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PRELIMINARY BAIT TRIALS WITH CAPTIVE STOATS

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ABSTRACT

Preliminary trials were undertaken to determine which of three baits (fish-based catfood, hen eggs, and dead mice) commonly used to catch stoats (*Mustela erminea*) was the most attractive. All six stoats ate eggs and mice significantly more often than catfood. Combining results from both sexes, there was no significant preference between eggs and mice; when results were divided by sex however, females ate mice significantly more often than eggs and males ate eggs significantly more often than mice. Although widely used, catfood is probably not an effective bait to catch stoats. The differences between sexes and individuals in food preference may make it difficult to develop a bait or lure that will attract all stoats equally.

1. INTRODUCTION

Programmes to control stoats are currently being undertaken, both on the mainland and on island sanctuaries, to try and protect threatened native fauna. These programmes might be considerably more successful if an effective bait could be identified. Few systematic studies have been undertaken on stoat baits in New Zealand. King & Edgar (1977) found that baited Fenn traps caught more stoats than unbaited ones and recommended using a strong-smelling fish-based catfood as bait if a diet study is to be undertaken. They also recommended using a dead white mouse in combination with the odour from a smear of rabbit gut on the entrance if live-traps were to be used.

In recent trials, hen eggs were significantly more successful at catching stoats than fish-flavoured cat food or muscle from road-killed possum (Phillipson 1990). Hen eggs also caught significantly more stoats than two synthetic lures based on the anal sac secretions of mustelids (Dilks *et al.* 1992, Phillipson & Steven 1992). Although some preliminary bait trials with synthetic scent lures based on mustelid anal sac secretions were successful at catching ferrets (*Mustela putorius furo*) (Clapperton *et al*. 1989), there has been no evidence of their effectiveness in catching stoats in New Zealand.

Phillipson (1990) and Dilks *et al*. (1992) recommended that broken hen eggs be used as bait to catch stoats. However, results from studies in Fiordland (Murphy & Dowding 1991, Dilks *et al*. 1992) have shown that adult female stoats did not enter live-or kill-traps (baited with broken hen eggs) until after they had raised their young. The ability to trap pregnant or lactating females would be an obvious advantage in any localised control programme.

The aim of the present study was to identify which of three baits commonly used in stoat control programmes was the most attractive to captive stoats.

2. METHODS

In May-June 1991, three female and three male stoats were live-trapped in the Eglinton Valley, Fiordland and taken to the Te Anau Wildlife Park. They were housed in separate outdoor enclosures (1.2 m x 2.4 m 0.9 m), with weld-mesh walls and roof and a plywood floor. Half the roof of each enclosure was covered with corrugated iron to provide some shelter. Each enclosure had rocks, logs, vegetation and a nest box, filled with straw and dacron. For the first 1-2 weeks the stoats were fed a selection of food items; dead mice, freshly killed rabbit, hen eggs and catfood. After this initial period they were all fed minced sheep.

Twelve trials were run to test preference between (sardines in aspic), hen eggs (slightly broken by being punctured with a nail) and dead mice. There was an interval of at least 4 days between each trial. In each trial, food items were presented cafeteria-style, in three separate dishes. The order of food in the dishes was changed for each trial. Food was placed in each stoat cage during the day and was checked the following morning. Between trials stoats were fed minced sheep.

In each trial, each male stoat was given 2 eggs, 2 dead mice and approximately 80 g catfood. Mice were held down by wire after preliminary observations showed that some stoats removed them to a cache but did not eat them immediately. Initially, each female was given 1 egg, 1 mouse and 50 g catfood but after the third trial this was changed to 2 eggs and 2 mice. The amount of each food presented was equal to at least one day's consumption.

Four single trials were also undertaken. These compared deer udder with eggs, deer udder with mice, and preference between three flavours of catfood.

Results were analysed statistically by the McNemar Symmetry Chi-squared test (Sokal & Rohlf 1981). Probability ≤ 0.05 was considered significant.

3. RESULTS

Very little of the catfood was eaten in any of the trials (Table 1) and both eggs and mice were eaten significantly more often than catfood ($P<0.01$).

Table 1. The number of trials in which each stoat ate catfood, eggs and/or mice.

Stoat	Catfood	Eggs	Mice
Samantha	3/12	2/12	12/12
Sigrid	0/12	12/12	9/12
Sylvia	1/12	6/12	9/12
sub-total	4/36	20/36	30/36
Sidney	1/12	12/12	9/12
Sylvester	0/12	12/12	5/12
Smithy	0/12	11/12	10/12
sub-total	1/36	35/36	24/36
Total	5/72	55/72	54/72

Combining results for male and female stoats, there was no significant difference between the number of trials in which either eggs or mice were eaten (P=0.86). When the results were divided by sex however, females were found to eat mice more often than eggs (P = 0.002) and males ate eggs more often than mice (P = 0.025).

