



NSWPIG SOP4

Poisoning of feral pigs with sodium monofluoroacetate (1080)

Background

Lethal baiting with sodium monofluoroacetate (1080) is considered to be one of the most effective methods of quickly reducing feral pig numbers. 1080 is an odourless, tasteless, concentrated solution that has a coloured dye added for identification of the toxin. It is incorporated into a suitable bait material and offered along a trail or in a bait station. Free-feeding with unpoisoned bait is performed for a number of days prior to laying poisoned baits and is an essential step in a baiting program. Aerial application of bait may be an effective means for dealing with specific feral pig problems although a number of restrictions apply. A disadvantage of using 1080 is that it carries a high risk of non-target poisoning due to the larger doses required to kill feral pigs.

This standard operating procedure (SOP) is a guide only; it does not replace or override the relevant legislation that applies in NSW. The SOP should only be used subject to the applicable legal requirements (including WHS) operating in the relevant jurisdiction.

Individual SOPs should be read in conjunction with the overarching Code of Practice for that species to help ensure that the most appropriate control techniques are selected and that they are deployed in a strategic way, usually in combination with other control techniques, to achieve rapid and sustained reduction of pest animal populations and impacts.

Application

- 1080 baiting is subject to an authorised control officer (ACO) risk assessment.
- Baiting with 1080 should only be used in a strategic manner as part of a co-ordinated program designed to achieve sustained effective control.
- 1080 baiting of feral pigs is considered a relatively inexpensive and effective method of reducing medium-high density pig populations.
- Poisoning is primarily used as an initial control method whilst other methods such as trapping, ground shooting and exclusion are used as follow-up techniques to keep pig numbers at a low level.
- Baiting with 1080 should not be used in areas where there is an unacceptably high risk to humans and companion animals, such as urban/residential environments.
- 1080 use is restricted in areas where there is a high risk of poisoning domestic stock and wildlife.
- The best time to conduct a poisoning program is when surface water is scarce, and pastures have dried off. At this time pigs will be concentrated near permanent water

points and are more likely to eat bait due to hunger. It can be difficult to get feral pigs to take or find bait when there is abundant green feed. To achieve maximum population reductions, it is also recommended that broad scale control programs be conducted prior to breeding, which usually peaks between May and October. In south-eastern Australia, late autumn is usually the most effective period for baiting pigs.

- Baiting of feral pigs with 1080 can only be carried out under conditions set down in a specific permit issued by the Australian Pesticides & Veterinary Medicines Authority (APVMA) under Commonwealth legislation (*Agricultural and Veterinary Chemicals Code Act 1994*).
- In NSW, 1080 must also be used in accordance with the *Pesticides Act 1999* and the relevant Pesticide Control Orders (which include distance restrictions, signage and notification requirements).
- 1080 is a restricted chemical product (under Regulation 45 of the Agricultural and Veterinary Chemicals Code Regulations 1995) and is listed as a Schedule 7 – Dangerous Poison under the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP). These listings require special precautions in the manufacture, handling, storage and use of 1080, along with specific regulations regarding labelling or availability.
- Handling of 1080 concentrated solution and preparation of baits must only be performed by an authorised person (ACO) who has the appropriate training.
- Prepared and manufactured 1080 baits can only be obtained through an authorised control officer employed by Local Land Services, National Parks and Wildlife Service, Border Fence Maintenance Board of NSW and other NSW public authorities.
- The 1080 user should refer to the [NSW Vertebrate Pesticide Manual \(VPM\)](#) for all relevant legislation and its application.

Aerial baiting

Only 1080 Feral Pig Baits that are specified in the VPM and approved for aerial baiting can be used and it can only be applied by helicopter. At this stage only PIGOUT is approved (See NSWPIG SOP5 Poisoning of feral pigs using PIGOUT 1080 baits) for procedures.

Animal welfare implications

Target animals

- The toxicity of 1080 is due to the conversion of fluoroacetate to fluorocitrate, which inhibits the tricarboxylic acid cycle – a mechanism necessary for cellular energy production. In general, herbivores experience cardiac failure, whereas carnivores experience central nervous system (CNS) disturbances and convulsions and then die of respiratory failure. Some species, usually omnivores such as pigs, can be equally affected by both CNS and cardiac signs.
- After a pig has ingested 1080 there is a latent period, usually around an hour, before signs such as salivation, jaw chomping, vomiting, increased lethargy, and laboured respiration are observed. Although the precise nature and extent of suffering after ingestion of 1080 is unknown, it is likely that the animal will experience discomfort prior

to and during vomiting. Some pigs exhibit signs of CNS disturbance including hyperexcitability, squealing, manic running, paralysis or convulsions, followed by coma and then death. Other animals may lie quietly, breathing slowly and laboriously until death. Time to death is variable depending upon amount 1080 absorbed but is usually around 4 hours after ingestion. With low doses, pigs can take a number of days to die.

