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BEHAVIOURAL PATTERNS OF POSSUMS AND CATTLE WHICH MAY FACILITATE THE TRANSMISSION OF TUBERCULOSIS

**A thesis presented in partial fulfilment of the requirements for the degree
of Master in Veterinary Science at Massey University**

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ABSTRACT

Behavioural patterns of a population of Australian brushtail possums with endemic tuberculosis were studied using radio telemetry, and by direct observational techniques, from November 1990 to April 1992. The study area, on the east coast of the Wairarapa, New Zealand, allowed observations of interaction between the major wildlife vector of tuberculosis in New Zealand, and cattle run as part of a commercial farming venture. The rugged 40 ha study area is mainly covered in 2-10 m high scrub, with patches of native bush and some large trees. Part of the area has been cleared of scrub and grassed. Poorer quality pasture is also available in small pockets in many other areas of the paddock.

Possums had distinct ranges that remained constant over the duration of the study period, and ranges of many possums overlapped. Males had significantly larger ranges during the breeding season, and had the largest ranges overall. The area covered by a possum in a night's activities varied considerably between possums, and often for an individual over consecutive nights. There were no significant differences between home ranges of tuberculous and non-tuberculous possums, although there were indications that the size of nightly activity areas of the former decreased as the disease progressed. Twenty-five juvenile possums were followed over 8-10 months, 2 dispersed from the area, and 7 died within their natal home range. Most of the juveniles died from starvation and exposure.

Interactions between possums and cattle were observed in a natural setting, and also by introducing sedated possums to the same area to simulate terminally-ill tuberculous animals. Possums spent a variable amount of time feeding on pasture in the 40 sq.m observation area, ranging from a few minutes, to several hours. Normally possums appeared to avoid cattle whenever possible, and if necessary climbed trees to get away. The activities of several debilitated possums are described and their apparent indifference to external influences - in particular time of day - noted. The intense interest shown by cattle in sedated possums is described, and the possibilities for transmission of tuberculosis from possums to cattle discussed. It is concluded that transmission of tuberculosis is unlikely to occur on open pasture under normal circumstances, but that sick tuberculous possums, and later their carcasses, are a source of infection.

Tuberculosis in English badgers is compared, and contrasted, with the situation in New Zealand. Possible explanations for the absence of the disease in Australian wildlife are discussed. The differences in habitat and population density are suggested as the main reasons for the variations between, and within, countries. The importance of controlling tuberculosis in New Zealand, deficiencies in present control systems and possible areas for future research are outlined.

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