

Measuring Behaviour: An Introductory Guide, Fourth Edition

M Bateson and P Martin (2012). Published by Cambridge University Press, Shaftesbury Road, Cambridge BB2 8BS, UK. 238 pages Hardback (ISBN: 978-1108745727). Price £27.99.

A lot of animal behaviour researchers have grown up with previous editions of *Measuring Behaviour* as their go-to book for advice on techniques and ideas for appropriate methods for quantifying what their subject species is doing. The latest (and fourth) edition of this excellent handbook will no doubt become a staple on the bookshelves of many more students (and established researchers); this time with Professor Melissa Bateson taking on the mantle from her father, Sir Patrick Bateson. This edition has been updated, and new areas added, resulting in an increase in pages since the third edition in 2007, from 176 to 238 pages.

Because this is a well-known publication, I have tried in this short review to concentrate on the subjects added to the book, which relates to developments in techniques, and the inclusion of humans as the subject for study, as well as ethical aspect of behavioural research.

This latest edition has a much nicer flow to it, with the introduction easy to read, and a more logical re-organisation of the different chapters, many of which have been given new headings and sub-headings. For example, a discussion on potential floor and ceiling effects when collecting behavioural data has been moved from the chapter on 'Interpreting findings' in the previous edition to the chapter on 'Measurement quality' in this edition. Previously, we were presented with Tinbergen's four questions in the Introduction, whereas the current edition places them in the chapter on 'Choosing a research question', where they fit far more aptly.

A new and daring chapter entitled 'Science and truth' offers a fresh view on the nitty gritty of our métier and the theory of science. It includes a whole section on the 'Replication crisis', which is highly relevant — and not only to behavioural research. And the chapter on 'Designing a behavioural study' (Chapter 4) should be compulsory reading for all students of applied animal behaviour, as well as their supervisors.

If, like me, you have been using one of the previous editions of *Measuring Behaviour* in your studies, teaching, and supervision, I can highly recommend upgrading to the fourth edition. This may be best illustrated by the chapter on 'Recording technology', containing an up-to-date (as far as that is possible) description of various techniques available for automatic tracking of behaviour, as well as how to code your collected data into usable form — but it also explains the use of old-fashioned check-sheets, which may still be relevant in some situations. In comparison, the previous edition was largely limited to video-recordings, check-sheets, and event-recorders. The fourth edition contains many new illustrations, and the few that are reused from previous editions have been updated and redrawn. Useful information can be found throughout, and the revised

chapters on data analysis, and interpretation of findings contain guides on common statistical mistakes, and how to write a scientific paper.

Overall, this is a highly useful book for anyone working in or around applied behavioural research. The use of numbered references makes the chapters easier to read, but it also would have been useful to have an alphabetically ordered reference list. However, if that is the only issue I can find for improvement, it bodes well. So, in summary, make sure this latest (and much renewed) edition of *Measuring Behaviour* becomes part of the library in your behavioural lab.

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Pigs: Welfare in Practice

I Camerlink (2020). Published by 5m Publishing, 8 Smithy Wood Drive, Sheffield S35, IQN, UK. 166 pages Paperback (ISBN: 978-1789181050). Price £14.95.

This compact volume is part of the 5m Publishing 'Welfare in Practice' series of short, practical books on the welfare of farmed animals. As described by the publishers, "The series covers what is currently known about the welfare requirements of specific animal species and how to put this into practice." The book is aimed primarily at farmers, stockworkers and animal handlers, with scientists and students (and smallholders) only a secondary audience, and this makes it rather different to many reference volumes used by animal welfare scientists.

The book is edited by Irene Camerlink, with Xavier Manteca as the series editor. Each chapter, and many of the individual sections within chapters, has its own author leading to an extensive list of almost fifty contributors from across the world. Many of these will be familiar to researchers and readers of textbooks about farm animal and pig welfare, and about farming economics. The vast majority of the authors are based in Western countries and more developed regions, primarily Europe and North America. While the book aims for international applicability, most of the cost and price examples are given in GBP and euros, which may suggest a somewhat Eurocentric bias.

