

# BOOK REVIEWS

## Animal-centric care and management: Enhancing Refinement in Biomedical Research

Edited by Dorte Bratbo Sørensen, Sylvie Cloutier and Brianna N Gaskill

Jas Barley

Consisting of 13 chapters over 190 pages, with references given at the end of each chapter. Contributors are distributed over the USA, UK and Europe so a balanced view is achieved.

The chapters cover general issues such as human-animal interactions, Culture of Care, animal emotions, abnormal behaviour, animal learning and animal training.

The remaining chapters deal with species specific topics of the more common laboratory species namely Zebrafish, mouse, rat, rabbit, dog, non-human primates (NHP) and the pig. It should be noted that the use of NHPs is probably more common in the USA and the Far East than it is in the UK and Europe.

Although people frequently skip reading the preface, it is important that you do not in this case, as it gives the background to animal centric management and explains what the book is trying to accomplish. The editors acknowledge the influence of Russell and Burch's book and their concept of the 3Rs, namely Replacement, Reduction and Refinement. They believe that currently most applications of the 3RS are scientifically centred and that we need to change to an animal centred approach.

They use the example of planning the procedures for modelling E coli induced diarrhoea in young pigs where study planning will typically focus on inoculation and frequency of faecal sampling, ignoring how oral gavage and repeated restraint may add stress to the general experience for the animals. Selection of measures used to ensure welfare within the experimental setting is determined once the experimental procedures have been set. Perhaps the pigs will be given additional enrichment such as an empty cardboard box to manipulate and

extra straw for rooting, in other words, the welfare of the pigs throughout the study is considered only within the limits and the framework set by the study design. What the book is trying to accomplish is to show that instead of fitting the animals into experimental conditions one should first strive to adjust the baseline conditions (husbandry and housing) to better meet the needs and preferences of the animals and then fit the experimental conditions within those.

The initial chapter of the book deals with human-animal interactions and points out that these are daily, significant and often unavoidable components that can impact not only on the research animals but also on the people who work with them and the eventual research outcomes. The interactions, unless deliberate effort is made, can negatively affect both animals and humans. The authors define human-animal interactions and provide a useful graphic of the associated terminology. Impacts are divided into several frameworks and in some cases further divided into harmful and beneficial and for animals and humans. They use the term human-animal interactions rather than human-animal relationships as they consider this term restrictive. Suggestions for changing human behaviour to improve animal welfare are also made, as are proposals for further work.

The chapter on a Culture of Care suggests a working concept in relation to animal research and testing that includes elements that relate to appropriate attitudes, behaviour, mindsets and mutual respect between staff with different roles. The authors consider that regardless of the context the term should be used thoughtfully rather than it becoming a watch-word that is used without thought or what is meant by the term. They discuss implementation of a Culture of Care from

various perspective, the tools used to shape the Culture of Care, role of local ethics committees on animal care and use, the challenge involved and assessment of the culture. Opportunities for promoting the culture are also considered.

Further chapters go on to discuss Animal Emotions and Moods and why they are important, together with abnormal behaviour. A very useful table is provided of what are considered as abnormal behaviours in the species covered in the book. Why those involved with animals should care about abnormal behaviour is also covered. The chapters on Animal Learning and Animal Training should be of great interest to all readers as the successful application of training an animal and dare we also suggest, the humans, to act in a particular way during husbandry and research activities can greatly reduce the associated stress of such activities for all concerned. Obviously, it is important that both aspects should be considered as inappropriate methods could lead to more harm being inflicted on the animals and trainers.

The chapters on the various species all take a slightly different approach which is probably due to the limits of available information. The chapter on Zebrafish includes biological health, environmental conditions and natural behaviour, psychological and emotional wellbeing (possibly not an aspect of a fish care normally considered), special considerations including strains of Zebrafish, human animal interaction and restrictive types of research and special considerations.

Mice are considered under sections that discuss the cognitive abilities and emotions of the species, the environment and how to enrich it and what is practical and then concentrates on handling both from the animal's and the handler's perspective including the use of non-aversive handling and standardising this in research. The authors of the rat chapter talk about free ranging rats and who they are, housing for rats in laboratories and covers the historical perspective and current knowledge including shelters exercise and mobility and complexity with recommendations for implementation. Relationships with rats in laboratories are also discussed including the historical perspective, current knowledge and recommendations for implementation.

Information on rabbits looks at general background, environment, social needs, social housing, handling, the human animal bond and training. Whereas for dogs the authors consider dog senses and cognition, housing environment, enrichment in the dog laboratory facility, handling and management, training and treating dogs as individuals.

