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The behaviour, pathophysiology and pathology of brushtail possums (*Trichosurus vulpecula*) poisoned with 1080 or brodifacoum, and the implications for possum welfare.

A dissertation presented in partial fulfilment of the requirements for the degree of

PhD

in

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Kate Elizabeth Littin

2004
Abstract

Millions of brushtail possums (*Trichosurus vulpecula*) are poisoned yearly in New Zealand owing to damage caused to agriculture and the environment. They are nonetheless sentient animals capable of suffering, and legislative and ethical obligations, and public concern demand that only the most humane poisons are used (Chapter 1). Accordingly, the aim of this work was to evaluate the effects of two poisons used for killing possums in New Zealand, 1080 and brodifacoum, and the implications for animal welfare. Animal Ethics Committee approval was obtained for all work. A lethal dose of 1080 in carrot baits caused retching, vomiting and seizures in possums caged indoors (Chapter 2). Possums did not fully lose consciousness until death but were likely to have been in a reduced state of awareness beforehand. The first signs of poisoning were observed after an average of nearly 2 h and they died on average 11.5 h after consuming baits, giving a period of potentially reduced welfare of approximately 9.5 h. Six possums of eight that consumed a sublethal dose showed signs of sickness, indicating that some sublethal doses can reduce welfare. Alpha-chloralose (a sedative) and paracetamol (an analgesic) had no effect on the behaviour of caged, 1080-poisoned possums (Chapter 3). The consumption of 0.88 mg/kg brodifacoum in cereal pellet baits by caged possums caused widespread haemorrhages which may have led to weakness, sickness or pain (Chapter 4). Possums did not lose consciousness until death after an average of 21 days but were likely to have been in a reduced state of awareness for up to six days beforehand. Signs of poisoning were first seen after 14 days on average, meaning welfare was potentially reduced for about seven days. Following the consumption of 0.86 mg/kg brodifacoum in cereal pellet baits, blood clotting ability was reduced and all possums had internal haemorrhages, both within eight days of bait being offered (Chapter 4). Possums penned outdoors with space for a high level of activity and exposure to spring and summer weather died after a lethal dose of 1080 or brodifacoum at about the same times as possums caged indoors, and following similar preceding signs of poisoning (Chapter 5). This implied that the results from caged possums are applicable to wild possums in New Zealand at most times of the year. This work, together with that of others, suggests that 1080 is the second-most humane poison for possums and that brodifacoum is among the least humane (Chapter 6).
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