- Vomiting is a prominent early sign of 1080 poisoning in feral pigs, occurring approximately 1 to 5 hours after ingestion. Most pigs vomit frequently over a number of hours. This high incidence of vomiting has the following implications:
 - Vomitus containing 1080 may cause secondary poisoning of non-target species.
 - Vomiting can result in sub-lethal dosing of target animals, potentially decreasing the overall effectiveness of the poisoning program.
 - Animals surviving a sub-lethal dose may develop an aversion to 1080, decreasing their susceptibility to subsequent poisoning programs.
- To minimise the animal welfare implications of leaving dependent piglets to die a slow death from starvation it is preferable not to undertake 1080 baiting programs when sows have recently farrowed. This can vary with season and area.

Non-target animals

- 1080 is toxic to a wide range of species including birds, mammals and reptiles; however, there are marked differences in sensitivity. Dogs are extremely sensitive, and most other mammalian carnivores are highly sensitive to 1080 poisoning. Herbivores are less sensitive, and birds and reptiles increasingly more tolerant.
- Poisoning of non-target species can occur either directly by eating baits intended for feral pigs (primary poisoning) or through the scavenging of tissues or vomitus from a poisoned animal (secondary poisoning).
- The susceptibility of non-target species to 1080 poisoning is determined by many factors including sensitivity to the poison, body weight, concentration of 1080 in the bait, bait placement, bait type and palatability, timing of baiting and level of exposure to toxic baits.
- Vomitus containing 1080 has the potential to kill a number of non-target animals. Pigs may vomit repeatedly for a number of hours after 1080 ingestion so it is likely that vomitus would be distributed over a wide area creating a potential hazard for non-target animals.
- Relatively large amounts of 1080 must be distributed in baits to kill feral pigs, creating a serious risk of primary poisoning in non-target species. Meat baits are of considerable concern as they need to contain a high concentration of 1080 (72 mg per bait), which is more than 10 times the concentration used for wild dog baits.
- Herbivorous and granivorous birds and mammals have a high risk of poisoning if they eat the grain, pellets or fruit/vegetable baits. Macropods and wombats appear to be the most at risk. Cats, dogs, native carnivorous mammals, birds and some rodents are potentially at risk when meat baits are used.
- To minimise the potential for toxic baits to be lethal to non-target animals, the following baiting strategies are used:

- *Pre-feeding with non-poisoned bait* – allows an assessment of what animals are eating the bait.
- *Camera traps* – devices that detect heat-in-motion – can be used to assess visitation. The camera is triggered to take photos as the subject moves within the detection zone i.e., vicinity of bait station.
- *Bait type* – use of bait that is locally attractive to pigs e.g., fermented grains, and less attractive to non-targets.
- *Colouring of baits* –bait material is dyed a green or blue colour to reduce attractiveness to non-target fauna, especially birds.
- *Use of bait stations* – bait can be placed in a fenced area which excludes livestock and other non-target animals but allows pigs to push through to access the bait.
- *Placement of baits* – the bait should always be placed in the prime feeding areas of feral pigs.
- *Timing of baiting* – baits are best laid in the evening as feral pigs are mostly active between dusk and dawn. Baits thus laid will be mostly consumed overnight before non-target animals have access.
- *Collection of uneaten bait and feral pig carcasses* – any uneaten bait and poisoned pig carcasses are collected and destroyed or buried with a minimum of 500 mm of soil.

First aid for dogs

- Care must be taken to ensure that working dogs and pets do not come into contact with 1080. Dogs may eat meat baits, pelleted bait, vomitus from a poisoned pig or poisoned pig carcasses. The prognosis for poisoned dogs is extremely poor unless vomiting can be induced shortly after ingestion of the bait and before clinical signs are evident.
- If a working dog or pet is known to have eaten material containing 1080 but is NOT yet showing signs of poisoning, induce vomiting by giving one of the following emetics by mouth:
 - washing soda crystals (sodium carbonate) – 3 to 5 crystals orally, DO NOT use laundry detergents or powders.
 - table salt – 2 teaspoons of salt in 1 cup of water; more or less depending on the size of the dog.
 - dilute hydrogen peroxide (3% solution) – 3 to 5ml.
 - If the dog has vomited, clean it up immediately as the vomit is toxic.
 - THEN SEEK VETERINARY ATTENTION IMMEDIATELY. The sooner action is taken following poisoning the better the prognosis.
 - If these emetics are not immediately to hand or you are not having success in making the dog vomit it is better to seek veterinary attention immediately rather than waste time.
- If the dog has already begun to show signs of toxicosis (retching and vomiting, frenzied behaviour such as running and howling, convulsions, difficulty breathing etc.), DO NOT induce vomiting, but seek veterinary attention without delay.

