that are better fitted to the needs or coping strategies of certain personality types? Should the personality of the individual be taken into account when forming new social groups of captive animals? Since personality type is a product of gene-environment interaction, can (and should) we provide certain stimuli in order to promote the expression of personalities that are expected to cope better with the adversities of the captive environment? Can exposure to particular rearing conditions promote the emergence of personalities that differ in their likelihood of survival in the wild following reintroduction? The welfare angle is indeed addressed (to some extent) in the book. For example, it is shown that the chances of wild populations in disturbed habitats of successfully adapting to new environments may be related to the levels of personality variation within the populations, since these are related to the degree of genetic variation. Moreover, personality-based screening prior to the adoption of animals from shelters has resulted in improved rates of successful adoptions. This resembles a recent preliminary study that was conducted at an Israeli primate breeding facility for biomedical research (BFC). In that study, long-tailed macaques that were evaluated for specific behavioural traits, such as boldness and exploration, prior to their arrival at the biomedical facility, were reported to be better suited for participating in experiments, compared to unscreened animals. This anecdotal evidence demonstrates how such screening can reduce the number of animals needed for research, and also lower the costs of research. In addition, variation in personality is evident in the ability of individuals to cope with stressors. This coping ability corresponds to basic personality types, and has implications for the individual's health and diseases, and therefore for its welfare. A "proactive coping strategy" is characterised by high aggressiveness, boldness, inflexibility and high emotional activation. These types of individuals have been found to have an enhanced sympathetic and noradrenergic response to stress. On the other hand, a "reactive coping strategy" consists in low levels of aggression, risk aversion and flexibility to changes. Reactive animals show an enhanced parasympathetic activation, and high HPA response. These few examples demonstrate the relevance of the study of animal personalities to many aspects of applied animal welfare, and animal welfare research.

In conclusion, I found the book both interesting (especially parts three and four) and useful. I also enjoyed the interdisciplinary approach to this topic, of integrating behavioural ecology with genetics and psychology. However, I do not consider it to be intended for those who are seeking to learn about the basis of animal personality research. Rather, in order for the reader to gain maximum benefits from reading it, I find it more suitable for those readers who already possess some relevant scientific background.

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Improving Farm Animal Welfare. Science and Society Working Together: The Welfare Quality Approach

Edited by H Blokhuis, M Miele, I Veissier and B Jones (2013). Published by Wageningen Academic Publishers, PO Box 220, 6700 AE Wageningen, The Netherlands. 232 pages Paperback (ISBN 978-90-8686-216-0). Price €54.00, US$81.00.

Improving Farm Animal Welfare is an edited book based on the findings of the large, six-year EU-funded Welfare Quality project. The ten chapters provide a wide overview of workings and findings of the project. The book aims to provide a "brief but comprehensive" overview of the project, and despite the tendency for this to sound like an oxymoron, succeeds in this aim quite admirably.

Chapter 3 provides a fascinating synopsis of how ethical and societal concerns for animal welfare can stimulate a thriving livestock industry. Chapters 4–7 cover the Welfare Quality vision (chapter 4), principles and criteria (chapter 5), protocols (chapter 6) and assessment (chapter 7). Chapter 8 covers the associated research on improving animal welfare on farms. Chapter 9 covers the implementation of the Welfare Quality assessment protocol. Chapters 1 and 2 offer an introduction which although important for contributing to the entirety of this book, would not appear to cater for the animal welfare scientist readership. Readers needing such a general introduction to animal welfare may find the concise factsheets on the Welfare Quality website more beneficial. Admittedly, though, readers new to the topic who want more information than is available in the factsheets will almost certainly find this book helpful, and may enjoy the basic introductory chapters. It is clear that the editors have focused on rigour in this publication, and the last chapter on "the way forward" is understandably brief and non-speculative, and does not add much to the book.

The Welfare Quality project disseminated its information in a large number of scientific papers, 19 detailed reports, factsheets, popular press releases and conferences. In light of this, the question arises about why an additional book is needed. The Welfare Quality website, in particular, is detailed and so far appears to not suffer from the usual ephemeral nature of this form of publication. Surprisingly, I found the fact that there are so many other sources of information on this project to support the need for a book such as this. The book brings together all of the main findings of the project and recommendations, and instils a confidence in the reader that they have not 'missed' an important aspect. This is aided by the book being relatively brief (210 or so pages) and clearly structured which makes it a fast and user-friendly source of information. Should a reader want to explore topics further, the referencing is excellent and interested readers can easily follow suggestions for obtaining more in-depth information.

