







Baiting feral pigs - options available

	HOGGONE® MeSN®	1080 Concentrate	PIGOUT® and PIGOUT® Econobait®
Active ingredient	Sodium nitrite (10% by weight)	Sodium fluoroacetate (30g/L)	Sodium fluoroacetate (30g/L)
Manufacturer	Animal Control Technologies Australia (www.animalcontrol.com.au)	Animal Control Technologies Australia (www.animalcontrol.com.au) Paks National (www.paks.com.au)	Animal Control Technologies Australia (www.animalcontrol.com.au)
Product appearance	 		
Australian Pesticide and Veterinary Medicines Authority registration classification	HOGGONE® and HOGGONE® bait box Schedule 6 poison Nationally registered in December 2019, launched January 2021	1080 treated wheat Schedule 7 Dangerous Poison under the Standard for the Uniform Scheduling of Drugs and Poisons	PIGOUT® bait Schedule 7 Dangerous Poison under the Standard for the Uniform Scheduling of Drugs and Poisons PIGOUT® - Nationally registered in December 2007, launched in March 2008 PIGOUT® Econobait® – Nationally registered in January 2020
Vertebrate pest species covered by product registration	Feral pigs (<i>Sus scrofa</i>)	Feral pigs (<i>Sus scrofa</i>) Wild dog (<i>Canis lupus familiaris</i> , <i>Canis lupus dingo</i> x <i>Canis lupus familiaris</i>) Fox (<i>Vulpes vulpes</i>) Feral cats (<i>Felis catus</i>) Rabbits (<i>Oryctolagus cuniculus</i>)	Feral pigs (<i>Sus scrofa</i>)
Standard Operating Procedure	Refer to https://animalcontrol.com.au/products/hoggone	Refer to https://animalcontrol.com.au Refer to PestSmart website – see: PIG005 https://pestsmart.org.au/poisoning-of-feral-pigs-with-1080/	Refer to https://animalcontrol.com.au Refer to PestSmart website – see: PIG005 https://pestsmart.org.au/poisoning-of-feral-pigs-with-1080/
Target sensitive	Yes	Yes	Yes
Product characteristics	<ul style="list-style-type: none"> HOGGONE® contains 100mg/g of microencapsulated sodium nitrite (beads of < 1mm diameter containing sodium nitrite) in a patented oil-based bait matrix, mainly consisting of peanut butter and milled grains Taste of sodium nitrite is aversive to pigs so is masked in formulation Highly hydroscopic (actively absorbs moisture) Ultimately degrades to non-toxic derivatives 	<ul style="list-style-type: none"> Strongly dyed liquid concentrate for use in local manufacture of bait materials for various species Totally biodegradable; rapidly broken down into non-toxic derivatives in natural soil and water systems 1080 naturally occurs in around 30 species of Australian native plants Native herbivores and birds have acquired some evolutionary tolerance to 1080 In Australia, 1080 is used extensively to protect wildlife, livestock and ecosystems from predation or competition by wild dogs, foxes, feral cats, feral pigs, and rabbits 	<ul style="list-style-type: none"> PIGOUT® - each bait weighs 200g, with 1080 mostly localised in its central core (72 mg of sodium fluoroacetate); bait matrix itself contains little poison PIGOUT® Econobait® - each bait weighs approx. 70g per bait and contains 0.34g/kg 1080 in each bait (with 24 mg 1080 spread throughout the bait). 1080 is dispersed throughout the bait matrix. This bait has a longer shelf life than PIGOUT Both baits are made with a sturdy corn and cereal fish-flavoured matrix that have been flavoured and



