

Book Reviews

Key Questions in Animal Behaviour and Welfare: A Study and Revision Guide

PA Rees (2022). Published by CABI Publishing, Nosworthy Way, Wallingford, Oxon OX10 8DE, UK. 256 pages Paperback (ISBN: 978-1789248975). Price £13.07.

As a lecturer who has recently taken over a large module on animal behaviour partly assessed through multiple choice questions (MCQs) and knowing how difficult it is to write good MCQs, let alone have spare left over for students to practice, I leapt at the chance to review this book.

As the blurb states, it is aimed at students and could be a very good study/revision guide. It covers a range of commonly covered (indeed essential) topics on animal behaviour and welfare and comprises three levels of question difficulty.

While it is all MCQs, there is the opportunity to look up the correct answers in the back, which importantly gives additional detail and rationale to that being the correct answer. Thus, integrating feedback and indeed additional knowledge acquisition.

A broad range of animal categories are used in the examples: companion, farm, wild, zoo and lab, making the content appealing to a range of students. For example, on our modules we have to find examples of relevance to animal scientists, zoologists, biologists through to environmental scientists and agriculture students. There are however some examples that are rather specific to, what I imagine, Paul Rees has used in his lectures. So, if you are a lecturer, recommend this book to your students with the caveat that they are not expected to know all the examples (or, more importantly, that as a lecturer you are not selling them short if you have not given those examples: we might not all have covered comparisons between hippopotamus' and domestic cats' social habits, or equations to calculate indices of association). Explain to the students that this is a learning opportunity to go away and find out more. There are lots of interesting examples, and even as a book of MCQs you are drawn into the quizzes to test your own knowledge and learn more.

The section on issues with experimental design is very good especially for students planning animal behaviour-based dissertations to gain confidence that they understand methods of measurement and experimental design.

Much work has been expended at my university to seek to decolonise the curriculum: to try to ensure that those individuals flagged as key contributors to the discipline are increasingly role models that we can all identify with, from a variety of backgrounds and areas of the globe. We are trying to move away from using names of scientists as 'fathers' of a topic or even key contributors (who knew Darwin had such thoughts about the intelligence of women and other races), so it is worth noting that many scientists are named in the book and

credited with their theories, which could be seen as not embracing the 'decol' curriculum.

Leaving this aside, I will be recommending that our library get copies of this book and hopefully it will be possible to digitalise some of these questions into our Virtual Learning Environment to entice students to use the resource which will help them engage and develop confidence in their knowledge and its application.

Overall, I think this is a very useful book of thought-provoking questions and explanations, helping students and academics alike. The questions are a culmination of a lot of pedagogic enterprise, which is now available for others to use. Well done Paul Rees and thank you for sharing.

Catherine Douglas, Newcastle University, UK

Preslaughter Handling and Slaughter of Meat Animals

Edited by L Faucitano (2022). Published by Wageningen Publishers, PO Box 220, 6700 AE Wageningen, The Netherlands. 436 pages Hardback (ISBN: 978-90-8686-372-3). Price €99.00.

This textbook provides a science-based overview and detailed description of procedures and management typical for the pre-slaughter period, as well as stunning and killing, in several animal species destined for meat production.

The book consists of ten well-written chapters, covering the scientific knowledge about slaughter and the pre-slaughter period for farmed fishes (the animal group slaughtered in highest numbers), mammalian and avian species traditionally included in human diets (cattle, pigs, horses, sheep, broilers, end-of-lay hens and turkeys) as well as minor species, such as game, ostriches, kangaroos and South American camelids.

Across the involved species, the book describes the final phase in the lives of the animals, including aspects relevant for animal welfare, meat quality, hygiene and productivity. The concern for animal welfare is not always given first priority in the written recommendations (eg in terms of pre-slaughter feed withdrawal or use of lairage). This, however, leaves the book practically relevant, as concerns for animal welfare typically do not stand-alone in real life either. Thus, even though it — at first glance — may seem surprising that 'animal welfare' is not included in the title of the book, it is fully justified by the practical approach and the integrated agenda of the book.

As regards to content, the book is divided into three parts — a first chapter reviewing how aspects of animal welfare and stress can be quantified across species by use of behavioural, physiological and carcass/meat quality measures. The second part consists of eight chapters, each covering one or a few animal species, and each describing

typical animal management and handling from pre-transport, through transport, lairage, stunning and killing. Chapter 10 constitutes the third part. This chapter gives an overview of the history of animal slaughter and discusses the use of mobile abattoirs in terms of animal welfare, feasibility and sustainability.

