

promoting some external purpose, if what one does to it *matters to it, in itself*, even if the action in question does not matter to anyone or anything else. In this view, what is required of anything said to possess intrinsic value is consciousness and some element of self-awareness. In other words, to say that X possesses intrinsic value is to say that what is done to or what happens to X matters to X, even if it does not matter to anyone or anything else. It is thus extremely difficult for me to understand, without retreating into some form of mysticism, how one can say that ecosystems or wilderness areas possess intrinsic value. In my view, sentience is a necessary condition for the attribution of intrinsic value.

To deny intrinsic value to something is not to trivialise it. To say, for example, that oxygen or water possess great instrumental value for living things is not to denigrate the value of oxygen for life. In my view, whatever arguments one may make in support of limiting environmental degradation and despoliation, should not rest upon mystical or religious assumptions that do not accord with common sense. The fact that some environmental ethicists accord consciousness to nature as a whole (cf some versions of the Gaia hypothesis) or even to plants (cf *The Secret Life of Plants*) represents a paradigmatic example of failure to accord with common sense and/or accepted science, and to thereby create a barrier to acceptance of environmental concerns.

As a person whose primary area of scholarship is the moral status of animals and the attempt to provide additional protections for animals used or impacted upon by humans, I particularly value Sandler's inclusion of animal ethics in the discussion of environmental ethics. This has not always been the case. In fact, some fairly extreme environmental advocates go as far as denying any concern for farm animals as, in essence, degenerate human products.

Sandler is too good a philosopher to commit such an egregious error. The book contains a fairly good account of the various bases philosophers have offered in order to ground animal ethics, in addition to environmental ethics. Again, this discussion is clear, lucid, and as comprehensive as possible given limitations of space. Covered in the discussion are consequentialism, deontology, and virtue ethics. Each discussion is enlivened by highly relevant examples. For example, he asks readers to consider cultural traditions sanctifying such practices as hunting as possibly justifying the killing of animals in a manner quite different from trophy hunting or sport hunting.

In all of Sandler's discussions, he is eminently fair to all sides, and avoids incorporating, as much as possible, his own biases into his accounts. As a *sine qua non* for an introductory textbook, this is extremely laudable. Every time I peruse the book, I am struck by how much material, both arguments and examples illustrative of key philosophical points, he has skillfully worked into the discussions. I cannot imagine a better basic textbook in environmental ethics.

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### **Advances in Poultry Welfare**

Edited by JA Mench (2018). Published by Woodhead Publishing, The Officers' Mess Business Centre, Royston Road, Duxford CB22 4QH, UK. 385 pages Hardback (ISBN: 978-0-08-100915-4). Price £124.20.

The poultry sector is very diverse. It includes various species, such as chickens, turkeys and ducks and meat or eggs are produced by purpose-bred birds of very different types. The sector is also diverse in that it is divided in different functional segments (ie selection, hatching, reproduction, rearing, growing, egg laying, transport and slaughter) which are all defined by specific and specialised systems and practices. In the past half century, major changes have taken place in the poultry industry mainly characterised by the intensification of housing systems and specialisation of management (eg optimisation of health-care, nutrition, climate and lighting). Intensive selection also dramatically changed the production capacity of the birds. These changes in production practices and genetic make-up affected the welfare status of the birds dramatically (both positive and negative).

*Advances in Poultry Welfare* nicely covers the diversity of the poultry sector and addresses current welfare concerns and related research in various segments of the poultry industry. The book concentrates on chickens (broilers and laying hens) although some references to ducks and turkeys are made throughout and there is a specific chapter on welfare issues in turkey production. As Joy Mench, the editor, writes, the aim of the book is not to provide a comprehensive overview of research in the area but rather to discuss some of the 'hot topics' in poultry welfare. This selection of topics inevitably causes some disappointment with readers who do not find their favourite topic represented. I, personally, missed, for example, topics like enrichment and the application of technology (precision livestock farming). I also missed a chapter on social science topics. Although there are occasional references to ethics, consumer attitudes, willingness to pay and marketing, these aspects are not thoroughly addressed even if they are essential in the advancement of poultry welfare.

The book starts by giving an overview of commercial poultry production systems and their main welfare challenges. This overview will be much appreciated by those not very familiar with the poultry industry and related welfare concerns. For the non-specialist reader, a little more thorough introduction in animal welfare concepts and theory could have been useful. As a general chapter and to make it more useful for the more advanced reader, it could have included more references to specialised literature on specific issues.

