



NSWPIG SOP5

Poisoning of feral pigs using PIGOUT 1080 baits

Background

Poisoning 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 is incorporated into bait material and offered either in bait stations, where many baits are laid in one area, or by cluster style aerial baiting (a number of restrictions apply). PIGOUT[®] baits contain a core of 1080 powder surrounded by a matrix of fish-flavoured cereal that has been dyed green to minimise uptake by non-target species. They are also coated with a biodegradable cellulose skin to further minimise non-target uptake, prevent drying out and increase resilience when deployed from the air.

Free-feeding with unpoisoned grain bait or PIGOUT[®] free-feeds is performed for a number of days prior to laying poisoned baits and is an important step in most baiting programs.

Although PIGOUT[®] baits are more target specific than freshly prepared baits, because of the large doses of 1080 required to kill pigs, baiting should be undertaken with caution. Good baiting technique helps to minimise the risk to non-target species and maximise the effect on targeted feral pig populations.

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

- Subject to an authorised control officer (ACO) risk assessment
- Poisoning 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 high pig populations. PIGOUT[®] baits have also been used in South Australia, Northern Territory and the Australian Capital Territory.
- 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 PIGOUT® should not be used in areas where there is an unacceptably high risk to humans and companion animals, such as urban/residential environments.
- Use of PIGOUT® 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, summer or autumn is usually the most effective period for baiting pigs.
- Baiting of feral pigs with PIGOUT® 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*).
- PIGOUT® 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.
- PIGOUT® baits can only be obtained through an authorised control officer employed by Local Land Services, National Parks and Wildlife Service and other NSW public authorities.
- The 1080 user should refer to the [NSW Vertebrate Pesticide Manual](#) for all relevant legislation and its application.

Aerial baiting

- Although not specifically covered in this SOP, aerial baiting of feral pigs using PIGOUT® may be applicable in inaccessible and remote areas. Aerial baiting of feral pigs is not generally used in NSW and should only be considered when:
 - difficult access makes ground baiting impractical
 - it is the most cost-effective means of control
 - it will form an integral part of a properly planned and executed control program
 - the risk to non-target species has been assessed and all steps will be taken to minimise this impact.
- There are a number of restrictions and legal requirements associated with aerial baiting programs. The intended program should be discussed with the Local Land Service (LLS) ACO several months in advance. 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® Feral Pig Bait is approved.

- Aerial baiting must be organised through either LLS or NPWS or another NSW public authority that the EPA has given approval to undertake such an activity.
- Approval for aerial baiting on land reserved under Part 4 of the *National Parks and Wildlife Act 1974* must be obtained from the relevant NPWS Branch Director.
- For all other land, approval for aerial baiting must be obtained from the LLS Chief Executive or their delegate.
- All programs involving aerial application of 1080 feral pig baits must follow the guidelines contained in the [NSW Vertebrate Pesticide Manual](#). Your local LLS has full details.

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 PIGOUT[®] baits there is a latent period, usually between one and several hours, before signs such as salivation, jaw chomping, vomiting, increased lethargy, and laboured respiration are observed. The delayed onset of symptoms associated with PIGOUT[®] baits, compared to feral pigs poisoned with unbound 1080, is due to the hydrophobic core not completely breaking down until it reaches the duodenum of the animal. 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 central nervous system 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 to 6 hours after ingestion under field conditions. With low doses, pigs can take a number of days to die, but may not show symptoms for much of this time.
- Vomiting is a prominent early sign of 1080 poisoning in feral pigs, occurring approximately 1 to 5 hours after ingestion. Some 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 if they consume the vomit
 - Vomiting may result in sub-lethal dosing of target animals decreasing the effectiveness of the poisoning program
 - Animals surviving a sub-lethal dose may develop an aversion to PIGOUT[®], 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 PIGOUT[®] baiting programs when

sows have recently farrowed. This will vary with season and area. Peaks in mating often occur in response to the flush of green vegetation that follows heavy rain or flooding, with farrowing occurring 112-114 days later. For example, in southern NSW, most births occur in summer and autumn. Weaning age of piglets varies from 2 to 3 months. At times of farrowing, sows tend to move over less distances and are usually more cryptic which may reduce the effectiveness of any pig control conducted at this time.