The species-specific chapters are quite diverse and to some extent use different terminology or jargon, but the reader is helped by the use of cross-referencing between chapters. The cross-referencing is particularly advantageous between the more theoretical Chapter 1 and the following species-specific chapters. In general, Chapter 1 is highly technical, focusing on selected indicators of animal welfare and stress but giving limited attention to the concept of animal welfare as such. In the text describing the concept of 'stress', it is defined as "the state of the animal when it has difficulties to adapt to environmental or physical constraints." To the best of my knowledge, there is no single agreed scientific definition of animal stress (it has been debated for decades, and still is), but the definition used in the chapter is different from several others used in animal welfare science today, which means that the chapter, to some extent, is not aligned with other literature in this area. Throughout the text, the chapter seeks to define complicated concepts such as 'emotions', 'cognitive abilities' and 'consciousness', for which textboxes are used, probably to indicate parts that are kind of supra-explanatory. However, this approach is not explained to readers and seems confusing, especially because it is not used in subsequent chapters. The chapter is really information dense, but not all sections seem directly relevant for the understanding of the biology, or welfare, of animals during the last days or hours of their life as meat-producing animals.

Overall, in my view, the content and concept of the book is novel, primarily because the species-specific chapters direct considerable attention to pre-transport, transport as well as pre-slaughter management and describe many procedures or management actions. To date, most textbooks focusing on this stage of animals' lives have either covered handling and transport or stunning and killing, but this book covers it all, thereby providing the reader with an opportunity to learn about the entire process for many animal species. In this context it is worth mentioning that even though the title of the book is 'handling', in reality the text covers so much more than simply how humans handle animals, and this term seems to be used in its broadest sense here.

The species-specific chapters are written by scientists with species-specific expertise, working on different continents, but all focusing on animals kept for meat production. For most chapters, focus is given to animal management typical of one or a few parts of the world (eg the cattle chapter focuses on South and North America) which, as a total, gives the book a global perspective, and also encompasses, for example, extensively raised animals and game species. Each of the chapters contains photographs of different procedures. The chosen pictures seem in no way sanitised,

but show realistic situations, thereby allowing the reader a graphical insight into actions taking place at this stage of the life of the animals, also when animal welfare is threatened as, for example, when cull dairy cows arrive non-ambulatory at markets. However, as pre-slaughter handling and management (and associated legislation) differ considerably between geographical regions and countries, it would have been an advantage for the international reader if the text pertaining to the pictures gave information about their geographical affiliation. A common feature of many of the pictures is their complexity which means that the average reader probably would have difficulty picking up the important points being relayed.

Each of the species-specific chapters can be read independently and provide a solid overview of the typically applied procedures and the knowledge about how these affect animal welfare, meat quality and productivity. The authors specify where the gaps in knowledge are. When reading more chapters, readers gain insight into nuances associated with the procedures that are typical across species, such as the use of pre-slaughter lairage, and the consequences in terms of animal welfare and meat quality.

Even though the book focuses on how animals are slaughtered conventionally, eg traditional livestock species, poultry and fishes, it also includes more atypical meat-producing species (eg farmed cervids or crocodiles), and also animals that are slaughtered in completely different ways, such as free-ranging African game species. In addition, the slaughter of animal categories of traditional meat species, the welfare of which are known to be challenged, such as end-of-lay hens, cull dairy cows or cull sows are also described. This diversity in species, animal categories and types of slaughter makes the book unique and provides the reader with an overview that is otherwise not easy to find. The book, however, does not contain a cross-species discussion of the different procedures in terms of animal welfare.

Across the involved animal species, the book sheds light upon what happens to animals in the interval from being 'on-farm' and until the final journey to the abattoir starts — such as stays at markets, auctions or assembly barns. This phase of the pre-slaughter logistic chain has only received very superficial scientific attention and is often afforded little attention in textbooks on animal slaughter, despite obvious animal welfare challenges.