Part two, focusing on management, starts with a chapter on the welfare effects of hatchery practices. This relates to the immediate effects on welfare caused, for instance, by chick handling, beak-trimming and methods of killing. But also concerns interesting (and often neglected) effects of conditions during incubation and hatching (eg lighting, temperature, *in ovo* nutrition, audio stimulation) on, for

example, leg health in broilers, immune function later in life or brain development. Also, topics like ‘at what stage of development does an embryo suffer?’ and sexing of embryos are addressed.

The next chapter focuses on the important effects of early life experiences on the later adaptability of the laying hen. Research in this area is reviewed addressing effects of rearing conditions on, for instance, adult behaviour, musculoskeletal and neuromuscular development and health. This may be specifically relevant for laying hens housed in more complex housing systems where they are supposed to use the three-dimensional space.

The next two chapters review electrical stunning and gas and low atmospheric stunning, respectively. Detailed information is given about measures of unconsciousness, the pros and cons of the different methodologies and the current status of development of alternative stunning methods.

The third part of the book deals with on-farm welfare assessment with one chapter focusing on the application of outcome based measures mainly referring to three poultry assessment systems: Welfare Quality®, Assurewel and AWIN. Together with information on actual application of outcome-based measures and the opinion of users, this chapter gives a good overview. The other chapter in this part focuses on the individual animal: behaviour of birds that are sick or in pain. It also addresses decision-making and methods relating to euthanasia.

Some continuing welfare challenges in poultry production come up for discussion in part four. This includes a chapter on skeletal problems in laying hens, which doesn’t simply provide basic information on bone growth but also a lot of detail on keel-bone damage. In another chapter the various aspects of feather-pecking and cannibalism are highlighted, asking the question ‘can we really stop beak-trimming?’ Another question addressed in this part of the book is about stocking density and space requirements and how to assess these needs (including factors that complicate this).

Basic background and evolutionary principles of social behaviour are provided in a further chapter. It makes clear that a basic understanding of social behaviour is crucial to implementing management strategies that reflect the nature of the birds’ social behaviour and allow optimal welfare. The information here is fairly dense. A specific chapter addresses the welfare issues in turkey production, such as fearfulness, injurious pecking, stress related to transport, foot-pad dermatitis and leg abnormalities as well as factors affecting these issues.

In a chapter on sustainability of laying hen housing systems, hen welfare is put in the larger perspective of environment, food safety, worker health and safety and economics. Although it has some overlap with earlier chapters, this is an interesting contribution.

The fifth and last part of the book highlights some emerging issues. One chapter deals with pest management. It rightly stresses that parasites affect animal welfare and control

approaches and options should be included in discussions about the adoption or change of production systems. The chapter provides an excellent introduction to this relevant area.

Genetic approaches to improve resistance to viral and bacterial diseases and heat stress are reviewed in the next chapter. The continued development of new technologies increases efficiency and accuracy of genomic approaches over classical genetic approaches and important contributions to poultry welfare are expected.

The increase of backyard poultry-keeping is another emerging issue and is considered in the following chapter. Various welfare concerns related to housing and management, health and biosecurity and behavioural problems are addressed. But also challenges related to food safety, municipal regulations and access to information and veterinary resources are discussed.

The last chapter is on mass depopulation and gives an excellent overview of the different methods and their welfare impacts.

The contributing authors are all well-respected experts in their area and the chapters generally maintain a high standard of information, including new and recent results and with ample references. The book is very useful for students in poultry welfare science, but established scientists and practitioners will also find it interesting reading. The photographs and figures are relevant and generally of good quality.

I consider *Advances in Poultry Welfare* a most welcome and relevant contribution to the assessment and improvement of poultry welfare.

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### **Advances in Cattle Welfare**

Edited by CB Tucker (2018). Published by Woodhead Publishing, The Officers’ Mess Business Centre, Royston Road, Duxford CB22 4QH, UK. 282 pages Hardback (ISBN: 978-0-08-100938-3). Price £138.

Worldwide cattle production systems are growing in size and intensity in response to growing demand for milk and beef, principally in developing countries. This is suspected of having adverse effects on the animals’ welfare, to the concern of the public in much of the developed world at least. This book attempts to address the latest developments in assessing and monitoring cattle welfare. Most of these are in Europe, and the Western focus of this book is slightly regrettable when 55% of the world’s cattle are in Asia and Africa alone (FAOSTAT 2018).

The book contains laudable attempts to identify and describe cattle needs from a scientific perspective — do they need access to pasture, how much space do they need and what for? This begs the question: what can be done about declining welfare in ever-intensive cattle units worldwide? A chapter by Schutz *et al* acknowledges that