# Wild dog facts

## 1080-Sodium fluoroacetate

1080 (sodium fluoroacetate) is used to control wild dogs, feral pigs, foxes, cats and rabbits in Queensland. It occurs naturally in a number of native plant species including *Acacia georginae* (Georgina gidgee) and members of the *Gastrolobium* and *Oxylobium* genera. Sodium fluoroacetate is a fluffy white material at room temperature, which forms colourless solutions with water and is normally odourless.

## How to access 1080

Only accredited officers of local governments and/or Biosecurity Queensland can supply 1080 for controlling declared pest animals. It cannot be sold directly to the public. Under the Health (Drugs and Poisons) Regulation 1996, administered by the Queensland Department of Health, its use is subject to *strict* regulatory control according to which:

- all baits must be distributed only on the land described, and must not be laid within two kilometres of any habitation (i.e. any dwelling except that of the owner of the land being baited) or public amenity, or within five km of a town area, unless authorised by Biosecurity Queensland
- no baits are to be laid within 5 m of a fenced property boundary
- the landholder must give at least three days notice of the intended laying of baits to every resident and/or occupier of the land adjoining or having frontage to the holding, road or reserve on which the poisoned baits are to be laid
- warning signs supplied to the landholder must be placed at all points of entry to the property and adjoining public thoroughfares even if the adjoining property is carrying out 1080 baiting. Warning signs must be erected and left in place for a minimum of one month.

## Toxicity of 1080

Dogs and foxes are highly susceptible to 1080, and the small amount required to target these species poses a minimal threat to non-target species. Feral pigs and rabbits are also susceptible, although higher doses are required. Table 1 compares the susceptibility of different animals to 1080.

**Table 1: Toxicity of 1080 ($LD_{50}$ values)**

| Animal | mg/kg body weight | Relative resistance (dog = 1) |
|---|---|---|
| Dog | 0.1 | 1 |
| Fox | 0.2 | 2 |
| Cat | 0.3 | 3 |
| Wallaby | 0.3 | 3 |
| Sheep | 0.3 | 3 |
| Cattle | 0.4 | 4 |
| Rabbit | 0.4 | 4 |
| Pig | 0.6 | 6 |
| Tiger quoll | 1.8 | 18 |
| Human | 2.0 | 20 |
| Rat | 7.0 | 70 |
| Hawk | 10.0 | 100 |
| Goanna | 55.0 | 550 |

**Note**: $LD_{50}$ values represent the lethal dose for 50% of a population.

## How 1080 works

Acetate is an essential component in the diet of animals. However, the addition of fluorine makes the substance toxic, as fluoroacetate interferes with the citric acid (Krebs) cycle. In mammals, fluoroacetate poisoning can cause death in a number of ways. Carnivores (dogs, cats, foxes) generally suffer failure of the central nervous system; herbivores (rabbits, cattle, sheep) suffer heart or lung failure; and in omnivores (pigs) the central nervous system, heart, or lungs can fail.

## Minimising risks

To minimize the impact on non-target species, bait materials are impregnated with concentrations of 1080 specific to the target species. The concentration used depends on:

- the lethal dose rate required
- body weight
- amount of bait likely to be consumed.

The potential danger to non-target species is further minimised by:

- using a specific bait type
- estimating likely bait consumption
- placing bait appropriately (including burying or otherwise concealing it)
- bait tying - where a bait is tied with wire then tied onto stakes or nearby vegetation  This prevents birds and goannas from taking the bait.
- stipulating a minimum bait size
- using an appropriate strength of fluoroacetate.

## Advantages

The single greatest advantage of 1080 over other vertebrate poisons is that it is much more target-selective. As dogs are highly susceptible to it, they require much less for a lethal dose than many other animals (see Table 1). This target-specificity, and the fact that it does not persist in the environment, make 1080 an effective toxin for controlling vertebrate pests.

## Disadvantages

The single greatest disadvantage of 1080 is that there is no known antidote for sodium fluoroacetate poisoning, so working dogs and domestic dogs can be killed if they eat a bait. Due to the time it takes for the fluoroacetate to be absorbed and to disrupt the Krebs cycle, the onset of symptoms can be delayed anywhere from 30 minutes to 20 hours depending on the species and the individual animal.

The best protection for working dogs is plan ahead, use muzzles, and restrain working dogs when they are not working.

## Persistence in the environment

Fluoroacetate is rapidly broken down into harmless compounds in natural soil and water systems.

## Symptoms of poisoning

Key symptoms commonly used to assign 1080 poisoning as the cause of death in a dog are vomiting, convulsions, coma and death. Despite the distressing symptoms, anecdotal evidence from human poisoning cases overseas suggests that there is little, if any, pain associated with 1080 poisoning.

## Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.biosecurity.qld.gov.au).

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