The species-specific chapters dealing with species traditionally slaughtered for human consumption are primarily based on knowledge that can be referenced back to scientific studies. For the minor species, or animal categories, such as game species, the character of the book changes (maybe because of the very limited scientific literature available), and it is based more on recommendations or practical advice from the authors. In addition, the terminology used in the chapters dealing with the minor species differs somewhat from the others (eg the use of the term 'harvesting' to describe hunting or slaughtering).

From an animal welfare perspective, such de-animalised terms (although probably professional jargon), makes it more difficult for the untrained reader to understand the processes taking place. The chapters describe hunting types that can be controversial (eg, helicopter culling or night culling) from a very functional perspective, but these are not, or only very superficially, discussed in terms of animal welfare.

The last chapter of the book could also have been the first, as this text looks back but also ahead in time. It might, thus, be advantageous to read this chapter first — also from an educational context — since it provides a very nice historical overview of the development from slaughtering single animals to sustain families to the industrial-scale slaughter of today. This is the first time the concept of ethics is introduced; prior to this point animal welfare is mainly described in terms of accommodating requests from consumers. The chapter acquaints the reader with more socio-economical aspects of animal slaughter, including a review of how slaughterhouses emerged as a unique institution in the early 19th century as part of a large transition from an agrarian to an industrial system, accompanied by increased urbanisation and technological advancements, and how they went from objects of city pride to largely being hidden away in large plants, that are seldom or never visited by ordinary people.

This book, however, does the opposite of hiding what goes on when animals are slaughtered for human consumption. As demonstrated above, the book uses words and pictures to describe the involved processes — and is a great example to follow for its openness and transparency. Although the different procedures tend not to be discussed primarily in terms of animal welfare, the manner in which they are presented cleverly integrates concerns related to welfare, meat quality and productivity, imbuing the reader with a concise understanding of why the different processes are performed as they are.

In conclusion, *Preslaughter Handling and Slaughter of Meat Animals* is a comprehensive book that would be a valuable addition to the library of those with an interest in how animals killed for human consumption are managed, and how these processes relate to animal welfare, meat quality and productivity. Parts of the book are not easily accessible due to the high technical level which perhaps preclude its effectiveness as a stand-alone for beginners or a broad readership. For those who can understand the technical terminology (such as students being schooled in animal production) the book offers a unique, open, science-based overview of procedures and practices, and why they are carried out, when different animal species are killed for their meat.

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Much Like Us: What Science Reveals about the Thoughts, Feelings, and Behaviour of Animals

N Sachser (2022). Translated from the German by Ruby Bilger. Published by Cambridge University Press, Cambridge CB2 1SZ, UK. 154 pages Hardback (ISBN: 978-1-108-83849-8). Price: £17.99.

Guinea pigs were how Norbert Sachser found his way into behavioural biology. In the 1970s as a student he was taught that when a population increases and space becomes scarce, stress levels in humans and mammals rise. Individuals become more aggressive, mothers less caring and health declines within the population. This pattern had been observed in mice, rats and rabbits, so young Sachser decided to study it in guinea pigs.

Guinea pigs, however, showed none of the signs of the expected density stress. They seemed happy crowded together in their enclosure. They formed themselves into stable bonded groups of a manageable size and the alpha males in each group rarely fought each other. About this time measuring the level of cortisol, a stress hormone, became available and Sachser's guinea pigs had normal levels whether they were top of or low down in the hierarchy — as long as the group was stable.

What was buffering the individuals against density stress were stable social bonds. Taken out of his group and put in a new group or paired with a strange female, a male guinea pig had soaring cortisol levels. Taken out of the group in the company of a bonded comrade, his stress levels were buffered. Individual behaviour and stress levels were also strongly affected by their early social experience with their own kind. Guinea pigs brought up in large groups could cope better with joining a new group.

To some readers of Sachser's book this will not be news, because studying species-specific societies and stressors should be part of any university's syllabus. However, his theme is to show not just how there has been a revolution in our scientific study of animal behaviour, but also to give a summary of the major changes in our understanding. His relatively short book takes a wide look at the changes and how they occurred.

From Aristotle onwards, human supremacism has seen animals as separate from and lower in value than humans. It is a view still widely held not least because it makes both scientists and non-scientists feel more comfortable in their use of animals for food, research and entertainment. In the early years of the last century it allowed biologists to ignore Darwin's book on animal behaviour, *The Expression of Emotions in Man and Animals*, while reverencing his *On the Origin of Species*, even though this in a different way highlights the similarities between humans and the other mammals.