- Veterinary intervention aims to decrease 1080 absorption and facilitate excretion; control seizures; and support respiration and cardiac function.
- See *First Aid – 1080 and your dog* for more information:
<https://pestsmart.org.au/resources/>

Workplace health and safety considerations

- If human poisoning occurs, contact a doctor or the Poisons Information Centre (Ph 13 11 26) IMMEDIATELY. Urgent hospital treatment is likely to be needed. There is no effective antidote to 1080.
- For further information refer to the Material Safety Data Sheet (MSDS), available from the supplier, the Pesticide Control (1080 Bait Products) Order, and the NSW DPI Vertebrate Pesticide Manual.

Procedures

- An ACO must conduct a risk assessment to determine if it is appropriate to supply 1080 baits to any person. Risk assessments should consider threats to non-target species particularly domestic dogs, human health and the environment.
- ACOs must conduct a risk assessment of planned group baiting programs where baiting occurs less than the prescribed minimum distances provided in the current Pesticide Control (1080 Bait Products) Order (PCO).
- Users of 1080 must always refer to any risk assessment, specific permit, approved label and PCO for up-to-date information on conditions of use including distance restrictions, public notification and bait preparation, distribution, storage, transportation and disposal.
 - [Pesticide Control \(1080 Bait Products\) Order](#)
 - NSW DPI [Vertebrate Pesticide Manual](#)

References

- Anon. (2018). *Vertebrate Pesticide Manual*. NSW Department of Primary Industries, Orange. Available at: <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/publications/nsw-vertebrate-pesticide-manual>
- APVMA. (2008). Sodium fluoroacetate. *Final review report and regulatory decision*. Australian Pesticides & Veterinary Medicines Authority, Kingston ACT. Available at: <https://apvma.gov.au/sites/default/files/publication/15061-sodium-fluoracetate-1080-final-review-report.pdf>
- Choquenot, D., McIlroy, J. & Korn, T. (1996). *Managing vertebrate pests: pigs*. Bureau of Resource Sciences. Australian Government Publishing Service, Canberra. Available at: <https://pestsmart.org.au/resources/>

- Eason, C., Miller, A., Ogilvie, S. & Fairweather, A. (2011). An updated review of the toxicology and ecotoxicology of sodium fluoroacetate (1080) in relation to its use as a pest control tool in New Zealand. *New Zealand Journal of Ecology*, 35: 1-20.
- Eisler, R. (1995). *Sodium monofluoroacetate (1080) hazards to fish, wildlife, and invertebrates: a synoptic review*. US Department of the Interior, National Biological Service Washington.
- Invasive Animals CRC. (2016). *Working dog safety & first aid*. NSW Department of Primary Industries, Orange. Available at: <https://www.cwba.org.au/wp-content/uploads/2018/11/Working-dog-safety-and-first-aid.pdf>
- McIlroy, J. (1983). The sensitivity of Australian animals to 1080 poison. V. The sensitivity of feral pigs, *Sus scrofa*, to 1080 and its implications for poisoning campaigns. *Wildlife Research*, 10: 139-148.
- McIlroy, J. (1986). The sensitivity of Australian animals to 1080 poison. 9. Comparisons between the major groups of animals, and the potential danger nontarget species face from 1080 poisoning campaigns. *Wildlife Research*, 13: 39-48.
- O'Brien, P. H. (1988). The toxicity of sodium monofluoroacetate (compound 1080) to captive feral pigs, (*Sus scrofa*). *Wildlife Research*, 15: 163-170.
- O'Brien, P., Lukins, B. & Beck, J. (1988). Bait type influences the toxicity of sodium monofluoroacetate (Compound 1080) to feral pigs. *Wildlife Research*, 15: 451-457.
- Sherley, M. (2007). Is sodium fluoroacetate (1080) a humane poison? *Animal Welfare*, 16: 449-458.
- Sherley, M. (2004). The traditional categories of fluoroacetate poisoning signs and symptoms belie substantial underlying similarities. *Toxicology Letters*, 151: 399-406.
- Twigg, L. & Parker, R. (2010). Is sodium fluoroacetate (1080) a humane poison? The influence of mode of action, physiological effects, and target specificity. *Animal Welfare*, 19: 249-263.