

## Small mammal behavior at rat bait boxes: Minimizing the risk to non-target species

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During a rodent infestation rodenticides are the method of choice to manage the problem. The effectiveness of anticoagulant rodenticides (ARs) is related to high toxicity and persistence in the organism, which can also pose an environmental risk. Therefore, their application is permitted only as long as adequate measures are used to minimize those risks. One of these measures is the application of bait in suitable bait boxes that exclude most bird and mammal species from consuming bait. However, non-target mammals and birds up to the size of rats that occur in the vicinity of bait boxes may access bait, which can lead to primary exposure to ARs. One option to minimize this threat is to use a bait box design that limits access of small non-target species to bait.

In our project we pursued this idea and attached bait at a height of 280 mm in the bait box. We assumed that only rats can reach this bait because of their size and their ability to raise their body towards the bait. Most small non-target species should be excluded from reaching the bait and therefore primary exposure should be minimized.

We tested this system in semi-natural enclosures from May until July 2017. The target species was the Norway rat (*Rattus norvegicus*). We also tested access to bait by non-target species: the Wood mouse (*Apodemus sylvaticus*), which is a good climber and the Common vole (*Microtus arvalis*), which cannot climb well as both species can occur in the farm environment where bait is used. Eight individuals of each species held the enclosure for one week. Their behaviour at and in the bait box and their consumption of non-poisonous bait was monitored by video cameras.

Results indicated that only the common vole cannot reach bait. The Norway rat as well as the Wood mouse were able to eat it. While the target species raised its body to reach it the Wood mouse jumped at the bait. Furthermore, the results showed that 280 mm is reachable just by tall rats but not by smaller ones.