

## The EPA Rodenticide Ban and Bromethalin

In 2008, the U.S. Environmental Protection Agency (EPA) announced that it would restrict the sale of the second-generation long-acting anticoagulant (LAA) rodenticides (e.g. brodifacoum) because of the risk of toxicity to children, pets and wildlife. Products sold to the public must now contain less toxic first-generation anticoagulants (e.g. warfarin, diphacinone) or rodenticides that are not anticoagulants (e.g. bromethalin). In addition, the EPA banned loose poison baits (pellets) and required that the poison be in a bait station. Reckitt Benckiser, the manufacturer of d-CON<sup>®</sup>, was late in complying with these new requirements. A new line of d-CON<sup>®</sup> baits containing the first-generation anticoagulant diphacinone will be introduced in 2015. Pest control professionals may still use LAA rodenticides but must meet restrictions on packaging and placement ([www2.epa.gov/rodenticides/restrictions-rodenticide-products](http://www2.epa.gov/rodenticides/restrictions-rodenticide-products)).

### What is bromethalin?

**Bromethalin** is a rodenticide that has replaced LAA's in many rat and mouse poison products sold to the public. It is a potent neurotoxin, with no anticoagulant activity. Bromethalin and its metabolite uncouple oxidative phosphorylation resulting in depletion of cellular adenosine triphosphate (ATP). Decreased ATP production disrupts the sodium-potassium channel pump leading to cerebral edema and increased intracranial pressure.

Little is known about the toxicity of bromethalin in humans. Animal studies predict that it is well absorbed orally and poorly absorbed dermally. A toxic dose in humans has not been established; however, a death with a self-reported dose of 17 mg has been described (*J Forensic Sci, 2006; 51: 1154-7*). In animals, the onset of clinical effects may be 2 to 4 hours post-ingestion but is usually delayed 8 to 12 hours or longer. Patients who are suspected of ingesting a large quantity of a bromethalin rodenticide (i.e. more than one bait package in a small child or an intentional ingestion in an adult) should be observed in a health care facility for a minimum of 12 hours. The clinical effects expected include headache, confusion, lethargy, tremors, seizures, coma, and respiratory depression. There is no specific antidote for bromethalin poisoning. Treatment consists of activated charcoal to prevent absorption of bromethalin and symptomatic and supportive care (i.e. benzodiazepines for seizures, mannitol and/or hypertonic sodium to decrease intracranial pressure). Because bromethalin is lipid-soluble, there might be a role for intravenous lipid emulsion (ILE) administration to reduce the distribution of bromethalin to tissues in patients exhibiting severe neurological toxicity.

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### Did you know?

**Tramadol became a Schedule IV controlled drug in all states on August 18, 2014.**

Tramadol (Ultram<sup>®</sup>, Ultram ER<sup>®</sup>, Ultracet<sup>®</sup>, ConZip<sup>®</sup> and generics) is an opioid analgesic that also possesses serotonin-norepinephrine reuptake inhibiting effects. When first approved by the FDA in 1995, tramadol was thought to have low addiction and abuse potential. Current data show that it is widely misused by opioid abusers, chronic pain patients and health professionals and has been shown to produce physical dependence and withdrawal. In recent years, at least 10 states placed tramadol on their controlled substances list. The Drug Enforcement Administration (DEA) designated tramadol a Schedule IV drug under federal law effective August 18, 2014. This places it in the same category as other drugs with abuse potential such as benzodiazepines, carisoprodol and zolpidem. Read more about tramadol and overdoses in the March 2011 (Supplement) ToxTidbits at [www.mdpoison.com/healthcareprofessionals/toxtidbits.html](http://www.mdpoison.com/healthcareprofessionals/toxtidbits.html)