During these trials, all eggs were punctured before being presented, in case stoats were unable to open an entire egg. In subsequent tests however, it was noted that all six stoats had no difficulty in breaking into intact eggs, including the largest size available.

Detailed results of the single trials are given in Appendix 1. It was concluded that deer udder was no more attractive than dead mice to stoats. In the catfood trial, male stoats seemed to prefer chicken & turkey but the females ate very little (or none) of any of the catfoods.

4. DISCUSSION

Although widely used, is probably not an effective bait for stoats. Of those tested, the bait of choice for control programmes is punctured hen eggs -they are as effective as mice overall, they last longer and are more easily obtained. These results necessarily only represent preliminary findings on food preference; trials testing a wider range of baits, with more stoats, are still needed. The results do indicate sexual differences in food preference however, and this may make developing a stoat bait or lure more difficult.

Individual differences were also marked; one female ate eggs in all the trials but another ate them in only 2 of the 12 trials. A larger sample of stoats and a wider choice of baits in any further work should show the likely extent of this problem.

Future work on stoat baits and lures should bear in mind that baits for controlling stoats may be different from baits for eradicating them. In control operations, it is necessary to kill only enough stoats to enhance survival or productivity of the species being protected. A pelleted form of poisoned bait with a specific long-lasting lure could be used for control over large areas, possibly by aerial sowing. In eradication programmes however (e.g. on islands), all stoats must be killed; in this case a variety of baits and lures may he needed to attract different individuals and both sexes. Research is needed to examine the role of sight, sound and smell in food location by stoats. Further bait trials should take note of the fact that stoats (both wild and captive) cache food regularly.

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APPENDIX 1
Single trials with deer udder and catfood

Three trials were undertaken with pieces of deer udder, as observations by hunters suggested that stoats fed preferentially on the udder (A. Saunders, pers comm.). Two trials tested preference between deer udder and eggs, the other tested udder against mice.

Table 1.1 The percentage of bait eaten by each stoat in a single trial. Stoats were given 2 eggs and approximately 100 g of deer udder.

Stoat	Eggs	Deer udder
Samantha	0	50*
Sylvia	0	100
Sigrid	0	50*
Smithy	50	0*
Sidney	50	0
Sylvester	50	0*

* The remainder was found cached.

In the first trial, all males ate one egg only and the females ate deer udder only (Table 1.1). In this trial, the udder was not held down and females may have preferred it because they could remove it easily. In the second trial, udder was nailed to the feeding tray. In this case, all stoats ate eggs and no udder was eaten (Table 1.2).

Table 1.2 The percentage of bait eaten by each stoat in a single trial. Stoats were given 2 eggs and approximately 100 g of deer udder, which was nailed down.

Stoat	Eggs	Deer udder
Samantha	50	0
Sylvia	100	0
Sigrid	50	0
Smithy	50	0
Sidney	100	0
Sylvester	50	0

In the third trial, each stoat was presented with two dead mice and two mouse-sized pieces of deer udder. Two male stoats ate one mouse and a piece of deer udder each and the other male ate one mouse only (Table 1.3). Only one female stoat ate half a piece of deer udder but all of them ate at least some of the mice. It was concluded that deer udder was no more attractive than dead mice to stoats.

Table 1.3 The percentage of bait eaten by each stoat in a single trial. Stoats were given 2 mice and 2 mouse-sized pieces of deer udder.

Stoat	Mice	Deer udder
Samantha	100	0
Sylvia	100	0
Sigrid	25	25
Smithy	50*	50*
Sidney	50*	50*
Sylvester	50*	0

* The other piece was found cached.

In a one-off trial, three different flavours of catfood (gourmet chicken & turkey, gourmet beef & liver and sardines & aspic) were tested to see if there was a marked preference between different flavours of catfood. Male stoats seemed to prefer chicken & turkey; females ate very little (or none) of any of the catfood (Table 1.4).

Table 1.4 The percentage of catfood eaten by each stoat in a single trial. Male stoats were given approximately 80 g of each catfood and females 50 g.

Stoat	Chicken	Beef	Sardine
Samantha	0	0	0
Sylvia	0	0	0
Sigrid	0	0	75
Smithy	100	25	0
Sidney	10	10	25
Sylvester	75	0	0