

## Letter

### Welfare in commensal rodent trapping: one step forward, two steps back

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Commensal rodents are well-adapted to be pests (Macdonald *et al* 2015), and many millions of brown rats (*Rattus norvegicus*) and house mice (*Mus musculus*) are killed globally every year (Mason & Littin 2003). They almost certainly comprise the majority of vertebrates killed by householders in and around their homes. In 2003, Mason and Littin described ‘remarkable paradoxes’ in the way society treats different types of animal, with wild rats and mice being subject to more cruelty in pest control than other species. We believe that, more than ten years on, and despite recent strengthening in wild animal welfare legislation in some countries, developments in rodent trap design are worsening this divide.

A wide range of traps are currently available for killing rats and mice, eg spring traps (including break-back traps, or ‘snap-traps’), glueboard traps and electronic traps. In the UK, spring traps require approval but break-back traps are exempt from the approval process. In 2012, Baker *et al* demonstrated wide variation in the mechanical performance of unregulated break-back traps for both rats and mice. This raised concerns about the welfare performance of at least some of these, including plastic break-back traps designed for ease of setting and to protect the user from having to touch trapped animals.

Now, novel designs of disposable killing mouse traps have appeared on the market. These consist of a sealed plastic housing containing a mouse-killing device and an external indicator of when the trap has been triggered, and they are designed to be disposed of with the trapped mouse inside. They include: flat, circular traps with a spinning killing mechanism; upright quarter-circle models apparently containing an upward, crushing killing mechanism; and flat ‘sealing’ models, containing an unknown killing mechanism, designed so that the entrance hole seals when triggered.

These traps are manufactured around the world and retailed widely, including online. They are clearly marketed for householders, being designed to protect the user from having to touch or see a trapped animal. The

sealing models are also marketed as protecting the family and pets against ‘mess’, ‘germs’, ‘odours’, ‘fluids’, ‘urine’, ‘blood’, ‘ticks’, ‘fleas’ or ‘other disease carrying parasites’, with the marketing material for one trap linking dead mice with risks of salmonella and asthma attacks, and their parasites with Lyme disease.

We feel that disposable killing traps that cannot be opened are unacceptable from an animal welfare perspective because they do not allow users to determine whether a trapped mouse is dead, and if necessary to dispatch it quickly and humanely. Since the animal can be trapped and discarded without checking first that it is dead, this violates most recognised good practice guidelines and we consider it may also breach some legislation. If the killing mechanisms were always effective, and caused death within recognised, satisfactory time limits, we would consider welfare impact to be acceptable. However, the consumer reports that we have reviewed for these devices indicate that in many instances mice are not killed by the trap (but may or may not be injured) and are being disposed of whilst still alive. Because disposable killing traps are generally not designed to be opened, some consumers report that they are unable to open the trap to either kill or release a trapped mouse. This highlights an important issue, which is that people who choose disposable killing traps may be faced with trapped live (and potentially injured) mice to deal with. There is also concern that some devices are not even effective, with numerous reports of mice escaping.

Because there is likely to be a significant degree of pain or distress caused to trapped rodents that are disposed of when still alive, it could be argued that a disposable killing trap that fails to kill a trapped mouse effectively may be no more humane than a glueboard trap.

There are more humane alternative traps for killing mice, including traps that have been approved or tested. If users’ sensitivities need to be protected, then there are available reusable, covered break-back traps from which trapped mice can easily be removed. If children or pets need to be securely excluded, lockable reusable variants exist, or standard break-back traps can be placed in lockable housing. Of course, any of these reusable models could be thrown away (if desired) after confirming that any trapped mice are dead, so there is no need to produce sealed units.

A further concern about the availability of disposable killing traps, specifically in the UK, is whether the killing devices inside the traps are of an approved kind. Gaps in existing legislation also contribute to poor welfare; for example, there are no explicit restrictions on these traps in the UK, New Zealand or Australia.

We examined and dismantled five types of disposable killing trap that are directly available in the UK, to determine their killing mechanisms; these included one trap with a *spinning* mechanism and four *sealing* traps. Three of the sealing traps were identical in form, apart from the

moulded brand mark underneath; they were sealed units, so we sawed them open to look inside. The fourth was of loosely similar design but a release button could be used to open the housing (on receipt of this model we discovered it was described as either disposable or reusable). All four sealing traps contained a plastic break-back style, spring-powered killing device with an overhead striking bar; in all cases, the killing device was integral with the base of the housing. There was a 1-cm diameter hole (with a twist-off cover) on the top of the housing of the three identical models, for positioning the bait and through which it would be possible to see whether an animal was present inside, but not its condition. The killing device in these traps could not be seen through the entrance hole (1.8-cm diameter), and an incapacitated mouse could not be removed through this hole to dispatch it if required. Placing a killing device (trap) firmly inside a housing could potentially improve the alignment of mice for effective and humane trapping over that of similar but unenclosed devices.

