

Book Reviews

Variables, Refinement and Environmental Enrichment for Rodents and Rabbits in Research Institutions

V Reinhardt and A Reinhardt (2006). Published by the Animal Welfare Institute, PO Box 3650, Washington DC 20027, USA. 71 pp Paperback. Available free of charge: viktor@snowcrest.net.

This book is the latest in a series of initiatives from long-standing advocates for animals Viktor and Annie Reinhardt of the Animal Welfare Institute in Washington DC. Aimed at animal-care staff, veterinarians and scientists who wish to improve the living conditions and welfare of rodents and rabbits housed in research institutions, and in so doing produce better science, it summarises and discusses available refinement and environmental enrichment techniques for these animals. The book is essentially a literature review of 260 articles and, as such, is best consulted for specific queries rather than read cover-to-cover, which can be hard going. Subject and author indices are provided which assist in using the book in this way.

The literature review is organised into two parts, each with a summary and discussion section. The first 'Variables and Refinement' considers various housing, husbandry and handling practices for rodents and rabbits which can result in physiological and behavioural responses that have the potential to confound research data. These are: confinement in a barren cage; cage cleaning; transfer to an unfamiliar location and separation from cage mates; restraint; multi-tier caging; and noise. For each of these practices, the impact on the animal (species, strain and sex) is briefly described, followed by information on how they can be refined so that the animals and science are less affected. For example, in mice and rats, the distress and fear associated with confinement can be buffered by the presence of one or more compatible companions and by increasing the complexity of the living space. Consequently, this part of the book should prove useful to staff responsible for designing, managing and analysing experiments using rodents and rabbits by helping them to identify and address possible confounding variables in the experiments as well as means of reducing suffering and improving animal welfare.

The second part of the book 'Environmental Improvements' focuses on changes in traditional housing conditions that can promote the physical and behavioural well-being of rodents and rabbits. It summarises the results of preference, consumer-demand and other studies that have been used to assess what these animals need and want in their environment (descriptive and theoretical articles are mentioned only if they have practical relevance). The environmental improvements included are classified as necessities (flooring and bedding material; shelter, burrows, nest boxes and nesting material; social housing) and enrichments (objects and structures; additional space; feeding enrich-

ment; interaction with humans). Twenty-five photographs illustrate some of the improvements described and the species-typical behaviours they promote. Attention is given in the text to the potential negative effects (eg increased aggression) as well as the positive effects of such improvements. Hence, this part of the book comprises a handy source of enrichment techniques for laboratory staff to consider applying to their local situation.

The authors note that a greater number of rodents and rabbits are used annually in the United States of America (> 20 million) compared with Europe (> 9 million), and that European legislation on laboratory animal welfare covers all rodents whilst mice and rats are excluded from the US Animal Welfare Act. They argue that less attention has been given to improving the living conditions for such animals housed in US research institutions because of the lack of a serious legal incentive to do so. This may well be the case, but some scientists are also reluctant to provide enrichment for their animals due to concerns that it may disrupt standardisation and reproducibility of results. Surprisingly little attention is given in the text to this debate and to the associated literature (eg Wolfer *et al* 2004; Bayne 2005).

In summary, this book is valuable because the authors have pulled together a large percentage of the relevant literature into one single resource. Since the information given on each article is limited to a few sentences in most cases, it does not itself provide sufficient guidance to enable laboratory personnel to go away and implement the refinement and environmental enrichment techniques that are included. In any case, many scientific readers will want to read the full articles in order to evaluate the evidence themselves. The book does, however, serve as an excellent resource for identify further reading. It can be accessed on the Internet at www.awionline.org/pubs/rabrodent/rodtab.html.

Mark Prescott

National Centre for Replacement, Refinement and Reduction of Animals in Research (NC3Rs),
London, UK

References

Bayne K 2005 Potential for unintended consequences of environmental enrichment for laboratory animals and research results. *ILAR Journal* 46: 129-139

Wolfer DP, Litvin O, Morf S, Nitsch RM, Lipp H-P and Wurbel H 2004 Cage enrichment and mouse behaviour: test responses by laboratory mice are unperturbed by more entertaining housing. *Nature* 432: 821-822

Feral Manual

Edited by C Bessant. Published by the Feline Advisory Bureau, Tisbury, Wiltshire SP3 6LD, UK. Price £20.

This manual on feral cats addresses their management, largely by the method of trap-neuter-release (TNR). It is edited by Claire Bessant and published by the Feline Advisory Bureau, a cat charity based in the United

Kingdom. A vast amount of experience and knowledge of the practicalities of setting up and running a successful TNR programme is presented in 13 short, readable chapters, so this manual should find a wide readership among all those involved in feral cat rescue programmes.

