

The editors make it clear that this is not a compendium of scientific knowledge. It is concerned primarily with policy formulation and a historical perspective is strongly in evidence.

This is a well-balanced and very valuable contribution that deserves to be widely read. For readers of *Animal Welfare*, one of the most noteworthy aspects of the volume may prove to be the bringing together of the welfare aspects of transport, and quality assurance (QA) concepts and procedures. Industries, especially those in the food chain, are conversant with QA schemes and protocols, and researchers in animal welfare might well find it productive to orient their research in such a way that QA recommendations are easily derived from their scientific results. Educators wishing to set scientific results in context will also find it a most useful text.

The quality of the editing and production of this volume is excellent. The illustrations are well-chosen, reference lists are very thoroughly organised and the format makes it very easy to use.

Stephen JG Hall
Department of Biological Sciences,
University of Lincoln, UK

Sustainable Food Production

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Does nature have an intrinsic value? Do animals? How do we know when animals are happy — can we know? What do farmers think and do their opinions matter? What is a sustainable farming system and (how) does animal welfare fit in? Is sustainability itself a moral framework or is it part of a broader set of values? Where do organic farming and GM fit into all this? Does science yield ‘truth’ or is truth itself a socially-negotiated construct?

These are just a few of the questions explored in this volume, a collection of paper contributions to the Seventh Congress of the European Society for Agricultural and Food Ethics held in Vienna last year. For readers working in the fields of animal welfare and agricultural and food ethics — and it is this readership that the book is aimed at — many of the themes explored will be familiar and those they engage with on a daily basis. That said, the papers (nearly ninety of them) span a spectrum of approaches and different readers are bound to find new angles or insights.

The collection is divided into fifteen thematic sections or parts. These range from sections that are highly conceptual, with papers focused on exploring basic ethical values underlying our relationship with and approach to nature and to animals, to those that are more practically-oriented; there are papers that, for example, discuss ways of measuring animal welfare, review the effectiveness of different practices or technologies (such as automatic milking), investigate the legislative context, examine different stakeholder perspectives and highlight practical attempts at

achieving ‘sustainability’ and/or welfare. There are also sections on genetic modification, both of plants and animals, on issues relating to sustainable disease control, and on nature conservation and ethics.

There were some interesting discussions of the core values underlying organic farming and the extent to which these values are made manifest in actual farming practices. There are also explorations of the high value the organic movement places on ‘naturalness’ and what the implications (both positive and negative) might be for sustainability and animal welfare. Several contributors are concerned that when organic systems expand and enter the commercial mainstream they are at risk of losing grip of their core values, and the organic ethos is reduced to matters of compliance with regulations. While these discussions were interesting, I found them frustratingly theoretical and abstract; I would have liked some comparative analysis of specific farms.

Farmer perspectives are also given a voice here in a couple of fascinating papers exploring attitudes to animal welfare. One, (de Lauwere *et al*) reports on interviews with actual farmers (a practical approach that in my view makes all the difference); what emerges is the range of different views held by those so intimately connected with livestock — from farmers concerned only with meeting ‘minimum standards’ to those whose practices are governed by a sense of the intrinsic value of an animal. Most interesting (and perhaps ethically paradoxical) are those who concurrently practice two systems of agriculture on the same farm, with one herd reared to organic or higher welfare standards and the other intensively. Another paper, (Vanhonacker *et al*) finds differences in the importance ascribed to ‘naturalness’ between producers and consumers of animal products, with consumers placing a far higher value on this aspect of welfare.

There are a couple of papers that deal with technology (in its broadest sense, including breeding) and its implications for animal welfare. For example, Huetinck and Driessen note that technology can change the welfare agenda: “A notion such as ‘naturalness’ loses its seemingly solid ground on which to found arguments, for instance when breeding is used to change the welfare requirements of livestock animals. Issues can get reframed and agendas set with different priorities. What is contested and what taken for granted can shift. New experiences are generated and practical knowledge changes in character. And what is considered good practice together with the terms in which it is discussed can all become part of the innovation process”. All this begs the question of what is ‘morally good’ for animals and, indeed, for farming and whether one can know when something is good. Indeed, a number of papers try and get to grips with the moral underpinnings of our attitudes to various animal/sustainability questions — what we value in naturalness, what we mean by sustainability, what we understand ‘animal welfare’ to be. What emerges in many papers is the sense that it is necessary to understand ‘where people are coming from’, as it were. Concerns about, for example, BSE or GM are not just about the immediate issue in question, but about the framing world view that lies behind it and whether this is the morally right way to live and to

relate to other living beings. So, for example, when it comes to farmer concerns about GM — the worries expressed may not only be extrinsic (focusing on the possibility of something going wrong) but rather intrinsic — a sense that it is ‘wrong’ to play God. Indeed, the need to respect public core values comes across particularly strongly in a couple of papers that question the ability of science (and scientists) to deliver ‘socially robust’ knowledge’.

