

standards required by UK law (and these are clearly marked as such) but also include others above and beyond these. Appendices include an example animal welfare policy and an example standard operating procedure. Advice is given throughout the document to encourage operators to strive for high standards of welfare.

The adoption of these guidelines, for the welfare of animals in abattoirs, by quality assurance schemes and by abattoirs themselves around the world would be a very valuable step towards raising global standards. They will be of interest to all those in the food animal industry.

Best Practice Guidelines for the Welfare of Cattle in Abattoirs; Best Practice Guidelines for the Welfare of Sheep and Goats in Abattoirs; Best Practice Guidelines for the Welfare of Pigs in Abattoirs; Best Practice Guidelines for the Welfare of Broilers and Hens in Processing Plants (June 2004). Produced by the Humane Slaughter Association. Each is 19 pp A4 paperback. (ISBNs: 1 871561 31 0; 1 871561 30 2; 1 871561 32 9; 1 871561 33 7 respectively. Published by and available from the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, UK; telephone +44 1582 831919; email info@hsa.org.uk. Price £5–10 per copy depending on number ordered.

Marking amphibians, reptiles and marine mammals

Studies of the biology of free-living animals for their conservation management or for other reasons often depend upon being able to reliably identify individuals. In most cases the only way this can be achieved is by marking them in some way. Many methods are available and in deciding which to use, the advantages and disadvantages of each, both for the purposes of the study and to the animals being marked, need to be carefully considered. New Zealand's Department of Conservation has published a very useful review of methods for marking amphibians, reptiles and marine mammals (details below) in which the practicalities, welfare aspects and issues of public perception are discussed.

The booklet, which is attractively illustrated with photographs of seals and reptiles marked in various ways, starts with introductory chapters on public perception and support, why and how animals are marked, and general safeguards for marking wildlife. There are then sections in which wide ranges of temporary, semi-permanent and permanent methods are outlined. For each method there is a description of the technique followed by bullet-point lists covering advantages, disadvantages, safeguards and acceptability.

The techniques outlined are too numerous to list here but include paints and dyes, adhesive tapes, fur removal, fluorescent powders, tags, telemetric devices, branding, ear notching, and toe clipping. Regarding the use of painful or stressful methods it is emphasised that, in addition to safeguards for animal welfare, the public "should be provided with the justification for the marking programme and the

method chosen and a careful explanation of the benefits and general and specific safeguards employed."

This is a valuable and well-written practical guide about the marking methods available and the issues surrounding their use. It is aimed at wildlife managers and researchers and, although the examples are of New Zealand fauna, it is relevant and includes sound advice for those working with reptiles, amphibians and marine mammals anywhere in the world.

Marking amphibians, reptiles and marine mammals: animal welfare, practicalities and public perceptions in New Zealand (June 2004). Produced by Mellor DJ, Bausoleil NJ and Stafford KJ of the Animal Welfare Science and Bioethics Centre, Massey University. 55 pp A5 ringbound (ISBN 0 478 22563 6). Published by and available free of charge from the Department of Conservation, PO Box 10-420, Wellington, New Zealand; email science.publications@doc.govt.nz.

Guidelines for the accommodation and care of primates in scientific research

Recognising concerns regarding the behavioural, social and environmental needs of non-human primates in the laboratory environment, the UK's Medical Research Council (MRC) has recently published an ethical guide entitled 'Best practice in the accommodation and care of primates used in scientific research'. Developed by the Centre for Best Practice for Animals in Research (CBPAR) following consultation with appropriate stakeholders and a review of the published literature, this guide is aimed at all those involved in research using primates and is essential reading for MRC staff and grant-holders, as all MRC-funded research using primates (including collaborations abroad) is now conditional on implementing the principles set out in the guidelines.

A brief introduction outlines the position adopted by the MRC concerning the use of primates in research. It "...supports the principles of the 3Rs (the replacement, reduction and refinement of laboratory animal use) and expects high standards of housing and care for the animals used in research which it funds...", and is "...committed to exceeding minimum legal requirements and to introducing and implementing standards which reflect contemporary best practice". Expanding on this central theme, subsequent chapters set out best practice guidelines in relation to the sourcing of animals, experimental design, accommodation and environment (including environmental enrichment), handling, restraint, training, the provision of technical and veterinary care and support, and the fate of the animals.

The most comprehensive section addresses the accommodation and environment, regarding which the guidelines state that "...primates must be provided with a complex and stimulating environment that promotes good health and psychological well-being and provides full opportunity for social interactions, exercise and to express a range of behaviours appropriate to the species". With this in mind, the importance of the cage/enclosure dimensions, floor material, natural light, and social housing is outlined, along

with the need for environmental enrichment, including (depending on the species) provision for resting, running, climbing, leaping and foraging as well as offering some control and choice over their environment. It is also suggested that the success of each form of enrichment be reviewed regularly to assess effectiveness.

