

the interpretation of data, we may expect that controversies will be particularly resistant to closure and consensus”.

Chapter 10 describes the quiet controversy over exercise requirements for laboratory dogs, a debate that encompassed all of the issues that are presented in this book — “the interplay between expertise and advocacy in speaking for animals; the differences between performance-based and engineering-based standards; the differences among animal protectionists, researchers and veterinarians; and the ambivalent role of the laboratory animal veterinarian”. The issue of laboratory primate welfare is also highlighted in this chapter, as an illustration of the manner in which, in order to meet ‘performance standards’ for these species, a process of locating and defining those who had the necessary expertise was undertaken in an attempt to determine what these animals want.

In the final chapter of this thoughtful book, Carbone sets out his conclusions and expectations of the future, which can most succinctly be presented by listing the chapter’s subheadings: Animal welfare must be seen as more than the absence of suffering; Individual animals must count; Legal protections matter and should be extended; Death should be seen as a serious harm to animals; Not all questions have technical fixes; Veterinarians can and should be animal advocates. The remaining sections of the book contain, in addition to a list of useful references, some 16 pages of chapter notes, and a short glossary and index.

What Animals Want is a readable, informative, well-researched, scholarly but also personal account — written by an insider looking carefully and thoughtfully at a familiar landscape. Ultimately, the author asserts that “the information gaps leave plenty of space in which scientists and veterinarians and animal caregivers and animal protectionists and government officials all vie to speak for what animals want”, and advises us to “respect a plurality of voices, to recognise some strengths and weaknesses of every word we put in animals’ mouths”. This book was written for those who want to know more about animal research, as well as for those who are very much involved in the animal research debate, in the hope of “broadening the range of voices and knowledges that will influence animal welfare policy”. It seems well crafted for this potential readership, and, although its clear focus is in the USA, I would recommend the book to anyone who chooses to consider the responsibility we bear, as a society, for the millions of animals who, for our benefit, live and die in research establishments worldwide. The author makes it clear, both in his introductory chapter and in his concluding one, that he wishes there were no animal research, but calls not for an immediate end to animal research, only to make it better by trying to improve the animals’ lives. The importance of what animals want is clear; the questions of what animals want remain largely unanswered; efforts to answer those questions should only be encouraged by the reading of this book.

Lesley Wiseman

Faculty of Veterinary Medicine
University of Glasgow, UK

Handbook of Primate Husbandry and Welfare

S Wolfensohn and P Honess (2005). Published by Blackwell Publishing Ltd, 9600 Garsington Road, Oxford OX4 2DQ, UK. 176 pp Paperback (ISBN 1 4051 1158 5). Price £34.99.

Non-human primates are highly intelligent animals with complex social, behavioural and psychological needs that are difficult to meet in captivity. Consequently, there is a high level of concern, including among the scientific community and general public, about their confinement in laboratories for use in research and testing, and in zoos for the purposes of conservation, education and/or recreation. It is essential, therefore, that while their use in experiments and captive-breeding programmes remains necessary, every possible action is taken to prevent or minimise any associated suffering and to improve animal welfare at every stage of the animals’ lives.

The overall purpose of this book is to encourage discussion and active review of the husbandry of captive primates, and to assist with the management of changes to benefit their welfare; information on scientific procedures is not included. Aimed at personnel working in research facilities, zoos and private collections, the book is sensitively written in a language easily accessible to all levels of staff. It draws upon the experience of the authors, who are a veterinarian with a great deal of experience with primates (particularly macaques) in research settings and a research primatologist who has worked with nocturnal primates in the field and macaques in captivity, respectively.

The book is very much a reference text and is written in that format, with nine chapters dedicated to specific topics. Over 40 black and white photographs help break up the text, many of which illustrate specific points (eg correct restraint technique, assessment of body condition, pregnant and non-pregnant ultrasound scans). A reference list is provided at the end of each chapter for further reading, but these are by no means exhaustive, omitting to include some important papers and sources of guidance. For example, the 4-page 2002 statement from the European Commission’s Scientific Steering Committee on “The need for non-human primates in biomedical research” is included in the reference list for the first chapter, but the 135-page 2002 report on “The welfare of non-human primates used in research” from the European Commission’s Scientific Committee on Animal Health and Welfare is not. An index is also provided, which is beneficial because I found the organisation of the book to be not wholly intuitive. For example, information on grouping and social development is included in the chapter on training of primates and not the chapter on breeding.