There are eight contributors (from the United Kingdom and the United States), although each chapter is not individually attributed. The first chapter includes definitions of a pet cat, abandoned cat, stray cat, feral and wild cat, and short paragraphs on domestication, feline social behaviour, the sensitive period and problems caused by feral cats. In the following nine chapters, topics such as how to set up a TNR programme (starting with identifying suitable colonies and organising volunteers), trapping equipment and techniques, anaesthetic and surgical protocols for early-age neutering, hand rearing of kittens, ongoing monitoring of colonies and legal requirements, are covered in detail.

Challenging issues that may be encountered when attempting to set up a TNR programme overseas, such as local resistance to depriving animals of the opportunity to reproduce, are described in chapter 11. There is also a chapter on cat hoarding, a welfare problem that can cause considerable practical and financial difficulties to a charity suddenly faced with having to care for a large number of (often neglected) animals at one time. An example of an extreme hoarding case is given, where over 150 cats were found in one house. The final chapter consists of the histories of four different TNR projects in such diverse locations as Gibraltar, southern Texas, the Canary Islands and Kenya.

At the end of the book, the Feline Advisory Bureau proposes a Code of Practice on feral cat rescue, which aims to raise standards of care and welfare for feral cats and kittens by setting out a minimum standard of care for feral cat rescue groups.

This is primarily a 'how-to-do' manual for the general reader rather than a scientific text, although anaesthetic protocols and surgical techniques for early-age neutering are presented in detail (chapter 8). While it is useful to find information on these topics presented together in one publication, I suspect that veterinarians interested in developing their expertise in early-age neutering will consult veterinary books and journals rather than the manual, unless of course these books and journals are not available (for example in developing countries). There is a basic, two-page glossary explaining terms such as antibiotic, census, scanner and worms, which presumably is aimed at non-English speakers working in programmes overseas.

While the manual's premise, one that I share, is that TNR is the most humane and effective method to control feral cat colonies, the complexity and controversy of the issue is only hinted at in a very short chapter 2 (Trap-neuter-release: the best solution). It has been argued that in some situations, particularly in some developing countries, animals may be so poorly nourished and mortality of juveniles so high, that

few animals reach maturity and are able to reproduce. The population is maintained by influx of animals from elsewhere, and by the abandonment or 'dumping' of local, 'loosely owned' cats. In these instances, the use of funds to set up a TNR program may not be the wisest choice.

References to support the data presented in the manual are not provided, and the list of useful contacts is short. Nevertheless, this is a well-presented, user-friendly manual with a very practical approach to the management of feral cats using TNR programs. Implementation of the manual's recommendations should lead to an improvement in the welfare of feral cats worldwide. The manual also highlights the need for more information, research and debate on the most humane, effective and appropriate methods for the long-term control of feral cats.

Irene Rochlitz

University of Cambridge, UK

Guidelines for the Humane Transportation of Research Animals

Written by the Committee on Guidelines for the Humane Transportation of Research Animals (2006). Published by The National Academies Press, Towcester, NN12 6BT, UK. 131 pp Paperback (ISBN 0-309-10110-7). Price £20.99.

The project was initiated by a professor Charles Kean expressing the research animal care community's concerns about the safe and humane transportation of animals used for research. Then follows a long list of contributors, many of whom are well-known in their field, which reflects the nature of the publication ensuring that all sections are represented. The result is, however, an over-emphasis on the transport conditions and circumstances for imported non-human primates with their associated regulatory requirements and biohazard potential, to the detriment of details of other species used in the laboratory. However, the guidance is robust on science-based practices, drawing analogies from practices for the transport of farm animals based on cross-species concepts of physiology, their specific needs and differences. Good practices have been developed that include sections on the thermal environment, space requirements, food and water, social interaction, handling, monitoring of journey progress, contingencies, training and responsibilities of personnel involved in journey planning and conduct. The major recommendations of the committee note the declining availability of air transport for non-human primates, the confusing and complex regulatory environment for transporting research animals and the unfamiliarity of many researchers with the essentials of a good journey planning and a quality journey.

The introduction, chapter 1, has a checklist of issues to consider when arranging transportation between animal facilities.

Chapter 2 focuses on the various regulations and guidelines, which are mostly US specific; the anomaly that laboratory rodents are not covered by the Animal Welfare Act is particularly different to Europe where all mammals are covered