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### FEEDING BY CAPTIVE KAKA ON BAITS USED IN 1080-POISONING OPERATIONS

(Short Answers in Conservation Science)

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# FEEDING BY CAPTIVE KAKA ON BAITS USED IN 1080-POISONING OPERATIONS

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## ABSTRACT

Plain and cinnamon-flavoured baits used in 1080-poisoning operations for brushtail possum control were offered to two captive North Island kaka at Mt Bruce National Wildlife Centre in July 1985. The kaka ate plain baits the first day offered, but were deterred from eating cinnamon-flavoured baits until the second day.

## INTRODUCTION

Carrots and pollard pellets commonly used as carriers of 1080 poison (sodium monofluoroacetate) for control of the brushtail possum (*Trichosurus vulpecula*) are also eaten by some birds (Spurr 1979). Residues of 1080 have been identified from carcasses of several bird species, including the North Island kaka (*Nestor meridionalis*), although it is not known whether these birds fed directly on poisoned baits or indirectly on poisoned prey (Spurr 1979). Many captive native birds are fed carrots and pollard pellets (normally fed to poultry), and probably would feed on similar materials used as baits for possum control.

Udy & Pracy (1981) and Pracy, Robertson & Udy (1982) noted that cinnamon and some other flavours were repellent to kaka, but not to possums. Cinnamon is now applied to both carrot and pollard baits used in 1080-poisoning operations, partly because of its supposed bird repellency and partly because of its ability to mask the smell and taste of 1080 poison from possums (Forest Research Institute 1985).

This study was set up to determine whether cinnamon-flavoured baits are less attractive than plain baits to kaka in captivity at Mt Bruce National Wildlife Centre.

## METHODS

The pair of North Island kaka at Mt Bruce were normally fed a mixture of seeds (mainly sunflower), fresh vegetables (such as carrots and silverbeet), fresh fruit (such as apples), and dried fruit (such as dates). Water sweetened with honey and jam was also provided.

The kaka were given plain baits for 5 days, then cinnamon-flavoured baits for 3 days in July 1985, at the time of year when poisoning operations often take place. The plain baits were freshly cut carrot pieces and Mintech NZ Ltd pollard pellets, without 1080. The baits were dyed with 0.02% Acid Brilliant Green, as in 1080-poisoning operations. The cinnamon-flavoured baits were flavoured with a surface coating of 0.1% cinnamon oil, as recommended by the Forest Research Institute (1985).

Carrot pieces and pollard pellets were given together; 20 of each, with equal numbers in four size-classes (0.5-1 g, 1-2 g, 2-4 g, 4-6 g). The baits were placed in feeding trays with the birds' usual food. Baits were put out at about 0830 h and usually removed at about 1630 h. The same baits were put out for up to 5 days to simulate the aging of baits in a poisoning operation.

Cinnamon was also added to dates, an item of the normal captive diet of kaka, and its repellency was tested for 3 days (c.f. 1 day by Udy & Pracy 1981).

The number of baits that were eaten or partly eaten were recorded. Also, kaka responses to dates were directly observed.

## RESULTS

Plain baits were eaten the first day offered, but cinnamon-flavoured baits were not eaten until the second day. On average, 15% of both plain and cinnamon-flavoured baits were eaten or partly eaten each day. Baits that were partly eaten were dropped on the ground below perches. The numbers of carrot and pollard baits eaten were similar; 59% of baits eaten were greater than 2 g in size.

Plain dates were eaten the first day offered, but cinnamon-flavoured dates were not eaten until the third day. One kaka was seen removing the outside layer of a cinnamon-flavoured date, then eating the inside.

## DISCUSSION

From direct observations of birds feeding and from the remains of baits, I obtained positive evidence of kaka feeding on both plain and cinnamon-flavoured carrot and pollard baits.

The kaka ate baits of all sizes, but especially the larger baits. In contrast, earlier assessments of trial poison operations by Harrison (1978) showed that fewer birds were killed when the smaller baits were screened out, implying that the birds preferred eating the smaller baits. However, Harrison's results could also be interpreted as showing that fewer birds were killed when fewer baits were applied, because equal weights rather than equal numbers of small and large baits were used in the trials. Also, the birds killed in Harrison's trials were small passerines that may have preferred eating small baits. The kaka tested at Mt Bruce preferred eating large baits, which they could hold in their claws.

The kaka ate only a few whole baits, and often only parts of baits. They preferred seeds to carrot and pollard baits. This indicates that the baits were not very attractive to kaka. However, although kaka ate only a few baits, they may have eaten enough for a lethal dose of 1080 if the baits had been poisoned. No data are available on the lethal dose of 1080 to kaka, but a North Island weka (*Gallirallus australis greyi*) can be killed by 8.1 mg 1080/kg body weight (McIntosh et al. 1966). This means that a weka weighing 1 kg would be killed by eating 5.4 g of bait containing 0.15% 1080 (the recommended loading for possum control). Kaka are likely to be at least as sensitive to 1080 as weka, which have a higher tolerance to 1080 than most parrots (e.g., see McIlroy 1984). Kaka, which are lighter than weka, probably would need to eat less than 3 g of poisoned bait to obtain a lethal dose of 1080.

The acceptance of cinnamon-flavoured baits by the pair of kaka may have been influenced by their being "pre-fed" with plain baits. However, other species (e.g., weka, red-crowned parakeets, and saddlebacks) all ate cinnamon-flavoured baits without previous exposure to plain baits.

The delay in acceptance of cinnamon-flavoured baits indicates that fresh cinnamon had some repellent effect, but that the effect wore off quickly. I noticed that the smell of cinnamon on the baits waned after the first day; perhaps the taste did too. My results are consistent with those of Udy & Pracy (1981) and Pracy *et al.* (1982), assuming their tests were made with fresh baits.

It is possible that the repellent effect of cinnamon may be prolonged by increasing its strength or slowing its release (e.g., from pollard pellets by putting cinnamon in the bait mixture instead of applying it to the bait surface). Alternatively, it may be possible to find another flavour more repellent than cinnamon to birds, but still non-repellent to possums.

Observations on the repellent effect of bait flavours to birds in captivity can validly be extrapolated to birds in the wild. However, the proportion of birds in captivity which fed on baits may be irrelevant in the wild. Baits may be less acceptable to wild birds not habituated to an artificial diet. On the other hand, baits may be more acceptable to wild birds faced with food shortages than to captive birds supplied with an excess of food. On the assumption that baits, cinnamon-flavoured or not, will always be acceptable to some birds, wildlife managers need to know what proportion of birds in a wild population would feed on baits, and also what would be their chances of doing so. Only if the chances are very low, and the need to poison (e.g., to protect the habitat of a bird such as the kaka) is very high, should 1080-poisoning operations be allowed in areas containing rare bird species.

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