

Chapter 5 on data collection. This chapter discusses more general issues surrounding data collection, although it does not specifically address issues surrounding the collection of animal health, livestock disease or epidemiological data. Chapter 6 by Viscarra and Rushton considers livestock data collection methods and there is some overlap with the previous chapter but arguably insufficient consideration of the type of data needed for economic analysis of animal health issues and the challenges and costs involved in collecting such data. Chapter 7 provides some more basic economic theory followed by an example of applied analysis relating to Foot and Mouth Disease (FMD). The chapter contains a useful section on uncertainty and risk and provides a broad presentation of some specific tools such as optimisation techniques (eg linear programming) and examples of various specific computer-based livestock models. Chapter 8, by Andrew James, on modelling and information, briefly reviews the strengths and weaknesses of some epidemiological models and other aspects of modelling techniques and the prospects for future development of models to guide decision-making. This includes consideration of risk. Chapter 9, by Alistair Stott, specifically considers optimisation methods to help decision-making for endemic diseases. It provides a useful, if brief, technical summary and review. The paucity of data for comprehensive analyses is noted. Chapter 10 provides further basic economics concerning markets, market analysis, cost-benefit analysis, mathematical programming and value chain analysis, again providing a useful introduction and 'taster' for the reader but without a comprehensive treatment, so that the reader would need to explore these topics further to obtain a full understanding. Chapter 11, by Martin Upton, provides some more economic theory relating to market analysis and policy analysis, with brief sections on tools, techniques and models such as mathematical programming and computable general equilibrium models. Chapter 12, by Rushton and Leonard, presents the new institutional economics approach to consideration of the role of government and animal disease control followed by Chapter 13 which provides a broad consideration of social and cultural factors. These two chapters provide the reader with a broader perspective of the role of economics and social science disciplines to animal production and health. Alex Shaw presents some useful practical considerations relating to the economics of zoonoses and their control in Chapter 14. Part I ends with a chapter on livestock populations and production systems with case studies in Central and South America and Nepal.

Part II provides a wide-ranging literature review of the application of economics to animal diseases and health problems. Chapter 16 covers what the author considers to be the main livestock diseases globally, including FMD (which the author describes as "probably the most important disease in the world in terms of economic impact"), anthrax, tuberculosis, salmonella, brucellosis, trypanosomiasis, bluetongue, echinococcosis, rabies, paratuberculosis and others. Chapters 17 and 18 consider diseases of large and small ruminants, respectively, whilst

Chapter 19 considers diseases of pigs and Chapter 20 diseases of poultry. These chapters provide useful overviews of major diseases globally, both for the veterinarian and non-veterinarian and especially for those not involved in livestock disease at a global level. The chapters contain reference to research literature on prevalence/incidence and economic impacts of each disease which is particularly useful as an introduction to relevant literature for those wishing to further consider the economic impacts of any of the particular diseases covered.

Part III contains a series of, in some cases very short, chapters giving examples of animal health challenges and policies from around the world. They include chapters by Otte and Pica-Ciamarra with an overview of livestock policies for poverty reduction in developing countries, Redmond and Beck on the difficulties of policy-making in Northern Ireland, Hernan Rojas on animal health and trade in Chile, Bonnet and Lesnoff on the use of economic analysis with epidemiological and geographical models to aid decision making for control of Contagious Bovine Pleuropneumonia in Ethiopia, Vinod Ahuja on veterinary service delivery for smallholder livestock farmers and C Devendra on economic analyses and policy issues relating to three crop-animal system case studies in Indonesia. These contributions provide interesting practical insights into the considerations required for policy-making.

The book ends with a brief conclusions section in which the author finally concludes that the economics of animal health and production requires a holistic or systems perspective which combines analysis of the political economy, economic incentives, social acceptability and technical feasibility of disease control measures and programmes.

As a whole, the book provides a large amount of very interesting, informative and useful material both for the economist and non-economist and especially for those wishing to have a better understanding of what role economics and economic analysis can play in the consideration of livestock disease control. If there is a criticism, it is that the material is sometimes rather disjointed and fragmented, and whilst some aspects are covered more than once across the different authored chapters, the contributions are not always well integrated. Nevertheless, there is a dearth of books that cover the topics contained within this one and for that reason, together with the breadth and diversity of material, I would recommend this book to those with an interest in livestock production and health, globally.

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Ethical Futures: Bioscience and Food Horizons

Edited by K Millar, P Hobson West and B Nerlich. Published by Wageningen Academic Publishers, PO Box 220, 6700 AE Wageningen, The Netherlands. 445 pp Paperback (ISBN 978-90-8686-115-6). Price €59.00, US\$88.00.