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<p>Inclusion in an integrated feral pig management program</p> <p><i>Baiting is a useful management tool as part of an integrated program. This includes its use prior to aerial shooting before animal movement patterns are disrupted, or at certain times of the year when the use of other methods may be less suitable</i></p> <p><i>No single method is effective in controlling feral pigs – an integrated approach involving strategic use of different methods is required</i></p>	<ul style="list-style-type: none"> Bait substrate permitted to be used and mixed with I080 varies between states and territories – confirm this with your relevant state and territory agency or check ACTA web site for labels and material safety data sheet Potential risks to non-target species due to high dose level required to kill feral pigs Potential risk from I080 to Australian native wildlife if they consume pig bait, and some carcass parts of poisoned pigs 	<ul style="list-style-type: none"> Bait substrate permitted to be used and mixed with I080 varies between states and territories – confirm this with your relevant state and territory agency or check ACTA web site for labels and material safety data sheet Potential risks to non-target species due to high dose level required to kill feral pigs Potential risk from I080 to Australian native wildlife if they consume pig bait, and some carcass parts of poisoned pigs
<p>Regulations and use</p>	<ul style="list-style-type: none"> HOGGONE® is an additional baiting option available to land managers to control feral pigs rather than a total replacement for I080 	<ul style="list-style-type: none"> Removal of I080 as a management tool may result in greater suffering to native species without an effective replacement available (Invasive Species Council 2020)
<p>Regulations and use</p>	<ul style="list-style-type: none"> Available through re-seller network – see www.animalcontrol.com.au/products/hoggone for more details No special permits are required To comply with APVMA requirements HOGGONE®, baits must be placed in custom designed and patented ACTA HOGGONE® bait boxes or HogHopper to limit access by non-target animals Signs must be in placed at entry points before any HOGGONE® baits are laid on the property Notification of neighbours is recommended but is not obligatory 	<ul style="list-style-type: none"> I080 is a highly regulated and restricted chemical product (under Regulation 45 of the Agricultural and Veterinary Chemicals Code Regulations 1995) Baiting of feral pigs with I080 can only be carried out under conditions set down in a specific permit issued by the APVMA under Commonwealth legislation (Agricultural and Veterinary Chemicals Code Act 1994) I080 is not available in its concentrated form to the general public in Australia Strict legislation in each state and territory is in place to ensure that it is used in ways that minimise opportunities for non-target animals to consume baited material Each state and territory has different requirements for bait access, training required, bait materials that can be used, and legal
		<ul style="list-style-type: none"> See details for I080 concentrate Refer to PIGOUT® feral pig bait product label and PIGOUT® Econobait® feral pig bait product for full details that should be followed to optimise baiting outcomes on feral pig control and minimise risks to non-target species For use with the necessary permits. Contact your state or territory agency for advice <p>PIGOUT®</p> <ul style="list-style-type: none"> Refer to PIGOUT® feral pig bait product brochure Manufactured, palatable, shelf-stable, target specific bait for feral pigs that are unappealing and minimise uptake by non-target species, particularly in ecologically sensitive areas Can be used in aerial baiting activities (in those states and territories where aerial baiting is permitted) - each bait strengthened by an edible, biodegradable cellulose skin



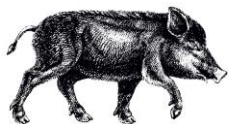
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	<p>requirements – check with your local state or territory Refer to:</p> <ul style="list-style-type: none"> ○ Australian Capital Territory ○ New South Wales ○ Northern Territory: ○ Queensland ○ South Australia ○ Tasmania ○ Victoria: ○ Western Australia <ul style="list-style-type: none"> • The handling and supply of 1080 powder or concentrated solution and preparation of baits can only be conducted by authorised and properly trained persons under the laws of each state, territory, or local government • Minimum notification requirements in place, including providing at least 72 hours notice to all adjoining neighbours and inhabitants within 1 km of the proposed baiting site(s) • Notifications must include details of dates between which baiting will occur • Signage is required for all land on which baiting occurs • Signs must be in place before any 1080 baits are laid on the property • Signs must remain in place for four weeks after the baits are laid • Baiting must commence within 10 days of notification or another 3 days notice of intent of bait laying is required • Minimum distances to fenced boundaries, roads and permanent or flowing water bodies must be complied with when placing baits as specified by each state or territory 	<ul style="list-style-type: none"> • No requirement to construct and use bait stations. Can be applied directly on the ground or aerially applied but can also be used in a HogHopper™ if additional non-target safety is needed • Most effective for use in cool conditions • Baits kept under cool conditions have a shelf life of 12 months from date of manufacture, but due to high moisture content baits cannot be stored for long period in warm conditions. Baits will soften and discolour on prolonged storage at high temperatures • Transient heating during transport and application is well tolerated • Baits have been formulated to withstand aerial deployment and for high palatability <p>PIGOUT® Econobait®</p> <ul style="list-style-type: none"> • Refer to PIGOUT® Econobait® feral pig bait label • Easy to use and handle • Smaller bait size than PIGOUT® • The smaller Econobait® delivered via the HogHopper™ can be used to target any size of pig • Highly palatable even after prolonged storage and proven to effectively knockdown pigs • Very little non-target interest • Stays attractive and palatable in hot and dry conditions
<p>Usage considerations</p> <ul style="list-style-type: none"> • Must not be handled by people with peanut allergies as the HOGGONE® placebo and bait contains peanuts and peanut oil • Containers must not be used for any other purpose and disposed of in accordance with details on product label 	<ul style="list-style-type: none"> • Gloves must be worn when handling • Wash hands after use • Dose concentrations of 1080 added to bait materials differs between states and territories • Containers must not be used for any other purpose and disposed of in accordance with details on product label • Bury carcasses, unused poison, and vomit 	<ul style="list-style-type: none"> • Gloves must be worn when handling • Wash hands after use • After each day's use, wash gloves • Containers must not be used for any other purpose and disposed of in accordance with details on product label • Bury carcasses, unused poison, and vomit