Strangely the information on non-human primates feels relatively limited, perhaps due to the authors considering that more consideration to animal-centric

managements has already been given to the species concerned than it has to rodents and other species. Covered in this section is basic biology and behaviour, social dynamics and group constellations relating to macaques, marmosets and tamarins including information on social housing of primates in captivity, the environment, foraging and food rich enrichment and socialisation and training.

The pig chapter authors provide information under the headings of characterisation: morphology, domestication and breeds, cognitive and emotional abilities, the environment including design for comfort and enrichment as well as social environments, behavioural management including: handling, habituation and training are included as is consideration of how to proceed.

The book is comprehensive, well-written and exceedingly well laid out. The principles of Animal-centric care and management may sound a new idea but for many animal care staff it is what we have been doing for many years, although there is always room for new ideas. However, the concept of designing experiments studies to consider the animals needs first rather than the scientific needs is something entirely new. Although only the common animals are covered, the principles are applicable to all species used in research, although some in depth knowledge of some of the more unusual species needs to be acquired.

I commend this book to you and would recommend that it is made available to all staff from the most junior technician to the head of teams using animals in research.

# Introduction to Laboratory Animal Science, Technology and Welfare, 3rd Edition

Revised by Stephen W Barnett

Bruce W Kennedy, Heather L Narver, Gail A Thompson and Robert H Weichbrod

This revised 3rd edition of the Introduction to Laboratory Animal Science, Technology and Welfare is a comprehensive, well organised, and beautifully illustrated manual for the education and training of people involved with laboratory animal technology and working in the field of animal care and use. The edition is comprised of over 200 pages of text and almost 200 photographs, illustrations and tables organised into 16 chapters with a glossary and index. Although the targeted audience is for the Institute of Animal Technology (IAT) levels 1 and 2 laboratory animal technician certifications in the United Kingdom, the book also can be used as a training tool for educators, research technicians and principal investigators around the world.

The book begins with an opening chapter on 'Animal Health', thus emphasising a most important topic for animal care and wellbeing. It continues with practical chapters on caging, housing, the facility, facility environment, nutrition, husbandry, hygiene, breeding, care of young animals, identification methods, experimental procedures, euthanasia, handling, sexing and safety. Also included are chapters on laws, regulations, recommended guidelines and ethics and animal welfare. The chapters cover the breadth of common laboratory animal mammals and Zebrafish used in research. Most likely because of the limited use of non-human primates in the UK, this species is not included in this edition.

While the information on euthanasia and the governing laws, guidance and recommendations (Animals Scientific Procedures Act, 1986, amended 2012), is a requirement to workers in the UK, readers outside of the UK can easily utilise the information presented as an education tool, with practical comparisons to their own governance applications and guidance in programmes of laboratory animal care and use. The other chapters relating to aspects of laboratory animal technology are very informative and help guide the reader in identifying current 'best practices'.

The final chapter is an extensive review of the common discussions involving ethics, philosophical theories and

the impact of Russell and Burch's 3Rs. This edition concludes with an excellent glossary and index.

The book is relatively small and compact in size, thus enhancing its use as a teaching tool and quick reference manual. It is also very modestly priced at £20 (\$25-30 US). The editors are commended for the information selected to present in this edition, the use of beautiful graphics and putting forward such a practical approach towards refinement of laboratory animal care and use techniques. We highly recommend Introduction to Laboratory Animal Science, Technology and Welfare, 3rd Edition as an education and training reference in this field. We also applaud the IAT for recognising the need, supporting the development and production of this important revised 3rd edition reference book.

## **A personal note from Gail A. Thompson (IAT Vice-president):**

I wish to thank the IAT for the strong support the Institute has provided since its organisation in 1950, for producing training programmes and materials. As a young, enthusiastic technician in the late 60s and early 70s, it was difficult for me to find study materials for preparation for the AALAS certification exams. Although AALAS was producing 'Syllabus' materials, the exams were not restricted to material in those recently produced documents. The 'Bible' for study material at that time was 'The IAT Manual of Laboratory Animal Practice & Techniques', edited by Douglas J. Short and Dorothy P. Woodnott, first published in 1963. My copy was from the printing in 1971. My copy is highlighted and underlined on almost every page. What a valuable tool for our scientific field it was when, so few resources were available. A few years ago, I was privileged to meet Dorothy Woodnott, a hero in our industry. This current manual produced by the IAT and revised by Stephen W. Barnett is but another sterling example of how the IAT has continued to produce and support training and reference materials for the proper care and humane use of laboratory animals, worldwide.