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Diseases of deer in south eastern Queensland

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The deer farming industry has become established in Queensland by capturing feral deer. Most of these are red deer *(Cervus elaphus)* but some rusa *(C. timorensis)* and fallow *(Dama dama)* are also farmed. When the farms were being stocked, no information was available on the diseases or pathogens of these animals in Queensland. Several deer were necropsied and surveys for bacterial, viral and parasitic pathogens were done between 1977 to 1982, to determine the existence of possible threats to the health of farmed deer and to other livestock in their vicinity. A full description of the materials and methods used in this work has been published elsewhere (McKenzie 1985). Brief details of its results are given here for general information.

Serums were collected from 677 red deer captured at 20 localities in south eastern Queensland. The serums were tested for antibodies to 4 bacterial and 26 viral antigens. Of 677 serums tested for antibodies to bacteria none reacted at positive titre to *Brucella abortus,* 14.5% for *Leptospira interogans serovar hardjo,* 0.6% for *L. pomona* and 0.3% for *L. tarassovi.* Of 432 serums tested for neutralising antibodies, the percentages positive were: bovine ephemeral fever virus 43%, Kimberley virus nil, Tibrogargan virus nil, D'Aguilar virus 86%, CSIRO village virus 76%, Bunyip Creek virus 79%, five epizootic haemorrhagic disease of deer viruses 19-50%; of 396 serums the percentages positive were bluetongue virus, serotype 1, 8%, serotype 20, nil, serotype 21, 13% Akabane virus 90%, Aino virus 34%, Peaton 86%, Douglas 35%, Tinaroo 44%; of 405 serums 4% reacted at positive titre for mucosal disease virus antibodies and none were positive for bovid herpesvirus 1; of 193 serums none were positive for bovid herpesvirus 2, Marrakai virus of 2 serotypes of Eubenangee virus. Of 369 serums tested for precipitating antibodies to a bluetongue group antigen, 48% reacted at positive titre.

The absence of antibodies to *B. abortus* means that the deer do not represent a reservoir of infection in the bovine brucellosis eradication area in which their feral range is situated. There was no evidence of disease in the deer associated with any of the leptospiral or viral infections.

Necropsy specimens from 23 red deer yielded the following helminths: *Orthocoelium (Ceylonocotyle) streptocoelium* (5 deer infected; mean 2,900 per deer; range 4 to 10,8000), *Fasciola hepatica* (1;5), hydatid cyst (Echinococcus granulosus) (1;1), *Capillaria* sp. (4;18;5 to 40), *Cooperia* sp. (3;9;1 to 15), *Dictyocaulus viviparus* (2;7;1 to 12) *Haemonchus placei* (6;70;1 to 198), *Oesophagostomum venulosum* (12;10;1 to 31), *Spiculopteragia asymmetrica* (15;243;11 to 774), *S. boehmi (spiculoptera)* (18;322;20 to 1,806). The deer were not obviously affected by these helminths. No evidence of *Elaphostrongylus cervi* was found. The ticks *Haemaphysalis bancrofti* and *Ixodes holocyclus* were each found on one deer. *Boophilus microplus* was found on 7 deer, on 2 of which the burdens were very heavy. *B. microplus* displayed biarra and Mt Alford type acaricide resistance.

Necropsy of 27 red, 6 fallow and 6 rusa deer obtained from capture operations, farms and fauna parks revealed trauma of the cervical vertebrae (6 cases), trauma of other sites (3), pregnancy toxaemia (2), acidosis (2), abdominal fat necrosis (at slaughter — 4 cases), *Trema aspera* poisoning (1), fatal *Boophilus microplus* infection (3), *Salmonella typhimurium* infection (1), fibrinous pleuropneumonia (2), pyelonephritis/metritis (3), hepatic fibrosis (1), congenital polycystic kidneys (1), lymphosarcoma (1), haemorrhagic enteropathy (3), muscular degeneration (1). No conclusive pathology was found in 5 others. No cases of "capture myopathy" were observed. The mean liver copper concentration in 24 mature red deer was 95 mg/kg dry matter (range 17.5-197.9).

Our results confirmed that deer in Queensland were not threatened by severe health risks from known pathogens during the establishment of deer farms. *B. microplus* did cause some concern but could be controlled by normal methods.

We greatly appreciated the cooperation of deer farmers and the Queensland National Parks and Wildlife Service during these investigations.

References

McKenzie, R. A. (editor) (1985) — *Deer Farming Techniques and Diseases of Deer in Queensland* Project Report Q085006. Qld Dept Prim, Ind., Brisbane.

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