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Mode of action	<ul style="list-style-type: none"> Pigs cannot metabolise sodium nitrite due to low levels of the enzyme, <i>methaemoglobin reductase</i>, compared with other species The consumption of sodium nitrite by pigs results in the conversion of haemoglobin to methaemoglobin in blood, causing a rapid depletion of oxygen in the brain and other vital organs. Animal's faint and become unconscious before death Methaemoglobin is incapable of carrying oxygen Action is fast, resulting in pigs limiting bait uptake within minutes and death within 1-3 hours 	<ul style="list-style-type: none"> When 1080 is consumed, fluoroacetate is absorbed then converted to fluorocitrate which interferes with the citric acid (Krebs or tricarboxylic acid) cycle in mitochondria of cells, a metabolic pathway that converts glucose into energy required for normal cell function. Fluorocitrate inhibits the enzyme, <i>aconitase</i>, and cellular energy production is then blocked. In feral pigs, this typically leads to unconsciousness due to failure of the central nervous system, but there is a delay of several hours before death 	<ul style="list-style-type: none"> See details for 1080 concentrate
Relative humaneness of pest control method (refer to: www.pestsmart.com.au, Sharp and Saunders, 2011)	Rated second only to ground shooting – head shot	<ul style="list-style-type: none"> Variability of effects of 1080 between pigs Rated lower on relative humaneness matrix compared with sodium nitrite Lack of field-based knowledge of clinical signs as assessments of humaneness of 1080 poisoning have been largely based on pen studies. Some abnormal behaviour occurs due to citrate buildup in blood and tissue prior to death causing hypocalcaemia and loss of muscle control Pigs have high animal-to-animal variability of susceptibility to 1080 toxin, so high doses are required Presumed minimal distress or pain during latent period while absorbed 1080 is converted to fluorocitrate Likely that pigs will experience nausea and discomfort before and during vomiting and retching so some stress is present before death Difficult to assess if animals are conscious after collapse or during convulsive episodes 	<ul style="list-style-type: none"> See details for 1080 concentrate
Symptoms exhibited	<ul style="list-style-type: none"> Effective and fast acting Pigs become slow in their movement, recumbent, dull and lose responsiveness, death 	<ul style="list-style-type: none"> Salivation, jaw chomping, retching, vomiting, increased lethargy, laboured breathing, convulsions, occasional frenzied behaviours, then coma and death Prolonged vomiting can occur in many cases of 1080 poisoning, occurring between 1-5 hours after ingestion. This can reduce the amount of 1080 absorbed and increase risks of secondary poisoning Pigs that consume a sub-lethal dose may develop an aversion to 1080, decreasing their involvement 	<ul style="list-style-type: none"> See details for 1080 concentrate



