

disjointed feeling. In addition, while many of the topics discussed in the book are of interest on their own and may give a general background of the development of the industrialisation of agriculture, it is often hard to see their immediate relevance to animal welfare.

An example of this is Chapter six on contemporary animal agriculture that deals with subjects such as ‘Social disruption’, ‘Lower real estate values’ and ‘Mental health’ but does not mention animal welfare at all (literally, I could not find the word welfare in the entire chapter). Similarly, the chapter ‘Symbiosis of plants, animals and microbes’ is only remotely connected to animal welfare, as are the chapters on ‘Chemical food safety’ or ‘Competition between animals and humans for cultivated crops’. While none of these are uninteresting subjects, I would have expected a book on animal welfare to at least make an attempt at linking them to animal welfare.

A second problem with many of the chapters that only touch on the concept of animal welfare is that they often contain a fairly naive or at least unconventional approach to animal welfare. The chapter on ‘Crop and animal processing wastes’, for example, states that “These wastes are used to produce soap, cosmetics, candles, paints, methane, ethanol, and many other products that improve the welfare of food animals globally by enhancing efficiency of feed utilization and total food and feed production for a burgeoning human population” (p 20). It remains unclear what the link between either feed utilisation and animal welfare, or feed production and animal welfare is.

There are chapters in the book that are more central to animal welfare, eg the report on the PEW commission (a Philadelphia-based public charity). While most of that report deals with subjects more relevant to human health (eg food inspection agencies or [human] food safety), there is also a section on animal welfare that contains a number of recommendations specifically aimed at improving the welfare of animals, eg the banning of gestation stalls and battery cages. The chapter also briefly mentions both the five freedoms of FAWC as well as the four principles of Welfare Quality®.

Finally, there are also parts of the book that deal directly with animal welfare. The chapter ‘Defining agricultural animal welfare’ is a very useful one, as well as being well written. In it, six different points of view are presented, from the ethicist and scientist to the industry and activist. While you may agree or disagree with the different views on animal welfare it is a treasure trove for anyone who wants to provoke their students into a heated debate. Each subchapter is long enough to give the author the possibility to develop their point of view but short enough to force them to be concise and to the point, which makes the chapter very readable.

Another part of the book that treats animal welfare is the chapter on assessing animal welfare and implementing animal welfare programmes which, amongst other things, contains a short list of nine general outcome-based measures that may be useful for assessing animal welfare. Most of these are concrete and comparatively easy to assess, eg cleanliness, coat condition, sores.

The book also contains a short overview of the production systems and possible animal welfare problems of, respectively, swine, poultry, dairy and beef cattle. The section on swine production systems endorses the use of gestation crates which, at least from a European perspective, is controversial (in the EU there will be a ban on gestation crates from 2013). The section would have benefited from a more balanced review of the available evidence concerning gestation crates as well as the welfare relevance of stereotypies. Unfortunately, there is also a factual error; pigs in Denmark are still being castrated (more than 98% of them) in contrast to what it says in the chapter. The sections on cattle and especially the one on poultry are less controversial, as well as being more balanced in their approach to the advantages and disadvantages of factors influencing production.

The overall emphasis of the book (but not of every chapter) is a defence of the use of animals in agriculture and research. When discussing animal welfare, the benefits of one individual is often weighed against the cost to another individual, in this perspective the benefit of the use of animals is relevant. However, I was somewhat surprised that it forms the major part of the book rather than being a review of different aspects of animal welfare, whether it would have been the philosophical theories for animal welfare, practical measures of animal welfare or factors influencing animal welfare. With the exception of the three chapters mentioned above, the treatment of animal welfare is very superficial.

If you are interested in various aspects of animal agricultural production then this book may be of interest to you. If, on the other hand, you are looking for a book on animal welfare, and animal welfare research I would not recommend buying this book.

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### **Veterinary Treatment of Llamas and Alpacas**

GR Duncanson (2012). Published by CABI Publishing, Nosworthy Way, Wallingford, Oxon OX10 8DE, UK. 224 pages Hardback (ISBN 978-1-78064-006-8). Price £75.00, US\$145.00, €100.00.

*Veterinary Treatment of Llamas and Alpacas* consists of 17 chapters and 248 pages and is concerned, unsurprisingly, with South American Camelids. The so-called New World camelids are: the domesticated llama (*Lama glama*), alpaca (*Lama pacos*), and the wild counterparts the guanaco (*Lama guanicoe*) and the vicuña (*Vicugna vicugna*). Dr Graham R Duncanson approaches the key aspects of the veterinary treatment of these species in a highly organised and systematic fashion. For a variety of reasons, South American Camelids are unique and very worthwhile studying. Throughout Europe, breeding has become increasingly common. Of particular interest is their adaptation to life in arid mountainous ecosystems where cold winds sweep without mercy.

The scope of the book is ambitious and it manages to deal with many aspects succinctly. For example, toenail problems are

noted as being prevalent outwith the species' natural habitat and, as such, regular trimming is advisable. An obvious point, perhaps, but a crucial one given that these animals are adapted to life on hardened ground. This book offers short, precise recommendations for many of the infectious, traumatic, nutritional and husbandry needs that are specific to South American Camelids. Criteria regarding vaccination and specific toxicities should be considered with care when different potential habitats are taken into account. The increasingly widespread distribution of both domestic species make it hard to suggest a single, unifying husbandry protocol.

South American Camelids are considered an interesting new farming species throughout the world and the population is estimated to be close to 3 million, with the majority found in the South American countries of Peru, Chile and Bolivia.

In both North America and Australia, an estimated population of 60,000 animals are farmed, whilst in the UK current estimates suggest around 10,000 domesticated camelids.

Camelids have a further appeal on account of their fine fibre and, in some instances, their recreational use (backpacking, exotic pets). Therefore, clinical disease and pathology will relate specifically to the level of management. Hence, South American Camelids present a unique challenge in terms of their welfare criteria and this book largely skips this issue. However, it remains a useful entry text for veterinarians seeking an insight into the husbandry and biology of these exotic species.

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