

tions are not clear in this text. For example, in many regions of the world, subclinical intramammary infections with *Staphylococcus aureus* remain as a major challenge for optimal udder health and milk quality. In most of these situations, a picture to depict this problem would be a relatively normal udder, with perhaps one smaller quarter, as opposed to the image shown in Plate 4.5. In a similar context, the information provided on coliform mastitis is lacking in detail and emphasis for the magnitude of the problem in some regions of the world.

In various sections of the book, it is evident that the authors are most familiar with free-stall cubicle housing systems with milking parlours that are used in Britain. It could be suggested that there is not enough emphasis on tie-stall systems that still predominate in many parts of the world, and on robotic milking systems that have gained huge momentum, in regions such as Scandinavia. Throughout the book, there are a number of other minor oversights in detail and emphasis.

On the subject of intramammary infection and clinical mastitis as a major animal welfare concern for the dairy industry, this book largely missed the mark. In the opening paragraphs, the authors state that their objective is to achieve a thorough understanding of mastitis, and by so doing, reduce the levels of infection, improve the economics of dairy production, and benefit cow welfare. However, throughout the remainder of the text, the authors fail to address the specific issue of animal welfare concerns related to mastitis. There is no mention of work being done to quantify the state of cow welfare in dairy production systems. The topics of animal welfare audits, or foods certified as being produced in a welfare-friendly system, are not described. To the authors' credit, they have included an extremely well-done chapter on 'The environment and mastitis'. This chapter focuses on stalls, bedding, yards and various other environmental factors. It is largely concerned with keeping dairy cattle clean in various production systems. Yet, in so doing, general welfare concerns are largely addressed.

On the subject of pain associated with clinical mastitis, the authors have not specifically addressed the topic. There is no mention of landmark research conducted in Britain to quantify the perceptions that various individuals have toward the level of pain that is inflicted by veterinary procedures, or that is endured by animals affected with different clinical ailments. In this research, mastitis was considered to be relatively high on the list of painful conditions. In the section on therapy for clinical mastitis, the authors describe the use of non-steroidal anti-inflammatory drugs for the treatment of inflammation in severe clinical mastitis. Yet, there is no mention of the control of pain by this therapy. The authors would contend, and rightfully so, that there are no drugs approved for the control of pain in cattle with mastitis, and as such, it should not be discussed. However, the authors do not seize a great opportunity to discuss this subject. In so doing, they could have emphasised that veterinarians, dairy farmers, and herdpersons should use means

available to them to influence regulators and pharmaceutical companies to address this situation.

In summary, *Mastitis Control in Dairy Herds* is a useful addition to currently available resources on mastitis and udder health management. The entire subject area is covered in considerable detail, and with generally appropriate emphasis. Readers should note that there are regional differences that might be important as to the relevance of the information provided to their personal situation. As for the impact of mastitis on dairy cow welfare, this book does not provide either new insight or avenues for further dialogue.

Ken Leslie

Department of Population Medicine, University of Guelph, Ontario, Canada

Biology of Breeding Poultry

Edited by PM Hocking (2009). Published by CAB International, Wallingford, Oxon OX10 8DE, UK. 464 pp Hardback (ISBN 78-1-84593-375-3). Price £95.00.

Over the past few decades, breeding poultry have undergone intensive selection for higher productivity and improved feed conversion. The management systems and feeding strategies for breeding birds have also developed in parallel with the genetic changes, but a comprehensive documentation of literature on these aspects of breeding poultry is seriously lacking. In this context, this book, edited by PM Hocking of the University of Edinburgh, UK, is a valuable contribution. The book is based on papers presented at the 29th Poultry Science Symposium held in Edinburgh in July 2007.

The book is organised into eight parts, each containing several chapters dealing with different key aspects of poultry breeding. The first part sets the scene by providing overviews of the genetics of modern commercial poultry and developments in the management of breeding poultry. Developments in genetic improvements in terms of quantitative genetics and transgenesis are discussed in Part II, including a short review on prospects for sex determination in poultry. The two chapters in Part III discuss in depth two aspects of interest, namely endocrinology and ovarian follicular development, in the reproduction process.

Mating behaviour and basic biology of sperm fertility have received little attention in recent decades. These issues are discussed in Part IV, where the relevance of sperm competition in fertilisation success is also detailed. As the growing period of broilers continues to shorten, the quality of day-old chicks has become increasingly important to success of poultry meat production. Chick quality is determined largely by egg- and incubation-related factors, which are dealt with in detail in Part V. These are described in a very clear and simple manner. There is also an interesting section on broodiness, which can be a nuisance in commercial breeder systems, and broody control.

