Comments provided by: German Environment Agency

Alternative Identity and Properties

Mechanical and electrical traps are a serious alternative to anticoagulant rodenticides (ARs) which are used by both professional and non-professional users for rodent control. There are several kinds of rodent traps on the market:

1.1 Mechanical traps

Several designs are on the market. The most common trap type is the spring-loaded bar mousetrap or rat trap, which differ principally only in their size and the strength of the spring. These traps may have a wooden or plastic base. These traps consist of a heavily spring-loaded bar and a trip to release it. Food such as peanut butter is commonly used as bait material. The spring-loaded bar swings down rapidly and with great force when the trip is touched by the rodent. The design is such that the neck or spinal chord of the target organism will be broken, or its ribs or skull crushed, by the force of the bar. In some designs, mouse traps are placed in a plastic box designed in a way that mice will run through it when placed on mice tracks, releasing the trip. When employed in that way, no bait or lure are needed. Some traps are equipped with either an optical signal which indicates a kill, or with electronic signal devices, which sent a short information or e-mail to a receiver (e.g. mobile phone or personal computer). These traps than need only to be inspected if a rodent has been killed, thus daily inspections of traps for reasons of humaneness are not required.

Investigations of the German Environment Agency have shown that, when properly hit, a mouse looses consciousness within 30 s. Existing tests have suggested that if properly applied, killing of rodents by means of snap traps may cause less suffering for the target animals than poisoning with ARs. The use of snap traps may be therefore more humane than that of ARs.

A modification of the spring-loaded bar trap is the jaw trap, which is made usually of plastic. Instead of a spring-loaded bar, that trap has a jaw-like plastic bar. The jaws are operated by a coiled spring and the triggering mechanism is between the jaws, where the bait is held. The trip snaps the jaws shut, killing the rodent. Although these traps use less force than the spring-loaded trap, their efficacy and humaneness (lose of consciousness) is comparable to them.

Other very efficient types of mechanical traps are produced by the Danish manufacturer Wisecon. The Wise-I trap kills rodents with a strong bar, which hits the mouse at the thorax and rats at their neck, after the bar is being released when the rodents trigger two light sensors, thus preventing the bar from being released to late or too early. This ensures a safe kill at the right body part with a force of approx. 1.3 kg. The Wise-I trap uses a lure to attract rodents. It is equipped with a control unit which sends an electronic signal to a receiver (mobile phone or personal computer).

A new type of mechanical trap is the Wise-trap for control of rats in sewers. The Wise-Trap consists of a trap unit and an electronic control unit. The trap is assembled at ground level, directly into the sewer pipe with an installation pole. The control unit is placed on a bracket immediately under the manhole cover and is operated from ground level. The trap is placed in a manhole, and consists of a pipe, which connects the sewer

pipes in the manhole. Hence, the rats are forced to pass the trap if they want to continue their way through the sewer pipe. When the rat's movement and body heat is registered, the trap is activated and shoots out a cluster of spikes with great force. The spikes are designed to hit the skull or spinal chord. The rat is immediately unconscious after being hit, dies shortly thereafter, and is washed out with the sewage. The spikes are then pulled back up and the trap is ready to shoot. Each trap release induces a signal which is transmitted to a receiving device (personal computer, mobile phone). The Wise-trap is a multi-catch trap.

Both the wise-trap as well as the wise-I have been approved by the German Environment Agency after a series of experimental tests as suitable, humane and efficient methods to eradicate rodent populations according to the German Infectious Diseases Protection Act.

1.2 Electrical traps

This trap type by electrocution with high voltage when the rodent completes the circuit by contacting two electrodes located either at the entrance or between the entrance and the bait. The electrodes are housed in an insulated or plastic box to prevent accidental injury to humans and pets. They can be designed for single-catch domestic use or large multiple-catch commercial use. Some brands offer remote indication to tell you when the trap has operated.

Technical Feasibility

The range of target organisms for rodent traps is the same as for anticoagulant rodenticides.

The most common use of rodent traps is killing house mice. House mice are not neophobic, and therefore will enter traps rather easily.

Tests conducted by the German Environment Agency show that under semi-natural conditions, house mouse groups of up to 20 mice are eradicated completely within 2 to 5 days. In comparison to that, house mouse groups of the same size are eradicated in the same experimental setup within 8 to 28 days when anticoagulant baits are tested. Hence, the efficacy of traps is comparable or sometimes even better.

There is no known mechanism of resistance against traps. One case (in Birmingham, UK in the 1980ies) of behavioral resistance of house mice against cereals has been described. As traps can be equipped with a wide range of lures, it is unlikely that behavioral resistance will affect rodent control in the future, or at least not more than rodent control with toxic baits in bait stations.

In many cases, in some industry branches internal standards for rodent control do not allow the use of toxic baits (e.g. food industry, pharmaceutical industry). Under these circumstances, traps are the only efficient alternative.

Corporate image of companies which either control rodents with traps as a biocide-free alternative or industry which contracts pest control companies using traps can be positively affected. The use of poisons has generally a rather negative public image compared to traps, which are regarded as a green technology.

Economic Feasibility

An economic disadvantage of common traps (such as regular snap traps) is that they have to be inspected with a higher frequency than toxic baits for reasons of humaneness

and hygiene. Moreover, most traps catch only one individual at a time. Thus, the use of traps is often presumed to be more labour intensive with higher working costs. However, this picture does not reflect the state-of-the-art of trap use in the pest control industry for two reasons:
First, more and more multi-catch traps are on the market, e.g. the Wise-Box and Wise Trap (see above).
Second, even more traps are equipped with electronic communication devices, which send a signal when a trap is fired. Inspections of traps are limited in these situations to cases when a rodent got actually killed by a trap. Regular or even daily inspections are not necessary in these situations.
Often, the second possibility is combined with the first one. Automatized collection of data of trap catches is a huge advantage over the use of anticoagulant rodenticides, since industry standards as well as legal control of food and livestock industry often require a documentation of pest control activities.
As automatized traps with electronic communication devices are less labour intensive (no need for daily inspections) for rodent control than the use of anticoagulants, their use may help reducing the costs of pest control rather than increase them.

Hazards and Risks of the Alternative
Rodent traps pose no risk to humans and pets when properly placed (e.g. in bait stations or in places which are inaccessible for children or non-target organisms).

Availability
Rodent traps are ubiquitous on the market, and there is no limit on their availability neither for professionals nor amateurs.

Conclusion on suitability and availability of the alternative
Due to technical progress in trap development, the development of resistances against anticoagulant rodenticides, and more strict regulations on anticoagulant rodenticide use, traps are becoming more and more important in pest control. They are a serious alternative to anticoagulant rodenticides and some pest control companies even work exclusively with them. It is therefore appropriate to consider traps within the comparative assessment of anticoagulant rodenticides as one possibility to substitute the use of ARs. Against this background, particularly the use of anticoagulant rodenticides to monitor rodent activity and as a preventive control measure in terms of permanent baiting should be reconsidered.