease in deer under 12 months old. Clinical Johne's disease in similar age sheep or cattle is extremely rare.

The figures in Table 1 are likely to be a fair less reliable indicator of the incidence of subclinical Johne's disease. No surveys have been carried out to estimate the prevalence of subclinical Johne's disease in New Zealand farmed deer. The figure quoted for subclinical Johne's disease relates to animals identified at meat inspection as having necrotic lesions in the gut associated lymph nodes. This type of lesion may be very rare in deer infected with *M. paratuberculosis*. In the report from Scotland, lymph node lesions in infected deer were seldom necrotic and caseation or mineralisation was not observed.

In 1989, *M. paratuberculosis* was cultured for the first time from a lymph node which was identified at meat inspection as having a lesion similar to those caused by *M. bovis*. Direct microscopic examination revealed large numbers of acid-fast staining bacteria. No mycobacteria were isolated from this case when it was cultured using media designed for isolation of organisms such as *M. bovis* and members of the *M. avium* complex. *Mycobacterium paratuberculosis* was subsequently isolated when culturing was repeated using media supplemented with mycobactin which is required for the in vitro growth of this bacterium. Since 1989, 17 of 22 of the bacteriologically confirmed cases have come from clinically normal adult animals, especially the fading elk syndrome, it is likely that the reported figures do correctly reflect a very low incidence of clinical Johne's disease in New Zealand farmed deer. An intriguing observation from both Scotland and New Zealand has been the occurrence of clinical Johne's disease in deer under 12 months old. Clinical Johne's disease in similar age sheep or cattle is extremely rare.

<table>
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<th>Year</th>
<th>Total No.</th>
<th>No. clinical Johne's disease</th>
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<td>1</td>
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</table>

Total 25 5 20

* Three isolates came from no visible lesioned deer which reacted to a tuberculin skin test.
** No. of isolates for only 9 months of 1992.

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References


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