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.
- 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. PIGOUT[®] baits contain a high volume of 1080 (72 mg per bait), which, for example, is 24 times the concentration used for standard fox baits.
- The overall 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.
- 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).
- PIGOUT[®] baits are targeted for omnivorous feral pigs, therefore other omnivores, such as brush-tailed possums, foxes and some birds can also be attracted to the bait. Remaining baits should be retrieved when evidence of possum (bait skin hollowed out) or bird (pecking of baits) take is evident.
- Although domestic stock has previously shown little interest in PIGOUT[®], bait take by cattle (*Bos indicus*) has occurred. Non-toxic test baits should first be trialled with cattle in situations where destocking is not possible.
- 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 could be distributed over a wide area creating a potential hazard for non-target animals that consume vomit. Vomit consumption by non-target wildlife did not occur during PIGOUT[®] trials; however, the occurrence cannot be ruled out completely.
- 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 baits.
 - *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 PIGOUT[®] baits, as they are attractive to pigs (under most conditions), and generally unappealing to non-targets.

- *Colouring of baits* – PIGOUT® baits are dyed green to reduce attractiveness to non-target fauna, especially birds.
- *Use of bait stations* – PIGOUT® baits 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. Field trials have shown that this is generally unnecessary, as few non-target species consume baits.
- *Placement of baits* – PIGOUT® baits should always be placed in the prime feeding areas of feral pigs. Limiting the number of cluster bait stations further limits non-target fauna exposure, particularly species with small home ranges.
- *Timing of baiting* – PIGOUT® 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 PIGOUT® baits 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 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.

Equipment required

PIGOUT® baits

- PIGOUT® baits have been developed to provide a highly-targeted and ready-to-use tool for the management of feral pigs. Each manufactured bait contains 72 mg of 1080 bound in a centralised core. The 1080 has been centralised to prevent toxin intake through minor bait nibbling by possums/rodents or pecking by birds. At least 2cm of bait matrix must be consumed from any one direction before the toxin is reached.
- The effect of 1080 on feral pigs, and in turn individual susceptibility to PIGOUT® baits, varies greatly depending on animal size, health, physical stress and environmental conditions. It is impossible for any one individual bait to reliably kill every feral pig, whose weight may range from 5kg to over 200kg. Furthermore, feral pigs are gregarious, and often feed within a mob. Baiting strategies that take into account such variables must be employed.
- Each PIGOUT® bait contains enough 1080 to kill a feral pig around 20 - 30kg under field conditions. Larger animals require two or more baits, and consequently cluster baiting at bait stations is required for the effective control of feral pigs. It is known that feral pigs will self-regulate bait intake based on body size, as long as sufficient bait is supplied. Large boars for example will take up to nine baits and the average for a mob is often around five baits. The high target-specificity of PIGOUT® baits to feral pigs means such a baiting strategy can remain safe for non-target species.
- Poisoned PIGOUT® baits are dyed green so they are readily distinguishable from human and animal food and to reduce attractiveness to birds.
- Prepared bait must be stored and transported in a secure and safe manner in the supplied PIGOUT® pails. Access must be restricted to approved personnel only. Refer to relevant State and Territory legislation for details.

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 1080 PCO.

- Users of 1080 must always refer to specific permit, approved label and Pesticide Control (1080 Bait Products) Order 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: <https://www.epa.nsw.gov.au/your-environment/pesticides/pesticides-nsw-overview/pesticide-control-orders>
 - NSW DPI Vertebrate Pesticide Manual: <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/publications/nsw-vertebrate-pesticide-manual>

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