The first chapter serves to introduce the primates, their characteristics and relationship with man. This chapter is important because it sets the context for what follows, it establishes the keeping of primates in captivity within an ethical framework, and explains the basis for the various related legal provisions and controls on their use.

The second chapter concerns the physical environment and includes information on accommodation design, environmental conditions and waste management. The authors make the observation that existing recommendations for primate housing, particularly in research facilities, are generally inadequate and that the minimum cage sizes specified in legal guidelines are sometimes too small to meet the behavioural needs of the animals. I totally agree and I am therefore pleased to see that the authors instead recommend performance standards that assess the ability of the animal to express its species-typical behaviours, which will vary depending on species, age, sex, individual temperament, group composition and dynamics. The section on accommodation design gives much sensible information, although the background literature is not very well referenced.

Chapter 3 is a valuable synthesis of the authors' experiences in overcoming the challenges of balancing health and safety concerns with progressive methods of housing and managing laboratory primates that improve animal welfare, staff morale and the quality of science. Of particular note in this regard is the move to housing macaques in rooms without cages and with close staff contact, both during routine room maintenance and handling, which can generate health and safety concerns. Hazards typically found in primate units/collections are identified and advice is given on developing an occupational health and safety programme to reduce work place risk.

The competence of staff of all levels involved in the care and use of primates is probably the most important factor influencing animal welfare and scientific validity. This is recognised by the authors who emphasise the importance of staff training and list some aims of a training programme, although they say little about how these can be achieved. Included in the aims are: a greater understanding of primate behaviour and ethology, the knowledge and tools for refinements in the management of primates, and mechanisms for evaluating primate welfare through behavioural indices. In my experience these aspects of primate management and use receive little attention in traditional staff training courses and resources (for laboratories or zoos), so it is very encouraging to see them recommended here. I hope resources such as this book will help redress this failing and develop cultures in which staff better understand and anticipate primate behaviour.

The next chapter concerns nutrition and is quite extensive for this size book, given that feeding-enrichment is covered elsewhere. This chapter summarises much of the information given in the more detailed but less accessible 'Nutrient Requirements of Nonhuman Primates' published by the US National Research Council (2003). One minor criticism is that although the authors point out in several places that a balance must be achieved between adequate nutrition via a formulated diet and stimulation and enrichment via supplementary foods, they say little about how to achieve this balance. A protocol for hand-rearing is included, although it is not made clear to which genera this applies.

Chapter 5, on assessing physical well-being, is excellent and covers observational assessment, clinical examination, quarantine and health screening programmes (including sampling strategy, reporting and post mortem procedure), common infectious diseases, husbandry-related diseases and sedation. It includes examples of score sheets for assessment of well-being, diagrams and photos for scoring of body condition, checklists for health monitoring, protocols for treating animals with fight injuries and tables of biological, breeding, haematological and biochemical data. Personally, I would have liked to have seen greater use of these tools in other chapters and more suggestions of suitable benchmarks of performance (eg acceptable pre-weaning mortality, levels of fighting, or care-staff/animal ratios) so that the reader can gauge whether their facility is operating according to best practice. Nonetheless, it should be possible for him/her to form a view on the basis of information in the text. One small point is that I could not find any reference to the possibility of pair- or group-housing primates during quarantine as a means of improving their welfare.

Chapter 6, on psychological well-being, complements Chapter 5, on physical well-being, and includes information on social and physical environmental enrichment, including feeding-based enrichment. Brief information is included on behavioural modification, which leads into the next chapter on training of primates. This chapter, Chapter 7, includes a discussion of sociality and psychological well-being in primates, of methods for managing introductions of animals to one another, and of training to permit physical contact and to facilitate procedures. In my view this chapter should have included more recommendations on how to implement the practices the chapter describes, since concerns about knowing how to socialise, habituate and train animals can have a stalling effect; many staff members have worked within their field for years or even decades and the thought of embarking on new ways of interacting with animals can make them uncomfortable.