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Time between consumption of lethal quantity of bait and death	<ul style="list-style-type: none"> 1-3 hours Useful if carcass recovery is required for disease management (e.g. if there was an African swine fever incursion in Australia) 	<p>in any subsequent poisoning programs (see: PestSmart website). This is a major issue</p> <ul style="list-style-type: none"> Typically occurs 4-6 hours after bait ingestion, but variability in response to 1080 between feral pigs Some pigs may survive up to 12 hours from taking a lethal dose, so pigs may move large distances from baiting points 	<ul style="list-style-type: none"> See details for 1080 concentrate
Animal movement post-baiting	<ul style="list-style-type: none"> Usually 50-300 meters and often ≤ 200 metres 	<ul style="list-style-type: none"> May be more than 500-metres away (and can be further) from bait site 	<ul style="list-style-type: none"> See details for 1080 concentrate
Mode of delivery	<p>HOGGONE® MeSN® placebo and bait – refer to product details for set up and usage instructions</p>	<ul style="list-style-type: none"> Bait substrate permitted to be used and mixed with 1080 varies between states and territories – confirm this with your relevant state and territory agency When applying 1080, a useful rule of thumb is to feed 60% of the final pre-feeding level Consider use of a Hogmat or HogHopper™ to limit bait uptake by non-target species. 1080 can only be used as bait for a maximum of three nights 	<ul style="list-style-type: none"> Recover any uneaten poisoned baits three days after placement, wherever possible <p>PIGOUT®</p> <ul style="list-style-type: none"> Each pig should be able to access at least one or two PIGOUT® baits The number of baits laid out should reflect the estimated number of pigs present <p>PIGOUT® Econobait®</p> <ul style="list-style-type: none"> Econobait® baits target any size of pig and can be delivered on ground (if assessed that there is low risk to non-target species) or via the HogHopper™
<p>Pre-feeding (or free feeding)</p> <p><i>Pre-feeding is critical for any baiting program and may need to be undertaken for an extended period depending on the situation</i></p> <p><i>Pre-feeding helps to identify potential non-target risks and fine-tune bait amounts</i></p> <p><i>Pre-feeding is recommended to first cluster pigs to a baiting point and accustom them to the new food type</i></p> <p><i>Likelihood of effective control increased by pre-feeding to attract pigs to a baiting site</i></p>	<ul style="list-style-type: none"> Refer to ACTA's technical booklet for full details on how to effectively bait pigs Pre-feed and introduce HOGGONE® bait box, placebo baits and toxic baits Required to ensure all animals have opportunity to locate the baiting site and to train pigs to open and feed from the bait box Placebo baits must be used for up to two nights prior to placement of toxic baits (depending on consumption levels of the placebo HOGGONE® by feral pigs) 	<ul style="list-style-type: none"> Required to ensure pigs have time to find bait, maximise group sizes of pigs to the baiting site and avoid bait shyness issues Must be undertaken for a minimum of 3 consecutive nights Pre-feeding period may take longer than 3 nights to maximise the number of pigs coming into the baiting site If using a bait delivery device, additional time must be given to provide pigs with an opportunity to learn how to use it 	<p>PIGOUT®:</p> <ul style="list-style-type: none"> Required to ensure pigs have time to find bait, maximise group sizes of pigs to the baiting site and avoid bait shyness issues Strongly recommend pre-feeding with grain (or non toxic PIGOUT® pre-feed baits) Pre-feeding reduces the number of PIGOUT® baits that need to be applied over a large area <p>PIGOUT® Econobait®</p> <ul style="list-style-type: none"> Strongly recommend pre-feeding with grain (or non-toxic PIGOUT® pre-feed baits) <p>If using a bait delivery device with PIGOUT® and PIGOUT® Econobait®, additional time must be given to provide pigs with an opportunity to learn how to use it</p>
Amount of bait required for a lethal dose	<ul style="list-style-type: none"> Pigs need to consume 100-200 g of HOGGONE® bait to obtain a lethal dose 	<ul style="list-style-type: none"> Dose concentrations of 1080 added to bait materials differs between states and territories Amount of bait required per pig determined by consumption of final pre-feed, typically 60% of final pre-feed amount Minimise non-target impacts by removing livestock from paddocks, dyeing bait material a green or 	<p>PIGOUT®:</p> <ul style="list-style-type: none"> Consumption of at least one bait for a lethal dose (72 mg in each PIGOUT® bait) Some pigs may require more than one bait to obtain a lethal dose (due to size or variability in tolerance to 1080 between individuals) <p>PIGOUT® Econobait®:</p>