The guide concludes with suggestions as to how the implementation of the principles of the 3Rs can be encouraged. Methods include the dissemination of relevant information through appropriate scientific publications, the inclusion in their publications of information on how researchers implemented the 3Rs, and encouraging the fostering of relationships with animal welfare scientists. Furthermore, it is suggested that recognition by the MRC of "...significant and original contributions to the development of the 3Rs in...reviews of MRC establishments... may be rewarded through...providing additional funds..."

Whilst readily applicable to most MRC-funded primate research, these guidelines relate specifically to the use of macaques and marmosets, and to associated breeding programmes. They set out optimal rather than minimum requirements and also allow a degree of flexibility by acknowledging that, in some situations, full implementation of these guidelines may not be possible. No reading list or details of where to find additional information are included, although those requiring such information are directed to a website where an up-to-date reading list can be found.

MRC Ethics Guide: Best practice in the accommodation and care of primates used in scientific procedures (2004). Produced and published by the Medical Research Council, 20 Park Crescent, London W1B 1AL, UK. 16 pp A5 paperback. Available free of charge from the MRC at: www.mrc.ac.uk/index/publications/publications-electronic_publications.htm

The behavioural biology of the mouse: implications for the welfare of laboratory mice

The house mouse (*Mus musculus*) is the animal most commonly used in research, with over 30 million kept worldwide. In a recent review of the scientific and pest control literature, Naomi Latham and Georgia Mason (Oxford University) discuss various aspects of mouse behaviour including the sensory capabilities, developmental processes and behaviour of the free-living house mouse, whilst proposing how laboratory environments might affect such behaviour and welfare. The authors also suggest how an understanding of the behaviour of free-living mice can generate new ideas for research and can help in interpreting findings.

Following a short description of the adaptability and sensory biology of free-living mice, the review proceeds to more in-depth discussions on the developmental factors that affect adult phenotype, sexual maturity and dispersal, choosing and establishing a territory, behaviour within the territory, dominance and territorial aggression, mating and reproduction, and morbidity and mortality. The remainder of the paper focuses on the implications of these natural behaviours for mouse use, functioning and welfare in the

laboratory. Here, the authors consider the differences between wild and laboratory mice and the impact of these differences on four topics: (i) housing issues that may affect welfare; (ii) housing issues that may affect mouse functioning; (iii) factors that could refine behavioural tests; and (iv) long-term housing/husbandry effects that may lead to unexplained variance in research results.

In terms of housing factors that might affect welfare, in addition to the issues that have already received considerable attention, such as nesting material and floor substrate, the authors suggest a number of new hypotheses relating to social factors. For example, they suggest that the lack of choice in dispersal age or strategy, and the lack of exposure to maternal auditory and olfactory cues following 'weaning', may reduce welfare. The authors also address the possibility that being housed with unfamiliar, same-sex adults, with little opportunity for escape from aggressive encounters or the odours and vocalisations of potentially threatening conspecifics, may be aversive and detrimental to welfare. Regarding the factors which may influence behavioural tests, the authors suggest a number of sensory cues that may be important, such as computers and large dark objects, which may be perceived as predator cues.

This paper will be of interest to anyone engaged in research using mice as well as those with a more general interest in the implications of behavioural biology for the welfare of captive animals.

Latham N and Mason G (2004) From house mouse to mouse house: the behavioural biology of free-living *Mus musculus* and its implication in the laboratory. *Applied Animal Behaviour Science* 86: 261-289

Video on emergency slaughter of farmed livestock

When farmed livestock have to be euthanased, for example because of severe injury or illness, and under circumstances in which treatment is not an option because of welfare, economic, or other considerations, it is very important (and in European and many other countries a legal requirement) that the procedure is carried out humanely. Everyone responsible for animals needs to have a system in place for dealing with such situations immediately when they arise, in order to prevent unnecessary suffering. In many cases this means that the task falls to the farmer him/herself, and it is essential that all who are responsible for despatching animals have the necessary knowledge, skills and equipment for the task.

The Humane Slaughter Association has recently published a video (see details below) in which humane killing techniques for a range of farmed livestock including cattle, pigs, sheep, infant animals, and poultry are demonstrated. The use of electrical and captive bolt stunning equipment is described, as is the use of a non-penetrative captive bolt poultry killer and firearms. Various manual methods that can be employed in emergencies when no special equipment is available are also described for some