This is of course problematic for those who want to know definitively what makes an animal happy, and what farming systems can meet their needs. One might, in fact, infer from some of the papers that animal welfare is not just about meeting the needs of animals but about making us *feel* that we’re meeting their needs — that our moral conscience needs to be catered for. For example, we value the concept of ‘naturalness’ so this is important irrespective of whether naturalness actively contributes to animal welfare. I personally find this quite problematic but perhaps this is just a problem of expression or unclear phrasing in some of the papers. Perhaps what is actually meant is that ‘science’, however it is defined, can only answer specific questions. What we need is a moral framework within which scientific findings can be situated, and this framework is one that must be developed by a broad range of stakeholders.

In the end, perhaps, this all comes down to the *a priori* nature of human values. Our definitions of animal welfare and of sustainability are themselves shaped by the fundamental understanding of the moral value of nature. This said, one paper argues that one’s initial world view (whether it be anthropocentric or ecocentric) is not itself so important as having contact with nature and increasing one’s ‘environmental literacy’ — that is, our knowledge of the natural world: the author states “...the more people come in contact with, observe and learn about nature, and thereby come to love, respect and care for a wide spectrum of ecological entities, the less importance the different philosophical theories will have for the application of practical ethics”. To know it is to love it. Such an assumption underlies a great deal of environmental outreach work but one cannot help but think that this attitude is itself derived from a particular world view.

As a newcomer to the field of animal welfare (my background is in climate change and environmental sustainability), I learnt a lot about animal welfare by reading this book. However, the collection suffers, in my view, from several major failings, all of which relate to the fact that it offers relatively little on sustainability — despite its title.

For a start, the perspectives presented are entirely those of Western contemporary academics. Dotted here and there one finds the odd snippet of insight into past attitudes to animals and to nature but I would have welcomed more contributions offering analyses of how perceptions of, and attitudes to, animals and the environment have changed over time — and indeed how they may change in the future. More worrying is the entire absence of developing world perspectives. Granted, these papers represent a collection of

contributions to a European Congress but the glaring fact remains that most farmers and consumers are from the developing world and at least half of all the world’s livestock are being reared today in the developing world. Perspectives and analyses from developing world thinkers and practitioners urgently need to be heard. What does sustainability mean in the context of a growing and rapidly urbanising population — a population that is not only expected to reach nine billion by 2050, but which is anticipated to consume far more by way of resource-hungry livestock products? What are the animal welfare challenges in the developing world today, given massive shifts in diet and the shift to more intensive farming practices, and how are the challenges set to change (and indeed grow) in the coming years?

And these questions need considering in the context of increasing pressures on land use, rising food prices, the emergence of the biofuels market and global environmental change. The papers were published in 2007, at a time when some of these issues started to hit the headlines — and, crucially, in the year when the Intergovernmental Panel on Climate Change published its Fourth Assessment report. This report detailed (amongst other things) both the damaging impact climate change may have on agriculture and the contribution of agriculture (particularly livestock) to climate changing emissions. According to an earlier report, published by the Food and Agriculture Organisation in 2006, livestock production contributes 18% to global greenhouse gas emissions. And, by 2050, production and consumption of livestock and livestock products is set to double, with most of this growth taking place in the developing world. Yet, other than a single case study paper exploring the impact of climate change on agriculture, a short argument in favour of veganism, an environmental comparison of organic and conventional poultry farming and a discussion of ruminant farming, there is not really much else in this collection that addresses these pressing issues. None of them do so in a forward-thinking, global, systemic way.

Moreover, while the collection includes papers on animal breeding, these are mostly discussions about the ethics of, for example, breeding hens that like to live in cages. However, in the developed world, particularly those that are Kyoto signatories, research attention is increasingly being focused on rearing livestock that generate fewer greenhouse gas emissions per unit of production. Some of these measures included modified feeding and breeding regimes, and for ruminants, modification of the gut bacteria, vaccinations, feed supplements and so forth to reduce enteric fermentation. These areas of investigation may have profound ethical, animal welfare and sustainability implications. Yet there is a total absence of papers investigating what these might be.