The first two chapters in Part VI deal with managing the environment and present practical aspects relating to lighting management and environmental enrichment of breeders. The

third chapter in Part VI introduces the breeding biology of ratites, game birds and minor poultry species, and does not fit in with the theme of ‘managing the environment’.

Despite the positive effect on health and reproduction efficiency, there is substantial evidence that feed restriction, especially during rearing, has adverse effects on broiler breeder welfare. In Part VII, a chapter providing an exhaustive review on feed restriction is included, which highlights not only the science behind restricted feeding but also potential approaches to lower its welfare consequences. As a nutritionist, it is pleasing to see two well-written chapters on the nutritional requirements of breeding poultry are included. In particular, models described for protein utilisation in breeders are useful.

The title of Part VII (health and welfare) is misleading because the three chapters in this section deal only with health aspects. The first two chapters give an overview of vaccination and immune protection of the neonatal chick. In the final chapter, the author describes and discusses various potential strategies to managing current disease challenges in breeders. Although welfare-related issues have been covered under different topics, a separate section on this critical aspect would have been a valuable addition. However, this criticism aside, the editor must be congratulated for compiling an up-to-date overview of this extremely complex area.

My overriding conclusion is that this is a necessary and essential book about the biology of breeding poultry. The extensive bibliography, with citations up to 2007, is provided after each chapter for readers requiring further information on the areas covered. A detailed index is appended and will be useful to locate specific terms. This book will be of great value to researchers, university teachers, technicians and students of poultry science. Those involved in the commercial industry will also find it useful because of the wealth of information provided.

V (Ravi) Ravindran

Massey University, New Zealand

The Behaviour and Welfare of the Horse, Second Edition

AF Fraser (2010). Published by CAB International, Wallingford, Oxon OX10 8DE, UK. 256 pp Hardback (ISBN 978-1-84593-629-7). Price £75.00.

The Behaviour and Welfare of the Horse is the second edition of the popular text *The Behaviour of the Horse*. The new, revised edition builds on the foundations set down in book one and continues to be a comprehensive information source on all aspects of domestic horse behaviour. A common and welcome theme throughout this book is the emphasis the author places on the practice of using behaviour to inform and guide management practices. For example, Fraser states in Chapter 1: “It follows that horse welfare is axiomatic, that the management of each horse should be in accord with its particular individualism and, therefore, that knowledge of equine behaviour in general is fundamentally required in modern horse care”.

The text naturally reflects the author’s considerable knowledge and expertise within the fields of veterinary health, ethology, welfare and horse husbandry. Much of the content from the previous edition has been updated and expanded in line with the broader animal welfare literature. Frequent references are made to the horse’s behavioural needs alongside the author’s opinions on the humane treatment of the horse. Of particular relevance to readers with an interest in welfare are the comments on specific welfare issues added at the end of many of the chapters.

The seven sections in the first edition have been reorganised into 16 chapters, each with more images, tables and bullet points improving readability and navigation. In addition, a useful Glossary of terms has been added which aids reference.

The first three chapters focus on behavioural development and the biological basis of behaviour. Chapter four is titled ‘Behavioural homeostasis’ and introduces equine maintenance behaviour and its relevance to behavioural well-being. The following five chapters then examine in detail ingestive behaviour, body care, kinetic behaviour, spatial factors and finally, rest, work and transportation. New to the second edition are advice sections on feeding, grooming and the housing of equines. Whilst this practical advice is an interesting addition it does not appear to fit succinctly with the ethos of the preceding chapters that are concerned primarily with behaviour and welfare. Furthermore, the advice presented is often traditional and not necessarily in line with methods that reflect best practice and current research. For example, straw is described as “the best bedding for horses” and indeed preference tests have shown that horses will choose straw over shavings or paper (Mills *et al* 2000). However, there was no mention of the drawbacks of a straw bed on respiratory health.

The chapters titled ‘Breeding function’, ‘Mare/foal dynamics’ and ‘Foal function and welfare’ will appeal to anyone with an interest in breeding and stud management. Breeding function contains valuable information on the sexual behaviour of the mare and stallion during in-hand and free-range breeding. Two insightful chapters on the mare and the foal then follow and include detailed information on the mare’s normal behaviour pre and post parturition, the behaviour of the neonate and the development of the foal through to weaning. There is a strong emphasis on foal well-being during weaning and the importance and benefits of early training on later life experiences.

The function and importance of play behaviour on development are highlighted in the following chapter alongside a balanced discussion on the significance of social behaviour and its importance to well-being. Fraser concludes this section nicely by commenting on the impact that the social group has on development and states that “young horses need the company of other horses to learn how to be completely equine”.

The following section examines the influence of humane control and husbandry on health and well-being throughout the lifetime of the adult horse. The majority of this chapter