Breeding of primates is covered in Chapter 8, which is a combination of background information and guidance. The authors avoid duplication with published texts on primate reproduction and breeding and instead concentrate on general themes and advice. A considerable amount of information is given on patterns of primate social grouping and factors that influence reproductive success. Also covered are nutritional, environmental and social influences on fertility, reproductive cycles, artificial control of reproduction, pregnancy diagnosis, parturition, lactation and weaning, breeding lifespan and selection of breeding males. Important issues such as contraception are not overlooked, though curiously little advice is provided on balancing supply and demand for research use. Methods of identification are not covered and instead the reader is referred elsewhere.

The final chapter is concerned with the sourcing and transport of primates. It reviews legislation and regulations relevant to acquisition and transport, and presents

sound advice on transportation (eg conditioning, transport containers, social groupings, feeding and watering, post-move monitoring), much of which stems from the authors' research on the welfare implications of transport and re-housing.

The order Primates is diverse, so it is difficult to produce a handbook that covers all species or genera. However, given the number of common marmosets used in UK laboratories, and the number of callitrichids (marmosets and tamarins) and apes kept in zoological collections worldwide, it is an omission for this book not to include more information on the behaviour, husbandry and welfare of these primates. Also, for those working in a zoo setting, information on important issues is missing. A book truly aimed at the zoological community should include issues such as the management of genetic diversity, surplus animals (particularly males), mixed-species exhibits, the influence of visitors and legislation relevant to zoos (eg Zoo Licensing Act 1981; Council Directive 1999/22/EC; Department of the Environment, Transport and the Regions Secretary of State's Standards of Modern Zoo Practice 2000)

On the whole, this book is a good single source of useful information on primate husbandry with clear relevance to animal welfare. The authors are to be congratulated on producing a resource that complements the existing literature, stimulates discussion and encourages progression in primate husbandry towards a better future for primates. I recommend this book to all who have responsibility for the husbandry and welfare of captive primates, including managers of research facilities and zoos, veterinarians, scientific investigators and animal care staff. However, despite the promotional information on the back cover, the book should not be regarded as a completely comprehensive guide to the practicalities, issues and precise methodologies related to good husbandry and management of primates.

Mark Prescott

*National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs), UK
Oxford Brookes University, UK*

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Laboratory Animal Medicine: Principles and Procedures

M Sirois (2004). Published by Elsevier Mosby, 11830 Westline Industrial Drive, St Louis, Missouri 63146, USA. 320 pp Paperback (ISBN 0 3230 1944 7). Price £23.99.

This book comes in a good handy size and would fit nicely on a facility's bookshelf or work bench. The book is targeted at veterinary technicians and laboratory animal technicians. There is wealth of hands-on information and the author is obviously a very experienced veterinary technician.

The book is divided into three sections. The first section gives a very worthwhile overview of the background relating to working with research animals. The emphasis is North American, but the brief synopsis of the moral and ethical positions is precise, to the point, and conveys a sense of the complex social and ethical environment in which animal based research is performed. There are very concise and clear descriptions of the various environmental factors that need to be controlled and the type of caging material used, although the references to wire-mesh floors could do with some qualitative comment on the acceptability of them within current animal welfare standards.

The second section deals with common laboratory species individually: rats, mice, rabbits, gerbils, hamsters, ferrets, NHPs (non-human primates) and non-traditional species (eg chinchillas, woodchucks, armadillos). The format is very useful for a student as it gives the study objectives at the start of the chapter and revision questions at the end. However, the sections on safety and the control of environments make only a passing comment on the problems associated with laboratory animal allergy, and with the current concerns about safety in the work place I would have expected some more discussion about the benefits of working with filtered air systems, such as individually ventilated racks and systems, which reduce exposure to animal allergens.

This section also has many references to the treatment and handling of pet animals in veterinary clinics, but I am not sure if this is useful because the two target audiences, veterinary technicians and laboratory animal technicians, are very different, with different treatment requirements. The husbandry aspirations of the animal carers also have a different emphasis. Although the welfare of each individual animal is always important, the treatment options in a veterinary clinic are different from those in a laboratory setting. For example, it would be unusual for clinician to euthanase an animal showing pinworms in a veterinary clinic, but this would be a serious consideration if this condition was diagnosed in a specific pathogen-free barrier unit.

Laboratory animal medicine, while respecting all welfare aspects relating to the individual animal, is concerned with 'herd health' and the impact of the individual on the group, whereas companion animal medicine has a different perspective, relating to the social interaction of the individual animal within a human framework.

There is also information on diseases for each species, but very little attention is drawn to the fact that by and large