So, to conclude, I enjoyed reading many of the papers in this book and gained a number of useful insights into the nature of animal welfare and the challenges it poses. But, despite its title, *Sustainable Food Production*, collectively, this volume does not really live up to its sustain-

ability billing. It fails to tackle some of the major *global* societal and ecological challenges that we address today, namely climate change, growing populations and pressures on land. I hope that the eighth congress will focus more on these pressing issues.

Tara Garnett

Food Climate Research Network, University of Surrey, UK

The Welfare of Laboratory Animals

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The Welfare of Laboratory Animals is the second volume in Springer's series of Animal Welfare books. Eila Kaliste has edited this book of 14 chapters with more than 20 contributing authors, all experienced European laboratory animal scientists. The book has two main sections: the first six chapters address general aspects of laboratory animal welfare while the following seven are species-specific and the last chapter is a discussion of how animal welfare can be considered under the constraints that the research places on the way animals are handled. The present book is the paperback version of a hardback edition first published in 2004.

This book is a valuable contribution to a field which has lacked an up-to-date comprehensive, yet relatively short, textbook. The author list includes a good balance between laboratory animal veterinarians and ethologists, and all authors are authorities in their field. The more affordable price of the paperback edition is an additional advantage. On the negative side is the fact that the chapters are quite uneven, both as regards content and organisation. Some chapters are extensive and fully referenced review papers; others are more textbook type with few references and, more seriously, the incoherent structure of the chapters on different species makes it difficult to find information. One would hope that for a second edition, the editor will take a stronger role in guaranteeing a more standardised format, with a coherent structure of the species chapters and a clear use of subheadings that help readers who want to look up a particular topic. The reader of the present edition will find it somewhat annoying that the hardback version is used verbatim, resulting in a number of outdated references. In particular, papers 'in press' in 2004 have been published in 2007, and it is awkward to read that the Council of Europe Appendix A is under revision when by now the revision is completed, accepted by the Council of Europe and even incorporated into a European Commission Recommendation! For a future edition, I would also recommend that the book is subject to more stringent language revision by native English speakers, not so much to avoid errors but more for a varied and nuanced English.

The first chapter, 'Animal welfare: an introduction' (Bratbo Sørensen) gives an overview of different definitions of animal welfare, the philosophical views underlying them and the different associated measurement approaches. This approach gives an insight into the philosophical discussion

behind the concept of animal welfare in a clear and accessible manner. This chapter is a very useful contribution, not least because it provides a different perspective without repeating other textbooks on the topic.

The second chapter, 'Research, animals and welfare' (Nevalainen) has the subtitle 'Regulations, alternatives and guidelines', which is what it addresses; in a relatively superficial manner as the chapter is only seven pages. It gives a very brief overview of European and North American regulations, an introduction to alternatives and the potential conflict between reduction and refinement, the importance of cost-benefit analysis and a final section addresses training. The chapter is clearly written and includes key issues: however, if the book aims to be international this chapter needs to also include major Australasian and Latin American countries.

The chapter on 'Infections in laboratory animals' (Nicklas) was a pleasant surprise: rather than presenting the typical list of pathogens and their manifestations, the author focuses on health monitoring and its importance in helping guarantee reliable research results, which makes much more interesting and relevant reading for the non-pathologist.

The chapter, 'Housing, care and environmental factors' (Kornerup, Hansen and Baumans) discusses principles of housing and care starting with the need for standardisation followed by a consideration of the impact of housing on animal welfare. The last section discusses the different international regulatory documents on laboratory animal welfare. The chapter is dense with references to other papers. A minor criticism is that the authors could have made better use of cross-references within the book and within the chapter. For example, the term environmental enrichment is used before it is defined.

'Nutrition and animal welfare' (Ritskes-Hoitinga and Strubbe) is an ambitious review of the topic of almost 30 pages, with many references to scientific papers. Nutritional requirements, different types of diets and how diet composition may affect animal welfare and research results are discussed. The second half of the chapter focuses on natural behaviour and different aspects of feeding: the importance of taking the circadian rhythm into account and how to handle group-housing and individual control of food intake as well as scientific and welfare considerations over fasting. Several illustrative cases of practical problems are given, of which the most prevalent is the general practice of *ad libitum* feeding in rodents.

The chapter 'Experimental procedures: general principles and recommendations' (Morton) also covers a lot of ground, and in some depth. The format is, however, quite different and is the typical textbook chapter with very few references in the text. It addresses handling, administration of substances, removal of body fluids, anaesthesia, analgesia and euthanasia as well as humane endpoints. Although anaesthesia is one of the most complex experimental procedures, the present book is not a handbook in experimental techniques, so maybe spending 15 pages on details on anaesthesia isn't quite the right focus. The recommendations against the use of ether and injectable anaesthetic