The contents are divided into four sections: the first, 'Understanding pig welfare', introduces the concept of animal welfare and gives an overview of the main issues related to pig welfare across the world. The second, 'Making the business case for animal welfare', discusses the economic benefits of improving animal welfare and includes examples of cost-benefit analysis applied to tail damage, gilt rearing and farrowing systems. The third section, 'Assessing animal welfare', covers welfare indicators including 'iceberg' indicators (those showing the 'tip of the iceberg', revealing greater problems underneath), the Welfare Quality® assessment protocol, qualitative behaviour assessment, the use of apps and Precision Livestock Farming. The final section, 'What you can do to

improve animal welfare?', discusses strategies available to improve pig welfare on-farm, in relation to human-animal interactions and environmental enrichment, and includes a chapter on each age and stage of pigs: piglets; weaning to fattening; gestating sows; lactating sows; cull sows and boars, as well as a discussion of gilt selection and rearing. Chapters 2, 3 and 4 each conclude with a section (using tables and scoring sheets) on how to apply the information to the reader's own pig herd, marked by a symbol indicating farm assessment sections, and there are instructions on how to design a step-wise action plan to improve pig welfare. These suggestions are, as described in the Introduction, based on repeated scientific studies and testing under commercial conditions; although a caution is offered that there are no guarantees of particular strategies being effective in all situations and readers are advised to consult their veterinarian for expert advice if in doubt.

International applicability of the book is enhanced by a chapter on 'A global understanding of animal welfare' that comprises sections on animal welfare and how it is affected by production systems, legislation, traditions, beliefs and consumer trends in Europe, North America and Canada, South America, Asia and Africa. As sub-sections of a short book these are necessarily fairly brief, which limits their coverage of specific countries within the continents. For example, the section on Europe concentrates on European Union countries rather than the continent as a whole. Also, while most of the regional descriptions focus on pig welfare specifically, the fascinating account of religious and cultural attitudes to animal welfare in Asia concentrates on animals in general rather than pigs in particular, and the section about Australia is similarly broad.

What's good about the book? Firstly, it is quite short (166 pages including Appendices and Index), affordable (available for around £15), quick to read and search for information. It brings together the most recent research and application on a multitude of aspects of pig welfare, and there is a helpful focus throughout on what farmers can do to enhance and improve their pigs' welfare, rather than only a theoretical evaluation of the issues. For the most part, the language and level of detail is carefully aimed at the intended audience (referring to 'your pigs', for example, and defining scientific and technical terms). The book does a good job overall of explaining quite complex science in a simple and straightforward way, starting with the helpful chapter on 'Understanding pig welfare' that, among other

things, explains the differences and relationships between animal performance, animal health and animal welfare.

However, there are a few drawbacks. Firstly, as expected from a short book, it lacks detail, meaning that those wanting to know more about a subject would need to also consult more detailed and in-depth scientific texts. Also, while some chapters include a few references, others have none, and the amount of citations and references is far fewer than would be found in a scientific journal article or standard textbook. This may frustrate readers wanting to know more about a particular subject, finding a mention within the book of 'a scientific study' but not being given any more details such as where the study was done, when, or by whom. This inconsistency also extends to the tone of the writing: while some chapters are carefully aimed at the producer, others read more like abbreviated versions of academic texts. This means that, in places, a little more detail and explanation would have been useful, for example, at the start of the first chapter the term 'affective states' is used in relation to animals' subjective feelings. While this phrase is likely to be familiar to scientists and scholars of animal welfare, farmers would benefit from a brief definition. Finally, and in relation to the fine detail of the book, there are two small irritations: photographic illustrations are integrated throughout, but these are all in black and white and many are very small, which limits their value and can make it difficult for the reader to see what is being illustrated. Also, in a (very) few places, the book would have benefited from a slightly more thorough proof-reading to eliminate mistakes such as missing words and, in one case, table columns being out of synch with the rows.

As a suggestion for a future second edition, the editors might consider including some pig producers as chapter and section contributors in addition to scientists and academics, since farmers are likely to understand best how to write for an audience of their peers. Overall, though, *Pigs Welfare in Practice* is a good book; informative, helpful and likely to achieve its aim of assisting producers in understanding more about the welfare of their pigs and using this knowledge to improve their welfare. It may also be useful for students and scientists who want a quick reference to the most up-to-date knowledge to use as a basis for locating more detailed information.

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