



## Frequently asked questions: PAPP for wild dog & fox control

### What is PAPP and how does it work?

Para-aminopropiophenone (or 'PAPP') is the active ingredient used in new toxic baits developed for the broad-scale management of wild dogs and foxes. Once it is eaten and absorbed into the bloodstream, PAPP works by converting normal haemoglobin in red blood cells to methaemoglobin, which cannot carry oxygen to the heart muscles and brain. Affected animals become lethargic and sleepy before quickly becoming unresponsive and dying. Symptoms are mild with no tissue or cell damage, which means that any animal that receives a partial dose can fully recover without ill effect.

### Is PAPP a humane poison?

Yes. PAPP satisfies the general criteria for a humane poison. This means that PAPP poisoning results in relatively rapid unconsciousness followed by death without any prolonged clinical signs. Poisoned animals show few signs of pain or distress, although minor whimpering and other vocalisations sometimes occur with wild dogs. The doses of PAPP in baits have been optimised so unconsciousness generally occurs within 60 minutes of bait ingestion, and death occurs up to an hour later. PAPP is currently being assessed under the *Wild Dog Humaneness Matrix* - [www.pestsmart.org.au/animal-welfare/humaneness-assessment/wild-dog/](http://www.pestsmart.org.au/animal-welfare/humaneness-assessment/wild-dog/)

### Which animals are susceptible to PAPP?

PAPP was first investigated as an antidote to cyanide poisoning in humans. Effects have been investigated in a range of species over the last 60-70 years including: rodents, birds, reptiles, rabbits, marsupials and primates (including humans). Members of the dog and cat families are highly susceptible compared with other species, due to the unique way that they metabolise PAPP.

In Australia, cats, foxes and wild dogs are the animals most susceptible to PAPP. PAPP is known to affect some native animals, particularly goannas, if ingested. PAPP toxin will only be available for wild dog and fox control in manufactured baits. The material used to make these baits has been shown to be less palatable to herbivores,



but care will be needed when developing control programs using the toxin. The risk may be managed by altering the timing and presentation of baits (eg baiting at cooler times when reptiles are less active and the risk of non-target uptake by goannas is manageable). PAPP does present additional risk to some native animals not affected by 1080, however these risks can be managed. The differing characteristics of the two toxins makes them extremely complementary and allow for greater flexibility when delivering wild dog and fox control programs.

The risk of secondary poisoning is also very low, as a susceptible animal would need to eat the bait from the stomach or vomit of a poisoned animal before the toxin degrades. As with other control techniques, PAPP has its limitations, but the addition of a new control tool will allow greater flexibility and strategic management of vertebrates pests across a much broader range of landscapes.

### Is PAPP safe for the environment?

Yes. PAPP is broken down in soil and water by microorganisms, is non-toxic to earthworms and other soil-dwelling life and is not considered to pose a threat to the environment. The low doses in baits, and restrictions on the number of baits allowed to be laid in a given area, mean that the environmental impact will be very low. PAPP is not readily water soluble and the quantities involved in typical baiting programs are too low to have any adverse effects on water courses. Even so, it is recommended that all uneaten PAPP baits are recovered and destroyed at the end of a baiting program and that baits are not placed where they are unlikely to be taken by target animals.



### Is PAPP safe for domestic and working dogs?

No. Since PAPP is lethal to wild dogs and foxes, it is also highly toxic to all domestic and working dogs, depending on the dose ingested. The carefully considered PAPP dose in fox baits mean that an average-sized working dog will be less affected after eating fox bait(s) but treatment should be sought immediately. Due to the higher dose in wild dog baits, if a domestic or working dog eats just one dog bait, it will die if there is no treatment (see antidote question below). This means that the distribution of PAPP baits will require careful consideration of potential risk to pets, working dogs and other non-target animals.

### Is there an antidote for PAPP?

Yes. The chemical methylene blue converts methemoglobin back to haemoglobin and immediately reverses the effects of PAPP poisoning, with full recovery usually occurring within 1 hour. At present, methylene blue can only be purchased and administered by a veterinarian.

### How was PAPP tested to be sure it is effective and safe?

As with all ACTA products, many important steps were taken to ensure PAPP can reliably kill target animals in a safe and effective way. Once the poison was identified, toxicology studies determined the doses needed to kill target animals. The sensitivity of non-target animals was tested to work out which species will be most at risk to PAPP poisoning. Environmental research was done to develop a shelf-stable product that can be used under various weather conditions. Once the product was developed, multiple trials were conducted under both laboratory and field conditions in a range of environments to prove that the product does kill target animals without unacceptable non-target risks. Field trials consistently demonstrated that target animal populations were reduced by more than 70% under operational conditions with good baiting procedures and have the potential to control all pests in the control area if programs are run thoroughly. This process has taken several years and has resulted in product data that proves these baits are both safe and effective for the intended use.

### Can an animal killed with PAPP be distinguished from one killed by 1080?

Yes. Bright yellow plastic marker beads incorporated into PAPP baits can be found in the stomach of affected animals and even in the decayed carcass. Similar red marker beads are incorporated into 1080 baits. This will help determine an animal's cause of death and help exclude accidental deaths (eg snake bite). Animals with PAPP poisoning also display grey-blue gums and tongue, caused by the change in blood colour from red to brown.



### Will PAPP replace 1080?

No. PAPP will be available in addition to 1080, and is designed to allow poison baiting to still be an option in places where 1080 use is restricted, or for land managers who would prefer not to use 1080. Baits containing either PAPP or 1080 are both expected to be available into the future. Baits containing 1080 are expected to remain the most common approach for broadscale canid control, and PAPP baits will enable more comprehensive regional control by 'filling the gaps' in areas not serviceable by 1080. PAPP will have particular benefits on the peri urban fringe but 1080 will continue to be the toxin of choice for other areas. 1080 baits remain a much cheaper option for large-scale programs in remote areas. As such, PAPP will complement 1080, so land managers will have a choice between two toxins rather than being restricted to just one.

### When will PAPP be available?

PAPP is currently commercially available in certain states and territories (see the list on [pestsmart.org.au](http://pestsmart.org.au)). The Invasive Animals CRC, manufacturing partner Animal Control Technologies (ACTA), Australian Wool Innovation (AWI) and other key stakeholders will announce the commercial availability for additional state and territory as this information becomes available.

### More information

More information on distribution and availability of PAPP baits can be sourced through Animal Control Technologies ([www.animalcontrol.com.au](http://www.animalcontrol.com.au)).

PestSmart Toolkit for wild dogs

[www.pestsmart.org.au/pest-animal-species/wild-dog/](http://www.pestsmart.org.au/pest-animal-species/wild-dog/)

Invasive Animals Ltd has taken care to validate the accuracy of the information at the date of publication [June 2016]. This information has been prepared with care but it is provided "as is", without warranty of any kind, to the extent permitted by law.