



RAT POISONS NOT ONLY KILL WILDLIFE, THEY CAN ALSO WEAKEN AND SICKEN THEM.

Known “sublethal” impacts include:

- Hemorrhaging beneath the skin and extensive bruising. Internal hemorrhaging in bones, body wall, heart, and elsewhere in the body. Possible heart failure.¹
- Hemorrhaging of the heart, liver, kidney, lung, intestines, and muscles.²
- Increased vulnerability to other causes of death such as vehicular collisions and predation.³
- Chronic anemia, making animals more susceptible to diseases, including mange, and other stressors.⁴
- Reproductive impacts. Female sheep exposed to anticoagulants had more aborted or stillborn lambs (up to 50%); male sheep had lower sperm motility.⁵
- Decreased food intake⁶ and decreased body weight.⁷
- Neonatal transfer to young kits. Decreased resilience to environmental stressors.⁸ Fetuses more susceptible to brodifacoum toxicity than adults.⁹
- Increased parasite and pathogen burdens¹⁰
- Shorter wings, tails, bones, bills, and birth defects.¹¹
- Rodents poisoned by anticoagulants are more likely to be eaten by predators.¹²

¹ Mendenhall and Pank. 1980. Secondary Poisoning of Owls by Anticoagulant Rodenticides. Wildlife Society Bulletin 8:311-315

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- ² Rattner et al. 2011. Acute Toxicity, Histopathology, and Coagulopathy in American Kestrels (*Falco sparverius*) Following Administration of the Rodenticide Diphacinone. *Environmental Toxicology and Chemistry* 30(5): 1213-1222
- ³ Fournier-Chambrillon, et al. 2004. Evidence of Secondary Poisoning of Free-Ranging Riparian Mustelids by Anticoagulant Rodenticides in France: Implications for Conservation of European Mink (*Mustela lutreola*). *Journal of Wildlife Diseases* 40(4):688-695
- ⁴ Riley, et al. 2007. Anticoagulant Exposure and Notoedric Mange in Bobcats and Mountain Lions in Urban Southern California. *Journal of Wildlife Management* 71(6).
- ⁵ Robinson, et al. 2005. Effect of the anticoagulant, pindone, on the breeding performance and survival of merino sheep, *Ovis aries*. *Comparative Biochemistry and Physiology, Part B* 140:465-473.
- ⁶ Oliver and Wheeler 1978. The toxicity of the anticoagulant pindone to the European rabbit, *Oryctogalus cuniculus* and the sheep, *Ovis aries*. *Australian Wildlife Research* 5:135-142.
- ⁷ Rattner et al. 2011. Acute Toxicity, Histopathology, and Coagulopathy in American Kestrels (*Falco sparverius*) Following Administration of the Rodenticide Diphacinone. *Environmental Toxicology and Chemistry* 30(5): 1213-1222
- ⁷ Litten, et al. 2002. Behavior, coagulopathy and pathology of brushtail possums (*Trichosurus vulpecula*) poisoned with brodifacoum. *Wildlife Research* 29:259-267.
- ⁸ Gabriel, et al. Anticoagulant Rodenticides on our Public and Community Lands: Spatial Distribution of Exposures and Poisoning of a Rare Forest Carnivore. *PLoS ONE* 7(7):e40163.
- ⁹ Munday and Thompson. 2003. Brodifacoum Toxicosis in Two Neonatal Puppies. *Vet Pathology* 40:216-219
- ¹⁰ Lemus, et al. 2011. Side effects of rodent control on non-target species: Rodenticides increase parasite and pathogen burden in great bustards. *Science of the Total Environment* 409 (2011) 4729-4734
- ¹¹ Naim, et al. 2010. Growth Performance of Nesting Barn Owls, *Tyto Alba javanica* in Rat Baiting Area in Malaysia. *J. Agric. Biol. Sci.* 5(6):1-13.
- ¹² Cox and Smith. 1992. Proc. 15th Vertebrate Pest Conf. UC Davis. Rodenticide Exotoxicology: Pre-Lethal Effects of Anticoagulants on Rat Behavior