In short, the value of this "brief but comprehensive" book is that it provides readers unfamiliar with the Welfare Quality

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project a detailed overview of their findings and recommendations, yet also provides those more familiar with the Welfare Quality project a fast and easily accessible source of information. With respect to the impact of the Welfare Quality project, the editors rightly point out that the findings of the project will "not simply sit on a shelf and gather dust". This book is an excellent 'go to' reference and is unlikely to gather much dust on my bookshelf.

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Handbook of Laboratory Animal Management and Welfare, Fourth Edition

S Wolfensohn and M Lloyd (2013). Published by Wiley-Blackwell, 9600 Garsington Road, Oxford OX4 2DQ, UK. 392 pages Paperback (ISBN 9780470655498). Price £39.99, €51.90, US$64.99.

The fourth edition of this popular laboratory animal science handbook, written by two prominent laboratory animal specialists (Sarah Wolfensohn and Maggie Lloyd), is an excellent reference for animal scientists that work with research animals in the laboratory setting. I commend the authors for taking a popular and useful handbook and improving upon it. The handbook has been extensively revised and reorganised from earlier editions and in my view has been significantly enhanced. It is written in a clear, succinct, easily read style that lends itself as a tool for training both novice and experienced investigators. My only disappointment with the book is the limited utility for North American and non-EU audiences due to the UK-centric references. Several of the most valuable chapters were written with the Animals Scientific Procedures Act 1986 and the UK Home Office Licensee in mind and will be of limited utility for the non-UK scientist.

The first chapter is a brief overview of education and training requirements for the UK personal license holder. It is followed by an excellent chapter that discusses the ethical considerations in using animals in research including practical reviews of the ethical review process, measuring harms and benefits, and of ways of working using the principles of the three Rs (replacement, reduction, refinement). The next chapter is a succinct overview of the regulations for research animal use within the UK. Throughout the handbook the authors do a good job in keeping the UK and EU regulatory framework in mind.

Chapter 4 reviews how to balance animal welfare with scientific considerations and provides important information for all research personnel to consider when conducting animal procedures. The authors convey an excellent approach for how to balance welfare and science in animal studies. Throughout this book the discussions of the balancing of welfare with scientific considerations is a strength that distinguishes this particular handbook from the plethora of other books that give an overview of the basic biology of laboratory animal species and techniques of using research animals. In contrast to the excellent discussions on how to balance welfare with scientific considerations, I found the chapter on experimental design to be somewhat limited in scope. The design of animal studies is so important I felt that more attention could have been devoted to how to control variability and impart scientific quality to animal protocol development. Perhaps if there is a future revision of this excellent handbook this section could be enhanced.

As one might expect in a handbook of laboratory animal science, in the subsequent chapters the authors provide an overview of research animal handling, basic techniques of substance administration, biological sampling, laboratory animal anaesthesia and analgesia, and an introduction to surgery and surgical techniques. Similar to the earlier editions, about half the handbook is devoted to chapters that review the basic biology, handling, and husbandry of common and less routinely utilised research animal species.

In summary, I recommend this handbook enthusiastically to those both familiar and unfamiliar with earlier editions. It provides an excellent teaching tool for research and laboratory animal scientists. The handbook is written for and most valuable for a UK readership but I think my North American colleagues will agree with me that many of the chapters are excellent reading with a global appeal for those interested in the care and welfare of research animals. The melding of animal welfare issues with scientific considerations is well done.

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Wild Animals in Captivity: Principles and Techniques for Zoo Management, Second Edition

Edited by DG Kleiman, KV Thompson and CK Baer (2013). Published by The University of Chicago Press, 1427 E 60th Street, Chicago, Illinois 60637, USA. 592 pages Paperback (ISBN 978-0-226-44010-1). Price £42.00, US$65.00.

The zoo industry has changed radically in recent years, with emphasis on animal welfare and conservation at the forefront of what used to just be menageries for public viewing. With these changes, we have seen surges in the research and husbandry that zoos are pushing and producing. This book is a good place to start for any zoo professional to become updated with the current direction. This does not mean that it is the final word on all that is out there and all the authors admit that, but I think this is what makes it a must read. One of the great points of this book is that although parts of every chapter may point out the things lacking in our knowledge of animals from their nutrition to behaviour, there is an underlying optimism and a positive push to obtaining this information. The editors state that this second edition was an overhaul of the first edition with more than 75% of the chapters and appendices changed or modified. This update does not come across as overwhelming, but rather as an uplifting demonstration as to how much research is being carried out in the