This is a broad-ranging book on ethical issues connected with the food and agriculture industries. It is divided into

13 themes, and the main topics are food ethics, environmental ethics, food security, teaching bioethics and veterinary ethics, the ethics of biotechnology, ethical perspectives and values on climate change, sustainable agriculture and the organic food sector. There are three leading papers, and 69 short (five page) papers from a total of 142 contributors, the majority of whom are from applied ethics, animal science, food science, agricultural economics, and philosophy departments at Universities or Institutes in Europe.

This book will be of most value to teachers in applied ethics. It should provide ideas on how to structure teaching and deliver general principles without over-indulging in fundamental philosophy or over-emphasising the role of ethics teaching in problem resolution.

There are some papers of direct interest to animal welfare. Vonne Lund explored the extent to which the four *prima facie* principles of biomedical ethics (autonomy, non-maleficence, beneficence, and justice) can be applied to animal care. Tjard Buning examined cultural differences in animal use and what the term 'natural behaviour' means and includes. There were two papers on animal protection legislation, from Austria and Norway, and five papers on the structure of teaching bioethics and veterinary ethics. Stef Aerts and colleagues gave a considered analysis of the ethics and practice of male chick destruction in hatcheries. Some more unusual topics included the ethics of animal use in obesity-related research, can killing be justified ethically on the grounds that animals can be replaced, and the ethical advantages of producing meat *in vitro* instead of using live animals.

Some interesting chapters which fell outside conventional animal welfare science included an engaging discussion of how natural law theory can support ethical matrices by Roxanna Lynch, and Raymond Anthony's article on why individuals in society do not make morally responsible choices, especially food choices. Helena Röcklinsberg debated the repercussions of decreasing greenhouse gas emissions through manipulation of animal production and how this could affect future directions in livestock farming. Ariane Willemsen discussed the moral obligations society has towards plants.

Fourteen papers reported original research findings and these were often surveys from postgraduate projects. Amongst these, was a timely paper from Nina Nissen on European perceptions towards USA-style enhanced meats. Richard Lee gave a discerning paper into the ways international standards are established by epistemic groups (networks of professionals with expertise in a topic). The case example he described (dietary fibre considered by the Codex Alimentarius Commission) had little direct bearing on animal welfare, but the lessons learnt in terms of how standards are negotiated, how risks are assessed, and how conflicts between technical and policy needs are addressed, were revealing.

To summarise, this book brings together a diverse group of authors and topics. There is likely to be something of interest to anyone involved with animal ethics but, because of the diversity, an individual's interest may be confined to a limited number of papers in this book.

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Principles & Applications of Domestic Animal Behaviour

EO Price (2008). Published by CABI, Wallingford, Oxfordshire OX10 8DE, UK. 336 pp Paperback (ISBN 978-1-84593-398-2). Price £29.95, €47.05, US\$59.95.

This book is based on EO Price's research and teaching during 36 years at the University of California, Davis and at the State University of New York in Syracuse. His own research has been mainly on rat behaviour and reproductive behaviour in cattle, sheep and goats. The book is meant as an introductory textbook for university students. However, I think it may also work well on a Master of Science level, when students have had only a short introductory course in behaviour.

The book focuses on the development of behaviour, to which he has devoted four chapters, and social behaviour, which has eight. However, the social chapters are on areas as diverse as reproductive behaviour, maternal and neonatal behaviour, and different aspects of social behaviour such as communication, agonistic behaviour, social organisation, personal space and social dynamics. The chapters on development cover the interaction between heredity and environment, behavioural genetics, early experience and behavioural development and learning. There are also chapters on more diverse areas, for example, biological rhythms, human-animal interactions, animal handling and atypical behaviours.

I find the book very well organised and well written. It is easy to read and the author provides many examples throughout the book. There are a lot of relevant photos, drawings, figures and tables to illustrate what is written in the running text. There is also a nice connection to other areas relevant to behavioural science, such as physiology, genetics and production. There are many examples of how housing and management affects the behaviour of farm animals, with good examples of what functions well and what doesn't for animals in captivity.

The text deals with many aspects of animal welfare, even though this does not appear to be the author's aim. For example, there is a section describing how sheep can be protected from coyotes and wolves by using different species of dogs. Here, he also brings up practical examples of using llamas or burros as protection against predators. In the social chapters, he provides many examples on how communication and knowledge about how rank orders function can help animals in different situations, thus giving examples of how welfare can be improved by changing the methods of, for example, feeding the animals. However, animal behaviour does not always have to deal with animal welfare. There are many instances when behaviour in itself is important for production as, for example, in reproduction where the author gives examples of how rearing of piglets in isolation can alter their subsequent performance of sexual behaviour, thus leading to low mating success.

If there is anything lacking from this book it would be a chapter on motivation and particular environmental factors