ANTICOAGULANT RODENTICIDES and RISKS to NON-TARGET WILDLIFE: COMPARISON of URBAN and FIELD USES

Penny Fisher, Charles T. Eason, and Cheryl O'Connor
Landcare Research, PO Box 69, Lincoln 8152, New Zealand

The impacts of exotic rodent species, particularly the Norway rat (*Rattus norvegicus*), the ship rat (*Rattus rattus*), and the house mouse (*Mus musculus*) on economic, production, health, and conservation values are widely recognised around the world. Developing strategies for the effective management of introduced vertebrate populations is a common challenge, of which the use of poison baits is often an important component. Over the last 10 years, the use of second-generation anticoagulant rodenticides — e.g., brodifacoum, bromadiolone — has increased as these compounds have a number of efficacy advantages over first-generation anticoagulants — e.g., warfarin, pival/pindone. Alongside increasing sophistication in the strategic use of rodenticides, scrutiny of their effects on the environment and non-target wildlife has also increased. The significance of effects on wildlife from anticoagulant rodenticide use ranges from mortality, as their acute toxicity to mammals and birds is reasonably well described, to potential sublethal, cumulative, or chronic effects, which are currently not as well understood. The presence of anticoagulant residues in wildlife is, at least, an indication that exposure has somehow occurred, and this is worthy of further investigation. The frequency and magnitude of residues in non-target animals from the use of anticoagulant rodenticides are likely to be determined by the toxicokinetic characteristics of the compounds used, and the degree and frequency of exposure through primary and secondary routes. Primary exposure of non-target animals can be minimised by the use of selective bait deployment, such as bait stations; however, secondary exposure of non-target animals is more difficult to control. To assess this problem, we therefore conducted a laboratory rat study comparing the persistence and level of first- and second-generation anticoagulant residues. This study simulated scenarios for voluntary intake of anticoagulant baits by rats, so that the resultant residues in tissues over time represented potential sources of secondary intake for predatory or scavenging non-target species. Field-based monitoring of wildlife is also important to continue to assess risks of rodenticide use to non-target wildlife. Contrasts are obvious between the scale and method of deployment of anticoagulant baits for pest animal control in New Zealand, and the more common scenario of commensal rodent control in urban or peri-urban areas. Recent monitoring of wildlife in New Zealand has highlighted the need for care, especially where there is repeated use of second-generation anticoagulant rodenticides. Some common factors to field and peri-urban use of anticoagulants are considered in terms of the potential exposure of non-target wildlife through secondary routes and known toxicokinetics of anticoagulant rodenticides.

Proceedings of the 4th International Conference on Urban Pests.
Susan C. Jones, Jing Zhai, and Wm H. Robinson editors. (2002)