

## **Towards a Gentle End: Best practice in Humane Killing for Small Laboratory Animals.**

Lucy Whitfield, MA VetMB DLAS MRCVS PGCert(VetEd) FHEA  
Royal Veterinary College, London, UK

It is the case that most of the animals which are used in biomedical research will be killed at the end of the experiment. These animals may be killed in order to collect tissue samples, or to end potential suffering as a consequence of the scientific procedures.

A significant number of animals are also killed following breeding, as the productive breeding life of small rodents is relatively short, requiring a relatively high turnover of animals. Production of genetically altered animals presents its own challenges, particularly where multiple alleles are involved, as only a small number of animals may be born with the required genotype and gender, leaving a large remainder that cannot always be used.

The method and circumstances in which laboratory animals are killed therefore has an impact on the cumulative suffering and lifetime experience of a significant number of animals. But what do we mean by "humane killing" and how is best to achieve this outcome?

This presentation will examine some of the common physical and chemical methods used for euthanasia of small laboratory animals and what we know about their impact on both animal welfare and scientific research. Overdose of anaesthesia will be included as an example, although most methods of killing induce death via the same pathway, by disruption of the hindbrain neurons in the respiratory centre, leading to generalised tissue hypoxia and death.

Physical methods of killing may cause more extensive brain damage and a rapid death but the precise application of the technique is essential to bring about a quick and humane death.

Whichever method of killing is applied, it is important to consider the experience of the animal immediately prior to the procedure. This is both for the good welfare of the animal and the quality of the scientific data: stressed animals have poor welfare but also undergo biochemical changes, which may increase data variability.

The animal should be handled and killed in as stress-free a manner as possible – for example techniques such as 'cup' or 'tunnel' handling are preferred to tail capture in mice. And of course, they must never be killed within sight, hearing or smelling distance of each other.

It's important also to remember the people involved in carrying out humane killing:. No-one likes to kill animals, so it's essential that the humans are satisfied that they are meeting sound ethical principles, that they are comfortable with whatever technique is used and that they are carrying out the techniques competently. We can ensure that we disseminate best practice in humane killing by careful training of the personnel involved and assessment of their competence against transparent and

recognised standards. An open and transparent culture helps us to support those who have to carry out euthanasia and to identify where problems may exist.

Animal welfare science is helping us to understand the impact of humane killing and to better inform our choice of method, although there is still more research required. Since most experimental animals will have to be killed, by improving our practice, we can help to safeguard their welfare from birth through to death.