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<p>Non-target species impacts</p> <ul style="list-style-type: none"> Minimal – any risks managed by using ACTA’s re-usable HOGGONE® bait box (APVMA requirement) Consuming meat from poisoned pigs by native Australian animals has been determined to pose little potential risk to non-target species Minimise non-target impacts by removing livestock from paddocks and locking gates to paddocks Wherever possible, reasonable steps should be taken to collect poisoned carcasses 	<p>blue colour to minimise attractiveness to birds and to distinguish baited material from human and animal food, locking gates to paddocks, and/or exclusion fencing. If non-target species are interacting with bait site (use cameras to monitor this), baiting should be ceased</p> <ul style="list-style-type: none"> High risk of poisoning of non-target species due to high dose rates required to destroy feral pigs and high risk of uptake of poisoned meat or grain by non-target mammals and birds Consuming meat from poisoned pigs by native Australian animals has been determined to pose little potential risk to non-target species but working dogs may be at risk Potential risk to non-target species if stomach contents, stomach, gastrointestinal tract, and/or vomit is consumed. Potential for secondary poisoning of non-target species dependent on: <ul style="list-style-type: none"> Exposure and concentration of 1080 residue Susceptibility of non-target animal consuming tissue Concentration of 1080 in tissue Amount of tissue consumed (Gentle et al. 2005) Minimise non-target impacts by removing livestock from paddocks, dyeing bait material a green or blue colour (depending on state or territory) to minimise attractiveness to birds, locking gates to paddocks, using products (e.g. a Hogmat or HogHopper™) and/or exclusion fencing All dogs, foxes and cats present in areas where feral pig baiting has been undertaken can be killed as they have a higher sensitivity to 1080 and can die if they consume vomit, eat a meat bait (where allowable for use) or feed on a poisoned carcass Dogs and foxes only need to eat <5% of their bodyweight of muscle from poisoned pigs for a lethal dose Wherever possible, reasonable steps should be taken to collect poisoned carcasses during and for 14 days after a baiting campaign 	<ul style="list-style-type: none"> Consumption of at least three whole baits for a lethal dose (24 mg in each PIGOUT® bait) Some pigs may require more than one bait to obtain a lethal dose (due to size or variability in tolerance to 1080 between individuals) <ul style="list-style-type: none"> Consuming meat from poisoned pigs by native Australian animals has been determined to pose little potential risk to non-target species Potential risk to non-target species if stomach contents, stomach, gastrointestinal tract, and/or any vomit is consumed To minimise non-target impacts, remove livestock from paddocks, locking gates to paddocks, use a HogHopper™ and exclusion fencing All dogs, foxes and cats present in areas where feral pig baiting has been undertaken can be killed as they have a higher sensitivity to 1080 and can die if they consume vomit, eat a meat bait (where allowable for use) or feed on a poisoned carcass. Dogs and foxes only need to eat <5% of their bodyweight of muscle from poisoned pigs for a lethal dose Wherever possible, reasonable steps should be taken to collect poisoned carcasses during and for 14 days after a baiting campaign All empty rinsed containers must be broken, crushed or punctured and disposed of in a local authority landfill Uneaten bait, animal carcasses and containers (if no landfill available) should be destroyed by burning or burial according to the requirements of the State or Territory in which use has occurred Manufactured baits are less susceptible to regurgitation than meat baits <p><u>PIGOUT® and PIGOUT® Econobait®:</u></p> <ul style="list-style-type: none"> Untaken baits should be recovered at the end of the baiting campaign, wherever possible Animal carcasses should be recovered during and for 14 days after a baiting campaign



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		<ul style="list-style-type: none"> All empty, rinsed containers must be broken, crushed or punctured and disposed of in a local authority landfill. Uneaten bait, animal carcasses and containers (if no landfill available) should be destroyed by burning or burial according to the requirements of the State or Territory in which use has occurred 	
Antidote	<p>No antidote</p> <p>Any substance that can reverse the effects of methaemoglobin has potential to be an antidote (e.g. methylene blue). The high dose of sodium nitrite in pig baits means that, once eaten, it is difficult to reverse effects using a safe level of methylene blue injection</p>	No antidote	No antidote
Risks of secondary poisoning to carcass scavengers	<ul style="list-style-type: none"> Negligible, rapid degradation of sodium nitrite Tissue levels not above normal levels in preserved meats 	<ul style="list-style-type: none"> Low – muscle tissue Potential risk to non-target species if stomach contents, stomach, gastrointestinal tract, and/or vomit containing 1080 is consumed 	<ul style="list-style-type: none"> Low – muscle tissue Potential risk to non-target species if stomach contents, stomach, gastrointestinal tract, and/or vomit containing 1080 is consumed
Risks to humans from consumption of meat from poisoned carcasses	None	Low	Low
Handling of unconsumed toxic bait	<ul style="list-style-type: none"> Refer to HOGGONE® label details 	<ul style="list-style-type: none"> All uneaten bait must be picked up from the bait sites and disposed of according to relevant state and territory regulations All unused bait must be collected and disposed of according to state or territory regulations Any vomit must be covered/removed from the site to minimise risk of secondary poisoning 	<ul style="list-style-type: none"> Refer to labels for both PIGOUT® and PIGOUT® Econobait® for full details

Gentle, M., Elsworth, P., and Parker, B. (2005). Sodium fluoroacetate residue in feral pig (*Sus scrofa*) carcasses – is it a significant secondary poisoning hazard?

Invasives Species Council (2020) 1080: A weighty ethical dilemma. Invasive Species Council. Fairfield, Victoria, Australia.

PestSmart website: www.pestsmart.org.au

Sharp, T. and Saunders, G. (2011). A Model for Assessing the Relative Humaneness of Pest Animal Control Methods, Second Edition. Australian Government Department of Agriculture, Fisheries and Forestry, Canberra, Australia, p. 118.