The trap with the circular spinning design was also a sealed unit that we needed to saw open to look inside. It is set by rotating the lid clockwise and when the trap is triggered a spring mechanism is released, which allows the lid to rotate anti-clockwise, until a moving vertical plastic plate pushes against a fixed vertical plastic plate. The trap is designed to kill a mouse by crushing it between these plates, which are orientated at an angle to each other. There is a 10-mm gap to one side of the moving plate. There is debate about whether a live mouse could squeeze through a gap this wide (eg Meehan 1984) but if possible, it could escape back into the main compartment of the trap (although the entrance door is closed once the trap has been triggered, preventing escape from the sealed device). We predict that the moving plate could potentially strike the mouse on the rump, or on the side of its body, neck or head, depending on how it is orientated when it triggers the trap. This contrasts with conventional break-back traps which are designed such that an overhead striking bar hits the mouse across the back of its head or neck, from above.

Spring traps that crush the skull are considered to be the most efficient and humane (Proulx & Barrett 1991; Mason & Littin 2003), but damage to either the skull or upper cervical vertebrae may cause immediate unconsciousness (Parrott *et al* 2009). Break-back traps are not defined in the legislation but the UK's Chartered Institute of Environmental Health describes them as having a flat treadle or bait pan which releases a metal loop or plastic jaws which close down on the target (Chartered Institute of Environmental Health 2014). While the killing devices inside the four sealing traps examined may fit this description, we think the device inside the spinning trap may not and we have concerns about its ability to cause a rapid and humane death. If it does not conform to the break-back style, then it could be illegal to sell, use or knowingly permit the use of one in the UK.

In conclusion, we are concerned that efforts to protect the sensitivities of a public increasingly distanced from nature may be compromising the welfare of animals considered to be vermin, as evidenced by the development of weaker plastic break-back traps (as identified by Baker *et al* 2012) and of un-openable disposable killing traps (as described here). Both types of trap are designed to avoid users having to touch, and — in the case of disposable killing traps — even see, dead rodents. These developments conflict with an apparently increasing general and public interest in wild animal welfare (Hadidian *et al* 2001; Mathews 2010), as supported by improved animal welfare legislation, eg in the UK and New Zealand. However, it has been suggested that inhumane treatment of rats and mice (and moles) may be tolerated because of the need for effective control for these species (Atkinson *et al* 1994; Mason & Littin 2003), the public's generally unsympathetic attitude towards vermin (Taylor & Signal 2009; Farnworth *et al* 2014) and the unobtrusive way in which nocturnal or burrow-living animals die (Atkinson *et al* 1994; Mason & Littin 2003). This could explain the continued exemption of break-back traps and mole traps from the UK spring traps approval system, under The Pests Act 1954 and The Wildlife (Northern Ireland) Order 1985. Removal of this exemption has been called for (Mason & Littin 2003; Baker *et al* 2012;) and, in their 2009 review of humane trapping standards, Talling and Inglis (2009) concluded that there was no ethical justification for banning the use of inhumane traps for only some species, rather than for all species that can be legally trapped. We reiterate that the exemption should be removed. As well as bringing spring trap welfare up to the same level for all species (and potentially eradicating inadequate break-back traps [Baker *et al* 2012]), removing the exemption would eliminate the loophole, currently open to trap manufacturers, of being able to sell any unregulated mouse and rat spring traps because break-back traps are not clearly defined. If the exemption persists, we recommend that break-back traps should be clearly defined in the legislation to eliminate the loophole that way.

We recommend that manufacturers of all disposable killing mouse traps make them easy to open by an adult (so that trapped mice can be inspected to ensure they are dead, or dispatched humanely if they are not), but also lockable to prevent access by children and non-target animals. We also suggest they use a conventional break-back trap design inside the housing and improve the instructions they provide to include information on how frequently to check traps and how to dispatch mice that are still alive in the trap. Advice on rodent-proofing and practising good food hygiene to minimise the need for trap use in the first place would also be desirable, although manufacturers may be unlikely to provide this. Ideally, all traps would be designed and marketed as reusable, to reduce wastage of resources and the quantities of plastic going to landfill.

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